

AN ABSTRACT OF THE THESIS OF

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Title: EXAMINATION STRESS AND COPING FROM A COGNITIVE-

PROCESS PERSPECTIVE

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Abstract approved: _____

Dr. Carol Sisson

This study was designed to determine whether or not students' emotions and coping would change during stages of an examination. If changes in emotions and coping were recorded at different phases of an examination, then these findings would substantiate the position that stress and coping are processes. In addition, the research attempted to determine whether or not mediating factors would influence students' reactions to the examination encounter. The mediating factors that were examined were personality traits, cognitive appraisals, stress emotions, and coping strategies.

One hundred-seventeen student volunteers from four sections of college mathematic classes participated in this study. They were asked to complete four sets of questionnaires on their reactions to tests.

The instruments used for measuring personality traits were The Reactions to Tests Scale (Test Anxiety), the Rosenberg Self-esteem Scale,

and the Test Efficacy Scale. Emotions were assessed with the Stress Emotions Scale; cognitive appraisal was measured by The Stakes and Difficulty of the Examination Scale; and coping was assessed by the Ways of Coping Checklist.

Eleven hypotheses were tested in this study. The statistical procedure for the first two hypotheses was the T test. In addition, a Pearson Product-Moment Correlation was computed to test for significant relationships for the remaining nine hypotheses. Regressions were used for variables which showed significant correlations with the personality trait measures in order to explain variations in emotions. Seven of the null hypotheses were rejected. The following conclusions were drawn from the study:

1. In some respects, stress and coping can be defined as a process.
2. The mediating factors, appraisal and coping, did influence the students' emotional reactions to the examination.
3. The mediating factor, personality traits, did influence the students' emotional and behavioral reactions to the examination.

In view of the findings, it is recommended that:

1. Further research be conducted on examination stress in order to convincingly substantiate that stress and coping are processes.
2. Counselors and educators in higher education develop testing procedures that facilitate students' test-taking ability.
3. Counseling services in higher education be designed to enhance the performance and comfort level of highly test-anxious students.

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Examination Stress and Coping
from a Cognitive-Process Perspective

by

Michaele E. Grina

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Typed by Marcia House for Michaele E. Grina

DEDICATED
TO MY
BELOVED MOTHER

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The death of my mother made last year the most stressful year of my life. Working on my doctorate, after an absence from school for over twenty years, has not made my life any easier. So, it seems only fitting that I extend the first acknowledgment to myself for displaying true grit under arduous conditions. My mother's unwavering belief in me is now alive and well within me.

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EXAMINATION STRESS AND COPING FROM A COGNITIVE-PROCESS PERSPECTIVE

CHAPTER I: INTRODUCTION

Stress, as a psychological concept, has been dealt with in a variety of ways. It has been defined as a stimulus, such as a major life event, i.e., divorce or retirement (Holmes & Rahe, 1967); as a response representing emotional tensions, i.e., anxiety or fear (Mechanic, 1962); and as a cognitive process which focuses on the perception that an event is construed as threatening or harmful (Lazarus & Folkman, 1984). This present study is based on the cognitively-oriented, process-centered theory of stress and coping developed by Lazarus and associated (Lazarus, 1966, Lazarus & Folkman, 1984).

Only one study currently exists describing this process approach to stress. A recent study in examination stress by Lazarus and Folkman (1985) has contributed considerable insight into describing how complex thoughts, feelings, and actions are played out in a specific stressful setting. They focused on changes in stress and coping during the examination. These investigators looked at ways students as a group responded to the examination, as well as their responses as individuals. Their findings from the students' reactions established a case for viewing stress as a process. Shifting patterns of thinking, feeling, and coping were recorded, as well as large variations in the students' responses. The perceived difficulty of the examination and the degree of investment in the outcome

of the test were the measures used to explain the large individual differences recorded (Lazarus & Folkman, 1985). Personality factors were not considered as mediating variables in their study.

Recent evidence suggests the event itself does not necessarily cause stress nor does the concept of stress as a response explain all stress events (Pearlin, 1981). The process approach, as defined by Lazarus, considers the occurrence of stress as being shaped by a complex interplay between the person and the event. The person can influence the event and the event can influence the person. Emphasizing a bi-directional relationship takes into account the characteristics of the person on the one hand, and the nature of the event on the other. Lazarus' process view of stress adds the concept that features of the person and the event interact to influence the meaning and management of a potential stressful encounter (Lazarus & Folkman, 1984).

It appears no research has been directed at describing and predicting how the mediating variables - thoughts, feelings, coping strategies, and personality traits interact and shape the course of a specific encounter. This present study will be directed toward describing and predicting how the mediating variables - thoughts, feelings, coping strategies, and personality traits interact and shape the course of a college mid-term examination.

Need for the Study

Cognitions in stress research had been undervalued in prior

research. Another important feature of Lazarus' theory, besides the interactional properties of the person and the event, is that cognitive activity mediates the stress encounter. How people think, feel, and act shapes the approach, reaction, and outcome to the stressor event (Lazarus & Folkman, 1984).

Little is known of the manner in which these mediating variables are interrelated and how they interact with the stressful event. What is needed is to specify the contexts in which stress and coping are presumed to occur in order to begin to address how events become stressful (Pearlin, 1981). There has been a paucity of investigations into the natural contexts in which the mediating processes could be observed unfolding (Coyne & Lazarus, 1980). What is needed is to expand the focus of stress research to ordinary stressful events, such as examinations, which represent one form of a common stress episode.

The conceptual basis of the present study on examination stress emerged from Lazarus and Folkman's (1985) beginning steps in studying reactions to being evaluated. Thus far, reactions to examinations from a cognitive-process perspective have been based on this singular study of 189 college students previously mentioned. To generalize about reactions to evaluation conditions, it is important to replicate and expand their findings.

In order to arrive at a more complete understanding of the large variations to test reactions recorded by Lazarus and Folkman (1985),

this study will also examine how personality traits come into play. There is support for the position that personality traits influence an individual's perception of both the nature of the stressful situation and the ability to meet it (Sarason, 1984).

This study will consider the importance of the personality trait, "test anxiety," as it relates to the individual's perception and performance under examination conditions. According to Sarason (1984), "test anxiety is a widely studied personality variable, in part because it provides a measure of ... one important, definable class of threatening situations, those in which people are evaluated" (p. 929). Test anxiety is a pervasive problem for college students, as people's lives are, in part, determined by test performance. Studies have repeatedly demonstrated that people with high test anxiety react with low performances in evaluative situations (Spielberger & Sarason, 1978). Spielberger (1972) contends that although examination situations are stressful and evoke anxiety reactions in most students, students with high test anxiety will experience the test situation as more threatening. Furthermore, the highly-test-anxious student's emotional responses will be more intense and more self-critical than students with low test anxiety.

Recently, Sarason (1984) did a series of studies expanding on how anxiety influenced thoughts and performance under test conditions. An anxious student was defined as a person engaged in irrelevant thoughts while being evaluated. Irrelevant thoughts referred to

thinking which interfered with concentration on the content of the test. The findings showed that irrelevant thoughts were strongly related to lower performance for highly-anxious people (Sarason, 1984). In this respect, a personality factor, anxiety, was linked not only to how the situation was being perceived, but also its outcome. Including the additional mediating variable, personality trait, in this present study, helps to explain the complex ways people experience and cope with stress.

In order to account for the complex and various reactions inherent in stressful situations, a process-oriented stress management model needs to be developed. No such model presently exists (Lazarus, 1984). Lazarus' stress theory assumes mediating factors will influence individual reactions. For example, not every person should be expected to respond in a similar fashion to any one stress-management technique, nor does any one technique work in every context. One study on test reactions illustrated this principle (Sarason, 1984). Highly-anxious people were found to be distracted from focusing on the content of the test because of irrelevant thoughts. Sarason concluded any technique would be useful if it aided in bringing the subject's attention back to the task at hand. A one-dimensional model that attempted to manage test anxiety by guided fantasy, for example, would be ineffective with this type of person in this particular situation. The fantasy could then serve as a short respite that is refreshing and invigorating to some students; however, others would be stimulated to perpetuate their habitual pattern of distracting themselves from concentrating on

preparing for the examination. By detecting these differences in reactions, Sarason's work leads to the possibility of developing training aids that could help worry-prone people attend more completely to their assigned tasks.

Statement of the Problem

Before a process-oriented stress management model can be developed, researchers need to continue more systematic efforts in studying how stress and coping work in test situations. The object of this study is to investigate the findings that stress and coping can be defined and measured as a process in an examination setting (Lazarus & Folkman, 1985). This present research on examination stress is based on a cognitively-process-oriented theory (Lazarus & Folkman, 1985) which characterizes stress and coping as a process; thereby, predicting inevitable flux and change during the course of a stressful episode.

A mid-term examination provides an appropriate context for systematically observing process and change as the examination unfolds. Three stages are identified in keeping with the concept of process adhered to in this study. The three distinct stages are the following: Time I - an anticipatory stage which covers the preparatory time before the examination; Time II - a waiting stage, which occurs after the examination and before the grades are announced; and Time III - an outcome stage after the results are learned. According to Lazarus (1985), these three stages will delineate a shifting pattern of cognitive appraisal, emotional reactions, and coping

strategies as the three stages of the examination unfold.

This present study will attempt to describe and predict how the group of students under investigation reacted to the examination; as well as account for individual differences. Variations in reactions will be examined on the basis of the mediating variables of thoughts, feelings, coping strategies, and personality traits.

The Objectives

The objectives of the study are as follows:

- 1) To examine changes in stress and coping as the examination process changes
- 2) To examine predictors of emotional reactions to the examination
- 3) To examine the ways personality traits influence emotion and coping

Definition of Terms

Appraisal (Thoughts)

Cognitive appraisal refers to an individual's thinking processes. Lazarus and Folkman (1984) define stress as the outcome of primary and secondary appraisal.

Primary Appraisal

Primary appraisal refers to how a person construes the significance of an event with respect to well-being. A person evaluates

the encounter as enhancing, neutralizing or endangering one's happiness. Three forms of stress appraisals are: threat, harm, and challenge. Threat refers to anticipated harms or losses; harm refers to damage the person has already experienced; and challenge refers to events that hold the possibility for mastering, or the opportunity for growth. The level of stress experienced will increase with threat and harm appraisals (Lazarus & Folkman, 1984).

Secondary Appraisal

Secondary appraisal is a judgment of what coping resources and options are available and appropriate. The thoughts of "what can I do" come into play when there is a primary appraisal of harm, threat, or challenge. Coping resources can be called upon from the physical, social, psychological, and material domain. The level of stress will increase when an individual believes coping resources are not available or inappropriate to the demands of the situation (Folkman, 1984).

Emotions

Emotions are a direct result of how people appraise their ongoing transactions in any particular context. As a person's appraisals of a transaction change; so, too, will his or her emotions. Lazarus had suggested that emotions therefore correspond closely to the appraisal of the event (Folkman & Lazarus, 1985).

In this study, thoughts and emotions are considered interdependent. Certain emotions are indicative of threat, challenge,

and harm appraisals. Threat appraisals generate the emotions: worry, fear, and anxiety. Challenge appraisals are linked to the emotions: confidence, hopefulness, exhilaration, being pleased, eagerness, happiness, energy, and excitement. And harm appraisals signal the emotions: disappointment, anger, sadness, guilt, and disgust (Folkman & Lazarus, 1985).

Coping

Coping is defined as the cognitive and behavioral efforts to master, reduce and/or tolerate the internal and external demands created by stress transactions (Lazarus, 1984). Such coping efforts serve two main functions. Coping that is directed at managing or altering the problem is called problem-focused coping. Some examples are: drawing on past experiences in an effort to understand the problem better, or doubling one's efforts to make things work. Emotion-focused coping refers to coping efforts that change a person's feeling about the stressful transactions. Emotional distress can be managed or reduced by detachment or focusing on the positive (Folkman, 1982).

Coping as a concept is typically associated with successful efforts in dealing with stress. In this study, coping will be viewed as efforts to manage stressful demands, regardless of whether they help or hurt the person. No coping strategy is inherently better or worse than any other, according to Lazarus (1984). Drawing on past experiences, a problem-focused coping effort may be helpful in certain situations and/or at certain stages of the stressful

episode.

Personality Traits

Trait measures are concerned with person characteristics that transcend situational characteristics and reflect stability in how people think, feel, and act in general. This study will be limited to examining the influence of only three personality traits: test anxiety, self-esteem, and test efficacy.

Test Anxiety

Test anxiety, as used in this study, represents a combination of cognitive and physiological responses and is experienced when all four of the following responses are present: recorded tension, worry, irrelevant thinking, and bodily reactions, as defined by the Reactions To Tests Scale (Sarason, 1984). A distinction needs to be made between the trait-test anxiety and the state-of-test anxiety. This study is concerned with students' anxious responses to tests in general, not to the state of test anxiety towards this particular examination.

Self-esteem

In this study, self-esteem refers to the positiveness of one's attitude toward oneself, which may give rise to feelings of confidence in one's ability to overcome adversity (Fleishman, 1984). To measure self-esteem, subjects were asked the ten items comprising the Rosenberg (1965) Self-Esteem Scale.

Test Efficacy

Test efficacy, as used in this study, refers to a person's ability to take tests in general. To measure test efficacy, students were asked to respond to four items comprising the Test Efficacy Scale (Cooley, 1986).

Limitations of the Study

The following limitations were considered before any generalizations or inferences could be made from this study.

1. The subjects in the study were freshman and sophomore students, which may limit the results to that particular educational level.
2. The investigations use self-report measures. Even though they are the most common methodology in stress and coping research, Lazarus and Folkman (1984) contend they possess three weaknesses:
 - a) Subjects only reveal what they wish to reveal and may not divulge their real feelings and thoughts.
 - b) Subjects are influenced by their unique habit of language and introspection.
 - c) Subjects may respond with perceptions, attitudes and feelings they do not really have.
3. The study does not reveal whether changes in emotions and coping in reactions to tests can be generalized to other evaluation conditions.
4. The study is limited to student volunteers and, therefore, does not reflect reactions from all the students in the four classes studied.
5. Uncontrollable variables, such as health background differences

and unrelated stresses of the subjects, may influence their responses and performance.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

In this section, the following issues are discussed: the historical background on stress and coping; a definition of stress and coping from a cognitive-process perspective and a summary of some of the key contributions and limitations of stress research to date. Stress is considered a pervasive part of the human condition, with the potential to endanger the well-being of us all (Lazarus & Folkman, 1984). However, researchers only agree on the existence and deleterious effects of stress. Although researchers agree on the existence of stress, there is general lack of consensus of a definition of both stress and coping. More questions than answers are raised, such as how and when do we perceive events as stressful; what accounts for the same stressful conditions affecting some and not others; and how can we protect or buffer against stress. Educators and counselors desire to learn about the stress process in order to buffer or manage its physical and psychological consequences such as somatic illness, depression, anxiety and other forms of psychological distress. Helping professions are also concerned with improving environmental adaptation in the family, at work, and in life satisfaction in general.

Recent trends in research favor studying how stress and coping work in natural settings (Lazarus & Folkman, 1984). In this context, the major objective is a better understanding of the meaning and

measurement of stress and coping (Pearlin, 1981). The major goal of these investigations is not only to describe but predict, and ultimately control, distressful outcomes.

Historical Background on Stress

Historically, there has been confusion and disagreement on the meaning and measurement of stress. The two broad domains of sources of stress to be discussed here are the following:

- 1) life events: e.g., divorce, retirement, death of spouse
- 2) specific events of everyday life: e.g., moving, time constraints, examinations

Life Events

In the search for sources of stress, considerable interest and research in life events research dominated the literature in the 60's and 70's. In the publication Life Events Survey (1961), Holmes and Rahe weighted key life events likely to arouse stress. The principle operating in this design consists of the view that as the number and severity of recent life changes increase, so does the likelihood of physical and psychological distress in the form of illness, depressed moods, and anxiety. Linking life events to illness offered the promise of an objective assessment of stress. An impressive number of studies have demonstrated associations between individual past stressful experiences and their current physical and psychological functioning (Holmes & Masuda, 1974; Rabkin & Struening, 1976). Much of the life work has been discussed and reviewed by the Dohrenwends (Dohrenwend &

Dohrenwend, 1974, 1981). According to the Dohrenwends (1974, 1981), the evidence of a causal link between life events and illness is less clear than the earlier and more favorable findings suggest. In recent investigations, researchers have pointed out that there is a great deal of variation in the reactions of individuals to similar life events. Johnson and Sarason (1979) report:

The correlation coefficient between measures of life stressors, illness and psychological distress are typically below .30, indicating that only about 10% of the variances between these variables is being accounted for (p.49).

Other limitations of life events research are reviewed elsewhere (Dohrenwend & Dohrenwend, 1974, 1981); (Rabkin & Struening, 1976). The problems to be considered here are how the life events approach is limited in accounting for individual differences and how events become stressful.

In regard to the first limitation of life events research to be discussed, Johnson and Sarason's (1979) findings, mentioned above, suggest the variations recorded may account for individual differences. These findings have led to the recent trend of exploring characteristics of individuals that moderate the negative effects of stress. The recognition of the importance of mediating variables signals a radical departure from conceptualizing stress as a static event.

The second limitation of life events research to be considered is the explanation of how life events become stressful. These theorists base their understanding of the stress response on the

assumption posited by Selye (1956) that the organism is intolerant of change. This view holds that the natural state of the organism is one of equilibrium between inner and outer forces. When changes occur, normal functioning is affected and disequilibrium results. In order to readjust, the organism needs to reestablish homeostasis. During the readjustment phase, a struggle ensues to recapture a sense of harmony. This struggle, which can be wearing and taxing, leaves the organism vulnerable to stress (Selye, 1956).

Selye's reasoning assumes change leads to dysfunction. However, change is a normal and inevitable condition of life. According to Pearlin (1981), this assumption is no longer accepted in explaining the mechanism of the stress response. It has been documented that individuals faced with a multitude of significant life events changes demonstrate no perceivable negative effects. Findings by Tobin and Lieberman (1976) and Roscow (1967) show that many old people who are physically ill and incapacitated are happy and function well. Based on the life events scale, which rates illness high, people who are chronically ill have been considered prime candidates of stress. A distorted picture of the actual outcome would have been created by following the life events approach (Lazarus, 1984).

It appears that the life events model fails to consider mediating factors such as the power of the personal significance of an event and the influence of varying coping resources and practices. The life events survey, which classifies and weights major life events omits many important and provocative events. In a study by Lazarus on aging, an inverse relationship was found between life scores and age

(Lazarus, 1980). Can it be that the frequency of major life events changes decreases with age, as this finding implies? Conditions such as loneliness, limited energy, an unresponsive milieu and lack of meaning or purpose (unavoidable and inevitable in certain segments of the aged population) are not covered on the life events scale.

There is now general consensus that the intensity of stress cannot be adequately predicted solely from the occurrence of key life events (Pearlin, 1981). The study of life events alone is not an adequate measure to describe and predict the process and outcome of all stressful experiences. Therefore, it becomes important to probe for mechanisms that explain the connections between events and stress. The question of how events become stressful remains unanswered. Given that the event itself does not necessarily cause stress, recent investigations have taken the direction of observing combinations of mediating factors affecting the relationship between the stressor event and the person. To one person, a move would represent a step up in status and the belief in a rosy future. For another, a move might represent one step towards the poorhouse and a feeling of despair. Little is known of the manner in which various components of stress are interconnected to form this process (Pearlin, 1981).

Moderating variables that form a relationship between the event and the person have taken on great importance and relevance in this quest for a more accurate, versatile description, and means of measuring stress (Pearlin, 1981; Lazarus & Folkman, 1984). With the recognition that mediating variables are at play, greater emphasis

shifts from a static to a process concept of stress, allowing flux and change. This supplemental model would need to take into account variability over time, allow for individual differences, and measure changes in the quality and meaning of the stressful episode.

Current stress and coping research has generally ignored moderating variables. There has been a paucity of investigations into the natural settings, or contexts, in which these processes could be observed unfolding (Coyne & Lazarus, 1980).

Specific Events (Daily Hassles)

An alternative approach to conceptualizing and measuring stress is one that supplements the life events strategy and focuses on specific events of everyday life. Lazarus and his colleagues refer to this concept as "daily hassles" - those frustrating and distressing demands and relationships that are a source of bother (Lazarus & DeLongis, 1983). Some of these hassles, such as sick children, car repairs and long commutes are passing and others are repeated. Lazarus and his associates designed a Hassles Scale to measure both the frequency and intensity of "daily hassles," which includes items such as misplacing and losing things and not having enough time (Lazarus & DeLongis, 1983). Many hassles have little to do with life events. The inclusion of daily hassles as a source and measure of stress adds a distinct contribution to the field. The two approaches, life events and daily hassles, serve supplementary roles in the measurement of psychological stress according to Lazarus (Lazarus & DeLongis, 1983).

Focusing on events that occur in the normal course of everyday lives can give a new perspective and insight into naturally-occurring stress and coping. This model is clearly in its infancy, yet shows promise in providing a sounder understanding of the nature of stress phenomena (Coyne & Lazarus, 1980).

Historical Background on Coping With Stress

Trait Approach

Historically, coping has been given limited attention. The life events perspective ignored coping resources and treated stress and coping as unrelated. Traditionally, social science has ignored ways of avoiding harm. Coping has fallen under the domain of a clinical approach where it has been regarded as individualized defense mechanism against threat (Lefcourt & Martin, 1986). In this context, coping ability has been judged solely on the possession of personality characteristics that help people defend against external threats. Coping effectively was equated with having the right personality characteristics which enabled one to deal with life problems effectively (Lazarus, Averill & Opton, 1974).

In the trait approach, which dominates coping research, the concern is with personality traits that influence coping responses. The assumption is that individuals with different personality styles will cope differently; a study by Kabasa (1982) illustrates this principle. Her premise was that a "hardy" person, characterized as having a greater sense of control, commitment, and more oriented to challenge, can endure high stress without falling ill. The sample

consisted of two groups, one with high stress, as measured by the Holmes and Rahe (1967) life events list, that had fallen ill; the other with high stress but free of illness. Her findings did support the notion that different personality styles will cope differently, but her method of assessment does not actually describe coping processes. Based on personality measures, she inferred that the "hardy" executive would "throw himself into" a stressful situation (like a job transfer) without specifying what he would actually do (Kobasa, 1979). Did he work overtime, bring work home, or eliminate all social life? If the executive coped with challenge at work by exhibiting hardiness, one would expect if challenged at home he would "throw himself into" the domestic problem. The problem with the Kobasa (1982) study is that it does not describe the actual coping processes of the two groups.

Another problem related to the trait approach is found in a study of surgical patients. Lazarus and Cohen (1973) measured how much the patients knew about their illness and its treatment and how much interest they had in learning more. Patients varied along a continuum of knowing very little and not wanting any more information, to knowing a lot and wanting more information. The standard trait measure used was the repression-sensitization scale designed by Byrne (1964). These findings showed no correlation between the trait measure and what these patients did in the actual surgical threat. Some patients, identified as repressors, recovered from surgery with ease and speed; however, so did some of the more sensitive patients (Lazarus & Cohen, 1973).

Measures of coping traits underestimate the complexity and variability involved in coping efforts. The two previous studies were concerned with linking a trait to a predicted outcome. What is missing with this trait approach is establishing a relationship between a trait, actual coping efforts, and the outcome of those coping efforts.

Another major limitation of the trait approach is the built-in assumption that people behave consistently across all situations and over time. However, substantial consistency has seldom been found in personality research (Bowers, 1973; Ekehammer, 1974). Trait measures, by definition, have a one-dimensional quality which inadequately captures the multi-dimensional essence of actual coping processes. For example, the possible tasks found by people coping with physical illness include dealing with pain, hospitalization, treatment procedures and rehabilitation (Moos & Tsu, 1977). It is difficult to see how the unfolding nature of most stressful encounters and the inevitable changes in coping can adequately be described by measures of a static trait (Folkman, 1982). In summation, the treatment of coping simply as a static trait, or personality style, has resulted in severely limiting the possible range of actual coping thoughts and behaviors.

Situational Approach

To account for variability over time and individual differences, Lazarus and his colleagues have adopted a situation-oriented approach to assess coping. People are requested to describe how they cope with

the demands of a specific situation; e.g., fatigue, traffic congestion, not enough money (Mechanic, 1962). The situation approach permits a description of complex coping thoughts and actions. Shifts in strategy can be observed and detected as the situation changes (Folkman, 1982). The results of this approach, including the accuracy of prediction, as yet cannot be determined as it is in its beginning stage of development. Only a few studies have been conducted which assess changes in coping across time (Folkman & Lazarus, 1985). The method and results of one of these studies will be discussed in the next section.

Traditionally, a large domain of stressful experiences and coping responses has been ignored. A more dynamic model is needed which takes into account the variability of the sources of stress, explores the connections between events and the person experiencing stress, and measures actual coping responses to contribute a greater understanding of this phenomenon.

A Current Definition of Stress

This dissertation is based on the cognitively-oriented, process-centered theory of stress and coping developed by Lazarus and his associates (Lazarus, 1966; Lazarus & Folkman, 1984). Cognitions in stress research had been undervalued in prior research. An essential feature of this theory is that cognitive activity mediates the stress encounter. How people think, feel, and act shapes the approach, reaction, and outcome to the stressor event.

Lazarus has reworked the concept of stress to emphasize the dynamic and relational properties existing between the person and the event. He borrowed, then refined, the ideas of a dynamic state and an orchestrated process orientation from the pioneers in the field (Wolff, 1953; Selye, 1956). In Lazarus' research, the attention was directed away from considering only the event as the stressor or what was happening within the organism, toward observing the ongoing relationship between the person and the event. This view allows the transactions to be bidirectional by introducing the potential of interplay and feedback. The person and the event mutually influence each other. Emphasizing this relationship takes into account the characteristics of the person on the one hand and the nature of the event on the other. In order to determine if stress is occurring, the context of the situation needs to be considered. Lazarus draws on all of these elements to define psychological stress "...as a relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). Therefore, the judgment that a particular person-environment relationship is stressful depends on the cognitive appraisal.

Cognitive Appraisal of Stress

According to Lazarus, in order to understand and control the effects of stress, the appraisal of the event to the individual needs to be known (Folkman, 1984). The meaning is determined by the cognitive appraisal process. These processes help the person evaluate the significance of what is happening to his or her state of

well-being. At the psychological level, appraisal provides information through which one's sense of well-being is judged to be in jeopardy. Lazarus identifies two major forms of appraisal:

- I. Primary Appraisal; i.e., what is at stake
- II. Secondary Appraisal; i.e., what can I do

Primary Appraisal

Primary appraisal refers to how the person construes the significance of the event with respect to well-being (Lazarus & Folkman, 1984). In other words, what is at stake or at risk is considered. The person evaluates the encounter as enhancing, neutralizing, or endangering one's happiness.

Lazarus identifies three major forms of stress appraisals as threat, harm, and challenge. Threat refers to anticipated harms or losses; harm refers to damage the person has already experienced; and challenge refers to events that hold the possibility for mastery or the opportunity for growth (Lazarus & Folkman, 1984). Marriage, parenthood, work and school could be perceived as triggering threat, harm, and challenge sequentially, as well as simultaneously.

Two studies will serve to demonstrate the powerful role played by cognitive appraisal in affecting the stress response. In a study by Lazarus and his colleagues, subjects watched films that showed people being harmed. Each subject's subjective distress level, as well as automatic disturbances, were monitored. One group was encouraged to view the films as damaging and painful, while the other group interpreted them by distancing. Sound tracks and statements

made before the film were the methods used in manipulating the appraisal. The findings showed that both physiological and subjective stress response levels were affected. The group influenced by the painful message showed higher physiological disturbances and stress response levels (Folkins, Lawson, Opton & Lazarus, 1968).

Additional evidence that differing appraisals influence coping and emotion is drawn from the following study. Subjects were requested to watch a brutal boxing match. One group was encouraged to view the film as fictitious, thereby generating detachment; while the appraisal of the other group was not manipulated. The film was appraised as less violent by those in the denial-like manipulation group (Geen, Stonner & Kelley, 1974). Both of these studies demonstrate that an individual's subjective interpretation of a stressful encounter mediates the stress response level.

Secondary Appraisal

Secondary appraisal is defined as a judgment of what coping resources and options are available and appropriate (Folkman, 1984). The thoughts of what can I do come into play when there is a primary appraisal for harm, threat, or challenge. What can I do translates into coping resources in the physical domain; how can I get more energy or stamina to finish this task, or what can be done to ward off this cold. An example on the social level is who can I enlist for support. Psychological resources encompass beliefs that sustain hope, skills for problem-solving, self-esteem, and morale. Emphasizing positive thinking and learning assertiveness training represent resources in

this area. Finally, material assets such as money, tools, and equipment can be useful resources in times of stress (Folkman, 1984).

From a research standpoint, little is known about how secondary appraisal plays its mediating role (Folkman & Lazarus, 1980). In a natural stress transaction, these appraisals are considered quite complex to track. There exists no adequate taxonomy of coping processes in measuring the personal and social resources that can be mobilized (Coyne & Lazarus, 1980). What is known is that both primary and secondary appraisals converge to shape the meaning of every encounter.

Person Factors That Influence Appraisal

Lazarus' theory explains that commitments and beliefs are among the most important "person factors" affecting cognitive appraisal (Lazarus & Folkman, 1984). Commitments refer to values and goals that are deemed important to hold meaning for a person. An encounter is bound to be significant if a strongly-held commitment is at stake. For example, an examination may be stressful for a student because the outcome could threaten the ideal of being a good student, as well as a long-term commitment to a desired profession.

A wide range of general beliefs (cultural) and specific beliefs (personal) is also relevant to appraisal; however, beliefs about personal control are of particular interest in stress theory (Lazarus & Folkman, 1984). Beliefs about personal control concern the extent to which a person assumes he or she can exercise control

over an outcome of importance. According to Rotter (1975), these beliefs have their greatest influence when a situation is ambiguous. In the absence of clear information, the person resorts to making inferences about what is happening. These inferences are influenced by personal factors such as personality traits, beliefs, and commitments (Shank & Abelson, 1977).

Archer's (1979) study on trait anxiety illustrates the influence of ambiguity. In a shock-avoidance experiment, he found that a personality trait, namely anxiety, played a role in influencing outcome results. In the ambiguously-structured treatment, subjects had no information as to the method and degree of control they exercised over being shocked. Under these ambiguous conditions, subjects with low trait anxiety reported a significantly greater expectancy of avoiding shock than did those with high trait anxiety. Whereas, under clearly defined conditions in terms of method and degree of shock, subjects with high and low trait anxiety did not differ in expectations of avoiding shock (Folkman & Lazarus, 1984).

Situation Factors that Influence Appraisal of Stress

Situational factors also create the potential of an individual appraising an encounter as stressful. For example, ambiguity is characteristic of many, if not most, real life situations. Rarely does a person know exactly what is expected of them, what is going to happen, and what are the consequences of their actions. Research on ambiguity is surprisingly limited, (Folkman, 1979), even though in daily living ambiguity is likely to be the most common and

important source of psychological stress. The greater the ambiguity of the situation, the greater is the potential for harm, threat, and challenge (Folkman, 1979).

Additionally, an ambiguous situation adds complexity to the meaning of a stressful transaction by generating multiple appraisals. Initially, the prospect of a divorce might appear positive; it may represent the opportunity of getting out of a bad situation. As the legal proceedings progress, both the harm of immediate financial loss and the threat of a custody battle may be concurrent themes. The idea of starting a new partnership may be construed as a challenge, or a threat, or both. Complicated appraisals depend on moment-to-moment interplay of the situation, personality factors, and cognitions (Folkman, 1979).

Discerning the meaning of a transaction can be further complicated by these shifting appraisals as the encounter unfolds. A study examining three stages of a college mid-term examination found significant changes in appraisals across time (Folkman & Lazarus, 1985). They assessed the presence and degree of threat, challenge, and harm appraisals by measuring the emotional state of the subjects. The sequence of feelings reported reflected the changing meaning, or significance, of what was happening. Ways people think about a stressful situation affect how they respond emotionally and how they cope (Folkman, 1979).

Emotional Factors Influencing Appraisal of Stress

Traditionally, emotions have been treated separately from

cognition. However, in Lazarus' theory, thinking and feeling are intertwined. For example, depending on the nature of an encounter and its appraised threat, a person might experience foreboding or worry. An appraisal of challenge might evoke eagerness or excitement; an appraisal of a harmful encounter might elicit anger, disgust, or disappointment (Lazarus, Kanner & Folkman, 1980).

Lazarus suggests certain emotions are indicative of threat, challenge, and harm appraisals. He uses the above-mentioned examination study to observe how threat, harm, challenge appraisals, and emotions associated with them change during the course of the examination. For example, threat appraisals generate emotions such as worry, fear, and anxiety. Challenge appraisals are strongly linked to feelings of confidence, hopefulness, and eagerness; harm appraisals signal anger, sadness, disappointment, guilt, and disgust (Folkman & Lazarus, 1985).

Lazarus and Folkman predicted that emotions indicating challenge, threat, and harm appraisals would change during three phases of the examination: an anticipatory stage which covered the preparatory time before the examination (Time I); a waiting period which occurred after the examination and before the grades were posted (Time II); and an outcome stage after the results were learned (Time III). During the anticipatory stage (Time I), emotions reflecting challenge and threat were expected to be most intense and then to decrease in intensity as the examination proceeded to the outcome stage. During Time I students do not know exactly what is expected of them

or what will actually happen during the examination, nor what the outcome will be. Since harm appraisals are evaluations of an event that has already occurred, they expected emotions reflecting harm would be least intense at Time I and become more intense during, and right after, the outcome phase (Time III) (Folkman & Lazarus, 1985).

The findings substantiate their theoretical position that as a person's appraisal changes so, too, will their associated emotions. Threat and challenge emotions, such as worry and confidence, were elevated at Time I and II and decreased significantly at Time III. Threat and challenge appraisals are considered to be anticipatory as they deal with what is to come. One is more likely to be worried, or hopeful, before the examination than after. Harm emotions, such as disappointment and guilt, increase significantly from Time I to Time II and remained high at Time III.

Harm appraisals are considered to reflect outcome concerns, such as performance, and evaluation. Guilt and disappointment would be more likely to surface after the examination than before it. Without a way to measure for variation during the course of this examination, the observed changes in appraisal and emotions would have been ignored and a complete picture of the transaction would be missing. These changes recorded during the examination episode, strengthen Lazarus' theoretical position that a stressful encounter can be viewed as the unfolding of complex processes rather than as a static event.

People are rarely passive in the face of what happens to them. They seek to change things when they can, and when they cannot, they seek to modify the meaning of a stressful encounter. Appraisal and coping are essential features for a complete analysis of this process (Lazarus & Folkman, 1984). Research on stress has not adequately accounted for the influence of coping, giving only a limited and distorted view of this function. As mentioned in the previous section in more detail, the definition and measurement of coping has represented a weak link because investigators have tried to assess coping as a trait, giving little attention to actual strategies for regulating or changing the stressful situation. So far, trait measures have failed to predict how people react over time or across a variety of stressful transactions (Lazarus & DeLongis, 1983).

Lazarus' process-oriented approach to coping expands the importance and significance of this concept. How a person manages a variety of specific stressful encounters and how changes take place in these transactions is considered.

Only if we observe a person over time and in diverse contexts can we confidently take the next steps of integrating our observations about coping into generalized concepts of trait or style and of identifying stable individual differences in coping competence. (Lazarus & DeLongis, 1983, p. 147)

Lazarus argues that one needs to describe the dynamic quality of coping, which will then provide more complete assessment measures. Coping is characterized in Lazarus' view by change. One might first engage in denial-like strategies in a threatening situation, then

decide to seek support from others but, finding no satisfactory solution, might try to analyze the problem in order to understand it better. The coping efforts attempt to change an encounter construed as stressful. In his model, not only does appraisal of a situation change constantly as a result of changes in the person-environment relationship, but coping can change constantly as well. Coping, then, is viewed as a complex process.

Using this cognitively-oriented theory, coping is defined as the cognitive and behavioral efforts to master, reduce and/or tolerate the internal and external demands created by stress transactions (Lazarus & Folkman, 1984). Such coping efforts serve two main functions. Coping that is directed at managing or altering the problem is called problem-focused coping. Some examples are analyzing the problem in an effort to understand it better, or making a plan and implementing it. The second main function, emotion-focused coping, refers to coping efforts that change a person's feeling about the stressful transaction. For example, emotional distress can be managed or reduced by wishful thinking or distancing (Folkman, 1982).

In Lazarus' model, no coping strategy is considered inherently better or worse than any other. Coping behaviors which are effective in one situation may not be effective in another. Coping strategies that may be beneficial, given moderate or temporary use, may be harmful if relied upon exclusively. The evaluative effectiveness is determined by the outcome. Effective coping in a specific encounter requires dealing with the source of the problem, as well as managing one's emotions successfully (Lazarus & Folkman, 1984).

In a typical stressful event both of these coping functions are employed. In fact, Folkman and Lazarus (1980) discovered in their study of coping in a middle-aged community sample, that a variety of both problem-focused coping and emotion-focused coping were represented in over 99% of more than 1,300 stressful encounters. In assessing these coping processes, they used the Ways of Coping Checklist, which surveyed what a person thought, felt, and did in a variety of specific encounters. Some examples of how this 68-item checklist categorized coping responses included problem-focused items such as "got the person responsible to change his/her mind" and "made a plan of action and followed it." Emotion-focused items included items such as "try to forget the whole thing," as well as "pray" (See Appendix F).

Lazarus and Folkman's (1980) findings indicated that most encounters generate multiple coping strategies from both problem-focused coping and emotion-focused coping. Moreover, the type of encounter significantly influenced the pattern of coping. Stressor events that were work related generated higher amounts of problem-focused coping. Health-related events generated higher amounts of emotion-focused coping (Folkman, 1982). These findings support the cognitively-oriented model of stress that claim how the event is appraised is the most important factor in account for coping variability. These coping patterns can possibly be explained in the following way: a work-related event might most often be appraised as permitting one to do something constructive by mastering or altering the situation. If one resolves the trouble through problem-focused efforts, there is no longer any reason to be threatened. Whereas, a health-related

episode might most often be appraised as having to be accepted. In confronting an illness, tasks to be managed and tolerated are feelings of anxiety, fear, dread, and protecting one's self-esteem (Folkman & Lazarus, 1980). Although these emotion-focused coping efforts do not change the situation, the goal is to change the person's feelings about the episode to a more favorable emotional reaction (Folkman, 1982).

The transactional quality not only of coping patterns but also emotions and appraisals are highlighted in this study of coping in a middle-aged community sample (1980). Emotion, appraisal, and coping are observed mutually influencing the individual's reaction throughout the encounter. What is characterized is an ongoing relationship of reciprocal action, each affecting and in turn being affected by the other. This study focused on the complex ways people coped over a variety of stressful events; i.e., health, work, and family. What was yet to be examined was the complex ways of coping and the ways coping changes as a single episode unfolds. Attention has not been given to the ways most people cope with ordinary stressful events nor to describing the dynamic quality of coping. Coping literature has neglected a description of how coping efforts are ordered in time and how coping changes and shifts as the stress encounter develops (Folkman & Lazarus, 1980).

Lazarus and Folkman's (1985) study on examination stress, previously mentioned, served as the vehicle for investigating types of coping, as well as changes in coping during a single episode. The

subjects in this study indicated on a 68-item Ways of Coping Checklist the specific coping strategies used during each stage of the examination. Each item was classified as either problem-focused or emotion-focused. The authors categorized all possible coping activities available to the subjects into a maximum of eight types of coping (See Appendix F).

At least 94% of the subjects employed both problem-focused and emotion-focused strategies at each of the three stages; thereby substantiating the notion that people do, indeed, cope in complex ways. Moreover, the findings reveal a widerange of coping strategies are used at each stage. On the average, the subjects used between six and seven different types of coping (Folkman & Lazarus, 1985).

Changes in coping strategies were also demonstrated as the examination unfolded. Problem-focused coping, seeking social support, emphasizing the positive, and self-isolation, decreased significantly in use, while distancing increased significantly in use from Time I to Time III. Time II to Time III was marked by significant decrease in use of wishful thinking and distancing strategies. The authors speculate that problem-focused coping was at its height at Time I, the anticipatory stage, presumably in the service of studying for the examination. Decrease in use of problem-focused coping, and increases in distancing at Time II, the waiting stage, could be explained as the general feeling that nothing more could be done to change the outcome of the examination. Significant decreases in

wishful thinking and distancing recorded from Time I to Time II is consistent with the idea that this form of coping, used extensively while waiting, no longer serves a useful purpose after the test results are known (Folkman & Lazarus, 1985). In conclusion, this singular study on examination stress represents the beginning step in recognizing the importance of analyzing the complexity of the appraisal and coping processes, for without focusing on the process of change, one cannot learn how people come to manage and live with stressful events.

Summary

Research on stress has been based largely on the idea that properties of an event cause stress. The method of measuring stress has been to assess major environmental changes or life events. The understanding of stress phenomena has suffered, as this approach is based on the limited assumptions that change alone is stressful and that life events must be major in order to create deleterious effects. A review of the literature suggests major life events show little correlation with illness. In the life events model, personality factors are sometimes introduced as mediating factors. Overall, trait measures by themselves have been poor predictors of outcomes. Relying on static measures of general traits precludes a structure-bound approach, the flexibility to consider individual differences, mediating factors, and variation across time.

In contrast, Lazarus' model is concerned with relational properties. The focus here is to observe how people interact with everyday

events. His research indicates a dynamic relationship exists between the person, the event, and the mediating factors, such as how people think, feel and act, which taken altogether, determine the outcome of the stress encounter.

The cognitive-process approach redefines the concept of stress and coping. Two recent studies by Lazarus, discussed in this section, revealed changes in cognitive appraisals and coping efforts as recorded over a variety of stressful events (1980), as well as during a single stressful episode (1985). These changes in appraisals and coping substantiated the theoretical position that complex processes were in effect, according to Lazarus (1984). Stressful transactions are characterized by flux rather than static events. Recognizing the importance of defining stress and coping as dynamic processes allows for the examination, description, and prediction of fluctuating appraisals and coping efforts across time. Without focusing on the process of change one cannot learn how people come to appraise and manage potential stressful transactions.

Lazarus' research, thus far, has contributed considerable insight into describing how complex thoughts, feelings, and actions are played out. However, this promising, cognitive-process approach is only in its infancy. It appears no research has been directed at describing and predicting how the mediating variables - thoughts, feelings, coping strategies and personality traits - interact and shape the course of a specific encounter.

CHAPTER III

RESEARCH DESIGN AND PROCEDURES

This chapter includes a description of the research sample, how it was selected, and experimental procedures. It includes background on the specific instruments and data-gathering procedures. This chapter also describes the statistical analysis of the data.

Sample

In this research, subjects will have the following characteristics:

1. Freshman and sophomore students attending Portland Community College.
2. Students enrolled in College Algebra classes Winter Term, 1987.
3. Students whose ages range from 18 through 38 years.
4. The participants are unpaid volunteers.
5. Number of subjects: 117 (77 male and 40 female).

Subject Selection

At the beginning of Winter Term, 1987, students enrolled in College Algebra (MATH 101) courses will be asked to participate in a research thesis project. College Algebra represents the mid-range of mathematics courses offered at Portland Community College. Typically, 1,750 students are enrolled in 100 and 200-level mathematics classes each term. College Algebra attracts students from diverse fields of study. Only those who are taking the course for a letter grade (not

Pass-Fail) will be included in the analysis.

All participants in the research will be informed of the nature and purpose of the study and will be given consent forms (See Appendix A for a copy of the form).

The sample size will be determined by the rule-of-thumb procedure specific to regression analysis. Ten independent variables will be included in the research. The rule-of-thumb minimum is suggested to be 10 individuals per variable in the study. The 117 participants satisfy this criteria (Courtney, 1984).

Procedures

Students will be asked to complete stress-related questionnaires in class on four occasions. At the beginning of a term, two days before the mid-term, on the day of the test, and the day grades are announced, subjects will be asked to describe their thoughts, feelings, and actions with respect to the examination (See Appendix B). The four occasions of data gathering are described as follows:

1) FIRST WEEK

<u>Assessment</u>	Personality traits: test anxiety, self-esteem, and test efficacy
	Instruments: Reactions to Tests Scale (Sarason, 1984)
	Self Esteem Scale (Rosenerg, 1965)
	Test Efficacy Scale (Cooley, 1986)

2) TWO DAYS BEFORE TEST (TIME I)

<u>Assessment</u>	Emotions, coping, and appraisal
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Instruments: Stress Emotions Scale (Lazarus, 1984)
 Ways of Coping Checklist (Lazarus, 1984)
 Stakes & Difficulty of the (Lazarus, 1984)
 Examination Scale

3) DAY OF TEST (TIME II)

Assessment Emotions

Instrument: Stress Emotions Scale (Lazarus, 1984)

4) DAY GRADES ARE ANNOUNCED (TIME III)

Assessment Emotions and coping

Instruments: Stress Emotions Scale (Lazarus, 1984)
 Ways of Coping Checklist
 (Lazarus, 1984)

A 4-point Likert Scale (0= not at all; 3= a great deal) will be used in all the instruments. Some of the questionnaires will instruct the subjects to indicate the extent of their thoughts, feelings, and coping efforts as they reacted to this specific test. The personality trait inventories, test anxiety, self esteem, and test efficacy are designed to inquire into the students' reactions to tests in general.

Conditions

A mid-term examination will be studied in its three stages: Time I, Time II, and Time III. These three conditions provide the context for observing process and change. These conditions possess several distinct characteristics.

Preparing for an examination is an anticipatory state (Time I),

presenting ambiguous conditions. The student does not know exactly what will happen or what the outcome will be. Time II represents the period immediately before the examination, when anticipation is most salient. The outcome stage (Time III), after grades are announced, clarifies the condition. The situation can be more clearly evaluated as either positive or negative. This evaluation is based upon what has already happened, not on what is anticipated. Emotions, appraisals, and coping efforts will reflect the different nature of these three conditions according to the cognitive-process theory.

Instrumentation

PERSONALITY TRAITS

FIRST WEEK

Reactions to Test Scale - Test Anxiety

The instrument, Reactions to Tests, was constructed on the basis of findings in a series of studies on reactions to tests. It consists of four scales made up of ten items each. Construct validity was established through factor analysis. Reliability was established with alpha coefficients ranging on the four scales from .68 to .81 (Sarason, 1984).

Scale 1: Tension (10 items)

This scale describes a person's reactions to tests in terms of general tension levels.

Scale 2: Worry (10 items)

This scale reflects troubling, pre-occupying thoughts that distract from task performance.

Scale 3: Test-Irrelevant Thinking (10 items)

This scale refers to intrusive and unrelated thoughts that interfere with task-focused thinking.

Scale 4: Bodily Reactions (10 items)

The statements in this scale refer to a person's awareness of specific bodily arousal and tension (See Appendix C).

Rosenberg Self-Esteem Scale

Self-esteem refers to the positiveness of one's attitude towards oneself and is a factor formed from ten items in Rosenberg's scale (1965). A satisfactory reliability index has been produced by several different procedures. These procedures, which include test-retest scores of .85 and .88, suggest scale consistency (Rosenberg, 1979).

Construct validity has been examined in two ways. There is evidence of convergent validity in Crandall's (1973) finding that the correlation of the Rosenberg Self-esteem Scale and the Coopersmith Self-Esteem Inventory (Coopersmith, 1967) was .60. The second procedure related depressive affect to self-esteem. Only 4% of those with the highest self-esteem scores, compared with 80 percent of those with the lowest scores, were rated as highly depressed ($r = .31$) (Rosenberg, 1979) (See Appendix C).

Test Efficacy Scale

The four statements that comprise the test efficacy scale will inquire as to students' ability to take tests in general. Reliability was established with an alpha coefficient of .78 (Cooley, 1986 - personal communication) (See Appendix C).

EMOTIONS

TWO DAYS BEFORE THE TEST - TIME I

DAY OF TEST - TIME II

DAY GRADES ASSIGNED - TIME III

Stress Emotions Scale

Emotions will be assessed by the Stress Emotions Scale (Lazarus & Folkman, 1985). As described in a previous section of this study, emotions are triggered by the stress appraisals of threat, harm, benefit, and challenge. Fifteen emotions were grouped into these appraisal categories. Scales were scored by summing the ratings for each item, based on the findings from the examination stress study by Lazarus and Folkman (1985).

Two separate analyses of the emotions scale, using a sample of 165 college students in a test situation, indicated that a three-factor solution was a simpler and more accurate description of the scale. Benefit emotions were combined with challenge emotions into a single factor in this analysis. Another emotional term was also added to

the scale, producing a 16-item scale. The alpha coefficients for the threat emotions were .70; for harm emotions .80; and a more reliable .84 for challenge emotions. This analysis also avoided the potential problem Lazarus & Folkman (1985) cited with the reliability of their challenge emotions (Cooley, 1986 - personal communication).

Threat Emotions Scale (4 items)

This scale reflects statements of feeling worried, fearful, and anxious in reactions to a stressful encounter.

Harm Emotions Scale (5 items)

This scale indicates feelings of anger, sadness, guilt, disappointment, and disgust.

Challenge-benefit Scale (7 items)

This scale highlights feelings of exhilaration, hope, pleasure, eagerness, happiness, energy, and excitement (See Appendix D).

COGNITIVE APPRAISAL

TWO DAYS BEFORE THE TEST - TIME II

Stakes and Difficulty of the Examination Scale

The primary appraisals used were stakes and difficulty of the examination, which refer to the significance attached to the situation. In the study on examination stress (Lazarus & Folkman, 1985), students were asked to indicate the reasons why the examination was particularly stressful to them. The five items to be used in this present

study to measure stakes have face validity. The stakes scale was scored by summing the ratings on the five items. The reliability (alpha) of the five-item stakes scale was .78. Difficulty of the examination is one item included in the stakes scale which considers the anticipated difficulty of the examination. This scale has face validity (See Appendix E).

COPING

TWO DAYS BEFORE THE EXAMINATION - TIME I

DAY GRADES ASSIGNED - TIME III

Ways of Coping Checklist

Coping is measured by the Ways of Coping Checklist, which is a modification of the 68-item list developed by Lazarus, Folkman, and Aldwin (1980). The revised 41-item self-report measure (Lazarus & Folkman, 1985), consists of a broad range of cognitive and behavioral strategies people use to manage stressful demands. The checklist was administered in this study at Time I and Time III, two days before the examination, and Time III, when grades are announced.

Eight scales were produced from the first revised checklist during the study on examination stress by Lazarus and Folkman (1985). Forty-one items from the checklist were factor-analyzed. Common factor analysis with oblique rotation was the procedure used to establish construct validity for the eight scales. Reliability was determined by the coefficient alphas analyzed for each scale (Lazarus & Folkman, 1985).

These eight scales, including one problem-focused and six emotion-focused scales, are characterized as follows:

Scale 1: Problem-focused coping (alpha= .88)

This scale is made up of ten statements that reflect meeting the demands of the task at hand, including thoughts and actions that focus on modifying or eliminating the stressful effects of the episode.

Scale 2: Wishful thinking (alpha= .86)

This scale is made up of five items that focus on hopeful thoughts designed to reduce the threat or harm appraisal of the situation.

Scale 3: Detachment (alpha= .74)

This six-item scale consists of statements that intend to control the distress of the episode by emotionally distancing oneself.

Scale 4: Seeking social support (alpha= .82)

This scale is composed of seven statements indicating a person's efforts to manage the stressful situation by actively seeking help from others.

Scale 5: Focusing on the positive (alpha= .70)

This scale of four items focuses on positive thoughts designed to re-evaluate the situation as less threatening or harmful.

Scale 6: Self-blame (alpha= .76)

The three statements on this scale direct the source of the problem inward by criticising one's efforts and performance.

Scale 7: Tension-reduction (alpha= .59)

This three-item scale reflects focusing on diversionary actions that make oneself feel better while under stress.

Scale 8: Keep to self (alpha= .65)

These three statements indicate the person's attempts to manage the stressful episode by refraining from letting others know what is happening to him or her (See Appendix F).

Statistical Analysis

Emotions and Coping as a Process - $H_{0, 2}$

In the first section of the analysis, changes in emotions and coping will be examined by investigating how students as a group respond to the examination during Time I and Time III.

The first step of the analysis is to examine changes in threat, harm, and challenge emotions from Time I to Time III. Differences in emotions will be examined, using paired T tests with differences of the mean having a significance of .05.

The hypothesis to be tested:

$H_{0, 1}$: There is no significant difference in mean scores for emotion at Time I and Time III.

In a previous section, it was suggested that certain emotions are indicative of threat, challenge, and harm appraisals in an examination setting. These stress appraisals, which are used in this analysis, are listed in Appendix D. The purpose here is to evaluate how emotional reactions change during the course of the examination.

This study will attempt to substantiate whether stress is a process. If changes in emotion are recorded over time, then a process will be in effect.

According to the cognitive-process theory, threat and challenge appraisals are anticipatory. They are evaluations which deal with an up-coming event. It is, therefore, predicted that emotions indicating challenge and threat to be most intensely experienced at the anticipatory stage (Time I) and to decrease in intensity as the examination proceeds to the outcome stage (Time III).

Harm appraisals are evaluations of an event that has already occurred; therefore, they are outcome appraisals. Only after the student has received his or her grade can s/he accurately assess if his/her efforts have been worthwhile. Harm emotions are predicted to be least intense at Time I and become more intense at Time III. This first hypothesis on changes in emotion will be tested according to the layout which is outlined below:

Layout of the Changes in Emotions from Time I to Time III

Variables	# Cases	Time	Mean	<u>T</u> Value	df	2-tailed Probability
Threat Emotions						
Challenge Emotions						
Harm Emotions						

The other variable to be examined is changes in coping. The purpose here is to evaluate how coping changes during the course of

the examination. This examination will attempt to substantiate whether coping is a process. If changes in coping are recorded over time, then a process will be in effect.

The assumption tested is that people typically use both problem and emotion-focused forms of coping rather than just one form of the other (Lazarus & Folkman, 1985). It is predicted that both problem and emotion-focused coping will occur during Time I and Time III.

The range of coping strategies are also examined. The assumption tested is that a maximum of eight types of coping are available to the subjects at each stage and that people will use a variety of specific types of coping to manage each phase of the examination process. It is predicted that problem-focused coping, wishful thinking, and self-isolation will decrease significantly from Time I and Time III. Whereas, distancing will increase significantly from Time I to Time III.

The hypothesis to be tested:

H_{02} : There is no significant difference in mean score for types of coping from Time I to Time III.

Differences in types of coping will be examined with paired T tests. The hypothesis will be tested according to the layout which is outlined below:

Layout of the Changes in Emotions from Time I to Time III

Variables	# Cases	Time	Mean	<u>I</u> Value	df	1-tailed Probability
Problem-focused Coping						
Wishful Thinking						
Distancing						
Seeking Social Support						
Emphasizing the Positive						
Self-blame						
Tension-reduction						
Self-isolation						

Situational Determinants of Emotion - $H_{03, 4, 5}$

In this section of the analyses, individual differences are examined. This section will attempt to explain individual differences based on a) situational determinants of emotion and, b) personality traits that influence appraisal and coping.

The assumption to be tested is that differences in emotion in this examination encounter are significantly related to appraisal and coping. This study focuses on what situational factors are important in predicting threat emotions immediately before the test (Time II). The primary appraisal, stakes, will be investigated. Having a stake in the grade received is a necessary condition to evoke threat. The assumption being tested is that the greater the stakes, the higher the potential for threat emotion. It is predicted that threat emotions will be related with the level of personal stakes.

The hypothesis to be tested:

H_{0_3} : There is no significant relationship between stakes and threat emotions at Time II.

The second situational factor to be studied is the cognitive appraisal, difficulty of the examination. It is predicted that the more difficult the person anticipates the examination to be, the higher the threat emotions.

The hypothesis to be tested:

H_{0_4} : There is no significant relationship between difficulty and threat emotions at Time II.

A relationship between coping and threat emotions is also predicted. Immediately before the test (Time II), it is expected that threat emotions will generate an increase in wishful thinking, self-blame, problem-focused coping, and seeking social support.

The hypothesis to be tested:

H_{0_5} : There is no significant relationship between types of coping and threat emotions at Time II.

The independent variable, threat emotions, is expected to influence all three dependent variables: stakes, difficulty, and coping. Correlations among predictors of threat emotions will be determined by the Pearson Product-Moment Correlation. Just looking at several correlations could be misleading because of the overlap between the dependent variables - stakes and difficulty. The relationship between the dependent variables and threat emotions could not be

accurately established. Therefore, a second type of analysis, multiple regression, will be used to enter the dependent variables, stakes, difficulty, and coping into a forward stepwise procedure.

Independent Variable	Dependent (Predictor) Variables
Threat Emotions (Time II) pre-test	

Personality Traits that Influence Coping - $H_{06, 7, 8}$

Personality measures are also included in this study to explain individual differences in coping and emotions. The prediction is that difference in coping and emotions during the stages of this examination are significantly related to the personality variables; test anxiety, self-esteem, and self-efficacy.

The first assumption to be tested, with respect to personality variables influencing coping, is that before the test (Time I), a student with high scores in all four scales of test anxiety will help prepare for the test by relying on emotion-focused coping, seeking social support or tension reduction. The independent variable is test anxiety and the dependent variables are the above-mentioned types of coping.

The hypothesis to be tested:

H_{06} : There is no significant relationship between test anxiety and seeking social support, tension reduction, and self-blame at Time I.

It is predicted that high scores in test anxiety will be associated with an increase in the use of seeking social support, tension-reduction, and self-blame at Time I.

The second assumption to be tested, with regard to personality variables relating to coping, is that a student with high self-esteem will engage in problem-focused coping, emphasizing the positive, and seeking social support in an effort to cope with the demands of preparing for the test. The independent variable is self-esteem and the dependent variables are the specified types of coping. If a high correlation is established, it is predicted that problem-focused coping, emphasizing the positive and seeking social support will increase at Time I.

The hypothesis to be tested:

H_{07} : There is no significant relationship between self-esteem and problem-focused coping, emphasizing the positive and seeking social support at Time I.

The final hypothesis established, with respect to personality variables and coping, is that a student who indicates high test efficacy will rely on problem-focused coping in managing the stress of the up-coming examination.

Hypothesis to be tested:

H_{08} : There is no significant relationship between test efficacy and problem-focused coping at Time I.

If a high correlation is established, it is predicted that

problem-focused coping will increase at Time I. The independent variable is test efficacy, and the dependent variable is problem-focused coping. Hypotheses 6, 7, and 8 will be tested according to the layout which is outlined below:

Personality Determinants of Coping (Time I)*

Personality Measures	1	2	3	4	5	6	7	8
Test-irrelevant Thinking								
Worry								
Tension								
Bodily Symptoms								
Self-esteem								
Test Efficacy								

* Note: Forms of coping

- | | |
|---------------------------|-----------------------------|
| 1. Problem-focused Coping | 5. Emphasizing the Positive |
| 2. Wishful Thinking | 6. Self-blame |
| 3. Distancing | 7. Tension Reduction |
| 4. Seeking Social Support | 8. Self-isolation |

Correlations among predictors of personality measures will be determined by the Pearson Product-Moment Correlation.

Personality Traits that Influence Emotions - H0
9, 10, 11

Personality factors, test anxiety, self-esteem, and test efficacy, are also expected to explain individual differences in emotion at Time II.

The first assumption made, with regard to personality variables relating to emotions, is that a student with high test anxiety will react immediately before taking the test by feeling threat emotions. The independent variable is test anxiety; the dependent variables are

the threat emotions. It is predicted that high scores on all four test anxiety scales will increase the probability that the use of threat emotions will increase at Time II.

The hypothesis to be tested:

H_{0_9} : There is no significant relationship between test anxiety and threat emotions at Time II.

The second assumption to be tested, with respect to personality variables influencing emotions, is that a student with high self-esteem will react immediately before taking an examination by feeling challenge emotions. The independent variable is self-esteem and the dependent variables are the challenge emotions. It is predicted that high self-esteem scores will be associated with an increase in the expression of challenge emotions at Time II.

The hypothesis to be tested:

$H_{0_{10}}$: There is no significant relationship between self-esteem and challenge emotions at Time II.

The final assumption to be tested, with respect to personality variables influencing emotions, is that a student with a sense of high test efficacy will feel challenge emotions the day of the test. The independent variable is test efficacy and the dependent variables are challenge emotions. It is predicted that high test efficacy scores will be associated with an increase in the expression of challenge emotions at Time II.

The hypothesis to be tested:

$H_{0_{11}}$: There is no significant relationship between test efficacy and challenge emotions at Time II.

Correlations among predictors of personality measures will be determined by the Pearson Product-Moment Correlation. These dependent variables are to be entered into a regression equation in a forward stepwise procedure. These hypotheses will be tested according to the following layout:

Personality Determinants of Emotion at Time II

Personality Measures	Threat Emotions	Challenge Emotions	Harm Emotions
Test-irrelevant Thinking			
Worry			
Tension			
Bodily Symptoms			
Self-Esteem			
Test Efficacy			

CHAPTER IV

PRESENTATION OF RESULTS

This chapter describes the statistical analyses performed for this study. Procedures for testing the hypotheses are explained and tables illustrating analyses of the data are included. The level of significance chosen for the analyses is .05.

Statistical Analysis of Emotions as a Process - H_{01}

The purpose of the analysis of H_{01} was to determine if significant changes in threat, harm, and challenge emotions from Time I to Time III would be recorded. The Stress Emotions Scale was administered to students in this study to measure threat, harm, and challenge emotions. Changes in emotions from Time I to Time III were examined using paired T tests. If significant changes in emotions were recorded over time, then these findings would substantiate that stress is a process. The results of the two-tailed T tests are tabulated in Table I.

H_{01} : There is no significant difference in mean scores for emotion at Time I and Time III.

Table I. Changes in Emotion from Time I to Time III.

Variable	# Cases	Time	Mean	<u>T</u> Value	df	Two-tailed Probability
Threat Emotions	58	I	1.6810	6.46	57	.000 *
	58	III	.9310			
Challenge Emotions	55	I	1.0935	- 1.07	54	.290
	55	III	1.1740			
Harm Emotions	58	I	.8690	.59	57	.559
	58	III	.8276			

*significant at .05 level of probability

As indicated in Table I, the generated T value is significant for threat emotions. The intensity of threat emotions decreased significantly from Time I to Time III. The threat emotions scores confirmed the prediction that under conditions of maximum ambiguity such as at Time I, people are likely to experience threat emotions. Thus, H_{01} was rejected for threat emotions, because a significant difference was found to exist between the mean threat emotion scores from Time I and Time III.

It was expected that harm emotions would increase at Time III when the outcome of the test results would be known. The data did not support this prediction. Both harm and challenge emotions' scores remained relatively constant from Time I to Time III. Therefore, H_{01} was retained, and it was concluded that harm and challenge emotions did not significantly change from Time I to Time III.

The results are inconclusive in regard to viewing stress emotions as a process. Significant changes in threat emotions from

Time I to Time III strongly support this position; however, the relatively constant scores of harm and challenge emotions from Time I to Time III do not reflect a process is in effect.

Statistical Analysis of Coping as a Process - HO₂

The purpose of the analysis of HO₂ was to evaluate how coping changes during the course of the examination. If changes in coping were recorded over time, then these findings would support the position that coping is a process. To assess coping, the Ways of Coping Checklist was administered to the students in this study two days before the test (Time I), and after grades were announced (Time III). The scores from the coping questionnaire were analyzed to determine whether or not significant changes would occur in coping strategies at different stages of the examination. Changes in the eight types of coping were examined from Time I to Time III with paired T tests. The results of the 1-tailed T tests are tabulated in Table II.

HO₂: There is no significant difference in mean scores for types of coping from Time I to Time III.

Table II. Changes in Coping from Time I to Time III.

Variable	# Cases	Time	Mean	<u>T</u> Value	df	One-tailed Probability
Problem- focused Coping	56	I	1.5946	1.82	55	.037 *
	56	III	1.4768			
Wishful Thinking	54	I	1.1074	3.59	53	.001 *
	54	III	.8963			
Distancing	56	I	.6756	- .09	55	.463
	56	III	.6815			
Seeking Social Support	56	I	1.0740	.32	55	.373
	56	III	1.0510			
Emphasizing the Positive	56	I	1.3125	1.38	55	.087
	56	III	1.2009			
Self-blame	57	I	1.2456	.40	56	.345
	57	III	1.2047			
Tension Reduction	55	I	.9152	- .08	54	.469
	55	III	.9212			
Self- Isolation	56	I	1.1250	3.06	55	.001 *
	56	III	.8512			

*significant at .05 level of probability

H_{02} was tested on the eight scales of the Ways of Coping Checklist. The data from Table II revealed that the computed T values were significant on three scales. As predicted, problem-focused coping, wishful thinking and self-isolation decreased significantly from Time I to Time III. The scores for these three coping scales were at their height at Time I, presumably reflecting preparation for the examination. The most dramatic shift from Time I to Time III was a large decrease in wishful thinking and self-isolation. Time III

represents the stage of knowing the outcome of the examination. Presumably, at this final phase of the examination, these two coping efforts no longer served a useful function. The significant changes in problem-focused coping, wishful thinking, and self-isolation recorded from Time I to Time III contradicted H_{02} , and it was rejected. Because of the significant changes in the use of problem-focused coping, wishful thinking, and self-isolation from Time I to Time III, these types of coping strategies can be viewed as a process that changed over time in accordance with shifts in the demands of the examination situation.

The statistical analyses of the remaining types of coping scales revealed no significant differences from Time I to Time III. Thus, H_{02} was retained and it was concluded no significant changes existed in the use of distancing, seeking social support, emphasizing the positive, self-blame and tension-reduction from Time I to Time III.

Statistical Analyses of Situational Determinants

Of Threat Emotions - H_{03} , H_{04} , H_{05}

One of the objectives of this research was to investigate the influence of individual differences in students' emotional reactions during the three phases of the examination. Individual differences in emotion in a stressful situation were expected to be due in large part to cognitive appraisal and coping. Cognitive appraisals: stakes, and difficulty of the examination were predicted to be a necessary condition to evoke threat emotions. The Stakes and Difficulty of

the Examination Scale was used to assess these cognitive appraisals. The Ways of Coping Checklist was used to assess whether or not coping is related to threat emotions. The threat emotions analyzed were those assessed on the day of the examination (Time II) by the Ways of Coping Checklist.

In summary, the situational determinants, stakes, difficulty of the examination, and coping were analyzed in terms of their relationships with threat emotions at Time II. Table III presents the results of the correlation among stakes, difficulty, and coping on threat emotions at Time II, as determined by the Pearson Product-Moment Correlation.

Table III. Correlation Among Situational Predictors of Threat Emotions (Time II)

Variable	Threat	Harm	Challenge
Stakes	.3680 *	.2554 *	-.0244
Difficulty	.1786	.1221	-.0899
Problem-focused Coping	.2761 *	.2546 *	.3266 *
Wishful Thinking	.5730 *	.5254 *	.0386
Distancing	.0077	.2487 *	-.0884
Seeking Social Support	.4667 *	.3200 *	.1114
Emphasizing The Positive	.1231	.1905	.2348 *
Self-blame	.3989 *	.4646 *	.0970
Tension-reduction	.3102 *	.2170 *	.2074
Self-isolation	.3631 *	.4279 *	.0585

n=59 *significant at .05 level of probability.

HO₃: There is no significant relationship between stakes and threat emotions at Time II.

An analysis of Table III reveals a statistically significant relationship between the level of personal stakes and threat emotions reported on the day of the examination (Time II). Thus, the student who judged the examination to be significant also indicated more intense threat emotions. The data contradicted HO₃ and it was rejected.

HO₄: There is no significant relationship between difficulty of the examination and threat emotions at Time II.

The results in Table III revealed no significant relationship existed between the perceived difficulty of the examination and the level of threat emotions expressed on the day of the examination (Time II). The data supported HO₄ and contradicted the prediction that the more difficult the examination, the higher the potential for threat emotions. HO₄ was retained.

HO₅ : There is no significant relationship between types of coping and threat emotions at Time II.

The third situational factor to be studied in relations to threat emotions (Time II) was coping strategies. An analysis of Table III reveals significant differences for six of the eight coping scales. The data contradicted HO₅ in regard to problem-focused coping, wishful thinking, seeking social support, self-blame, tension-reduction, and self-isolation. In this respect, HO₅ was

rejected. H_{05} was retained for the remaining two scales, and it was concluded that there was no significant differences between distancing or emphasizing the positive and threat emotions at Time II.

Statistical Analyses of Personality Trait Predictors
of Coping - $H_{06, 7, 8}$

The important dimension of this section of the analyses was to determine if individual differences could be accounted for on the basis of personality traits. The personality traits, test anxiety, self-esteem, and test efficacy were predicted to relate to coping efforts used by students dealing with the demands of the upcoming examination (Time I). Coping was measured by the Ways of Coping Checklist. The Reactions to Tests Scale was used to measure the level of test anxiety; the Self-esteem Scale determined self-esteem scores, and the Test Efficacy Scale assessed self-efficacy. In order to determine if the individual differences in coping could be significantly explained by the above-mentioned personality traits, a Pearson Product-Moment Correlations was selected to calculate the relationship. Table V present the results of the testing.

Table IV. Correlations Among Personality Predictors of Coping - Time I.

Personality Traits	Forms of Coping **							
	1	2	3	4	5	6	7	8
Test-irrelevant Thinking	-.0502	.5200*	.3943*	.3514*	.0726	.2902*	.0626	.3088*
Worry	.0004	.5442*	.0574	.3421*	.1596	.4347*	.2194*	.3655*
Tension	.1838	.5792*	.0490	.2850*	.2934	.4029*	.2917*	.4418*
Bodily Reactions	.2390*	.6659*	.0836	.4430*	.2508*	.4195*	.3131*	.4459*
Self-esteem	.0562	-.1525	-.1559	.0613	-.0450	-.3125*	-.0208	-.2982*
Test Efficacy	.2116*	-.1534	.1430	-.0798	.0762	-.0945	-.0604	.0435

n= 64 *significant at the .05 level

** Note: Forms of coping

- | | |
|---------------------------|-----------------------------|
| 1. Problem-focused Coping | 5. Emphasizing the Positive |
| 2. Wishful Thinking | 6. Self-blame |
| 3. Distancing | 7. Tension-reduction |
| 4. Seeking Social Support | 8. Self-isolation |

H_{06} : There is no significant relationship between test anxiety and seeking social support, self-isolation, and self-blame at Time II.

An analysis of Table V reveals a statistically significant relationship between test anxiety and four of the coping scales at Time I. All four of the test anxiety scales, test-irrelevant thinking, worry, tension, and bodily reactions, showed a powerfully significant relationship to wishful thinking, seeking social support, self-blame, and self-isolation. In this respect, the data contradicted H_{06} , and it was rejected. Three out of four test anxiety scales, worry, tension, and bodily reactions were significantly

related to emphasizing the positive. The only relatively weak relationship with respect to this personality trait and coping existed between test anxiety and the use of problem-focused coping and distancing. In this respect, the data supported H_{0_6} , and it was retained.

H_{0_7} : There is no significant relationship between self-esteem and problem-focused coping, emphasizing the positive, and seeking social support at Time I.

The results in Table V indicate there is no significant relationship between self-esteem and the use of problem-focused coping, emphasizing the positive, and seeking social support in service preparing for an examination. The data supported H_{0_7} , and it was retained. It is interesting to note that self-esteem did show a negative correlation with two other coping scales, self-blame and self-isolation. Presumably, in coping with the demands of an impending examination, students with high self-esteem have little use for self-blame and self-isolation.

H_{0_8} : There is no significant relationship between test efficacy and problem-focused coping at Time I.

An analysis of Table IV reveals a significant relationship between test efficacy and problem-focused coping at Time I. The data contradicted H_{0_8} , and was rejected. This data supported the position that a student who judged their ability to take tests in general as high, would use problem-focused coping strategies in their efforts to

anticipate the demands of a specific impending examination (Time I).

Statistical Analyses of Personality Trait Predictors

of Emotion H0
9, 10, 11

The purpose of the last section of the analyses was to account for individual differences on the basis of the personality traits: test anxiety, self-esteem, and test efficacy influencing emotional reactions on the day of the examination (Time II). The Reactions to Tests Scale measured the degree of test anxiety; the Self-esteem Scale was used to assess self-esteem; and the Test Efficacy Scale measured test efficacy. Threat, harm, and challenge emotions that were generated by the students the day of the examination (Time II) were assessed by the Stress Emotions Scale. In order to determine if test anxiety, self-esteem, and test efficacy were significantly related to threat emotions at Time II, a Pearson Product-Moment Correlation was used to calculate the relationship. Table V presents the statistical data.

Table V. Correlations Among Personality Predictors of Emotions Time II.

Personality Traits	Threat Emotions	Challenge Emotions	Harm Emotions
Test-irrelevant Thinking	.2483*	- .1040	.3035*
Worry	.5838*	.0187	.2621*
Tension	.5910*	.1028	.1588
<u>Bodily Reactions</u>	.7007*	.2451*	.2857*
Self-esteem	.1632	- .1494	- .1494
Test Efficacy	- .0161	.1275	.1275

n= 60 *significant at the .05 level

H_{0_9} : There is no significant relationship between test anxiety and threat emotions at Time II.

Examination of Table V indicates a significant relationship was established between all four test anxiety scales and threat emotions immediately before the test (Time II). Bodily reactions demonstrated the strongest correlation to threat emotions (Time II), although worry and tension were strongly related to threat emotions the day of the examination. The data contradicted H_{0_9} and it was rejected. Although no other predictors were made relating test anxiety to harm or challenge emotions, the results showed that test-irrelevant thinking, worry, and bodily reactions were significantly related to harm emotions at Time II.

$H_{0_{10}}$: There is no significant relationship between self-esteem and challenge emotions at Time II.

In Table V, the generated probability value for self-esteem did support the retention of $H_{0_{10}}$. It was concluded that there was no significant relationship between self-esteem and challenge emotions at Time II.

$H_{0_{11}}$: There is no significant relationship between test efficacy and challenge emotions at Time II.

No significant relationship was indicated by the results in Table V. $H_{0_{11}}$ was retained, and it was concluded that no significant relationship existed between test efficacy and challenge emotions at Time II.

Predicting Threat, Harm, and Challenge:

Multiple Regression Analyses

The preceding results in Table IV and Table V have established that the students' emotional state at the time of the test is related to specific personality traits, appraisals, and coping strategies. A final analysis of the above data attempted to determine how clearly the stress emotions could be predicted using all of the above-mentioned variables. All of these variables - namely, test anxiety, self-esteem, test efficacy, stakes, difficulty, and coping were entered into a regression equation in a forward stepwise procedure. A multiple regression analysis was used to illustrate the ability of the personality trait, appraisal, and coping variables to predict the emotional state immediately before the test. The results of the regression analysis for threat emotions are shown in Table VI.

Table VI. Regression of Threat Emotions (Time II) on Test Anxiety, Self-esteem, Test Efficacy, Stakes, Difficulty, and Coping.

Summary Table

Variable	R ₂	(Total Equation)		(Value Added by Variable)	
		F	P	F	P
Bodily Reactions	.4910	54.025	.000	54.025	.000
Self-esteem	.5908	39.699	.000	13.405	.001
Stakes	.6693	36.436	.000	12.831	.001
Self-blame	.6965	30.409	.000	4.746	.034
Test-irrelevant Thinking*	.7282	27.861	.000	6.058	.017

* negative weighting

The results from Tabel VI indicate a profile of the type of students predicted to experience threat emotions on the day of the test (Time II). This student profile can be determined by considering the results of the variables measured. Bodily reaction accounted for almost 50% of the variance. Given that bodily reacation and test-irrelevant thinking measure test anxiety, and coupled with the high score of self-esteem, the data reveals that personality variables significantly contributed to the variance overall. In all, 73% of the variance in threat emotions at Time II was explained. In conclusion, two personality traits, as well as the primary appraisal stakes, and one coping scale combined to significantly explain individual differences in threat emotions at Time II. The standardized regression coefficient for these variables were all positive, except for test-irrelevant thinking. The more a student thinks about the task of taking an examination, the more likely threat emotions can be partially explained.

The results for the regression analysis for challenge emotions at Time II are shown in Table VII.

Table VII. Regression of Challenge Emotions (Time II) on Test Anxiety Self-esteem, Test Efficacy, Stakes, Difficulty and Coping.

Summary Table

Variable	R ₂	(Total Equation) F	P	(Value Added by Variable) F	P
Problem-focused Coping	.1067	6.567	.013	6.567	.013

According to Table VII, 11% of the variance in challenge emotions at Time II was significantly accounted for by problem-focused coping. No other variables that were entered into this regression significantly improved the prediction fo challenge emotions at Time II.

The results for the regression analysis for harm emotions at Time II are shown in Table VIII.

Table VIII. Regression of Harm Emotions (Time II) on Test Anxiety, Self-esteem, Test Efficacy, Stakes, Difficulty, and Coping.

Summary Table

Variable	R ²	(Total Equation) F	P	(Value Added by Variable) F	P
Wishful Thinking	.2760	21.348	.000	21.348	.000

The data in Table VIII reveals that 28% of the variance in harm emotions at Time II was significantly explained by wishful thinking. No other variables that were entered into this regression improved the prediction of harm emotions at Time II significantly.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter includes three sections; (1) Summary of the purpose and the procedures, as well as the findings of the study; (2) Discussion, conclusions, and implications based on the statistical analyses described in Chapter IV; and (3) Recommendations.

Summary

The purpose of this study was to describe and predict students' reactions to a college mid-term examination. Given that evaluative situations are generally considered stressful in nature, stressful reactions were expected to be recorded in relation to the examination. This study was based on a cognitively-oriented, process-centered theory of stress and coping (Lazarus & Folkman, 1984). This theoretical orientation describes stress and coping as complex processes. The students' reactions to the examination were expected to produce shifting patterns of their thinking, feeling, and coping. In this respect, the examination was viewed as an unfolding process. The students' thoughts, emotions, and coping strategies were assessed and expected to change during three states of the examination: the anticipation stage before the examination (Time I); the day of the examination (Time II); and the outcome stage when grades were announced (Time III).

Another important dimension of Lazarus' stress theory tested in

this study is that mediating factors would influence students' reactions to the examination encounter. The present study was directed at describing and predicting how the mediating factors - thoughts, feelings, coping, and personality traits interacted to explain the variations in reactions recorded during the course of the examination.

A review of the pertinent literature discussed the historical background of stress and coping. Information was presented which defined early theories and current approaches about the nature of stress and coping. In the final section of the Review of Literature, the theory of stress, on which this study was based, was described.

Subjects consisted of 117 freshmen and sophomore student volunteers who were enrolled in four sections of college mathematics classes. Measurement of personality traits was conducted by means of three standardized instruments: the Reactions to Test Scale (Test Anxiety), the Rosenberg Self-Esteem Scale, and the Test Efficacy Scale. Measurement of emotion was assessed by means of the Stress Emotion Scale. Measurement of appraisal was evaluated by means of the Stakes and Difficulty of the Examination Scale. Measurement of coping was administered by means of the Ways of Coping Checklist. Statistical analyses for hypotheses one and two utilized T tests. A Pearson Product-Moment Correlation was conducted to test for significant relationships for the remaining nine hypotheses. Regressions were used for variables which showed significant correlations with the trait measures in order to explain variations in emotions.

Summary of the Findings

- HO₁ : A significant difference was found to exist between the mean threat emotions' scores from Time I and Time III; HO₁ was rejected. Harm and challenge emotions did not significantly change from Time I to Time III. In this respect, HO₁ was retained.
- HO₂ : The significant changes in problem-focused coping, wishful thinking, and self-isolation recorded from Time I to Time III contradicted HO₂ and it was rejected. There were no significant differences in mean scores for distancing, seeking social support, emphasizing the positive, self-blame, and tension-reduction from Time I to Time III. Thus, HO₂ was retained.
- HO₃ : There was a significant relationship between stakes and threat emotions at Time II. The data contradicted HO₃ and it was rejected.
- HO₄ : There was no significant relationship between difficulty of the examination and threat emotions at Time II. HO₄ was retained.
- HO₅ : There was a significant relationship between the coping strategies: problem-focused coping, wishful thinking, seeking social support, self-blame, tension-reduction, and self-isolation, and threat emotions at Time II. HO₅ was rejected. There was no significant relationship between the coping strategies: distancing and/or emphasizing the positive and threat emotions at Time II. In this respect, HO₅ was retained.
- HO₆ : There was a significant relationship between test anxiety and the coping strategies: seeking social support, tension-reduction, and self-blame at Time I. HO₆ was rejected.
- HO₇ : There was no significant relationship between self-esteem and the coping strategies: problem-focused coping, emphasizing the positive, and seeking social support at Time I. HO₇ was retained.
- HO₈ : There was a significant relationship between test efficacy and problem-focused coping at Time I. HO₈ was rejected.

HO₉ : There was a significant relationship between test anxiety and threat emotions at Time II. HO₉ was rejected.

HO₁₀ : There was no significant relationship between self-esteem and challenge emotions at Time II. HO₁₀ was retained.

HO₁₁ : There was no significant relationship between test efficacy and challenge emotions at Time II. HO₁₁ was retained.

Discussion, Conclusions, and Implications

The concept of process is at the heart of Lazarus' cognitive theory of stress and coping. According to Lazarus, a process-oriented approach has two meanings: first, that the person and the stress event are in a dynamic relationship that is constantly changing and, second that this relationship is bidirectional, with the person and the stress event each acting on the other. A process orientation means that a person's reactions are likely to change throughout the stressful encounter as a result of the shifts in the interaction of the person and the event. A person's reactions to the event are considered to be influenced by his/her cognitive appraisal and management of the potential stressful encounter. If the event is appraised as stressful, then stress emotions are generated. As the person's appraisal of a stressful encounter changes, so, too, will the person's associated emotions and coping efforts (Lazarus & Folkman, 1984).

A central purpose of this study was to determine whether or not emotions and coping would change during stages of an examination. If changes in emotions and coping were recorded at different phases of the examination, then these findings would substantiate the

position that stress and coping are processes.

The findings in this study, in regard to stress and coping being defined as a process, were inconclusive. In terms of the stress emotions that were measured, only threat emotions showed significant changes in their use from the anticipatory stage (Time I) to the outcome stage (Time III). Harm emotions were predicted to increase when the outcome of the examination results would be known (Time III). The students reported that Time I generated a similar degree of harm emotions as Time III. One possible explanation is that harm emotions which measure sadness, guilt, and disappointment were relevant before the examination by reflecting the students' lack of preparedness for the examination (Time I). Although challenge emotions were expected to decrease from Time I to Time III, this did not occur as indicated in Table I. A person is more likely to be hopeful before the examination than after it, according to Lazarus (1984). However, given that this examination was the first in a set of four examinations scheduled for these subjects, the challenge emotions generated at Time III could be explained as reflecting hopeful anticipation toward the next set of examinations.

The results on harm and challenge emotions contradict Lazarus' conclusions established in his study (Lazarus & Folkman, 1985), on examination stress. In the Lazarus and Folkman study, all three of the stress emotions changed during the course of the three stages of a mid-term examination. The evidence unquestionably supported the position that a process was in effect. One possible implication

that can be drawn is that the situational demands of the first examination in a term, which was investigated in this study, are significantly different from the demands and expectations of one mid-term examination. A further problem in comparing the results of these two studies is that opportunities for observing changes in this present study were diminished because emotional changes were computed for only two stages.

The results for considering coping as a process were also inconclusive. Significant changes in coping, however, were revealed by observing the results for each coping scale. The significant decreases in the use of problem-focused coping, wishful thinking, and self-isolation from Time I to Time III demonstrates that coping does change as the stressful encounter unfolds. When the outcome of the examination is known (Time III), these coping efforts presumably serve no useful purpose. The absence of significant changes in the remaining types of coping from Time I to Time III suggests that no one situational demand was experienced by the group as a whole.

Situational Determinants of Threat Emotions

From this study, it was concluded that individual differences in emotional reactions recorded at each stage of the examination were due in large part to cognitive appraisal and coping. These findings confirmed and strengthened Lazarus' theoretical formulation. According to Lazarus (1984), a transaction is considered stressful only if a person appraises it as stressful. The more the person attaches significance to a given situation and has a stake in its outcome,

the greater the potential for emotion to be generated in the encounter. A person's appraisal of the situation also influences the way s/he copes with the perceived demands of the potential stressful encounter (Lazarus & Folkman, 1985).

The findings revealed that students who judged the examination to be of significance and, thus, had a stake in its outcome, also indicated more intense threat emotions. In order to manage this increase in threat emotions generated the day of the examination (Time II), the affected students used all eight types of coping. However, the following two strategies were significantly used less frequently: 1) emphasizing the positive aspects of the examination, and 2) distancing from the examination. The more threatened a student felt in anticipating the examination, the more likely s/he would engage in multiple strategies which included both problem-focused coping and emotion-focused coping.

Having a stake in the situation also evoked a significant increase in harm reactions the day of the test (Time II). A very similar pattern emerged for stakes and harm emotions as did for stakes and threat emotions. The more harmed a student expected to be, the more likely he/she would utilize the majority of the coping strategies: problem-focused coping, wishful thinking, distancing, seeking social support, self-blame, tension-reduction, and self-isolation. The greater the stake in the examination, the more the student is invested in spending time and energy coping with his/her threatened and/or harmed feelings.

Cognitive appraisal was assessed not only by stakes, but also by difficulty of the examination. No significant relationship was reported to exist between difficulty of the examination and threat emotions (Time II). The reason for this unexpected outcome may result from the method in which this scale was measured. A one-time question on difficulty of the test may not be sufficient data to capture an accurate assessment.

Personality Trait Predictors of Coping

It appears that this is the first study to investigate how personality traits interact with other mediating variables - thoughts, feelings, and coping strategies to shape the course of a specific, stressful encounter. Personality traits were considered an important dimension that would help explain the large individual differences recorded. In the previous section, individual differences were explained by cognitive appraisal and coping, which supports Lazarus' (1984) cognitive theory. However, there is support for the position that personality traits influence a person's perception of both the nature of the stressful situation and the ability to meet it (Sarason, 1984).

This study considered the importance of the personality traits; test anxiety, self-esteem, and self-efficacy, as it relates to the person's use of specific types of coping. The findings revealed that highly-anxious students who attempted to manage their anxiety and meet the demands of preparing for an examination (Time I), were more likely to use at least five different types of emotion-focused

coping. Their lack of the use of problem-focused coping suggests highly-anxious students invest their time and energy managing their anxious feelings at the expense of preparing for the examination. A potential profile of the highly-anxious student begins to emerge by observing their choices of emotion-focused strategies. Associated with the highly test-anxious student is wishful thinking, seeking social support, self-blame, tension-reduction, and self-isolation. The typical use of self-blame and self-isolation by highly-anxious students substantiates Spielberger's (1972) findings that highly test-anxious students are more self-critical than students with low test-anxiety. This information would be crucial for educators and counselors interested in designing programs for test-taking anxiety.

Self-esteem's relationship to coping revealed significant findings as well. Students with high self-esteem have little use for self-blame and self-isolation when anticipating and preparing for a test (Time I). This data does not provide the basis for a complete profile for it does not describe what coping efforts a student with high self-esteem would do in meeting the demands of the situation. Given that highly test-anxious students cope by using self-blame and self-isolation, and students with high self-esteem don't engage in self-blame and self-isolation, it could be postulated that students with high test-anxiety might be low in self-esteem. This notion might be further investigated by educators and counselors concerned with decreasing test anxiety and increasing self-esteem.

Test efficacy was found to have a significant relationship to a coping strategy as well. Test efficacy refers to an ability to take tests in general. A person who judges her/his test-taking ability as high, typically uses problem-focused coping when preparing for a test (Time I). To improve one's sense of mastery of tests in general, increasing the use of this strategy is suggested.

Personality Trait Predictors of Emotion

Spielberger (1972) contends that although examination situations are stressful and evoke anxiety reactions in most students, students with high test-anxiety will experience the test situation as more threatening. The findings in this study substantiate this position. A highly test-anxious student describes him/herself as thinking irrelevant thoughts, worried, tense, and sensitive to their bodily reactions and feels intensely threatened on the day of the test (Time II). Further evidence that test anxiety affects emotional responses in general is found in a study by Spielberger (1972). He contends that the highly test-anxious student's emotional responses will be more intense than students with low anxiety. This position is somewhat supported in this study. Not only were increased threat emotions linked to test anxiety, but also harm emotions were significantly elevated. As it was expected, challenge emotions were not associated with the test-anxious student. This emerging profile of the highly test-anxious student suggests that many of their emotional and coping resources are directed at managing their feelings rather than focusing on the task of taking the examination (Time II).

By decreasing irrelevant thinking, worry, tension, and awareness of bodily arousal of the test-anxious student, the degree of threat and harm emotions associated with the task of taking a test is expected to decrease.

In conclusion, personality traits, as well as appraisal and coping, interacted in a way that significantly explained the large variations in threat emotions recorded the day of the test (Time II). A student manifesting a high degree of bodily arousal and tension, self-esteem, stakes in the outcome of the examination, self-blame, and thinking focused on the task of taking the examination can be predicted to feel highly threatened on the day of the test (Time II). Personality traits that persist from situation-to-situation also combine with situational factors to create this student profile. This profile provides clues as to how to diminish the level of threat generated the day of the test.

Major Conclusions

In accordance with the objectives outlined in Chapter I, three major conclusions can be drawn.

1. In some respects, stress and coping can be defined as a process.
2. The mediating factors, appraisal and coping, did influence the students' emotional reactions to the examination.
3. The mediating factor, personality traits, did influence the students' emotional and behavioral reactions to the examination.

Recommendations

Stress and Coping as a Process

The data collected revealed that only threat emotions significantly changed during the two stages of the examination in which they were examined. In this respect, a process was in effect. This research marks only the second study on examination stress. Lazarus' (1985) study showed all three stress emotions significantly changing during three stages of an examination. Since certain aspects of the two studies are dissimilar and somewhat contradictory, further research on examination stress is recommended in order to convincingly substantiate that stress and coping are processes. These examination studies should be conducted during three phases of an examination, as well as at the beginning, middle, and end of a term, thereby creating a more comprehensive understanding of students' seemingly complex reactions to tests. For, without focusing on processes that unfold over a period of time, we cannot learn how people come to manage stressful examination situations.

Situational Determinants of Emotion

The research demonstrated that at any given phase of the examination there were substantial individual differences in cognitive appraisal and coping. The greater the stake; i.e., appraisal, in the outcome, the more likely the student will feel threatened and/or harmed. The affected student will direct her/his coping resources to managing these intense feelings rather than focusing on the task of the

examination. If this research and premise is accepted, then it seems clear that if the academic goal of achievement is to be met, the emotional climate for test taking for students must be improved. It is, therefore, recommended that educators and counselors develop testing procedures that serve to facilitate students focusing on the task of preparing for the examination. Reducing the stakes of a particular examination might serve to enhance performance. A number of tests throughout the term, the choice to cancel out the effects of the worst grade, and a variety of evaluative assessments are suggested strategies toward this end. A counseling program designed to educate students as to the nature and impact of the significance of stakes associated with examinations should greatly assist students' understanding of their stressful reactions in test situations and potentially improve their performance. A treatment approach that emphasized cognitive theory would be instrumental in changing the appraisal or stakes and alter any information-processing distortions.

Reducing threat and harm emotional reactions and enhancing challenge emotions would also allow the student to attend more to the task of the examination. Study skills classes, as well as individual and group counseling procedures, should be designed to promote emphasizing the positive aspects of the examination, as well as problem-focused coping. These two coping strategies, which are significantly related to challenge emotions, can be effectively encouraged and strengthened by a variety of counseling procedures, such as visualization, self-affirmations, confidence building, rational-emotive imagery, decision making, and time management.

Personality Traits as Predictors of Coping and Emotion

Overall, the research evidence shows a persistent and significant relationship between the personality trait, test anxiety, as a predictor of coping and emotion. The results on test anxiety produce sufficient data to create a profile of the test-anxious students' pattern of coping and emotional reaction to tests. On the day of the test, a highly test-anxious student feels intensely threatened at the thought of taking a test and attempts to cope with these feelings by the use of wishful thinking, seeking social support, self-blame, tension-reduction, and self-isolation.

If this research and premise is accepted, then it seems that the way highly test-anxious students attempt to manage their feelings, and meet the demands of the examination situation needs to be improved. Counseling strategies that will serve to enhance the performance and comfort level of highly test-anxious students need to be developed. Counseling services in higher education need to be established for test-anxious students that de-emphasize wishful thinking and promote problem-focused coping would not only be expected to reduce the level of threat emotions and increase the level of challenge emotions, but also favorably improve the amount of worry and test-irrelevant thinking characteristic of test-anxious students. Test-anxious students need to make more favorable appraisals about their performance and re-appraise the outcome in more positive ways. Counseling services that would contribute to producing these desired changes is highly recommended. These students also report a keen awareness of bodily arousal

and tension. Relaxation techniques, meditation, biofeedback, and physical exercise are suggested additional components for this program to help monitor and manage intense feelings of tension and threat.

Test-anxious students' coping strategies need to be taken into consideration also. Given that the data revealed highly test-anxious students cope by using self-blame and self-isolation, and that students with high self-esteem don't engage in self-blame and self-isolation, counseling efforts directed at improving test-anxious students' self-esteem are recommended. A counseling program that offers task-oriented groups, such as focusing on positive thinking, thought stopping, confidence building, and assertiveness training, would need to be tailored to the special vulnerabilities and coping deficiencies of these students. Institutions of higher education need to be apprised of the importance of both group and individual counseling services in assisting students with this prevalent and stressful problem - test anxiety.

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APPENDICES

APPENDIX A
Appeal for Subjects

INTRODUCTION
COPING WITH TESTS RESEARCH PROJECT

This research project is designed to investigate students' reactions to tests and approaches to coping with tests. You will be asked at several times in the quarter to complete questionnaires dealing with reactions and coping.

Participation in this project is strictly voluntary and will have no impact upon your grade. If you do not wish to participate or wish to stop your participation at any time you are free to do so.

Your responses to all questionnaires will be kept confidential. We do not want any names connected with questionnaires, but we do need some way of matching up the questionnaires you take at various points in the quarter. For this reason, we are asking that you use the last four digits of your social security number as identification on each of the questionnaires.

We will be sharing results of this study with you toward the end of the quarter.

SUBJECT CONSENT FORM

1. I understand that I have the right to complete information as to the nature and purpose of the study as soon as the information can be given without affecting the outcome of the study.
2. I understand that if any deception is involved, it is essential to the success of the study and I can expect to be briefed regarding it after the study has been completed.
3. I understand that I have the right to refuse to participate in the experiment or study without academic or other penalty.
4. I understand that I have the right to anonymity and that this confidentiality will be maintained by the investigators. In the event that the findings of the study are made public in any way, the results of my participation will not be associated with my name.
5. The nature and purpose of the study have been explained to my satisfaction. The investigators have also explained the benefits of my participation, the possible uses of the data, and my right to ask further questions regarding the study at any time.
6. I understand that I have the right to terminate my participation in the study if I so desire.

APPENDIX B

Questionnaires: Reactions to the Tests

PRE-MEASURES

Last four digits of social security number _____

Age _____ Sex _____

REACTIONS TO TESTS

Almost everybody takes tests of various types and there are differences among people in how they react to them. The purpose of this survey is to gain a better understanding of what people think and feel about tests.

In filling out this survey, for each item please circle the response alternative that reflects your typical reaction to the situation described.

	Not typical	Somewhat typical	Quite typical	Very typical
1. Not at all typical of me.				
2. Only somewhat typical of me.				
3. Quite typical of me.				
4. Very typical of me.				
1. I feel distressed and uneasy before tests.	1	2	3	4
2. The thought, "What happens if I fail this test?" goes through my mind during tests.	1	2	3	4
3. During the tests, I find myself thinking of things unrelated to the material being tested.	1	2	3	4
4. I become aware of my body during tests (feeling itches, pain, sweat, nausea).	1	2	3	4
5. I freeze up when I think about an upcoming test.	1	2	3	4
6. I feel jittery before tests.	1	2	3	4
7. Irrelevant bits of information pop into my head during a test.	1	2	3	4
8. During a difficult test, I worry whether I will pass it.	1	2	3	4
9. While taking a test, I find myself thinking how much brighter the other people are.	1	2	3	4
10. I feel the need to go to the toilet more often than usual during a test.	1	2	3	4
11. My heart beats faster when the test begins.	1	2	3	4

	Not typical	Somewhat typical	Quite typical	Very typical
12. My mind wanders during tests	1	2	3	4
13. After a test, I say to myself, "It's over and I did as well as I could."	1	2	3	4
14. My stomach gets upset before tests.	1	2	3	4
15. While taking a test, I feel tense.	1	2	3	4
16. I find myself becoming anxious the day of a test.	1	2	3	4
17. While taking a test, I often don't pay attention to the questions.	1	2	3	4
18. I think about current events during a test.	1	2	3	4
19. I get a headache during an important test.	1	2	3	4
20. Before taking a test, I worry about failure.	1	2	3	4
21. While taking a test, I often think about how difficult it is.	1	2	3	4
22. I wish tests did not bother me so much.	1	2	3	4
23. I get a headache before a test.	1	2	3	4
24. I have fantasies a few times during a test.	1	2	3	4
25. I sometimes feel dizzy after a test.	1	2	3	4
26. I am anxious about tests.	1	2	3	4
27. Thoughts of doing poorly interfere with my concentration during tests.	1	2	3	4
28. While taking tests, I sometimes think about being somewhere else.	1	2	3	4
29. During tests, I find I am distracted by thoughts of upcoming events.	1	2	3	4
30. My hands often feel cold before and during a test.	1	2	3	4

	Not typical	Somewhat typical	Quite typical	Very typical
31. My mouth feels dry during a test.	1	2	3	4
32. I daydream during tests.	1	2	3	4
33. I feel panicky during tests.	1	2	3	4
34. During tests, I think about how poorly I am doing.	1	2	3	4
35. Before tests, I feel troubled about what is going to happen.	1	2	3	4
36. The harder I work at taking a test, the more confused I get.	1	2	3	4
37. I sometimes find myself trembling before or during tests.	1	2	3	4
38. During tests I think about recent past events.	1	2	3	4
39. During tests I wonder how the other people are doing.	1	2	3	4
40. I have an uneasy feeling before an important test.	1	2	3	4

Rate the statements below for how accurately they describe your thoughts and feelings:

	Inaccurate	Accurate	Very accurate	
1. Inaccurate				
2. Accurate				
4. Very accurate statement				
41. On the whole, I am satisfied with myself.	1	2	3	4
42. At time, I think I am no good.	1	2	3	4
43. I feel that I have a number of good qualities.	1	2	3	4
44. I am able to do things as well as most other people.	1	2	3	4
45. I feel I do not have much to be proud of.	1	2	3	4

	Inaccurate		Accurate	Very accurate
46. I certainly feel useless at times.	1	2	3	4
47. I feel that I'm a person of worth, at least on an equal plane with others.	1	2	3	4
48. I wish I could have more respect for myself.	1	2	3	4
49. All in all, I am inclined to feel that I am a failure.	1	2	3	4
50. I take a positive attitude toward myself.	1	2	3	4

Rate the following to convey how skilled you are at taking tests. Use the same scale you did above:

51. My test results accurately reflect my knowledge.	1	2	3	4
52. I am good at taking tests.	1	2	3	4
53. I am confident I will do my best on tests.	1	2	3	4
54. Even with an equal level of knowledge, I do better on tests than my fellow students.	1	2	3	4

TWO DAYS BEFORE TEST (TIME I)

Last four digits of social security number _____

When you think about the upcoming test in this class, how do you feel?
Use the following scale to rate these feelings:

		Not at all	Slightly	Moderately	A great deal
1.	Worried	1	2	3	4
2.	Confident	1	2	3	4
	(Reverse)				
3.	Angry	1	2	3	4
4.	Exhilarated	1	2	3	4
5.	Fearful	1	2	3	4
6.	Hopeful	1	2	3	4
7.	Sad	1	2	3	4
8.	Pleased	1	2	3	4
9.	Anxious	1	2	3	4
10.	Guilty	1	2	3	4
11.	Disappointed	1	2	3	4
12.	Eager	1	2	3	4
13.	Happy	1	2	3	4
14.	Energetic	1	2	3	4
15.	Disgusted	1	2	3	4
16.	Excited	1	2	3	4

TWO DAYS BEFORE TESTS (TIME I)

Last four digits of social security number _____

Refer to the upcoming test in this class when completing this questionnaire. The following statements define things you may be doing to deal with the upcoming test. Please rate the degree to which you are using each of these approaches.

	Not used	Used somewhat	Used quite a bit	Used a great deal
17. I try to analyze the problem in order to understand it better.	1	2	3	4
18. I feel that time will make a difference - the only thing to do is to wait.	1	2	3	4
19. Talk to someone to find out more about the situation.	1	2	3	4
20. Criticize or lecture myself.	1	2	3	4
21. Hope a miracle will happen.	1	2	3	4
22. Go along with fate; sometimes I have bad luck.	1	2	3	4
23. Go on as if nothing is happening.	1	2	3	4
24. I try to keep my feelings to myself.	1	2	3	4
25. Look for the silver lining, so to speak; try to look on the bright side of things.	1	2	3	4
26. Accept sympathy and understanding from someone.	1	2	3	4
27. I am inspired to do something creative.	1	2	3	4
28. Try to forget the whole thing.	1	2	3	4
29. I'm changing or growing as a person in a good way.	1	2	3	4
30. I'm waiting to see what will happen before doing anything.	1	2	3	4
31. I'm making a plan of action and following it.	1	2	3	4

	Not used	Used somewhat	Used quite a bit	Used a great deal
32. Realize I brought the problem on myself.	1	2	3	4
33. Get away from it for awhile; try to rest or take a vacation.	1	2	3	4
34. Try to make myself feel better by eating, drinking, smoking, using drugs or medications, etc.	1	2	3	4
35. Talk to someone who can do something concrete about the problem.	1	2	3	4
36. I let my feelings out somehow.	1	2	3	4
37. I try not to act too hastily or follow my first hunch.	1	2	3	4
38. Rediscover what is important in life.	1	2	3	4
39. Change something so things will turn out all right.	1	2	3	4
40. Avoid being with people in general.	1	2	3	4
41. Ask a relative or friend I respect for advice.	1	2	3	4
42. Keep others from knowing how bad things are.	1	2	3	4
43. Talk to someone about how I am feeling.	1	2	3	4
44. Stand my ground and fight for what I want.	1	2	3	4
45. Draw on my past experiences; I was in a similar situation before.	1	2	3	4
46. Make a promise to myself that things will be different next time.	1	2	3	4
47. I know what has to be done, so I am doubling my efforts to make things work.	1	2	3	4
48. Wish that I can change what is happening or how I feel.	1	2	3	4
49. Come up with a couple of different solutions to the problem.	1	2	3	4

	Not used	Used somewhat	Used quite a bit	Used a great deal
50. Accept it, since nothing can be done.	1	2	3	4
51. I try to keep my feelings from interfering with other things too much.	1	2	3	4
52. I daydream or imagine a better time or place than the one I am in.	1	2	3	4
53. I pray.	1	2	3	4
54. Have fantasies or wishes about how things might turn out.	1	2	3	4
55. Wish that the situation would go away or somehow be over with.	1	2	3	4
56. I go over in my mind what I will say or do.	1	2	3	4
57. I jog or exercise.	1	2	3	4

Below is a list of reasons why examinations can be stressful. Please indicate how much each item applies to you by circling the appropriate number:

In this examination, there is the possibility of:

	Does not apply			Applies a great deal
58. Not achieving the grade I want.	1	2	3	4
59. Appearing incompetent to others.	1	2	3	4
60. Jeopardizing my view of myself as a capable student.	1	2	3	4
61. Losing the approval or respect of someone important to me.	1	2	3	4
62. Jeopardizing my opportunity of pursuing my preferred field of study.	1	2	3	4

	Not at all difficult				Extremely difficult
63. How difficult do you think this test will be?	1	2	3	4	

DAY OF TEST (TIME II)

Last four digits of social security number _____

When you think about the upcoming test in this class, how do you feel?
Use the following scale to rate these feelings:

		Not at all	Slightly	Moderately	A great deal
1.	Worried	1	2	3	4
2.	Confident	1	2	3	4
	(Reverse)				
3.	Angry	1	2	3	4
4.	Exhilarated	1	2	3	4
5.	Fearful	1	2	3	4
6.	Hopeful	1	2	3	4
7.	Sad	1	2	3	4
8.	Pleased	1	2	3	4
9.	Anxious	1	2	3	4
10.	Guilty	1	2	3	4
11.	Disappointed	1	2	3	4
12.	Eager	1	2	3	4
13.	Happy	1	2	3	4
14.	Energetic	1	2	3	4
15.	Disgusted	1	2	3	4
16.	Excited	1	2	3	4

AFTER TEST, AFTER RESULTS (TIME III)

Last four digits of social security number _____

When you think about the test you took in this class, how do you feel?
Use the following scale to rate these feelings:

		Not at all	Slightly	Moderately	A great deal
1.	Worried	1	2	3	4
2.	Confident	1	2	3	4
	(Reverse)				
3.	Angry	1	2	3	4
4.	Exhilarated	1	2	3	4
5.	Fearful	1	2	3	4
6.	Hopeful	1	2	3	4
7.	Sad	1	2	3	4
8.	Pleased	1	2	3	4
9.	Anxious	1	2	3	4
10.	Guilty	1	2	3	4
11.	Disappointed	1	2	3	4
12.	Eager	1	2	3	4
13.	Happy	1	2	3	4
14.	Energetic	1	2	3	4
15.	Disgusted	1	2	3	4
16.	Excited	1	2	3	4

AFTER TEST, AFTER RESULTS (TIME III)

Last four digits of social security number _____

Refer to the test in this class that you just took when completing this questionnaire. The following statements define things you may be doing to deal with your performance on the test. Please rate the degree to which you are using each of these approaches:

	Not used	Used somewhat	Used quite a bit	Used a great deal
17. I try to analyze the problem in order to understand it better.	1	2	3	4
18. I feel that time will make a difference - the only thing to do is to wait.	1	2	3	4
19. Talk to someone to find out more about the situation.	1	2	3	4
20. Criticize or lecture myself	1	2	3	4
21. Hope a miracle will happen	1	2	3	4
22. Go along with fate; sometimes I have bad luck	1	2	3	4
23. Go on as if nothing is happening	1	2	3	4
24. I try to keep my feelings to myself	1	2	3	4
25. Look for the silver lining, so to speak; try to look on the bright side of things	1	2	3	4
26. Accept sympathy and understanding from someone	1	2	3	4
27. I am inspired to do something creative	1	2	3	4
28. Try to forget the whole thing	1	2	3	4
29. I'm changing or growing as a person in a good way	1	2	3	4
30. I'm waiting to see what will happen before doing anything	1	2	3	4
31. I'm making a plan of action and following it	1	2	3	4

	Not used	Used somewhat	Used quite a bit	Used a great deal
32. Realize I brought the problem on myself	1	2	3	4
33. Get away from it for awhile; try to rest or take a vacation	1	2	3	4
34. Try to make myself feel better by eating, drinking, smoking, using drugs or medications, etc.	1	2	3	4
35. Talk to someone who can do something concrete about the problem	1	2	3	4
36. I let my feelings out somehow	1	2	3	4
37. I try not to act too hastily or follow my first hunch	1	2	3	4
38. Rediscover what is important in life	1	2	3	4
39. Change something so things will turn out all right	1	2	3	4
40. Avoid being with people in general	1	2	3	4
41. Ask a relative or friend I respect for advice	1	2	3	4
42. Keep others from knowing how bad things are	1	2	3	4
43. Talk to someone about how I am feeling	1	2	3	4
44. Stand my ground and fight for what I want	1	2	3	4
45. Draw on my past experiences; I was in a similar situation before	1	2	3	4
46. Make a promise to myself that things will be different next time	1	2	3	4
47. I know what has to be done, so I am doubling my efforts to make things work	1	2	3	4
48. Wish that I can change what is happening or how I feel.	1	2	3	4
49. Come up with a couple of different solutions to the problem	1	2	3	4

	Not used	Used somewhat	Used quite a bit	Used a great deal
50. Accept it, since nothing can be done	1	2	3	4
51. I try to keep my feelings from interfering with other things too much	1	2	3	4
52. I daydream or imagine a better time or place than the one I am in	1	2	3	4
53. I pray	1	2	3	4
54. Have fantasies or wishes about how things might turn out	1	2	3	4
55. Wish that the situation would go away or somehow be over with	1	2	3	4
56. I go over in my mind what I will say or do	1	2	3	4
57. I jog or exercise	1	2	3	4

APPENDIX C
Personality Trait Scales

Reactions to Tests Scale

(Test Anxiety)

Tension

1. I freeze up when I think about an upcoming test.
2. I feel distressed and uneasy before tests.
3. I feel jittery before tests.
4. While taking a test, I feel tense.
5. I find myself becoming anxious the day of a test.
6. I wish tests did not bother me so much.
7. I am anxious about tests.
8. I feel panicky during tests.
9. Before tests, I feel troubled about what is going to happen.
10. I have an uneasy feeling before an important test.

Worry

1. The thought, "What happens if I fail this test?" goes through my mind during tests.
2. During a difficult test, I worry whether I will pass it.
3. While taking a test, I find myself thinking how much brighter the other people are.
4. After a test, I say to myself, "It's over and I did as well as I could."
5. Before taking a test, I worry about failure.
6. While taking a test, I often think about how difficult it is.
7. Thoughts of doing poorly interfere with my concentration during tests.
8. During tests, I think about how poorly I am doing.

9. The harder I work at taking a test, the more confused I get.
10. During tests, I wonder how the other people are doing.

Test-irrelevant Thinking

1. During tests, I find myself thinking of things unrelated to the material being tested.
2. Irrelevant bits of information pop into my head during a test.
3. My mind wanders during tests.
4. I think about current events during a test.
5. I have fantasies a few times during a test.
6. While taking tests, I sometimes think about being somewhere else.
7. During tests, I find I am distracted by thoughts of upcoming events.
8. I daydream during tests.
9. During tests, I think about recent past events.
10. While taking a test, I often don't pay attention to the questions.

Bodily Reactions

1. I become aware of my body during tests (feeling itchy, pain, sweat, nausea).
2. I feel the need to go to the toilet more often than usual during a test.
3. My heart beats faster when the test begins.
4. My stomach gets upset before tests.
5. I get a headache during an important test.
6. I sometimes feel dizzy after a test.
7. My hands often feel cold before and during a test.
8. My mouth feels dry during a test.
9. I sometimes find myself trembling before or during tests.
10. I get a headache before a test.

Self-esteem Scale

1. On the whole, I am satisfied with myself.
2. At times, I think I am no good.
3. I feel that I have a number of good qualities.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I certainly feel useless at times.
7. I feel that I'm a person of worth, at least on an equal plane with others.
8. I wish I could have more respect for myself.
9. All-in-all, I am inclined to feel that I am a failure.
10. I take a positive attitude toward myself.

Test Efficacy Scale

1. My test results accurately reflect my knowledge.
2. I am good at taking tests.
3. I am confident I will do my best on tests.
4. Even with an equal level of knowledge, I do better on tests than my fellow students.

APPENDIX D
Stress Emotions Scale

Stress Emotions Scale

Threat Emotions

1. Worried
2. Confident
3. Fearful
4. Anxious

Harm Emotions

1. Angry
2. Sad
3. Guilty
4. Disappointed
5. Disgusted

Challenge Emotions

1. Exhilarated
2. Hopeful
3. Pleased
4. Eager
5. Happy
6. Energetic
7. Excited

APPENDIX E
Cognitive Appraisal Scale

Stakes and Difficulty of the Examination Scale

Stakes

1. Not achieving the grade I want.
2. Appearing incompetent to others
3. Jeopardizing my view of myself as a capable student.
4. Losing the approval or respect of someone important to me.
5. Jeopardizing my opportunity of pursuing my preferred field of study.

Difficulty of the Examination

1. How difficult do you think this test will be?

APPENDIX F
Coping Scale

Ways of Coping Checklist

Problem-focused coping

1. I go over in my mind what I will say or do.
2. Stand my ground and fight for what I want.
3. I know what has to be done, so I am doubling my efforts to make things work.
4. Come up with a couple of different solutions to the problem.
5. I try not to act too hastily or follow my first hunch.
6. I'm making a plan of action and following it.
7. I try to see things from the other person's point of view.
8. I try to keep my feelings from interfering with other things too much.
9. Change something so things will turn out all right.
10. I try to analyze the problem in order to understand it better.
11. Draw on my past experiences; I was in a similar situation before.

Wishful Thinking

1. Wish that I could change what is happening or how I feel.
2. Wish that the situation would go away or somehow be over with.
3. I daydream or imagine a better time or place than the one I am in.
4. Have fantasies or wishes about how things might turn out.
5. Hope a miracle will happen.

Detachment

1. Try to forget the whole thing.
2. Go on as if nothing is happening.
3. I'm waiting to see what will happen before doing anything.

4. Go along with fate; sometimes I just have bad luck.
5. I feel that time will make a difference - the only thing to do is to wait.
6. Accept it, since nothing can be done.

Seeking Social Support

1. Talk to someone about how I am feeling.
2. Accept sympathy and understanding from someone.
3. I let my feelings out somehow.
4. Talk to someone who can do something concrete about the problem.
5. Talk to someone to find out more about the situation.
6. Ask a relative or friend I respect for advice.
7. I pray.

Focusing on the Positive

1. I'm changing or growing as a person in a good way.
2. Rediscover what is important in life.
3. I am inspired to do something creative.
4. Look for the silver lining, so to speak; try to look on the bright side of things.

Self-blame

1. Criticize or lecture myself.
2. Realize I brought the problem on myself.
3. Make a promise to myself that things will be different next time.

Tension-reduction

1. Get away from it for awhile; try to rest or take a vacation.

2. Try to make myself feel better by eating, drinking, smoking, using drugs or medications, etc.
3. I jog or exercise.

Keep to Self

1. I try to keep my feelings to myself.
2. Avoid being with people in general.
3. Keep others from knowing how bad things are.