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THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

STUDENTS' STRESS: THE RELATIONSHIP OF COLLEGE

STUDENTS' STRESS VARIABLES TO GOAL

ORIENTATIONS, ACADEMIC SELF-CONCEPT,

AND ACHIEVEMENT VARIABLES

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

By

Mohammed Ali Akour

Norman, Oklahoma

1997

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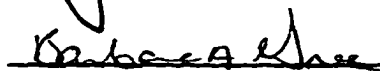
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**A DISSERTATION
APPROVED FOR THE DEPARTMENT OF
EDUCATIONAL PSYCHOLOGY**

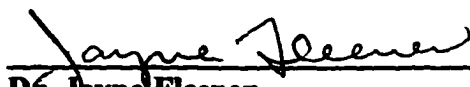
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ABSTRACT

STUDENTS' STRESS: THE RELATIONSHIP OF COLLEGE STUDENTS' STRESS VARIABLES TO GOAL ORIENTATIONS, ACADEMIC SELF-CONCEPT, AND ACHIEVEMENT VARIABLES

Path analysis was utilized to test the validity of a hypothetical causal model, depicting the influence of students' stressors on Grade Point Average (GPA) when mediated by: (1) Cognitive Appraisal Strategies; (2) Cognitive Reactions; (3) Emotional Reactions; (4) Physiological Reactions; (5) Mastery Orientation; (6) Performance Orientation; and (7) Academic Self-Concept. Students' stressors consisted of: (1) Instruction and Evaluation; (2) Classroom Environment; (3) Teachers; (4) Work; (5) Family; and (6) Negative Personal Beliefs. The convenience sample consisted of college students ($N = 582$) from two major universities in the Midsouth: The University of Oklahoma, Norman, Oklahoma, and the University of Central Oklahoma, Edmond, Oklahoma. Students completed questionnaires designed to assess the aforementioned causal relationship.

Results revealed that Academic Self-Concept was the most influential and predictive of GPA. Cognitive Appraisal Strategies and Negative Personal Beliefs Stressors had strong influences on Academic Self-Concept. Furthermore, Negative Personal Beliefs Stressors strongly influenced Cognitive Appraisal Strategies. Additionally, Negative Personal Beliefs Stressors correlated strongly with all stressors and stress reactions. Finally, tests for "goodness of fit" indicated that the trimmed model fits the data well.

CHAPTER ONE

INTRODUCTION AND DEFINITION OF PROBLEM

Stress is a part of current societal problems. Even though stress has been acclaimed as a problem in the workplace, school, and home, the identification of definite student stress producers and consequences has been somewhat neglected. While some portion of stress is essential for development and survival, when carried to severe extremes, it becomes incapacitating (Selye, 1974). Studies have shown that stress is costly to students, schools, and teachers. In its resolution on student stress, the National Education Association stated that "it believes that there are greater and increasing mental and emotional pressures on the students of this nation; increased suicide among students speaks greatly to those pressures and the resultant waste of human potential" (Glaser, 1980). According to Pelletier and Lutz (1988), stress costs the American employer approximately \$150 billion per year.

According to Reeve (1992) individuals respond to stress producers on various levels: physiological, emotional, behavioral, and cognitive. Stress produces cognitive disruption which is explained by the information-processing approach. Once a stress producer has been interpreted as threatening to one's well-being or self-esteem, a variety of intellectual functions may be adversely affected. For instance, the pattern of thinking is confused resulting in poor memorization and lack of concentration. These adverse reactions to stress producers, if not coped with successfully using coping and

cognitive strategies, can result in avoidance behavior and encourage Performance Orientation (i.e., the goal is to avoid negative consequences, not to improve competence). Lacking cognitive/coping strategies, that have been proven to be effective, can diminish a learner's perceptions regarding his/her ability or Academic Self-Concept (Schunk, 1991).

In general, the greater the stress, the greater the reduction in cognitive efficiency and the more interference with flexible thinking. Because attention is a limited resource, when we focus on the threatening aspects of a situation and on our arousal, we reduce the amount of attention available for effective coping with other tasks at hand. Memory is also affected because short-term memory is limited by the amount of attention given to new input, and retrieval of past relevant memories depends on smooth operation of the use of appropriate retrieval cues. Similarly, stress may interfere with problem solving, judging, and decision making by narrowing perceptions of alternatives and by substituting stereotyped, rigid thinking for more creative response. Consequently, achievement drops and self-concept may be negatively affected by stress producers.

According to Reeve (1992), emotional stress reactions include irritation, anger, and depression. Physiological stress reactions are automatic mechanisms facilitating swift emergency action. They are regulated by the hypothalamus and include many emergency body changes carried out through the action of the autonomic nervous system and the pituitary gland. They lessen sensitivity to pain and provide extra energy for fight or flight. They are useful for combating physical stressors, but they

can be maladaptive in response to psychological stressors, especially when stress is severe or chronic. According to Selye (1956), the general adaptation syndrome is a three-stage pattern of physiological defenses against continuing stressors that threaten internal well-being. A resistance stage follows the alarm reaction; psychological defenses are activated until adaptive resources fail in the stage of exhaustion. In the exhaustion stage, the body loses its power to resist. If the severe stressor continues, major illness may occur.

Many factors and/or events contribute to stress. This research project was conducted to gain insight into the major producers of stress among college students and should help college students, educators, employers, and family members increase their knowledge and awareness regarding stress producers. Knowledge of stress producers can also help educators, employers, and family members in making adjustments for adaptation and improvements for students to cope with stress. Making such adjustments and improvements is essential in improving students' abilities to cope with stress and performance. Therefore, to help students cope with stress, it is imperative to identify sources of students' stress.

For the purpose of this study, stress is defined as the pattern of response college students make to perceived stimulus events that disturb their equilibrium and burden or exceed their ability to cope.

Statement of the Problem

The purpose of this exploratory study was to examine the causal relationship of college students' stressors and GPAs when mediated by the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies.

Theoretical Rationale

The theoretical rationale underlying the development of the student stress model (Figure 1) originated with the Information-Processing Approach (Figure 2), Bandura's Social Cognitive Paradigm (1986, Figure 3), Instructional Psychology and Technology Theories, and the Interactional Stress Theories (Lazarus, 1966; Derogatis & Coons, 1993).

The Information-Processing Approach was partially based on Human-Factors Research and Information Theory (Anderson, 1990). Human Factors Research is concerned with human skills and performance. Information Theory is part of communication sciences that attempt to explain the processing of knowledge. As mentioned earlier, the greater the stress, the greater the reduction in cognitive efficiency and the more interference with flexible thinking. Because attention is a limited resource, when we focus on the threatening aspects of a situation and on our arousal, we reduce the amount of attention available for effective coping with other

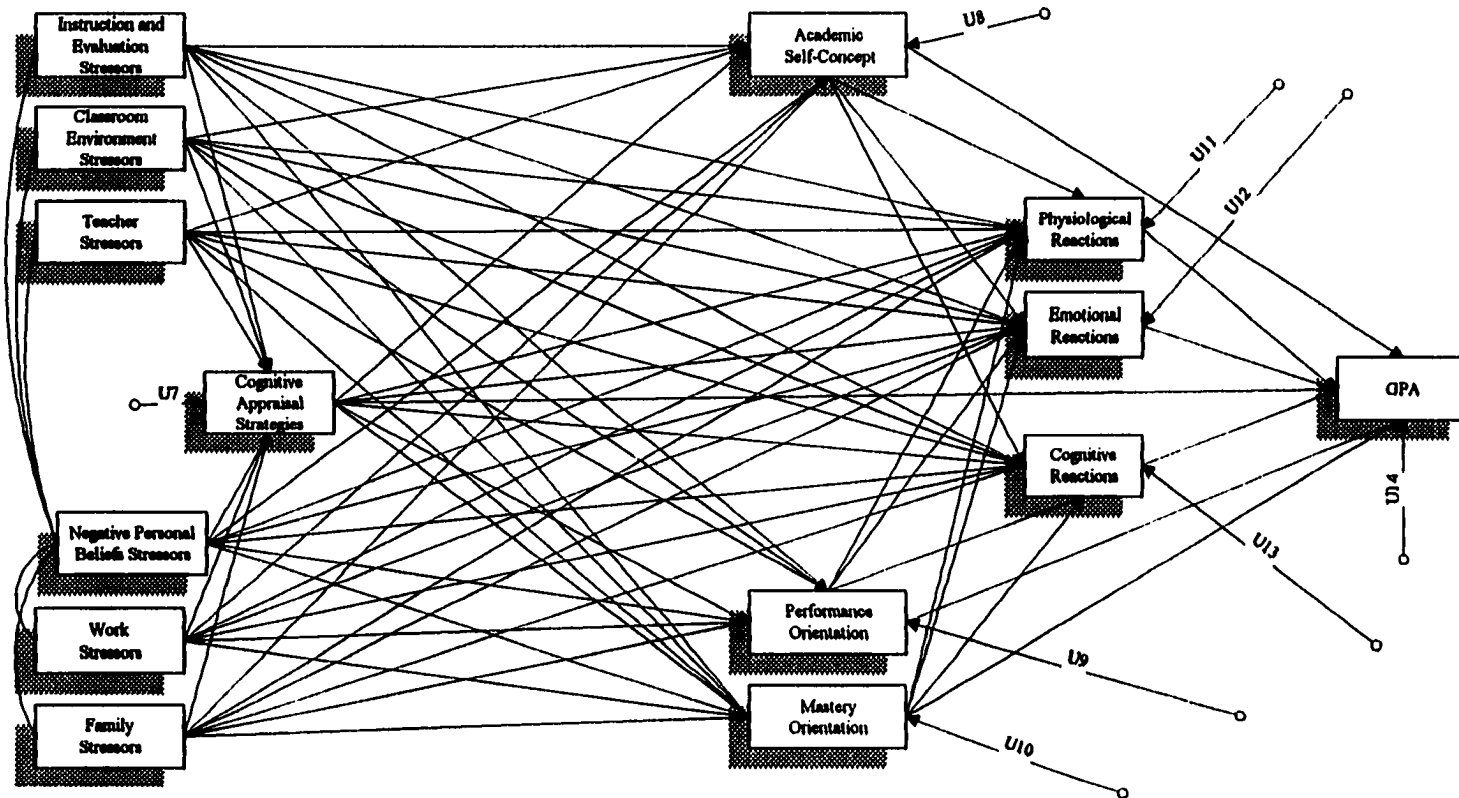
tasks at hand (see Figure 2). Memory is also affected because short-term memory is limited by the amount of attention given to new input, and retrieval of past relevant memories depends on smooth operation of the use of appropriate retrieval cues. Similarly, stress may interfere with problem solving, judging, and decision making by narrowing perceptions of alternatives and by substituting stereotyped, rigid thinking for more creative response. Consequently, achievement drops and self-concept may be negatively affected by stress producers.

According to Bandura, humans are thinking organisms who are capable of providing some power of self-direction. Moreover, they are capable of learning vicariously. Cognitive and emotional responses can be developed by observing affective response of others undergoing painful or pleasurable experiences. It is likely in this manner that people learn or fail to learn appropriate strategies for dealing with stress. In other words, the individual is an active mediator who operates on the environment rather than a passive recipient. Furthermore, Bandura emphasized that social and cognitive factors, especially observational learning, reciprocal determinism (Figure 3), and perceptions of self-efficacy (Figure 4), influence behavior in important ways. An individual's sense of self-efficacy impacts his or her perceptions, motivation, and performance. People usually do not attempt to perform tasks when they expect to be ineffectual. People usually avoid situations when they do not feel capable. Even when they feel capable, they may not take the required action or persist to successful completion of the task, if they think they lack what it takes (Bandura, 1986).

Instructional Psychology and Technology theories proposed the theoretical models of the connections between the external events of instruction and the internal events of cognition and learning. These theories address the effects of prior experience and knowledge, motivation, personal and social factors on learning and performance.

Figure 1

Hypothetical Path Model of College Students Stress



Note:
U: Represent unexplained path.

Figure 2

An Information-Processing Model of Stress

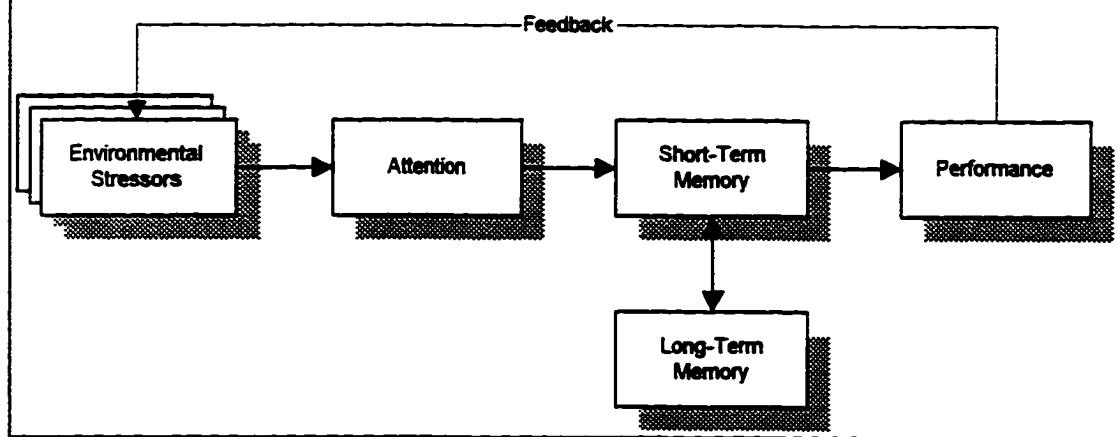


Figure 3

Reciprocal Determinism: In Reciprocal Determinism, the Individual, the Individual's Behavior, and the Environment all Interact

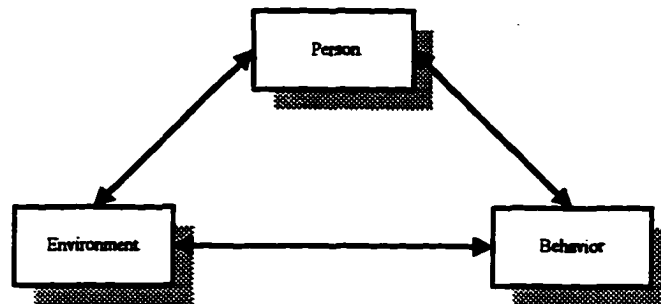
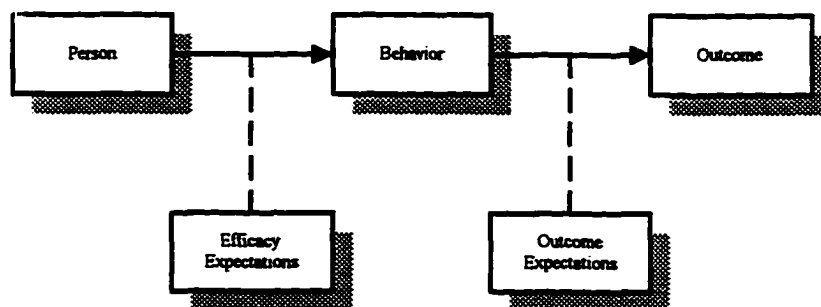


Figure 4

Bandura's Self-Efficacy Model: The Model Positions Efficacy Expectations Between the Person and his or her Behavior; Outcome Expectations are Positioned Between Behavior and its Anticipated Outcome.



According to Lazarus & Folkman (1984), stress most often has been defined as either stimulus or response. Stimulus definitions focus on events in the environment. On the other hand, response definitions, which have been used largely in biology-related fields, refer to a state of stress (e.g., reactions with stress, being under stress). Stimulus and response definitions have confined use (Lazarus & Folkman, 1984). This is because a stimulus receives definition as stressful only in terms of a stress response (Lazarus & Folkman, 1984). Consequently, reasonable rules are still necessary to stipulate the circumstances under which some stimuli are stressors (Lazarus & Folkman, 1984). As a result, Lazarus & Folkman (1984), characterized stress as the relationship between the person and the environment, which takes into account characteristics of the person and the nature of the environmental event. Lazarus & Folkman (1984, page 19), defined 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.”

The decision that a specific person-environment relationship is stressful depends on cognitive appraisal (Lazarus & Folkman, 1984). Cognitive appraisal plays a central role in defining the situation. For example, in appraising an event one might want to know what the demand is, how great a threat it is, what resources one has for meeting it, and what strategies are appropriate (Lazarus & Folkman, 1984).

As one of the leaders in stress research, Lazarus has differentiated two stages in cognitive appraisal of demands and requirements. He utilized the term primary appraisal for the preliminary evaluation of the desirability, value, and seriousness of a

demand. The primary evaluation begins with the questions “what’s happening?” and “is this thing good for me, stressful, or irrelevant?” If an individual’s answer to the second question is stressful, he or she will then appraise the probable impact of the stressor by deciding if damage has occurred or is possible to and if a response is necessary. If a person determines an action must be taken, secondary appraisal starts. At this time, this person appraises the personal and social means that are available for him or her to confront the stressful event and think about the response options that are necessary (Lazarus, 1976). The process of appraisal proceeds as coping responses are tested; therefore, if the first responses are unsatisfactory and the stress continues, different responses are initiated, and their sufficiency and effectiveness is assessed (Lazarus, 1991).

According to Lazarus & Folkman (1984), secondary appraisal is a complex evaluative process. This process takes into consideration which coping alternatives are accessible, the likelihood that a given coping choice will achieve what it is expected to, and the likelihood that one will be able to employ specific tactics effectively. Bandura (1986) made clear the differentiation between these two expectations (see Figure 3). Bandura (1986) used the outcome expectancy term which refers to the person’s evaluation that a given behavior will result in certain outcomes. Expectations of failure and cessation of effort may be based on the perception that a situation is unresponsive, punishing, or unsupportive instead of on a perception of one’s own inadequacy. Such expectations are called outcome-based expectancies. Bandura used the term efficacy expectation to refer to the person’s

belief that he or she can satisfactorily perform the behavior necessary to produce the outcomes. Perception of one's own inadequacy is called efficacy-based expectancies, see Figure 3. When people know that they possess a large asset of coping strategies, metacognition improves and strengthens their confidence in meeting environmental demands (Bandura, 1986). Self-confidence in turn can shield people from experiencing the full impact of many stressors because believing they have the coping resources readily available immediately shortens the stressful response to "What to do next?"

Significance of the Study

Throughout the past two decades, many researchers have become increasingly interested in the following three areas of research: 1) Academic Self-Concept and achievement (March & Holmes, 1990; Caracosta & Michael, 1986); 2) goal orientation, perceived ability, cognitive engagement, and achievement (Greene & Miller, 1993, 1996; Roedel, Schraw, & Plake, 1994; Ames, 1992; Dweck & Leggett, 1988); and 3) stress, stressors, stress reactions, and management (Macan, Shahani, Dipboye, & Phillips, 1990; Vitaliano, 1987; Ganz & Ganz, 1988). However, there was no known study attempting to include goal orientation in the exploration of the relationship between college students' stressors, Stress Reactions, Cognitive Appraisal Strategies, Academic Self-Concept, and GPA. Figure 1 depicts a hypothetical model of categories and consequences related to the stress level of students. This hypothetical model formed the basis for this study.

The gain in this exploratory study was in determining the significance of the relationship between college students' stress variables (e.g., stressors, stress reactions, Cognitive Appraisal Strategies) to goal orientations, GPAs, and Academic Self-Concept variables. Educators, employers, family members, society, etc., can benefit from this study results in making adjustments and improvements to help students cope with stress. The educator, teachers in particular, can adjust and improve their instructional methods, evaluation, and interactions with students. Employers and family members can be more supportive of students in coping with stress. The outcome of this study adds to the general knowledge about students, stress and its related consequences.

Research Hypothesis

The purpose of this exploratory study was to examine the causal relationship of college students' stressors and GPAs when mediated by the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies (see Figure 1). This purpose led to the investigation of the relationship between students stressors and their effect on Cognitive Appraisal Strategies, Academic Self-Concept, Mastery Orientation, Performance Orientation, Physiological Reactions, Emotional Reactions, Cognitive Reactions, and GPA. The investigation of the aforementioned relationship generated the following general hypothesis and eight questions.

Hypothesis 1.0

There are no significant relationships between stressors and GPA when mediated by the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies.

There are eight criterion variables in the hypothetical model: GPA, Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies. Therefore, Hypothesis 1.0 was partitioned into eight questions based on the eight criterion variables in the hypothetical model as follows.

Question 1.1

What is the nature of the relationship between GPA and the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Cognitive Appraisal Strategies, Performance Orientation, and Mastery Orientation?

Question 1.2

What is the nature of the relationship between Physiological Reactions and the following variables: Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Question 1.3

What is the nature of the relationship between Emotional Reactions and the following variables: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Question 1.4

What is the nature of the relationship between Cognitive Reactions and the following variables: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Question 1.5

What is the nature of the relationship between Academic Self-Concept and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, and Family Stressors?

Question 1.6

What is the nature of the relationship between Performance Orientation and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Question 1.7

What is the nature of the relationship between Mastery Orientation and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Question 1.8

What is the nature of the relationship between Cognitive Appraisal Strategies and the following variables: Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Definition of Terms

Stress: the pattern of responses a student makes to stimulus events that disturb his/her equilibrium and burden or exceed his/her ability to cope. It is also a reaction to anything people consciously or unconsciously perceive as a threat, either real or imagined.

Stressors: a stimulus event that places a demand on students for some kind of adaptive response. Stressors are situations that are perceived as a threat that causes stress.

Classroom Environment Stressors: students' interactions and relationships with their peers and classmates in school, classrooms settings and conditions.

Instruction and Evaluation Stressors: ambiguous instructions, ambiguity in class assignments, and tests which don't reflect what is taught.

Teacher Stressors: teachers' abilities, efforts, expectations, and attitudes.

Negative Personal Beliefs Stressors: low self-confidence, lack of security, lack of skills, lack of resources, lack of ability, and unpleasant past experiences.

Work Stressors: work demands and resources, relationships with co-workers and superiors.

Family Stressors: Family Stressors comprised of family demands, lack of support, lack of resources, structure, expectation, and illness.

Cognitive Appraisal Strategies: the process of dealing with internal and external demands that are perceived as straining or exceeding an individual's resources.

Academic Self-Concept: students' feelings of their academic ability.

Goal Orientation: students are either performance or mastery oriented.

Performance Goal: students with performance goal orientation tend to use shallow types of learning strategies. They are motivated to doing better than others, getting high grades, being normative, passing the course, lacking of focus on learning.

Mastery Goal: students with mastery goal orientation tend to use deep types of learning strategies. They are motivated to self improvement, working hard, focusing on learning processes, and learning for the sake of learning.

Stress Reactions: the students' physiological, emotional, and cognitive reactions to stressors.

Physiological Reactions: experiencing allergies, sleeping problems, and headaches.

Emotional Reactions: experiencing nervousness, anxiety, and fatigue.

Cognitive Reactions: experiencing confusion, loss of memory, loss of attention, and poor concentration.

Achievement: students' academic performances (GPA).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

The literature concerning college student stress consists mostly of descriptions of stress (i.e., definitions, types, gender differences, sources, consequences, coping strategies, etc.) as well as life stress events (i.e., financial problems, school problems, work problems, family problems, social, etc.). The review of literature which follows will address these two areas after presenting a theoretical rationale for studying college student stress and the model being proposed in the study. In addition, the review of literature will address college student goal orientation and Academic Self-Concept, as well.

Descriptions and Definitions of Stress

There are three types of stress theories: (1) stimulus-oriented theories, (2) response-oriented theories, and (3) interactional, or transactional (Lazarus, 1966; Derogatis & Coons, 1993). According to Derogatis and Coons (1993), stimulus-oriented theories consider stress as a potential within the stimulus in the organism's environment. This approach suggests that stress is imposed on the individual because of the conditions of the environment which demand change or adaptation.

Measurement efforts are utilized on the conditions of the environment and on the instruments that will attempt to reflect cumulative environmental stress. Response-oriented theories define stress in terms of the response an individual makes to the events of the environment. The pattern of responses has been used as an operational measure of stress. Interactional theories emphasize the characteristics of the individual as mediator between the conditions of the environment and the responses of an individual. In addition to the individual's mediation of stimulus upon responses, perceptual, cognitive, and physiological characteristics of the individual impact the environment in a significant way. The definition of stress is a function of the ongoing, active relationship between the person's adaptive and coping mechanisms and the conditions of the environment (Derogatis and Coons, 1993).

Consequently, there is great disagreement over the definition of stress. Different scholars have distinct definitions and often abide by those most fitting to the pursuit of their particular interests. For example, Selye (1974) defined stress as a "nonspecific response of the body to any demand made upon it." Selye (1974) indicated that it was insubstantial whether the source of event was pleasant or unpleasant; what counted most was the strength of the need for adaptation or return to normalcy. By contrast, Lazarus's (1966) focus on cognitive appraisal presumes that specific kinds of information are operative in appraising a particular stimulus as a stressor. Rutter (1983) added the proposition that personal characteristics (i.e., sex, age, temperament) as well as past experience which individuals bring to the stress

interaction play a key role in their appraisal of the interaction and the meaning they assign to it.

Selye (1956, 1974) published a theory of stress in which he described the implications of stress as additive with effects which are cumulative and involving serious pathology when they overwhelm one's ability to cope. This theory was referred to as the General Adaptations Syndrome (GAS). According to the GAS theory, the body's stress response goes through three stages: alarm, resistance, and exhaustion. The alarm reaction takes place when an organism detects some threat. If the threat persists, the physiological arousal arises or levels off when the organism becomes accustomed to the threat. However, if the stress remains, the body's resources for fighting may be exhausted and the organism goes into the exhaustion stage. However, Rutter (1983), who defined stress in terms of adaptation and bodily reaction, postulated a multiplicative effect and suggested that it is not absolutely the severity of the given stressor as much as the number of stressors individuals must deal with at a particular point in time which ascertain their ability to cope.

Furthermore, Lazarus and Folkman (1984) described stress as a specific stimulus-response transaction which threatens an individual. The stress one experiences is not in a situation or in a person, but in a transaction between the two (situation and person) depending on how a person appraises the situation and adapts to it (Lazarus & Folkman, 1984). Lazarus and Folkman's (1984) focal point was the individual's cognitive interpretation of the stressful situations. They characterized primary and secondary appraisals to have distinct attributes. The primary appraisal is

one's first evaluation of the stressful event by determining whether the stress is a relevant or irrelevant threat. The secondary appraisal is an evaluation of one's coping resources and whether one has sufficient strategies to cope with the stressors.

Defining, understanding, and researching stress is a complex process. This complexity stems from the numerous stressors and reactions which may overlap and interact with each other. Nonetheless, certain assumptions are shared across definitions. For instance, stress is a function of stimulus, an individual's interpretations, and an individual's coping skills. Also, it is assumed that stress demands a readjustment or adaptation and stress reactions can be positive or negative.

The aforementioned descriptions and definitions of stress are merely generic. The following section will explain the descriptions and definitions of college student stress.

Descriptions and Definitions of College Students Stress

College students' environment consists of home, school, and work, generally. Meeting the demands and requirements of home, school and work can be extremely stressful. Basic definitions of stress suggest that it is environmentally produced; in contrast, more complex models assume the cognitive factors are of more significance for greater number of stressors (Fisher, 1995). Therefore, the threat of these demands and requirements need not be objectively real; it is only necessary for the college student to perceive a threat for stress to occur.

For the purpose of this study, stress is defined as the pattern of response a college student makes to perceived stimulus events that disturb his equilibrium and burden or exceed his ability to cope.

In short, stress encompasses a true or false imagined threat to college students' security, survival, or self-esteem. When college students encounter home, school, or work events, they assign some meaning to them. This interpretation can be positive or negative. The resulting response will depend on the type of meaning assigned. Unpredictable, unpleasant, unfair, and uncontrollable home, school, and work events, are frequently perceived as threatening and result in major stress problems and illnesses.

Types of Stressors

Perhaps major life stressful events that are naturally occurring are an inescapable portion of people's lives. Intimate relatives move away, die, get sick, and so on. People get new homes, new jobs, get fired or laid off, get promotions, leave home, start college, succeed, fail, get married, etc. In addition to the major life events, there are also reoccurring frustrations such as traffic jams, missed appointments, etc. Unexpected, disastrous events, such as earthquakes or major catastrophes, will negatively affect most people who are close to them. Furthermore, chronic societal problems, such as pollution, AIDS, poverty rate, and crime, will negatively affect most people who are close to them, as well.

In an attempt to treat the problems of stress sources effectively, many stress experts tried to classify the stress sources (stressors) as simply as possible. For instance, Wheaton (1996) characterized and described six types of stressors, similar to the ones above. The first encompasses life change events, such as divorce, job loss, death of a family member, etc. The second includes daily hassles such as having to wait for something, traffic jams, taking care of house maintenance, etc. The third type refers to macro stressors (macrosocial system) such as economic recessions, divorce rate, infant deaths, high school dropout rate, etc. The fourth type involves nonevents which refers to those events that are desired and do not occur as expected. This type refers to events such as an anticipated promotion that does not occur, or an anticipated salary raise that does not occur. The fifth type comprises trauma events such as war stress, natural disasters, nuclear accidents, etc. The sixth type embodies chronic stress which refers to those events that are the open-ended type which include the problems of overload, excessive task or role demand, excessive complexity, etc.

In short, change and the need to adapt to social, physical, environmental, and biological demands are basic causes of stress (stressors).

Stress Reactions

As mentioned earlier in the introduction, people react to threats on various levels: physiological, behavioral, emotional, and cognitive. Selye (1974), a physiologist, suggested that physiological stress reactions are automatic mechanisms facilitating swift emergency action. They are regulated by the hypothalamus and

include many emergency body changes, carried out through the action of the autonomic nervous system and the pituitary gland. They lessen sensitivity to pain and provide extra energy for fight or flight. They are useful for combating physical stressors, but they can be maladaptive in response to psychological stressors, especially when stress is severe or chronic. According to Selye (1956), the general adaptation syndrome is a three-stage pattern of physiological defenses against continuing stressors that threaten internal well-being. A resistance stage follows the alarm reaction; psychological defenses are activated until adaptive resources fail in the stage of exhaustion. In the exhaustion stage, the body loses its power to resist and if the severe stressor continues, major illness may occur.

However, Lazarus (1966), suggested that stress reactions embody not only physiological changes, but irritating behavioral reactions such as muscle tension or spasms that can be observed in hand tremors, speech disturbances, or grinding one's teeth during sleep. Lazarus (1966) also suggested that stress reactions include disturbing emotions (e.g., anxiety, anger, depression, irritability), and cognitive dysfunction (e.g., confusion, poor concentration, memory failure).

Lazarus and Folkman (1984) defined stress as a process, not as a stimulus event nor as a physiological response. Since people have different perceptions, learning styles, memory, cognitive strategies, Lazarus and Folkman (1984), argued against theorizing stress as a stimulus because people differ broadly in their reactions to stressors. Lazarus and Folkman (1984) emphasized heavily the cognitive processes that moderate between environmental events and physiology.

Coping With Stress

According to Lazarus and Folkman (1984), coping refers to the process of dealing with internal or external demands that are perceived as straining or exceeding an individual's resources. Coping strategies are ways of dealing with the perceived threat of different types of stressors. There are two primary coping categories proposed by Lazarus and Folkman (1984). The first is the problem-focused coping category, or taking direct actions, and the second is the emotion-regulation coping category, which is usually indirect or avoidant. The problem-focused category consists of all strategies intended to deal directly with the stressor through overt action or through problem-solving activities. The emotion-regulation coping category is useful for dealing with the impact of more uncontrollable stressors. The goal here is not to change the external stressful situation; rather, it is to change our feelings and thoughts about it. If our resources match the perceived demand, coping can be successful. Therefore, the success of coping depends on a matching of coping strategies to the stressful event's demands. The possession of multiple coping strategies is more adaptive because we are more likely to obtain a match and deal with the stressful event. Our knowledge of possessing a large number of coping strategies (metacognition) strengthens our confidence in facing stressful-event demands (Bandura, 1986). Consequently, self-confidence protects us from encountering the full strength of stressors because we have the coping means promptly available which immediately shorten the stressful response to "what I am going to do next?"

Nonetheless, the manifestations of stress symptoms seem to be reduced if people have acquired good coping skills for managing stress. On the other hand, if people do not have these coping skills, they may be subject to more frequent or severe symptoms (Reeve, 1992). According to Selye (1974), there are two types of responses to stress: 1) eustress which means a positive and proactive reaction to stressors; stressors are defined as a challenge rather than threat; 2) distress which means a non-positive, unproductive reaction to stressors; stressors are defined as threat rather than challenge. For example, when college students do not do well on quizzes, they may try to find out what went wrong and try again; this reaction is eustress, or they may blame the teacher and give up, and that is distress reaction.

In summary, there are many types of coping techniques that are available (e.g., biofeedback, progressive muscle relaxation, time management, diet, spiritual guidance, problem solving and exercise) to reduce the adverse effects of stress; however, identification of symptoms and associated causes is the critical step in dealing with stress.

Research On Selected Variables Used In This Study

The subsequent sections consist of the literature related to variables used in the study. The first section discusses the literature related to college students' stress related variables (school stressors, Family Stressors, Work Stressors, stress reactions, coping strategies, etc.). The second and third sections discuss the literature related to college students' goal orientation and Academic Self-Concept, accordingly.

Research on College Students' Stress Related Variables

The following review of research literature will characterize the major sources of stress, stress reactions, consequences, and coping strategies experienced by college students.

Ganz & Ganz (1988) examined five assumptions that have been used to attribute unsuccessful grade performance by community college students: outside employment, personal problems at home, lack of effort needed to succeed, poor reading ability, and failure to persist at academic tasks. Two hundred and three undergraduates were administered the Social Readjustment Rating Scale and other questionnaires and short tests to investigate these assumptions. Results revealed that student age as well as perceptions of their own reading ability, chances of success, and ability to persist at tasks, were useful in predicting grade performance. Work hours, general life stress, and the ability to cope were not valid predictors.

Student identification of potential stressors is vital to the development of coping strategies. Kohn and Frazer (1986) conducted a study to identify events which elicit academic stress. To generate items for the study, a convenient sample of 202 students was utilized. Students were asked to identify the five most significant stressors they encounter in academic life. This process yielded 35 items: final grades, crowded classes, classes irrelevant toward major, excessive homework, classes without open discussion, term papers, examinations, fast-paced lectures, pop quizzes, incomplete assignments, unclear assignments, late dismissals of class, noisy

classrooms, cold classrooms, unclear course objectives, hot classrooms, nonnative language lectures, announced quizzes, studying wrong material, giving incorrect answers in class, missing class, buying text books, learning new skills, boring classes, attending the wrong class, arriving late for class, forgetting pencil/pen, note-taking in class, evaluating classmates' work, poor classroom lighting, speaking in class, waiting for graded tests, forgetting assignments, and being unprepared to respond to questions.

After the identification of the 35 academic stressors, a convenient sample of 498 college students was utilized to assess the stress level. The result indicated that final grades, excessive homework, term papers, examinations, and studying for examinations were the most significant stressors encountered by the students. It is the authors' contention that it is essential for educators to enhance students' educational experience, tailor counseling programs, and modify the educational facilities and structures to minimize the effects of stress (Kohn & Frazer, 1986).

In an investigation of personal and academic stressors on college campuses Archer and Lamnin (1985) surveyed undergraduate students at a large university to assess academic and social stressors experienced by the students. They found that the major academic stressors were perceived to be tests, grade competition, time demands, professors, classroom environment, and career success. The major personal stressors were intimate relationships, parental conflicts, finances, and interpersonal conflicts with friends.

The dimensions and extent of stress felt by undergraduates were explored in surveys conducted over three years at the University of California, Los Angeles (Dunkel & Lobel, 1990). A total of 161 students were interviewed in 1983, 187 in 1984, and 150 in 1985. Sources of stress included academic demands, interpersonal issues, financial concerns, sexuality, and emotional distress. Students experienced high stress levels in the domains of friendships, romantic and family relationships, financial affairs, and academic work.

Student perception of the ability to cope with stress is directly related to the level of stress experienced. Felsten and Wilcox (1992) examined the effects of stress and cumulative situation-specific mastery beliefs and satisfaction with social support on somatic and psychological symptomatology and academic performance of 146 college men. Mastery referred to beliefs that one possessed adequate skills and experience to cope with the situation. Social support referred to support from family, friends, and professionals.

Results suggested that cumulative measures of perceived stress, mastery beliefs, and satisfaction with social support for individual stressors experienced during a semester were related to psychological and somatic distress and academic performance during the semester. Stress was directly related to increased symptomatology and decreased grade point average (GPA), whereas mastery beliefs were directly associated with reduced depression and anxiety. Neither mastery nor satisfaction with support appeared to act as a stress-buffer through a statistical interaction with stress to moderate effects of high stress. Situation-specific mastery

beliefs reduced appraisal of stress and were associated with better psychological adjustment (Felsten and Wilcox, 1992).

At the graduate level, Hudson and O'Regan (1994) reported a study that examined psychology students' stress levels. One hundred seventy-one students completed the Psychology Student Stress Questionnaire and a demographics sheet. Significant differences in student stress levels were found across the following variables: number of children a student has and the relationship status, number of hours worked, relationships with significant others, students' gender. Results suggested that students who are not in a committed relationship have higher stress level. However, there are significant differences only when there is one child involved and no committed relationship. This study revealed that women who are working full-time and are not in a committed relationship had the highest stress level.

In a similar study, Cahir and Morris (1991) assessed the impact of emotional, financial, and academic stressors of graduate psychology training on students. Seven factors were identified as sources of stress with factor number one being the greatest source of stress: 1) problems with time constraints; 2) difficulty with feedback from specific faculty; 3) financial constraints; 4) trouble getting help from faculty; 5) limited emotional support from friends; 6) difficulty with feedback with regard to status in the department; and 7) stress from lack of input in program decisions. The results of the study reported that female students had higher stress scores than males. Also, third-year students reported having higher stress scores than students in other years of the program.

In an attempt to assess the impact of medical school training on the emotional, academic, and social life of the medical student Blumberge and Flahery (1985) found an inverse relationship between academic performance and reported stress levels.

Khanna and Khanna (1990) reported the results of a study conducted on fifty medical students. The data of the study was collected via personal interviews with students. Students indicated that education related stress was the most frequent. This consisted of lack of time to study, excessive work required by instructors, grade competition, disorganization of courses, tests that did not reflect what was taught, and poor teacher-student relationships. Students reported long distance relationships with significant others and the resultant problems, problems at home, and problems in relationships with other students to be stressful, as well. Students also reported divorce of parents, students' own divorce, adjusting to marriage, birth of a child during the first week of school, illnesses in the family, and balancing school with married life as stressors.

Stress manifestations were reported in the form of emotion, somatic, and lifestyle pattern changes. Some examples of emotion reactions included the lack of concentration, day dreaming, mental exhaustion, feelings of depression, anxiety, irritability, feeling of low self confidence and low control over life. Somatic manifestations were reported to include weight fluctuations, increased blood pressure and heart rate, headaches, physical fatigue, and excessive sleeping. Lifestyle pattern changes were manifested in the changes in eating habits, stopping exercising, and interruption in sleep patterns (Khanna and Khanna, 1990).

Stress coping strategies of students were classified as responses based on person-centered and environment-centered approaches for management of stress. Furthermore, responses in the person-centered category were divided into two categories: 1) physical activity and 2) feelings and thought processes. In the first category, entertainment, rest, increased smoking and increased intake of coffee and food were reported. Students' responses that elicited feelings and thought processes included talking with friends more, meditation and creative visualization, worrying, trying to be realistic, and getting away and thinking about something different. Environment-centered approaches that emphasized social activities for coping with stress were post-test parties, picnics and going out with friends, talking with others, and rewarding oneself (Khanna and Khanna, 1990).

Vitaliano (1987) administered measures of appraisal including perceptions of stress, situational stressors, and locus of control to 433 first and second year medical students. Three types of stressors relating to the academic environment, social/familial issues, and personal performance were examined. Internal attributors perceived less threat and more mutability when appraising personal performance stressors than external attributors. In contrast, when appraising stressors in the academic environment, internal attributors actually perceived less mutability than external attributors. The observed internal-external situational stressor interactions were in line with expectations from existing theory. It is suggested that appraisal was better predicted by the interaction of person and situation factors rather than by either factor alone. This is consistent with the cognitive-phenomenological stress model.

Family can also be a significant source of stress for college students. Anderson and Yuenger (1987) studied 425 students' case files at a university counseling service to find out how common complaints were about parents. They found that 103 students reported stresses caused by the family as a significant area of concern. The major problems were lack of parents' emotional contact, too much control, and manipulation.

According to Macan, Shahani, Dipboye, and Phillips (1990), one potential coping strategy frequently offered by university counseling services is time management. A total of 165 students completed a questionnaire measuring their time management behaviors and attitudes, stress, and self-perceptions of performance and grade point average (GPA). The study's results suggested that the most predictive factor was Perceived Control of Time. Students who perceived themselves as having control of their time reported significantly greater evaluations of their performance, greater work and life satisfaction, less role ambiguity, less role overload, and fewer job-induced and somatic tensions.

In summary, college students' stress consists of many sources (academic, work, home, relationship with others, time management, financial, etc.). Students react to stress differently. The availability of skills and resources to cope with stress is critical. Because it has been documented that stress can have a major impact on the academic performance and personal lives of students, it is important that the stressors of college students be explored on a continuing basis.

Research on College Students' Goal Orientation

As the investigations of stressor influences on college students' psychological aspects has been somewhat confirmed, research effort in motivation has been initiated to examine the relationships between various psychological motivational variables and the cognitive processes that influence students' achievement (Greene & Miller, 1996; Greene & Miller, 1993; Meece, Blumenfeld & Hoyle, 1988; Dweck & Leggett, 1988). Goal orientation theory (e.g., Dweck, 1986; Dweck & Leggett, 1988) provides the basis for investigating these processes. Goal orientation theory proposes that goals individuals pursue in intellectual achievement create the framework within which they interpret and react to events. According to goal orientation theory, there are two types of goals individuals pursue: performance goal orientation and learning goal orientation. Individuals with performance goal orientation are concerned with gaining favorable judgment of their competence while attempting to avoid negative reactions to their abilities. Performance oriented individuals tend to prefer receiving a positive evaluation on a relatively simple task rather than taking a chance of failure on a more difficult task. Learning oriented individuals tend to be interested in increasing their competence at a task. They are highly attracted to acquiring new skills and improving their knowledge and have high level of task persistence. Learning oriented individuals tend not to be influenced by what others think of their abilities.

Elliot and Dweck (1988) investigated goal orientation differences pursued by "helpless" and "mastery" oriented individuals. The sample consisted of one hundred and one fifth-grade children who were randomly assigned to four separate

experimental conditions involving learning and performance goals and high and low abilities. The results of the study suggested that when children believed they had low ability, they responded to feedback in a characteristically helpless pattern (e.g., making the attribution that mistakes reflect a lack of ability). On the other hand, when the value of the performance goal was highlighted and children believed their current skills were high, they responded in a mastery-oriented manner as they encountered difficulty.

In an attempt to test the validity of a goal mediational model for conceptualizing the influence of individual and situational variables on students' cognitive engagement in science activities, Meece, Blumenfeld and Hoyle (1988) used structural equation analysis. A sample consisting of 275 fifth- and sixth-grade students completed a set of questionnaires. This questionnaire was designed to assess students' goal orientations and their use of high-level effort-minimizing learning strategies while completing six different science activities. The major results of the study indicated that students who placed greater emphasis on task-mastery goal reported more active cognitive engagement. On the other hand, students oriented toward gaining social recognition, pleasing the teacher, or avoiding work reported a lower level of cognitive engagement.

To examine the relationship among college students' self-reported goal orientation, perceived ability, cognitive engagement while studying, and course achievement a study was conducted by Greene and Miller (1996). The sample consisted of 108 college students of which 75% were women and 90% were

Caucasian. The sample was administered an instrument containing 54 Likert-type items.

The results of the study suggested that perceived ability and learning goal scores were positively correlated with meaningful engagement (self-regulation and deep strategy use.) A positive correlation was found between learning goals and perceived ability. On the other hand, performance goals were positively correlated with shallow cognitive engagement. In addition, a causal model that examined the links between learning goals, perceived ability, and performance goals to cognitive engagement and then from cognitive engagement to achievement was tested. The testing of path analysis supported the hypothetical causal model in which perceived ability and learning goals influenced meaningful cognitive engagement, afterwards influencing midterm achievement. Midterm achievement was negatively influenced by performance goals, which was influenced by shallow processing. Furthermore, a link from meaningful cognitive engagement to shallow cognitive engagement was detected. The study reported that meaningful cognitive engagement suppressed the negative effects of shallow engagement on achievement.

In summary, research has confirmed that students pursue different achievement goals depending on their individual needs and competencies or on the demands of the situation. The salience of different goals can, in turn, influence students choice of achievement tasks, definitions and attributions for academic success, and selection of cognitive strategies (Greene & Miller, 1996; Dweck & Legget, 1988).

Research On College Students' Academic Self-Concept

According to Byrne (1996) self-concept definition in research has been somewhat problematic. This problem can be related to five major reasons: 1) lack of a universally accepted definition, 2) assumed synonymy of self terms, 3) ambiguous distinction between the terms self-concept and self-efficacy, 4) ambiguous distinction between self-concept and self-esteem, 5) the tendency to convey informal rather than formal notions of self-concept. However, Academic Self-Concept could be characterized by two elements that are common to research. First, Academic Self-Concept reflects descriptive (e.g., "I like most school subjects") as well as evaluative (e.g., "I do well in most school subjects") aspects of self-perception. Second, the self-concept is more related to ideas such as self-perceptions of competence or self-efficacy than to constructs like self-esteem, self-acceptance, or self-worth (Strein 1993, cited in Byrne, 1996). Further, the literature review by Handford and Hattie (1982) indicated school performance indicators to be more highly correlated with self-concept than are IQ or general academic achievement.

There is an increasing research in the educational and psychological literature regarding the links between self-efficacy and various aspects of academic achievement (e.g., Pajares & Miller, 1994). According to Bandura (1986) beliefs of one's confidence are integral to both self-concept and self-efficacy; the two represent different Phenomenon, and thus, should not be regarded as synonymous constructs.

Pajares and Miller (1994) examined the role of self-efficacy and self-concept beliefs in mathematical problem solving. The sample consisted of 350 undergraduate

students. The results of the study indicated that math self-efficacy was more predictive of problem solving than was math self-concept, perceived usefulness of mathematics, prior experience with mathematics, or gender. Furthermore, self-efficacy mediated the effect of gender and prior experience on self-concept, perceived usefulness, and problem solving. They found that the direct effect of self-concept on performance was a modest .163, whereas the direct effect of self-efficacy was .545. They claimed the Academic Self-Concept failed to attain the same level of specificity as self-efficacy. They suggested that self-efficacy is context-specific assessment of competence to perform a specific task, whereas, self-concept includes beliefs of self-worth that are associated with one's perceived competence. The authors indicated that even though self-concept judgments may be subject specific, they are never task specific. Self-concept is more global and less context dependent. For the purpose of this study, Academic Self-Concept will be viewed as more global and less context dependent.

Summary

In summary, college students' stress consists of many sources (academic, work, home, relationship with others, lack of coping resources and strategies, financial, etc.) that students have to deal with. Coping strategies are ways of dealing with the perceived threat of different types of stressors. There are two primary coping categories proposed by Lazarus and Folkman (1984). The first is the problem-focused coping category, or taking direct actions, and the second is the emotion-

regulation coping category, which is usually indirect or avoidant. Nonetheless, the manifestations of stress symptoms seem to be reduced if people have acquired good coping skills, for managing stress. On the other hand, if people do not have these coping skills, they may be subject to more frequent or severe symptoms (Reeve, 1992) which may be intensified by a poor self-concept, poor cognitive strategies, and the use of performance goal orientation.

Since goal orientation has not previously been included in studies of the relationship between stress variables, Academic Self-Concept and achievement, it was important to investigate possible stress effects on the underlying motivational and psychological aspects of college students (e.g., goal orientation, and Academic Self-Concept) as related to achievement.

CHAPTER THREE

METHODS AND STATISTICAL PROCEDURES

Introduction

This chapter describes the methods and procedures used for data collection and analysis. The information is presented in two segments: Methods and Statistical Procedures. The first segment explains the methods that were utilized for the research design, selection of the subjects and subjects characteristics, and the development of the measurement instrument. The second segment presents the statistical procedures that were utilized in the data analysis.

Research Method

Research Design

This study used an ex-post facto design as described by Kerlinger (1973): “systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations had already occurred or because they are inherently not manipulable” (p. 379). In the present study the independent variables were not directly manipulated; further, no randomization of individuals was conducted, and no treatment was used. The study was correlational and exploratory. The hypothesis and research questions were tested for significance at the probability of

an alpha error equal to or less than .05 for correlation. The statistics that were used to analyze the data consisted of Pearson product moment correlation, regression analysis, ANOVA, and recursive path analysis.

Sample

The convenient sample consisted of college students at the University of Oklahoma (OU), Norman, Oklahoma, and students at the University of Central Oklahoma (UCO), Edmond, Oklahoma. The population of the study was the college students at the two universities mentioned above.

To improve the generalizability of the study, the researcher attempted to obtain a sample that was large and diverse. Having detailed information about the characteristics of subjects can also enhance the generalizability of the study.

This study involved sensitive and personal information about students and professors. To obtain accurate information, enhance cooperation, and increase the number of student volunteers, students and professors were informed that their identity would be confidential. No individual will be identified in any way. Further, the names of classes from which the questionnaires were collected would not be disclosed.

In Fall 1996, according to the institutional research office at the University of Oklahoma, there were 20,026 students enrolled at OU. Of the 20,026 students there were 14,226 (71 %) Caucasian/White, 1,229 (6.1 %) African American, 595 (4.6 %) Hispanic/Latino, 1,345 (6.7 %) American Indian, 929 (4.6 %) Asian, and 1,702

(8.5 %) international. The average age for undergraduates was 22.1 and for graduates was 31.8.

In Fall 1996, according to the institutional research office at the University of Central Oklahoma, there were 14,522 students enrolled at UCO. Of the 14,522 students there were 11,194 (77.1 %) Caucasian/White, 814 (5.6 %) African American, 269 (1.9 %) Hispanic/Latino, 544 (3.7 %) American Indian, 310 (2.1 %) Asian, and 1,391 (9.6 %) international. The average age for all students was 28 and the mode was 21.

A total of 1,000 questionnaires were distributed in 15 classes, after obtaining professors and officials approval. Of the 1,000 questionnaires distributed only 602 students completed the questionnaires. Five of 602 students were dropped due to the incompleteness and/or inappropriateness of their responses. An additional 15 students were dropped from this study because they were identified as outliers. Consequently, the current study retained only 582 students for the research analyses. Of the 582 students in the sample, 432 students were from the University of Oklahoma and 150 students were from the University of Central Oklahoma.

The sample consisted of 275 (47.3 %) women and 307 (52.7 %) men. Of the 582 students in the sample, there were 409 (70.3 %) Caucasian/White, 77 (13.2 %) Asian, 48 (8.2 %) other, 29 (5.0%) African-American, and 19 (3.3 %) Hispanic/Latino (see Figure 5).

The self-reported age range, mean, and SD, were 17 to 54, 22, 5.6, respectively (see Figure 6). The self-reported GPA range, mean, and SD, were 1.80 to

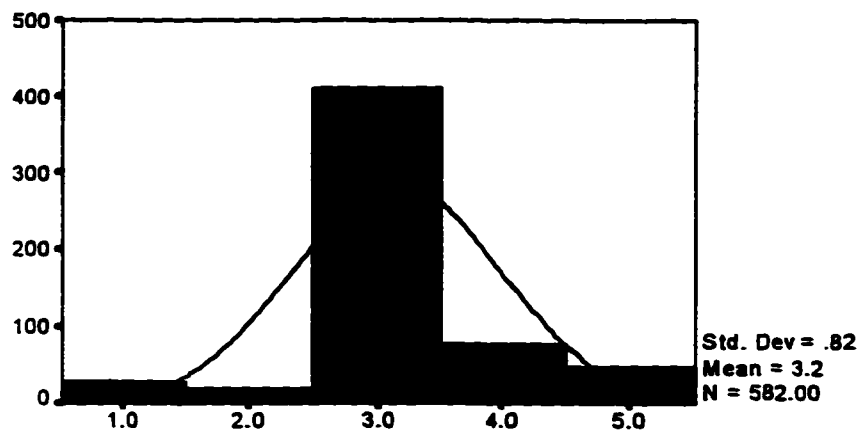
4.00, 3.26, 47, respectively (see Figure 7). Of the 582 students in the sample, 222 (38.1%) reported their parent's combined annual income between \$50,000-100,000, 204 (35.1%) reported their parent's combined annual income between \$20,000-50,000, 100 (17.2%) reported their parent's combined annual income over \$100,000, 56 (9.6%) reported their parent's combined annual income less than \$20,000 (see Figure 8).

A comparison between the characteristics of the sample and the two populations from which the sample was drawn, suggested that the characteristics of the sample are similar to the two populations.

Additional evidence for the sample representiveness, indicated that the sample consisted of 73 different areas of study. Table 1 highlights the structure of students according to their major.

Figure 5

Sample Structure According to Ethnic Background



Note:

- 1.0: African-American
- 2.0: Hispanic/Latino
- 3.0: Caucasian/White
- 4.0: Asian
- 5.0: Other

Figure 6

Sample Structure According to Age

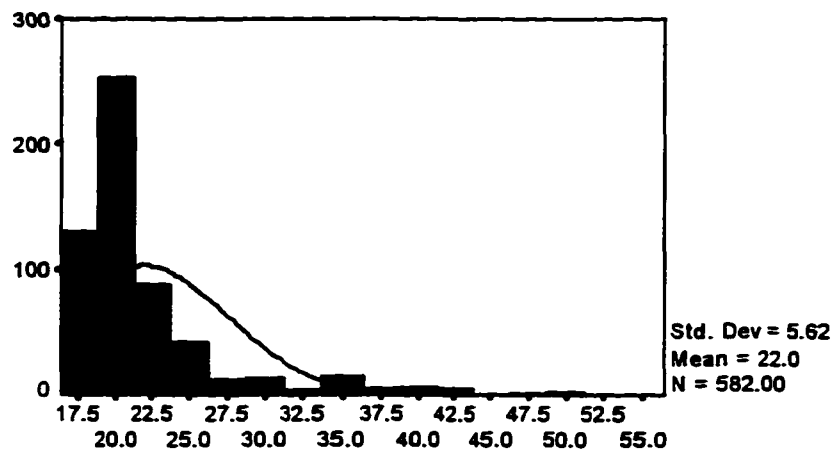


Figure 7

Sample Structure According to GPA

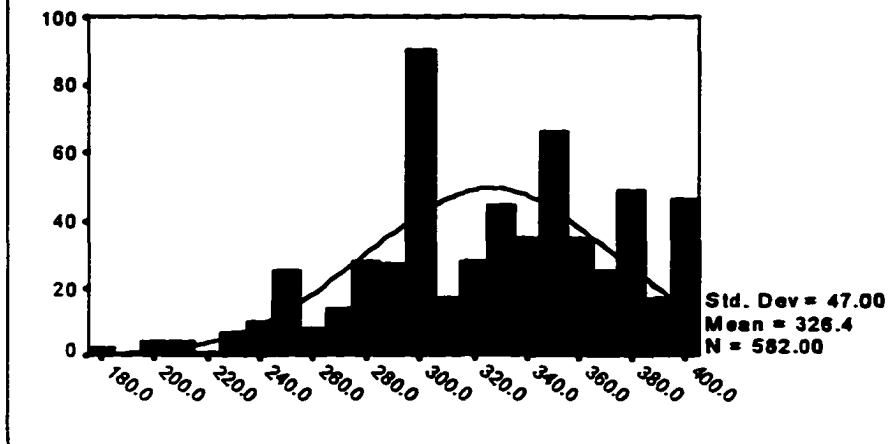
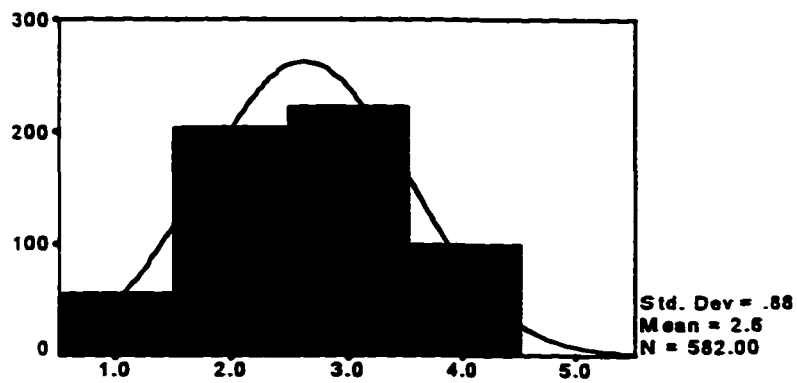


Figure 8

Sample Structure According to Income



Note:

- 1.0: Indicates parent's combined annual income less than \$20,000
- 2.0: Indicates parent's combined annual income between \$20,000-50,000
- 3.0: Indicates parent's combined annual income between \$50,000-100,000
- 4.0: Indicates parent's combined annual income over \$100,000

Table 1
Sample Structure According to Major

No.	Area of Study	Frequency	Percent
1.	Business	58	10.0
2.	Biology	41	7.0
3.	Chemical Engineering	37	6.4
4.	Pre Medicine	25	4.3
5.	Zoology	25	4.3
6.	Nursing	25	4.3
7.	Microbiology	23	4.0
8.	Undecided	21	3.6
9.	MIS	19	3.3
10.	Education	19	3.3
11.	Management	17	2.9
12.	Meteorology	15	2.6
13.	Bio Chemistry	15	2.6
14.	Engineering	14	2.4
15.	Chemistry	14	2.4
16.	Electrical Engineering	13	2.2
17.	Finance	13	2.2
18.	Mechanical Engineering	12	2.1
19.	Accounting	12	2.1
20.	Physical Therapy	11	1.9
21.	Computer Engineering	11	1.9
22.	Pharmacy	9	1.5
23.	Psychology	9	1.5
24.	General Studies	7	1.2
25.	Dental	6	1.0
26.	Forensic Science	6	1.0
27.	Industrial Engineering	5	.9
28.	Library and Information Science	5	.9
29.	Medical Technology	5	.9
30.	Funeral Services	5	.9
31.	Natural Science	4	.7
32.	Computer Science	4	.7
33.	Public Administration	4	.7
34.	Communication	4	.7
35.	Environmental Science	4	.7
36.	Aerospace Engineering	3	.5
37.	History	3	.5
38.	Economics	3	.5
39.	Geology	3	.5
40.	Health and Sport Science	3	.5
41.	Botany	3	.5
42.	Petroleum Engineering	3	.5
43.	Fashion Merchandising	3	.5
44.	Community Health	2	.3
45.	Civil Engineering	2	.3
46.	English	2	.3
47.	Sociology	2	.3
48.	Journalism	2	.3
49.	Interior Design	2	.3
50.	Industrial Safety	2	.3
51.	Social Work	2	.3
52.	Architecture	2	.3
53.	Dental Hygiene	2	.3
54.	Geography	2	.3
55.	Science Education	1	.2
56.	International Studies	1	.2
57.	Construction Science	1	.2
58.	Drama	1	.2

59.	Aviation	1	2
60.	Spanish	1	2
61.	Ballet Performance	1	2
62.	Visual Communication	1	2
63.	French	1	2
64.	Advertising	1	2
65.	Criminal Justice	1	2
66.	Physics	1	2
67.	Allied Health	1	2
68.	Optometry	1	2
69.	Occupational Therapy	1	2
70.	Pre Vet/Zoo	1	2
71.	Radiology	1	2
72.	Music	1	2
73.	Astronomy	1	2
	Total	382	100.0

Measures

According to Derogatis and Coons (1993), the self-report method for obtaining data is the primary method used for stress assessment. This is because so many prominent stress theories emphasize intrapsychic cognitive processes (e.g., appraisal, coping) and/or emotional states (e.g., anxiety, depression) as being central to the definition.

Consequently, the development and validation of College Students Stress Inventory (CSSI) was initiated to examine the variables under consideration. The CSSI developed largely based on the review of literature and surveying of college students. As a result, a 94-item CSSI was developed. Subjects were asked to rate how much stress they perceived in relation to various events encountered on a *never stressful to always stressful* 5-point Likert-type scale. Furthermore, subjects were asked to rate how they perceived statements related to their Academic Self-Concept, Performance Orientation, Mastery Orientation, Stress Reactions, and Cognitive Appraisal Strategies on a *never agree to always agree* 5-point Likert-type scale. A demographic section was also included in the CSSI (see Appendix B).

Content validity for the CSSI was established through a formal review by a panel of 30 judges including educational psychologists, teachers, educators, and educational administrators (see Appendix A). To develop and validate the CSSI, a pilot study was conducted prior to this study. The data from the pilot study was submitted to principal component analyses followed by varimax rotation (SPSS, 1995) to examine the construct validity in relation to the judgmental categories identified in

the content validation. The pilot study items which had factor loadings less than .30 or did not contribute to a meaningful factor structure were deleted. This process resulted in 13 meaningful subscales with 53 items (see Appendix E).

To provide more evidence on the reliability and factor structures of CSSI, the same process that was conducted on the data from the pilot study was also conducted on the data from the current study. However, the current study factor loading criteria was increased to .40 with one exception for one item in the Classroom Environment Stressors subscale (relationship with peers). This item was retained because of previous research and theories that provided evidence for the validity of this item. Thus, items which had factor loadings less than .40 or did not contribute to a meaningful factor structure were deleted (see Table 2). The results of the current study replicated the results of the pilot study, especially the replication of yielding 13 factor structures and the consistent reliability of those factors.

In summary, in both studies factor analyses and content analyses resulted in the same 13 meaningful and reliable subscales. Students' achievement was measured by their self-reported GPA. (See Appendix E for detailed information about the development and validation of CSSI and the results of the pilot study.) The pilot study and the current study provided reliability coefficients for the CSSI 13 subscales (see Table 2 and Table 30 in Appendix E):

1. ***Instruction and Evaluation Stressors subscale.*** This subscale assessed students' self-perceptions of Instruction and Evaluation Stressors. Items in this subscale tap students' perceptions concerning unclear class descriptions, ambiguous

instructions, and tests which do not reflect what is taught (pilot study: five items, coefficient alpha = .74) (current study: four items, coefficient alpha = .76).

2. ***Classroom Environment Stressors subscale.*** This subscale assessed students' self-perceptions of Classroom Environment Stressors. Items in this subscale tap students' perceptions concerning the condition of classrooms, relationship with peers, and prejudice in school (pilot study: four items, coefficient alpha = .68) (current study: three items, coefficient alpha = .69).
3. ***Teacher Stressors subscale.*** This subscale assessed students' self-perceptions of Teacher Stressors. Items in this subscale tap students' perceptions concerning teachers' expectations, ability, attitudes, effort, and motivation (pilot study: five items, coefficient alpha = .87) (current study: four items, coefficient alpha = .83).
4. ***Negative Personal Beliefs Stressors subscale.*** This subscale assessed students' self-perceptions of their low self-confidence, lack of security, lack of resources, lack of ability, lack of stress reducing strategies, personal health problems, and social isolation as sources of stress (pilot study: ten items, coefficient alpha = .89) (current study: nine items, coefficient alpha = .83).
5. ***Work Stressors subscale.*** This subscale assessed students' self-perceptions of problems at work, relationships with bosses and peers as a source of stress (pilot study: three items, coefficient alpha = .91) (current study: three items, coefficient alpha = .89).
6. ***Family Stressors subscale.*** This subscale assessed students' self-perceptions of lack of family resources and family responsibility as a source of stress (pilot study:

two items, coefficient alpha = .73) (current study: four items, coefficient alpha = .72).

7. ***Academic Self-Concept subscale.*** This subscale assessed students' self-perceptions concerning their beliefs of being good students, learning things easily, doing well in school, and getting good grades (pilot study: six items, coefficient alpha = .84) (current study: six items, coefficient alpha = .89).
8. ***Mastery Orientation subscale.*** This subscale assessed students self-perceptions concerning their intrinsic motivation for doing classroom assignments. Items in this subscale tap students' self-perceptions for enjoying doing classroom assignments and enjoying challenging classroom assignments (pilot study: two items, coefficient alpha = .78) (current study: two items, coefficient alpha = .76).
9. ***Performance Orientation subscale.*** This subscale assessed students self-perceptions concerning their extrinsic motivation for doing classroom assignments. Items in this subscale tap students' self-perceptions for likening competition with their peers and comparing their performance with other students (pilot study: two items, coefficient alpha = .76) (current study: two items, coefficient alpha = .79).
10. ***Cognitive Appraisal Strategies subscale.*** This subscale assessed students' self-perceptions of their ability to deal with stressors. Items in this subscale tap students' self-perceptions of their ability to identify the causes of stress, develop plans to solve them, and to resolve problems that arise (pilot study: three items, coefficient alpha = .61) (current study: three items, coefficient alpha = .73).

11. ***Cognitive Stress Reactions subscale.*** This subscale assessed students' self-perceptions of their Cognitive Reactions to stress. Items in this subscale tap students' self-perceptions when under stress regarding making the wrong decisions, experiencing confusion, experiencing loss of memory, experiencing loss of attention, and experiencing of poor concentration (pilot study: five items, coefficient alpha = .81) (current study: five items, coefficient alpha = .86).
12. ***Emotional Stress Reactions.*** This subscale assessed students' self-perceptions of Emotional Reactions to stress. Items in this subscale tap students' self-perceptions when under stress regarding their experiences of anxiety, nervousness and fatigue (pilot study: three items, coefficient alpha = .76) (current study: three items, coefficient alpha = .74).
13. ***Physiological Stress Reactions.*** This subscale assessed students' self-perceptions of Physiological Reactions to stress. Items in this subscale tap students' self-perceptions when under stress regarding their experiences of headaches, allergies, and sleeping problems (pilot study: three items, coefficient alpha = .67) (current study: three items, coefficient alpha = .70).

For the purpose of statistical analyses of the current study, the current study scale factor structure was utilized (see Table 2).

Table 2
Current Study Scale Factor Structure

No.	STATEMENTS	FACTOR LOADINGS	SCALE ALPHA	MEAN	SD
♦	CLASSROOM RELATED STRESSORS				
♦	Instruction and Evaluation Stressors		.76		
1.	Unclear class descriptions	.56		3.14	1.03
2.	Ambiguous instructions	.66		3.60	.98
3.	Ambiguity in class assignments	.60		2.98	.91
4.	Tests which don't reflect what is taught	.41		4.10	1.01
♦	Classroom Environment Stressors		.69		
5.	Classroom conditions	.53		2.31	.84
6.	Relationship with peers	.38		2.28	.89
7.	Classroom settings	.61		2.11	.81
♦	Teacher Stressors		.83		
8.	Teacher's ability	.59		2.77	.94
9.	Teacher's effort	.60		2.64	.93
10.	Teacher's attitudes	.62		2.85	.93
11.	Teacher's expectations	.50		2.93	.91
♦	NON-CLASSROOM RELATED STRESSORS				
♦	Negative Personal Beliefs Stressors		.89		
12.	Low self confidence	.66		2.38	1.06
13.	Lack of security	.70		2.33	1.01
14.	Lack of resources	.61		2.75	1.07
15.	Lack of skills	.68		2.54	1.04
16.	Hopelessness	.71		2.35	1.09
17.	Unpleasant past experiences	.69		2.49	1.02
18.	Lack of ability	.66		2.36	1.00
19.	Social isolation	.57		2.21	1.01
20.	Personal health problems	.51		2.03	1.01
♦	Work Stressors		.89		
21.	Problems at work	.77		2.22	1.13
22.	Relationship with boss	.82		1.94	1.04
23.	Relationship with peers at work	.76		1.92	.99
♦	Family Stressors		.72		
24.	Family expectations	.42		2.73	1.20
25.	Illness of family member	.46		2.45	1.14
26.	Family lack of resources	.51		2.37	1.13
27.	Family responsibilities	.64		2.42	1.09
♦	ACADEMIC SELF-CONCEPT		.89		
28.	I believe that I am a good student	.68		3.89	.72
29.	I believe that I learn things easily	.65		3.69	.81
30.	I do well in school	.82		3.86	.71
31.	School work is easy for me	.60		3.33	.81
32.	I do well in my classes	.76		3.74	.72
33.	I get good grades in my classes	.71		3.80	.73
♦	MASTERY ORIENTATION		.76		
34.	I like doing classroom assignments	.62		3.07	.87
35.	I like challenging classroom assignments	.62		3.04	.94
♦	PERFORMANCE ORIENTATION		.79		
36.	I like to compete with my peers	.66		2.93	1.12
37.	I like to compare my performance with others	.66		3.15	1.06
♦	COGNITIVE APPRAISAL STRATEGIES/COPING STRATEGIES		.73		
38.	When problems arise, I am able to resolve them	.57		3.67	.72
39.	When problems arise, I develop a plan to solve them	.56		3.62	.88
40.	When I am under stress, I am able to identify the causes	.54		3.59	.81
♦	STRESS REACTIONS				
♦	Cognitive Reactions		.86		
41.	When I am under stress, I make the wrong decisions	.57		2.79	.82

<i>No.</i>	<i>STATEMENTS</i>	<i>FACTOR LOADINGS</i>	<i>SCALE ALPHA</i>	<i>MEAN</i>	<i>SD</i>
42.	When I am under stress, I experience confusion	.70		2.45	1.06
43.	When I am under stress, I experience loss of memory	.67		2.07	1.02
44.	When I am under stress, I experience loss of attention	.75		2.67	1.06
45.	When I am under stress, I experience poor concentration	.75		2.88	1.04
♦	Emotional Reactions		.74		
46.	When I am under stress, I experience anxiety	.59		3.47	.97
47.	When I am under stress, I experience nervousness	.59		3.15	.96
48.	When I am under stress, I experience fatigue	.52		3.17	1.06
♦	Physiological Reactions		.70		
49.	When I am under stress, I experience headaches	.52		2.60	1.16
50.	When I am under stress, I experience allergies	.56		1.90	.99
51.	When I am under stress, I experience sleeping problems	.49		2.74	1.19

Statistical Procedures

Path Analysis

Path analysis techniques test the validity of a theory about causal relationships between three or more variables using a correlational research design (Gall, Borg & Gall, 1996). Path analysis techniques explore the direct and indirect effects between variables. Gall, Borg & Gall (1996) described three general steps of path analysis techniques: 1) formulating of hypotheses that indicates the variables casual link; 2) selecting and/or developing of variables measures and; 3) computing of statistics that show the strength of relationship between each pair of variables that are causally linked in the hypotheses and interpreting the statistics to determine whether they support the theory or not.

However, Miller (1977, cited in Leclair, 1981) described a more precise six-step sequence in the application of path analysis: 1) forming a causal model; 2) forming a pattern of associations between the variables in the sequences; 3) drawing a path diagram; 4) computing path coefficients for the basic model; 5) testing for “goodness of fit” with the basic model and; 6) interpreting the result. In either case, both of these procedures by Gall, Borg & Gall (1996) and Miller (1977) were considered in this study.

A recursive model of path analysis is a unidirectional causal relationship. For instance, in Figure 1 the path from Academic Self-Concept to GPA indicates that Academic Self-Concept variable has a causal effect on GPA; however, GPA variable does not have a causal effect on Academic Self-Concept. A path coefficient is a

standardized regression coefficient or a beta weight denoting the direct effect of one variable on another variable in the path analysis. A path coefficient can vary in value from -1.00 to 1.00; the larger the value the stronger the causal effect of one variable on the other. Accordingly, the current study utilized a recursive path analysis to examine relationships between variables of interest. Furthermore, to analyze the path model, the author applied the procedures described by Pedhazur (1982) and Cohen and Cohen (1983).

As stated earlier, multiple regression analyses were applied to determine the magnitude of each relationship. This study involved analyzing eight criterion variables: 1) GPA; 2) Physiological Stress Reactions; 3) Cognitive Stress Reactions; 4) Emotional Stress Reactions; 5) Academic Self-Concept; 6) Mastery Orientation; 7) Performance Orientation and; 8) Cognitive Appraisal Strategies. To determine the path coefficients, the eight criterion variables were regressed on the appropriate set of predictor variables.

Theoretical parsimony was applied to determine the smallest variable set that explains the maximum amount of variance in the criterion (Pedhazur, 1982). This was done by a process called theory-trimming. Two criteria for path deletion were applied (Pedhazur, 1982; Cohen & Cohen, 1983). The first criterion was to delete any path that did not reach significant at .05 level. The second criterion was to delete any path that had a path coefficient less than .05. Therefore, the only paths that were retained in the trimmed model were significant at the .05 level and had coefficients greater than .05.

The decomposition of the zero-order correlations into their direct and indirect effects was performed to examine the quality of the relationships. Direct effects represent a straight path from the predictor to the criterion, such as the path from Academic Self-Concept to GPA. An indirect path represents a path that is mediated through another variable, such as the path from Cognitive Appraisal Strategies to Academic Self-Concept to GPA.

Finally, the Pedhazur (1982) procedure to test the trimmed model “goodness of fit” was applied. There are two tests recommended to calculate the “goodness of fit”: Q probability and Chi-square. Both of these tests were applied.

CHAPTER FOUR

PRESENTATION OF RESULTS

In this chapter the results and statistical analyses are presented and discussed. The general Hypothesis 1.0, which referred to the full model, is partitioned into eight research questions. Presentation and discussion of the results will be according to the order of research questions introduced in Chapter One. Each question will be discussed separately consistent with the hypothetical model.

There are four statistical steps necessary to answer each question. The first step examines the magnitude of the relationships between predictor and criterion variables in the saturated or full model. The second step utilizes theory-trimming to determine the retention and elimination of paths. The third step involves testing the trimmed model and testing its adequacy. The fourth step examines the decomposition of the relationships into direct and indirect effects, and these effects will then be contrasted to the observed effects.

The final statistical procedure is to test the trimmed model "goodness of fit." However, prior to the presentation of results, a brief exploratory data analysis and Pearson correlations of all variables are presented.

Exploratory Data Analysis

To inspect assumptions of linearity and normality, standardized residual plots and histograms, were examined for all scales. Five of 602 students were dropped due to the incompleteness and/or inappropriateness of their responses. An additional 15 students were dropped from this study because they were identified as outliers.

Descriptive Statistics

Table 3 presents the means, standard deviations, and Pearson-product moment correlations for all variables in the study. GPA scores ranged from 1.80 minimum to 4.00 maximum and averaged 3.26. Instruction and Evaluation Stressors scores ranged from 1.00 minimum to 5.0 maximum and averaged 3.37 with a standard deviation of .75. Classroom Environment Stressors scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.24 with a standard deviation of .63. Teacher Stressors scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.80 with a standard deviation of .76. Negative Personal Beliefs Stressors scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.38 with a standard deviation of .76. Work Stressors scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.03 with a standard deviation of .96. Family Stressors scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.49 with a standard deviation of .84. Academic Self-Concept scores ranged from 1.00 minimum to 5.00 maximum and averaged 3.72 with a standard deviation of .60. Mastery Orientation scores ranged from 1.00 minimum to 5.00 maximum and averaged 3.05 with a standard deviation of

.81. Performance Orientation scores ranged from 1.00 minimum to 5.00 maximum and averaged 3.04 with a standard deviation of 1.0. Cognitive Appraisal Strategies scores ranged from 1.00 minimum to 5.00 maximum and averaged 3.63 with a standard deviation of .65. Cognitive Reactions scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.57 with a standard deviation of .81. Emotional Reactions scores ranged from 1.00 minimum to 5.00 maximum and averaged 3.25 with a standard deviation of .81. Physiological Reactions scores ranged from 1.00 minimum to 5.00 maximum and averaged 2.41 with a standard deviation of .89.

Many correlations between variables were significant. GPA scores correlated positively with the Academic Self-Concept, Mastery Orientation, Performance Orientation, and Cognitive Appraisal Strategies scores. This result suggested that students with high GPAs tend to have favorable Academic Self-Concept, Mastery Orientation, Performance Orientation, and Cognitive Appraisal Strategies. On the other hand, GPA scores correlated negatively with Teacher Stressors and Negative Personal Beliefs Stressors. This result indicated that the higher the GPA the lower the perceived Teacher Stressors and Negative Personal Beliefs Stressors.

Scores on the Negative Personal Beliefs Stressors subscale correlated positively with Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Work Stressors, Family Stressors, Cognitive Reactions, Emotional Reactions, and Physiological Reactions scores. This result indicated that students who experience unfavorable stress tend to perceive all stressors as stressful and have cognitive, emotional, and physiological stress reactions. Furthermore, scores

on the Negative Personal Beliefs Stressors subscale correlated negatively with Academic Self-Concept, Cognitive Appraisal Strategies, and GPA. This result indicated that the higher the stress level of the student the lower the Academic Self-Concept, Cognitive Appraisal Strategies, and GPA. Finally, Cognitive Reactions correlated positively with Emotional and Physiological Reactions. This result suggested students who experience negative Cognitive Reactions to stress tend to experience emotional and physiological reactions as well.

In summary, GPA scores correlated positively with the Academic Self-Concept, Mastery Orientation, Performance Orientation, and Cognitive Appraisal Strategies scores. Stressors scores correlated positively with stress reactions scores. Stressors scores correlated negatively with Academic Self-Concept, Cognitive Appraisal Strategies, and GPA scores. Cognitive, emotional, physiological reactions to stress scores were positively correlated. The correlational results of this study replicated the pilot study results.

Table 3
Means, Standard Deviations, and Pearson Product-Moment Correlations
for Variables in the Study

N o.	VARIABLE	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	GPA	3.26	.47	--												
2.	Instruction and Evaluation Stressors	3.37	.75	.00 ns	--											
3.	Classroom Environment Stressors	2.24	.63	-.06 ns	.40 ***	--										
4.	Teacher Stressors	2.80	.76	-.09 *	.48 ***	.40 ***	--									
5.	Negative Personal Beliefs Stressors	2.38	.78	-.11 **	.35 ***	.48 ***	.33 ***	--								
6.	Work Stressors	2.03	.96	-.08 *	.25 ***	.32 ***	.23 ***	.50 ***	--							
7.	Family Stressors	2.49	.84	-.04 ns	.35 ***	.36 ***	.30 ***	.60 ***	.55 ***	--						
8.	Academic Self-Concept	3.72	.60	.53 ***	-.04 ns	-.35 ***	-.13 **	-.33 ***	-.17 ***	-.17 ***	--					
9.	Mastery Orientation	3.05	.81	.26 ***	.00 ns	-.03 ns	-.08 ns	-.06 ns	.07 ns	.07 ns	.32 ***	--				
10.	Performance Orientation	3.04	1.0	.19 ***	-.03 ns	.00 ns	.02 ns	-.08 ns	-.01 ns	.01 ns	.26 ***	.30 ***	--			
11.	Cognitive Appraisal Strategies	3.63	.65	.12 **	-.07 ns	-.21 ***	-.11 **	-.32 ***	-.18 ***	-.15 ***	.35 ***	.21 ***	.12 **	--		
12.	Cognitive Reactions	2.57	.81	-.06 ns	.27 ***	.29 ***	.30 ***	.44 ***	.27 ***	.39 ***	-.16 ***	-.06 ns	-.02 ns	-.29 ***	--	
13.	Emotional Reactions	3.25	.81	.08 ns	.33 ***	.28 ***	.25 ***	.37 ***	.20 ***	.32 ***	-.07 ns	-.08 ns	.08 ns	-.12 ***	.55 ***	--
14.	Physiological Reactions	2.41	.89	-.04 ns	.23 ***	.25 ***	.20 ***	.32 ***	.22 ***	.32 ***	-.14 **	-.01 ns	.00 ns	-.19 ***	.57 ***	.50 ***

Note. N=582 * $p < .05$ ** $p < .01$ *** $p < .001$ ns = not significant

Hypothesis Testing

In this section, the results of the general hypothesis 1.0 are presented.

Hypothesis 1.0 was partitioned into eight questions. There are four statistical steps necessary to answer each question. The first step examines the magnitude of the relationships between predictor and criterion variables in the saturated. The second step utilizes theory-trimming to determine the retention and elimination of paths. The third step involves testing the trimmed model and testing its adequacy. The fourth step examines the decomposition of the relationships into the direct and indirect effects and these effects will then be contrasted to the observed effects. The testing of the trimmed model “goodness of fit” is presented last.

Hypothesis 1.0

There are no significant relationships between stressors and GPA when mediated by the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies. (Again, there are four steps utilized in answering each question.)

Question 1.1

What is the nature of the relationship between GPA and the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Cognitive Appraisal Strategies, Performance Orientation, and Mastery Orientation?

I. Relationship Magnitude

To analyze the relationship magnitude, GPA scores were regressed on the following: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies scores. Table 4 presents the results of this analysis which includes the standardized and unstandardized beta weights, the standard error of B, T, R, R square, and the adjusted R square for the entire equation.

An examination of Table 4 showed an R square of .323 which indicated that almost 32% of the variance in GPA was explained by the predictor variables. The 68% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error.

Multiple regression techniques capitalize on chance relationships among variables; therefore, it is essential to examine a closer estimate of R square that is Adjusted R Square. As can be seen in Table 4, R square was .323 and adjusted R square is .315. The difference was small, consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, two statistical tests were applied. First, the significant level of .05 was applied. Second, the criterion of meaningfulness, beta greater than .05, was also applied (Pedhazur, 1982). The same tests were applied to all research questions in the study. As a result, five of the predictors' direct paths were retained in the trimmed model and two paths were eliminated. The five retained paths were Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, and Mastery Orientation variables. The two eliminated path were Performance Orientation and Cognitive Appraisal Strategies.

The inspection of the beta weight in Table 4, indicated that Academic Self-Concept with a beta of .554 had the largest effect on GPA. On the other hand, Performance Orientation had the least effect on GPA, as suggested by its beta weight of .0240.

The standardized beta weights were applied in Figure 9 as the path coefficients. For instance, the path from Academic Self-Concept to GPA is labeled .55, which accorded to the standardized beta weight from Table 4. The U paths refer to the variation explained by variables outside the model and/or measurement error or unexplained variation not in the model. The square root of (1 - R square) is utilized to calculate the U paths.

III. Testing the Trimmed Model Utilizing Theory-Trimming

Theory-trimming determines the smallest set of predictor variables which explain the maximum amount of variance in the dependent variable or theoretical parsimony. To achieve this, only five significant predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, GPA was only regressed on significant Academic Self-Concept, Physiological Reactions, Emotional Reactions, Cognitive Reactions, and Mastery Orientation. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 5 and Figure 10. An examination of Table 4 and 5 indicated that there were discrepancies in the standardized beta weights for the five retained variables. These discrepancies occurred because the standardized weights in Table 4 were computed from a seven variable saturated model while the betas from Table 5 were computed from the five predictor trimmed model. A comparison of the R square of .323 from the saturated model (see Table 4) and the R square of .319 from the trimmed model (see Table 5) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was small and indicated that the trimmed model adequately explained GPA. The saturated model probability of obtaining an F value at least as large as 39.20 was .0000 while the trimmed model probability of obtaining an F value at least as large as 54.02 was .0000. Unlike the independent variables in the saturated model, all independent variables in the trimmed model were statistically significant in predicting GPA.

In order to test the stability of the trimmed model equation, a comparison of the R square (.319) and the adjusted R square (.313) was conducted. Adjusted R square corrects the optimistic bias of the sample R square by taking sample size and the number of predictors into account. Unlike R square, adjusted R square does not necessarily increase as additional variables are added to an equation. This comparison indicated that the stability of the trimmed model equation was also supported since there was only a slight amount of reduction.

Table 4

**Summary Statistics for GPA Regression on Saturated
Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Physiological Reactions	-4.730603	2.298319	-.089640	-2.058	.0400
Emotional Reactions	5.489268	2.516846	.094744	2.181	.0296
Cognitive Reactions	6.978354	2.814345	.120575	2.480	.0134
Academic Self-Concept	43.208006	3.189973	.554015	13.545	.0000
Mastery Orientation	6.199521	2.174088	.106283	2.852	.0045
<u>Eliminated Paths</u>					
Cognitive Appraisal Strategies	4.886200	2.734630	-.067457	-1.787	.0745
Performance Orientation	1.133045	1.706858	.024074	.664	.5071
(Constant)	136.422657	16.053129		8.498	.0000
Multiple R	.56872				
R Square	.32345				
Adjusted R Square	.31519				
Standard Error	38.89546				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	7	415152.74852	59307.53550
Residual	574	868379.59512	1512.85644

F = 39.20236 Signif F = .0000

Table 5

**Summary Statistics for the Regression of GPA on the
Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig. T
<u>Retained Paths</u>					
Physiological Reactions	-4.531349	2.296017	-.085864	-1.974	.0489
Emotional Reactions	5.490468	2.507443	.094765	2.190	.0289
Cognitive Reactions	7.719206	2.789343	.133376	2.767	.0058
Academic Self-Concept	42.351900	3.059682	.543038	13.842	.0000
Mastery Orientation	5.932813	2.129349	.101711	2.786	.0055
(Constant)	123.747151	14.181570		8.726	.0000

Multiple R	.56501
R Square	.31924
Adjusted R Square	.31333
Standard Error	38.94831

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	409757.29202	81951.45840
Residual	576	873775.05162	1516.97058

F = 54.02310 Signif F = .0000

IV. Decomposition of Effects Analysis

The decomposition of effects includes the analyses of direct effects, indirect effects, unanalyzed effects, and reproduced correlation (see Table 6). The direct effects stand for a straight path from the predictor to the criterion, such as the path from Academic Self-Concept to GPA. An indirect path is one that is mediated through another variable, for instance, the path from Cognitive Appraisal Strategies to Academic Self-Concept to GPA depicted in Figure 9. The causes of unanalyzed effects are not stated by the model, and they result from correlated predictor variables; therefore, they cannot be meaningfully interpreted and analyzed. For example, Family Stressors correlated with Negative Personal Beliefs Stressors, however, no causal links are stated for these two variables. The reproduced correlations between GPA and the preceding variables from the trimmed model are computed by summing the direct and indirect effects.

In order to determine how much predictive power is lost by trimming the model, the reproduced correlations are contrasted to the original zero-order correlations between each predictor variable and the outcome variable. An examination of the difference between the observed effect and the reproduced effect assess the model quality. If the discrepancy between the observed effect and the reproduced effect is small, the more fit the model for explaining the relationship of the predictors to the outcome measure.

Table 6
Decomposition of Effects on GPA in the Trimmed Model

No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Instruction and Evaluation Stressors	.00 ns	.00	.02	.02	.02
2.	Negative Personal Beliefs Stressors	-.11 **	.00	.02	.02	-.09
3.	Family Stressors	-.04 ns	.00	.03	.03	-.01
4.	Academic Self-Concept	.53 ***	.54	-.02	.52	.01
5.	Mastery Orientation	.26 ***	.10	.00	.10	.16
6.	Performance Orientation	.19 ***	.00	.01	.01	.18
7.	Cognitive Appraisal Strategies	.12 **	-.06	.15	.09	.03
8.	Cognitive Reactions	-.06 ns	.13	.00	.13	.07
9.	Emotional Reactions	.08 ns	.09	.00	.09	.01
10.	Physiological Reactions	-.04 ns	-.09	.00	-.09	-.05

*P < .05

**P < .01

***P < .001

ns = not significant

Question 1.2

What is the nature of the relationship between Physiological Reactions and the following variables: Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

To analyze the relationship magnitude, Physiological Reactions scores were regressed on the following: Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies scores, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 7 showed an R square of .16 which indicated that almost 16% of the physiological variance variable was explained by the predictor variables. The 84% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for this subscale is .70, the predictor variables have explained 16% of the possible 70% of systematic variation.

As can be seen in Table 7, R square was .16 and adjusted R square is .14. The difference was small, consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to question one were also applied to question two. As a result, four of the predictors' direct paths were retained in the trimmed model and six paths were eliminated. The four retained paths were: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, and Family Stressors. The six eliminated paths were: Academic Self-Concept, Performance Orientation, Mastery Orientation, Classroom Environment Stressors, Teacher Stressors, and Work Stressors.

The inspection of the beta weights in Table 7 indicated that Family Stressors with a beta of .18 had the largest effect on Physiological Reactions. On the other hand, Work Stressors had the least effect on Physiological Reactions, as suggested by its beta weight of -.0048. Again, the standardized beta weights were applied in Figure 9 as the path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The four retained predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, Physiological Reactions scores were only regressed on the following: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, and Family Stressors scores. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 8 and Figure 10. A

comparison of the R square of .157 from the saturated model (see Table 7) and the R square of .151 from the trimmed model (see Table 8) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was small and indicated that the trimmed model adequately explained Physiological Reactions. The saturated model probability of obtaining an F value at least as large as 10.66 was .0000 while the trimmed model probability of obtaining an F value at least as large as 25.84 was .0000.

In order to test the stability of the trimmed model equation, a comparison of the R square (.15) and the adjusted R square (.14) was conducted. This comparison indicated that the stability of the trimmed model equation was also supported since there was only a slight amount of reduction.

Table 7

Summary Statistics for the Regression of Physiological Reactions on the Saturated Model Variable Set Under Consideration

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	-.136322	.058711	-.099321	-2.322	.0206
Instruction and Evaluation Stressors	.112611	.055391	.094870	2.033	.0425
Negative Personal Beliefs Stressors	.124648	.065604	.105913	1.900	.0579
Family Stressors	.186636	.055370	.176834	3.371	.0008
<u>Eliminated Paths</u>					
Academic Self-Concept	-.043865	.066598	-.029682	-.659	.5104
Performance Orientation	.021360	.036130	.023950	.591	.5546
Mastery Orientation	.010210	.046454	.009238	.220	.8261
Work Stressors	-.004495	.044511	-.004832	-.101	.9196
Teacher Stressors	.022327	.054085	.019028	.413	.6799
Classroom Environment Stressors	.100618	.066374	.071265	1.516	.1301
(Constant)	1.554091	.362383		4.289	.0000
Multiple R	.39665				
R Square	.15733				
Adjusted R Square	.14258				
Standard Error	.82470				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	10	72.50947	7.25095
Residual	571	388.35746	.68014
F = 10.66103 Signif F = .0000			

Table 8

**Summary Statistics for the Regression of Physiological Reaction on the
Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	-.148816	.055731	-.108423	-2.670	.0078
Instruction and Evaluation Stressors	.139774	.049532	.117753	2.822	.0049
Negative Personal Beliefs Stressors	.160851	.059962	.136674	2.683	.0075
Family Stressors	.194041	.051372	.183850	3.777	.0002
(Constant)	1.614177	.286491		5.634	.0000

Multiple R	.38977
R Square	.15192
Adjusted R Square	.14605
Standard Error	.82303

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	4	70.01688	17.50422
Residual	577	390.85006	.67738

F = 25.84094 Signif F = .0000

IV. Decomposition of Effects Analysis

In order to determine how much predictive power is lost by trimming the model, the reproduced correlations were contrasted to the original zero-order correlations between each predictor variable and the outcome variable (see Table 9). An examination of the differences between the observed effects and the reproduced effects indicated that Negative Personal Beliefs Stressors and Family Stressors variables had significant differences in values. The lost effects are attributed to indirect effects not presented in the trimmed model.

Table 9 Decomposition of Effects on Physiological Reactions in the Trimmed Model						
No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Instruction and Evaluation Stressors	.23 ***	.12	.00	.12	.11
2.	Negative Personal Beliefs Stressors	.32 ***	.14	.04	.18	.14
3.	Family Stressors	.32 ***	.18	.00	.18	.14
4.	Cognitive Appraisal Strategies	-.18 ***	-.11	.00	-.11	-.07

*** $P < .001$

Question 1.3

What is the nature of the relationship between Emotional Reactions and the following variables: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

Emotional scores were regressed on the following: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 10 showed an R square of .22 which indicated that almost 22% of the emotional variance variable is explained by predictor variables. The 78% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for emotional subscale was .74, predictor variables explain 22% of the possible 74% systematic variation.

As can be seen in Table 10, R square was .22, and the adjusted R square was .20. The difference was small; consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to question 1.0 were applied to question 1.3. As a result, five of the predictors' direct paths were retained in the trimmed model, and five paths were eliminated. The five retained paths were: Performance Orientation, Mastery Orientation, Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, and Family Stressors. However, the five eliminated paths were: Academic Self-Concept, Cognitive Appraisal Strategies, Classroom Environment Stressors, Teacher Stressors, and Work Stressors.

The inspection of the beta weight in Table 10 indicated that Negative Personal Beliefs Stressors and Instruction and Evaluation Stressors have the largest effect on Emotional Reactions with betas of .22 and .19, respectively. On the other hand, Teacher Stressors had the least effect on Emotional Reactions, as suggested by its nonsignificant beta weight of .02. Again, standardized beta weights were applied in Figure 9 as the path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The five retained predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, Emotional Reactions scores were only regressed on the following: Performance Orientation, Mastery Orientation, Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, and Family Stressors scores. The results of standardized beta weights and their corresponding

path coefficients for the trimmed model are presented in Table 11 and Figure 10. A comparison of the R square of .217 from the saturated model (see Table 10) and the R square of .212 from the trimmed model (see Table 11) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was small; and thus, indicated that the trimmed model adequately explained Emotional Reactions. The saturated model probability of obtaining an F value at least as large as 15.86 was .0000 while the trimmed model probability of obtaining an F value at least as large as 31.10 was .0000.

In order to test the stability of the trimmed model equation, a comparison of the R square (.212) and the adjusted R square (.205) was conducted. This comparison indicated that the stability of the trimmed model equation was also supported since there was only a slight amount of reduction.

Table 10

**Summary Statistics for the Regression of Emotional Reactions on the
Saturated Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig. T
<u>Retained</u>					
Performance Orientation	.091495	.031714	.112629	2.885	.0041
Mastery Orientation	-.101327	.040777	-.100645	-2.485	.0132
Instruction and Evaluation Stressors	.215710	.048621	.199510	4.437	.0000
Negative Personal Beliefs Stressors	.245195	.057586	.228729	4.258	.0000
Family Stressors	.113890	.048603	.118468	2.343	.0195
<u>Eliminated Paths</u>					
Academic Self-Concept	.062641	.058458	.046535	1.072	.2844
Cognitive Appraisal Strategies	-.022808	.051535	-.018243	-.443	.6582
Classroom Environment Stressors	.065127	.058261	.050642	1.118	.2641
Teacher Stressors	.024889	.047475	.023288	.524	.6003
Work Stressors	-.032705	.039071	-.038596	-.837	.4029
(Constant)	1.382915	.318091		4.348	.0000
Multiple R	.46631				
R Square	.21745				
Adjusted R Square	.20374				
Standard Error	.72391				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	10	83.14486	8.31449
Residual	571	299.22627	.52404

F = 15.86616 Signif F = .0000

Table 11

**Summary Statistics for the Regression of Emotional Reaction on the
Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig. T
<u>Retained Paths</u>					
Performance Orientation	.100253	.030955	.123411	3.239	.0013
Mastery Orientation	-.097690	.038572	-.097032	-2.533	.0116
Instruction and Evaluation Stressors	.242485	.043475	.224274	5.578	.0000
Negative Personal Beliefs Stressors	.248083	.050866	.231423	4.877	.0000
Family Stressors	.102448	.045554	.106566	2.249	.0249
(Constant)	1.575884	.202527		7.781	.0000
Multiple R	.46108				
R Square	.21259				
Adjusted R Square	.20576				
Standard Error	.72299				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	5	81.28931	16.25786
Residual	576	301.08182	.52271

F = 31.10293 Signif F = .0000

IV. Decomposition of Effects Analysis

An examination of Table 12 indicated that Negative Personal Beliefs Stressors and Instruction and Evaluation Stressors had the most direct effect on the Emotional Reactions variable. However, there was no identified indirect effect on Emotional Reactions.

In order to determine how much predictive power was lost by trimming the model, the reproduced correlations were contrasted to the original zero-order correlations between each predictor variable and the outcome variable (see Table 3). An examination of the difference between the observed effects and the reproduced effects indicated that there were significant differences; especially the difference in the Family Stressors variable. This difference was attributed to indirect effects that were not accounted for in the model.

Table 12
Decomposition of Effects on Emotional Reactions in the Trimmed Model

No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Instruction and Evaluation Stressors	.33 ***	.22	.00	.22	.11
2.	Negative Personal Beliefs Stressors	.37 ***	.23	.04	.27	.10
3.	Family Stressors	.31 ***	.11	.00	.11	.20
4.	Mastery Orientation	-.07 ns	-.10	.00	-.10	-.03
5.	Performance Orientation	.19 ***	.12	.00	.12	.07

**P < .05*

***P < .01*

****P < .001*

ns = not significant

Question 1.4

What is the nature of the relationship between Cognitive Reactions and the following variables: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

Cognitive Reactions scores were regressed on the following: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 13 showed an R square of .31 which indicated that almost 31% of the Cognitive Reactions variance variable was explained by predictor variables. The 69% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for emotional subscale was .86, predictor variables have explained 31% of the possible 86% systematic variation.

As can be seen in Table 13, R square was .306, and adjusted R square was .294. The difference was small; consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to previous questions (1.1-1.3) were applied to this question as well. As a result, six of the predictors' direct paths were retained in the trimmed model and four paths were eliminated. The six retained paths were: Academic Self-Concept, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, and Family Stressors. The four eliminated paths were: Performance Orientation, Mastery Orientation, Classroom Environment Stressors, and Work Stressors.

The inspection of the beta weights in Table 13 indicated that Academic Self-Concept, Family Stressors, and Negative Personal Beliefs Stressors had the largest effect on cognitive reactions with betas of $-.22$, $.17$, and $.17$, respectively. On the other hand, Classroom Environment Stressors had the least effect on Cognitive Reactions as suggested by its nonsignificant beta weight of $.021$. Again, the standardized beta weights were applied in Figure 9 as path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The six retained predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, Cognitive Reactions' scores were only regressed on the following: Academic Self-Concept, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, and Family Stressors scores. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 14

and Figure 10. A comparison of the R square of .306 from the saturated model (see Table 13) and the R square of .301 from the trimmed model (see Table 14) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was small; and thus, indicated that the trimmed model adequately explained Cognitive Reactions. The saturated model probability of obtaining an F value at least as large as 25.27 was .0000 while the trimmed model probability of obtaining an F value at least as large as 41.46 was .0000.

In order to test the stability of the trimmed model equation, a comparison of the R square (.301) and the adjusted R square (.294) was conducted. This comparison indicates that the stability of the trimmed model equation was also supported since there was only a slight amount of difference between the R square and the adjusted R square.

Table 13

**Summary Statistics for the Regression of Cognitive Reactions on the
Saturated Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Academic Self-Concept	-.301933	.055077	-.224059	-5.482	.0000
Cognitive Appraisal Strategies	-.161323	.048554	-.128898	-3.323	.0009
Instruction and Evaluation Stressors	.093395	.045809	.086288	2.039	.0419
Teacher Stressors	.112416	.044729	.105068	2.513	.0122
Negative Personal Beliefs Stressors	.179622	.054255	.167379	3.311	.0010
Family Stressors	.163595	.045792	.169988	3.573	.0004
<u>Eliminated Paths</u>					
Performance Orientation	.044073	.029880	.054196	1.475	.1408
Mastery Orientation	.034705	.038418	.034434	.903	.3667
Classroom Environment Stressors	.027581	.054892	.021424	.502	.6155
Work Stressors	-.020743	.036811	-.024453	-.563	.5733
(Constant)	2.559499	.299694		8.540	.0000
Multiple R	.55393				
R Square	.30684				
Adjusted R Square	.29470				
Standard Error	.68204				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	10	117.57841	11.75784
Residual	571	265.61533	.46518

F = 25.27613 Signif F = .0000

Table 14

**Summary Statistics for the Regression of Cognitive Reactions on the
Trimmed Model Variable Set Under Consideration**

Retained Paths

Variable	B	SE B	Beta	T	Sig T
Academic Self-Concept	-.269322	.052022	-.199859	-5.177	.0000
Cognitive Appraisal Strategies	-.153724	.047931	-.122827	-3.207	.0014
Instruction and Evaluation Stressors	.092469	.044976	.085432	2.056	.0402
Teacher Stressors	.117893	.043634	.110187	2.702	.0071
Negative Personal Beliefs Stressors	.179264	.051262	.167046	3.497	.0005
Family Stressors	.165191	.042683	.171647	3.870	.0001
(Constant)	2.654877	.293510		9.045	.0000
Multiple R	.54953				
R Square	.30198				
Adjusted R Square	.29470				
Standard Error	.68204				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	6	115.71755	19.28626
Residual	575	267.47620	.46518

F = 41.46013 Signif F = .0000

IV. Decomposition of Effects Analysis

An examination of Table 15 indicated that Academic Self-Concept, Family Stressors, and Negative Personal Beliefs Stressors had the most direct effect on the Cognitive Reactions variable. Negative Personal Beliefs Stressors variable had an indirect effect on Cognitive Reactions operating through Cognitive Appraisal Strategies.

An examination of the difference between the observed effects and the reproduced effects indicated that there were significant differences between them. These differences were attributed to indirect effects not included in the model.

Table 15
Decomposition of Effects on Cognitive Reactions in the Trimmed Model

No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Instruction and Evaluation Stressors	.27 ***	.08	.00	.08	.19
2.	Teacher Stressors	.30 ***	.11	.00	.11	.19
3.	Negative Personal Beliefs Stressors	.44 ***	.16	.03	.19	.25
4.	Family Stressors	.39 ***	.17	.00	.17	.22
5.	Academic Self-Concept	-.16 ***	-.19	.00	-.19	-.03
6.	Cognitive Appraisal Strategies	-.29 ***	-.12	.00	-.12	-.17

*P < .05

**P < .01

***P < .001

ns = not significant

Question 1.5

What is the nature of the relationship between Academic Self-Concept and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

Academic Self-Concept scores were regressed on the following: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 16 showed an R square of .19 which indicated that almost 19% of the Academic Self-Concept variance variable was explained by predictor variables. The 81% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for emotional subscale was .89, predictor variables have explained 19% of the possible 89% systematic variation.

As can be seen in Table 16, R square was .185, and adjusted R square was .175. The difference was small; consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to previous questions were applied to this question. As a result, three of the predictors' direct paths were retained in the trimmed model and four paths were eliminated. The three retained paths were: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, and Negative Personal Beliefs Stressors. The four eliminated paths were: Classroom Environment Stressors, Teacher Stressors, Family Stressors, and Work Stressors.

The inspection of the beta weights in Table 16 indicated that Negative Personal Beliefs Stressors and Cognitive Appraisal Strategies, had the largest effect on Academic Self-Concept with betas of $-.27$, $.26$, respectively. On the other hand, Work Stressors had the least effect on Cognitive Reactions as suggested by its nonsignificant beta weight of $-.0021$. Again, the standardized beta weights were applied in Figure 9 as path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The three retained predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, Academic Self-Concept scores were only regressed on the following: Academic Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, and Negative Personal Beliefs Stressors. The results of this regression indicated that Instruction and Evaluation Stressors was not significant; thus, it was eliminated from the inclusion in the trimmed model equation. Therefore, two predictors were used to compute the path coefficients and R square for the trimmed

model: Cognitive Appraisal Strategies; and Negative Personal Beliefs Stressors. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 17 and Figure 10. A comparison of the R square of .185 from the saturated model (see Table 16) and the R square of .177 from the trimmed model (see Table 17) was conducted to determine the adequacy of the trimmed model. This difference between these two R square coefficients was small; and thus, indicated that the trimmed model adequately explains Academic Self-Concept. The saturated model probability of obtaining an F value at least as large as 18.68 was .0000 while the trimmed model probability of obtaining an F value at least as large as 62.36 was .0000.

In order to test the stability of the trimmed model equation, a comparison of the R square (.177) and the adjusted R square (.174) was conducted. This comparison indicated that the stability of the trimmed model equation was also supported since there was only a slight amount of reduction.

Table 16**Summary Statistics for the Regression of Academic Self-Concept on the Saturated Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	.245978	.037215	.264848	6.610	.0000
Negative Personal Beliefs Stressors	-.217181	.042554	-.272717	-5.104	.0000
Instruction and Evaluation Stressors	.078587	.036515	.097842	2.152	.0318
<u>Eliminated Paths</u>					
Classroom Environment Stressors	.012305	.044004	.012879	.280	.7799
Teacher Stressors	-.056455	.035627	-.071104	-1.585	.1136
Work Stressors	-.001691	.029421	-.002686	-.057	.9542
Family Stressors	.009428	.036516	.013201	.258	.7964
(Constant)	3.194169	.197404		16.181	.0000
Multiple R	.43075				
R Square	.18554				
Adjusted R Square	.17561				
Standard Error	.54719				
Analysis of Variance					
	DF	Sum of Squares	Mean Square		
Regression	7	39.15280	5.59326		
Residual	574	171.86621	.29942		
F =	18.68040	Signif F = .0000			

Table 17**Summary Statistics for the Regression of Academic Self-Concept on the Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	.250752	.036991	.269988	6.779	.0000
Negative Personal Beliefs Stressors	-.197033	.031718	-.247417	-6.212	.0000
(Constant)	3.283684	.175512		18.709	.0000
Multiple R	.42100				
R Square	.17724				
Adjusted R Square	.17440				
Standard Error	.54759				
Analysis of Variance					
	DF	Sum of Squares	Mean Square		
Regression	2	37.40156	18.70078		
Residual	579	173.61745	.29986		
F =	62.36556	Signif F = .0000			

IV. Decomposition of effects Analysis

An examination of Table 18 indicated that Negative Personal Beliefs Stressors and Cognitive Appraisal Strategies had strong direct effects on the Academic Self-Concept variable. Negative Personal Beliefs Stressors variable had an indirect effect on Academic Self-Concept variable operating through Cognitive Appraisal Strategies.

An examination of the difference between the observed effects and the reproduced effects indicated that there was only a small difference between them.

Table 18
Decomposition of Effects on Academic Self-Concept in the Trimmed Model

No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Negative Personal Beliefs Stressors	-.33 ***	-.25	-.08	-.33	.00
2.	Cognitive Appraisal Strategies	.35 ***	.27	.00	.27	.08

*P < .05

**P < .01

***P < .001

ns = not significant

Question 1.6

What is the nature of the relationship between Performance Orientation and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

Performance Orientation scores were regressed on the following: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 19 showed an R square of .025 which indicated that almost 2.5% of the Performance Orientation variance variable was explained by predictor variables. The 97.5% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for emotional subscale was .79, predictor variables have explained 2.5% of the possible 79% systematic variation.

As can be seen in Table 19, R square was .025, and adjusted R square was .013. The difference was not small; consequently, the stableness of the regression equation was not maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to previous questions were applied to this question. As a result, one of the predictors' direct path was retained in the trimmed model and six paths were eliminated. The retained path was Cognitive Appraisal Strategies. The six eliminated paths were: Instruction and Evaluation Stressors, Classroom Environment Stressors, Negative Personal Beliefs Stressors, Teacher Stressors, Family Stressors, and Work Stressors.

The inspection of the beta weights in Table 19 indicated that Cognitive Appraisal Strategies had the largest effect on Performance Orientation with beta of .11. On the other hand, Work Stressors had the least effect on Performance Orientation as suggested by its nonsignificant beta weight of .004. Again, standardized beta weights were applied in Figure 9 as path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The one retained predictor was used to compute the path coefficients and the R square for the trimmed model. Therefore, Performance Orientation scores were only regressed on Cognitive Appraisal Strategies scores. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 20 and Figure 9. A comparison of the R square of .025 from the saturated model (see Table 19) and the R square of .015 from the trimmed model (see Table 20) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was not small, and indicates that

the trimmed model was not adequate in explaining Performance Orientation. The saturated model probability of obtaining an F value at least as large as 2.16 was .0354 while the trimmed model probability of obtaining an F value at least as large as 9.088 was .0027.

In order to test the stability of the trimmed model equation, a comparison of the R square (.0154) and the adjusted R square (.013) was conducted. This comparison indicated that the stability of the trimmed model equation was supported since there is only a slight amount of reduction in values.

Table 19

Summary Statistics for the Regression of Performance Orientation on the Saturated Model Variable Set Under Consideration

Variable	B	SE B	Beta	T	Sig. T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	.174578	.067445	.113436	2.588	.0099
<u>Eliminated Paths</u>					
Instruction and Evaluation Stressors	-.075317	.066177	-.056589	-1.138	.2555
Classroom Environment Stressors	.072444	.079750	.045760	.908	.3641
Teacher Stressors	.062460	.064568	.047474	.967	.3338
Negative Personal Beliefs Stressors	-.143184	.077122	-.108504	-1.857	.0639
Work Stressors	.004236	.053320	.004061	.079	.9367
Family Stressors	.097015	.066180	.081978	1.466	.1432
(Constant)	2.417416	.357761		6.757	.0000
Multiple R	.16051				
R Square	.02576				
Adjusted R Square	.01388				
Standard Error	.99169				
Analysis of Variance					
	DF	Sum of Squares	Mean Square		
Regression	7	14.92727	2.13247		
Residual	574	564.49885	.98345		
F =	2.16836	Signif F = .0354			

Table 20**Summary Statistics for the Regression of Performance Orientation on the Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	.191156	.063408	.124208	3.015	.0027
(Constant)	2.349166	.233780		10.049	.0000
Multiple R	.12421				
R Square	.01543				
Adjusted R Square	.01373				
Standard Error	.99177				
Analysis of Variance					
	DF	Sum of Squares	Mean Square		
Regression	1	8.93923	8.93923		
Residual	580	570.48688	.98360		
F =	9.08830	Signif F = .0027			

IV. Decomposition of Effects Analysis

An examination of Table 21 indicated that Cognitive Appraisal Strategies had a direct effect on the Performance Orientation variable. Negative Personal Beliefs Stressors had an indirect effect on the Academic Self-Concept operating through Cognitive Appraisal Strategies.

However, an examination of the difference between the observed effect and the reproduced effect indicated there was a small difference. Again, this difference was attributed to indirect effects that were not included in the model.

Table 21 Decomposition of Effects on Performance Orientation in the Trimmed Model						
No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Negative Personal Beliefs Stressors	-.08 ns	.00	-.03	-.03	-.05
2.	Cognitive Appraisal Strategies	.12 **	.12	.00	.12	.00

*P < .05

**P < .01

***P < .001

ns = not significant

Question 1.7

What is the nature of the relationship between Mastery Orientation and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

Mastery Orientation scores were regressed on the following: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 22 showed an R square of .075 which indicated that almost 7.5% of the Mastery Orientation variance variable was explained by predictor variables. The 92.5% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for emotional subscale was .76, predictor variables have explained 7.5% of the possible 76% systematic variation.

As can be seen in Table 22, R square was .0751, and adjusted R square was .0638. The difference was small; consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to previous questions were applied to this question. As a result, four of the predictors' direct paths were retained in the trimmed model and three paths were eliminated. The four retained paths were: Cognitive Appraisal Strategies, Teacher Stressors, Work Stressors, and Family Stressors. The three eliminated paths were: Instruction and Evaluation Stressors, Classroom Environment Stressors, and Negative Personal Beliefs Stressors.

The inspection of the beta weight in Table 22 indicated that Cognitive Appraisal Strategies had the largest effect on Performance Orientation with a beta of .21. On the other hand, Instruction and Evaluation Stressors had the least effect on Cognitive Reactions, as suggested by its nonsignificant beta weight of .015. Again, the standardized beta weights were applied in Figure 9 as path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The four retained predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, Mastery Orientation scores were only regressed on the following: Cognitive Appraisal Strategies, Teacher Stressors, Work Stressors, and Family Stressors scores. The results of this regression equation eliminated Work Stressors since it did not reach statistical significant. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 23 and Figure 10. A comparison of the R square of .075 from the saturated model (see Table 23) and the R square of .065 from the trimmed

model (see Table 23) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was small; and thus, indicated that the trimmed model adequately explained Mastery Orientation. The saturated model probability of obtaining an F value at least as large as 6.66 was .0000 while the trimmed model probability of obtaining an F value at least as large as 13.48 was .0000.

In order to test the stability of the trimmed model equation, a comparison of the R square (.065) and the adjusted R square (.060) was conducted. This comparison indicated that the stability of the trimmed model equation was also supported since there was only a slight amount of reduction in value.

Table 22

**Summary Statistics for the Regression of Mastery Orientation on the
Saturated Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal					
Strategies	.264407	.053023	.212925	4.987	.0000
Teacher Stressors	-.107551	.050761	-.101312	-2.119	.0345
Work Stressors	.083340	.041918	.099020	1.988	.0473
Family Stressors	.123506	.052028	.129341	2.374	.0179
<u>Eliminated Paths</u>					
Instruction and					
Evaluation Stressors	.017169	.052026	.015987	.330	.7415
Classroom Environment					
Stressors	.029335	.062696	.022965	.468	.6400
Negative Personal					
Beliefs Stressors	-.106385	.060630	-.099913	-1.755	.0799
(Constant)	2.049153	.281259	7.286		.0000
Multiple R	.27414				
R Square	.07515				
Adjusted R Square	.06387				
Standard Error	.77963				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	7	28.35028	4.05004
Residual	574	348.89027	.60782

F = 6.66319 Signif F = .0000

Table 23

**Summary Statistics for the Regression of Mastery Orientation on the
Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Cognitive Appraisal Strategies	.277606	.050636	.223553	5.482	.0000
Teacher Stressors	-.102444	.044901	-.096501	-2.282	.0229
Family Stressors	.131482	.040628	.137694	3.236	.0013
(Constant)	2.006121	.247337		8.111	.0000
Multiple R	.25580				
R Square	.06543				
Adjusted R Square	.06058				
Standard Error	.78100				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	24.68450	8.22817
Residual	578	352.55605	.60996

F = 13.48971 Signif F = .0000

IV. Decomposition of Effects Analysis

An examination of Table 24 indicated that Cognitive Appraisal Strategies had a direct effect on the Mastery Orientation variable. Negative Personal Beliefs Stressors variable had indirect effect on the Academic Self-Concept variable operating through Cognitive Appraisal Strategies.

An examination of the difference between the significant observed effects and the reproduced effects indicated that there was a small difference in value.

Table 24
Decomposition of Effects on Mastery Orientation in the Trimmed Model

No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Teacher Stressors	-.08 ns	-.10	.00	-.10	-.02
2.	Negative Personal Beliefs Stressors	-.06 ns	.00	-.07	-.07	-.01
3.	Family Stressors	.07 ns	.13	.00	.13	.06
4.	Cognitive Appraisal Strategies	.21 ***	.22	.00	.22	.01

*p < .05

**p < .01

***p < .001

ns = not significant

Question 1.8

What is the nature of the relationship between Cognitive Appraisal Strategies and the following variables: Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

I. Relationship Magnitude

Cognitive Appraisal Strategies scores were regressed on the following: Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors scores.

An examination of Table 25 showed an R square of .12 which indicated that almost 12% of the Cognitive Appraisal Strategies variance variable was explained by predictor variables. The 88% of unexplained variation was due to variables not accounted for in the analysis and/or measurement error. Considering that the alpha internal consistency for emotional subscale was .73, the predictor variables had explained 12% of the possible 73% systematic variation.

As can be seen in Table 25, R square was .116, and adjusted R square was .107. The difference was small; consequently, the stableness of the regression equation was maintained.

II Retained and Eliminated Paths Utilizing Theory-Trimming

To determine the retention and elimination of paths, the same two statistical tests that were applied to previous questions were applied to this question. As a

result, one of the predictors' direct path was retained in the trimmed model and five paths were eliminated. The only retained paths was Negative Personal Beliefs Stressors. The five eliminated paths were: Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Work Stressors, and Family Stressors.

The inspection of the beta weights in Table 25 indicated that Negative Personal Beliefs Stressors had the largest effect on Cognitive Appraisal Strategies with beta of -.32. On the other hand, Teacher Stressors had the least effect on Cognitive Appraisal Strategies, as suggested by its nonsignificant beta weight of -.013. Again, the standardized beta weights were applied in Figure 9 as path coefficients.

III. Testing the Trimmed Model Utilizing Theory-Trimming

The two retained predictors were used to compute the path coefficients and the R square for the trimmed model. Therefore, Cognitive Appraisal Strategies scores were only regressed on Negative Personal Beliefs Stressors and Classroom Environment Stressors. The results of this regression equation indicated that the Classroom Environment Stressors variable was not significant; thus it was eliminated. The results of standardized beta weights and their corresponding path coefficients for the trimmed model are presented in Table 26 and Figure 10. A comparison of the R square of .116 from the saturated model (see Table 25) and the R square of .104 from the trimmed model (see Table 26) was conducted to determine the adequacy of the trimmed model. The difference between these two R square coefficients was small; indicating that the trimmed model adequately explained Cognitive Appraisal

Strategies. The saturated model probability of obtaining an F value at least as large as 12.60 was .0000 while the trimmed model probability of obtaining an F value at least as large as 67.49 was .0000.

In order to test the stability of the trimmed model equation, a comparison of the R square (.116) and the adjusted R square (.107) was conducted. This comparison indicated that the stability of the trimmed model equation was also supported since there was only a slight amount of reduction in value.

Table 25

**Summary Statistics for the Regression of Cognitive Appraisal
Strategies on the Saturated Model Variable Set
Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Negative Personal Beliefs Stressors	-.278198	.046254	-.324446	-6.015	.0000
<u>Eliminated Paths</u>					
Instruction and Evaluation Stressors	.064886	.040829	.075029	1.589	.1126
Classroom Environment Stressors	-.092863	.049159	-.090275	-1.889	.0594
Work Stressors	-.027598	.032949	-.040718	-.838	.4026
Family Stressors	.056274	.040853	.073182	1.377	.1689
Teacher Stressors	-.011613	.039921	-.013585	-.291	.7712
(Constant)	4.229098	.133529		31.672	.0000
Multiple R	.34096				
R Square	.11625				
Adjusted R Square	.10703				
Standard Error	.61319				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	6	28.43986	4.73998
Residual	575	216.19798	.37600

F = 12.60644 Signif F = .0000

Table 26

**Summary Statistics for the Regression of Cognitive Appraisal
Strategies on the Trimmed Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig T
<u>Retained Paths</u>					
Negative Personal Beliefs Stressors	-.276836	.033697	-.322858	-8.215	.0000
(Constant)	4.289079	.084239		50.916	.0000

Multiple R .32286
R Square .10424
Adjusted R Square .10269
Standard Error .61467

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	25.50046	25.50046
Residual	580	219.13738	.37782

F = 67.49313 Signif F = .0000

IV. Decomposition of effects Analysis

An examination of Table 27 indicated that the Negative Personal Beliefs Stressors variable had a significant direct effect on the Cognitive Appraisal Strategies variable.

An examination of the difference between the observed effect and the reproduced effect indicated that there was no difference between them.

Table 27
Decomposition of Effects on Cognitive Appraisal Strategies in the Trimmed Model

No.	VARIABLES	Observed Effects	Direct Effects	Indirect Effects	Total Effects	Difference Between Observed and Total Effects
1.	Negative Personal Beliefs Stressors	-.32 ***	-.32	.00	-.32	.00

* $P < .05$

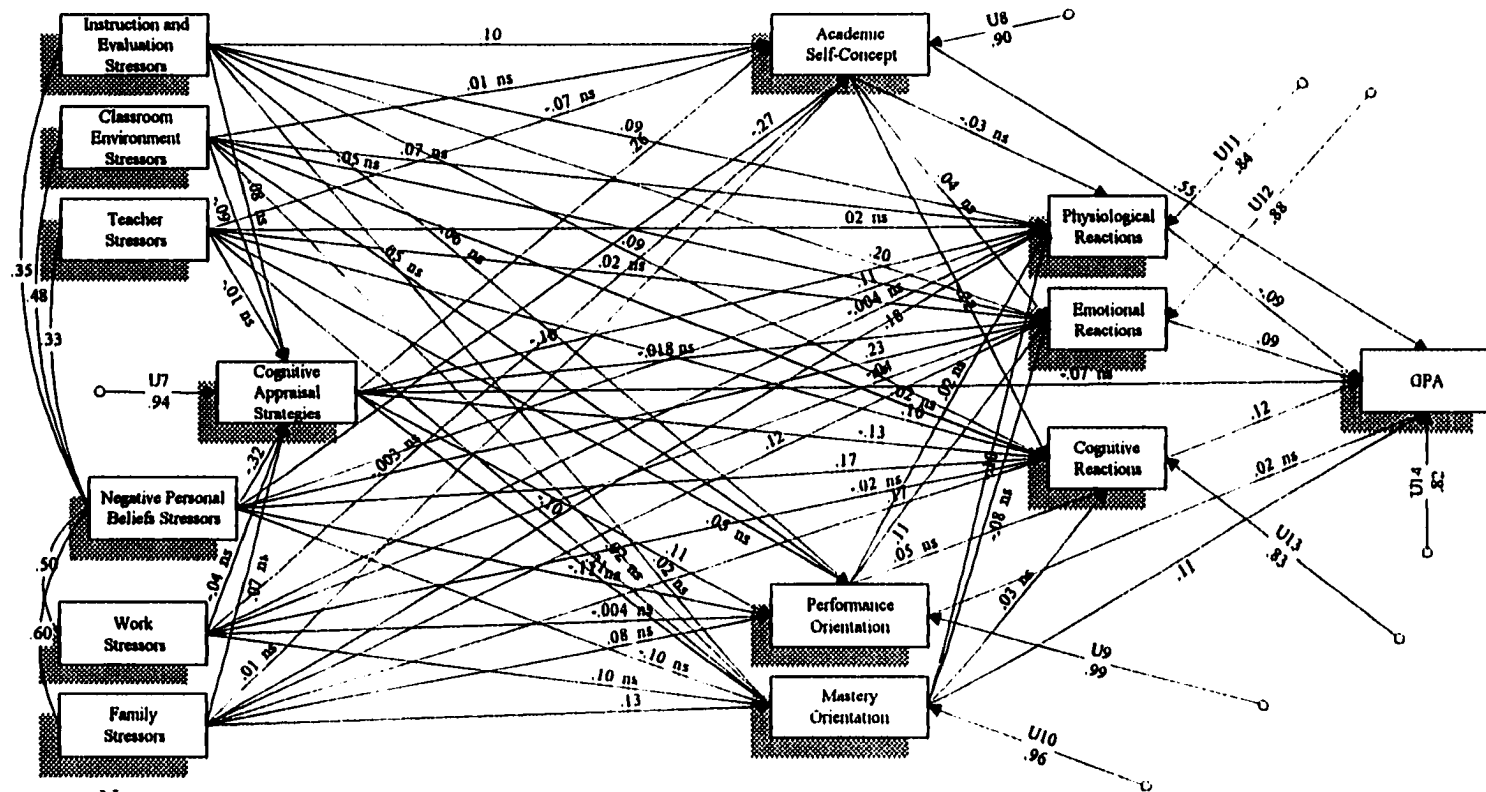
** $P < .01$

*** $P < .001$

ns = not significant

Figure 9

Saturated Path Model for Explaining GPA



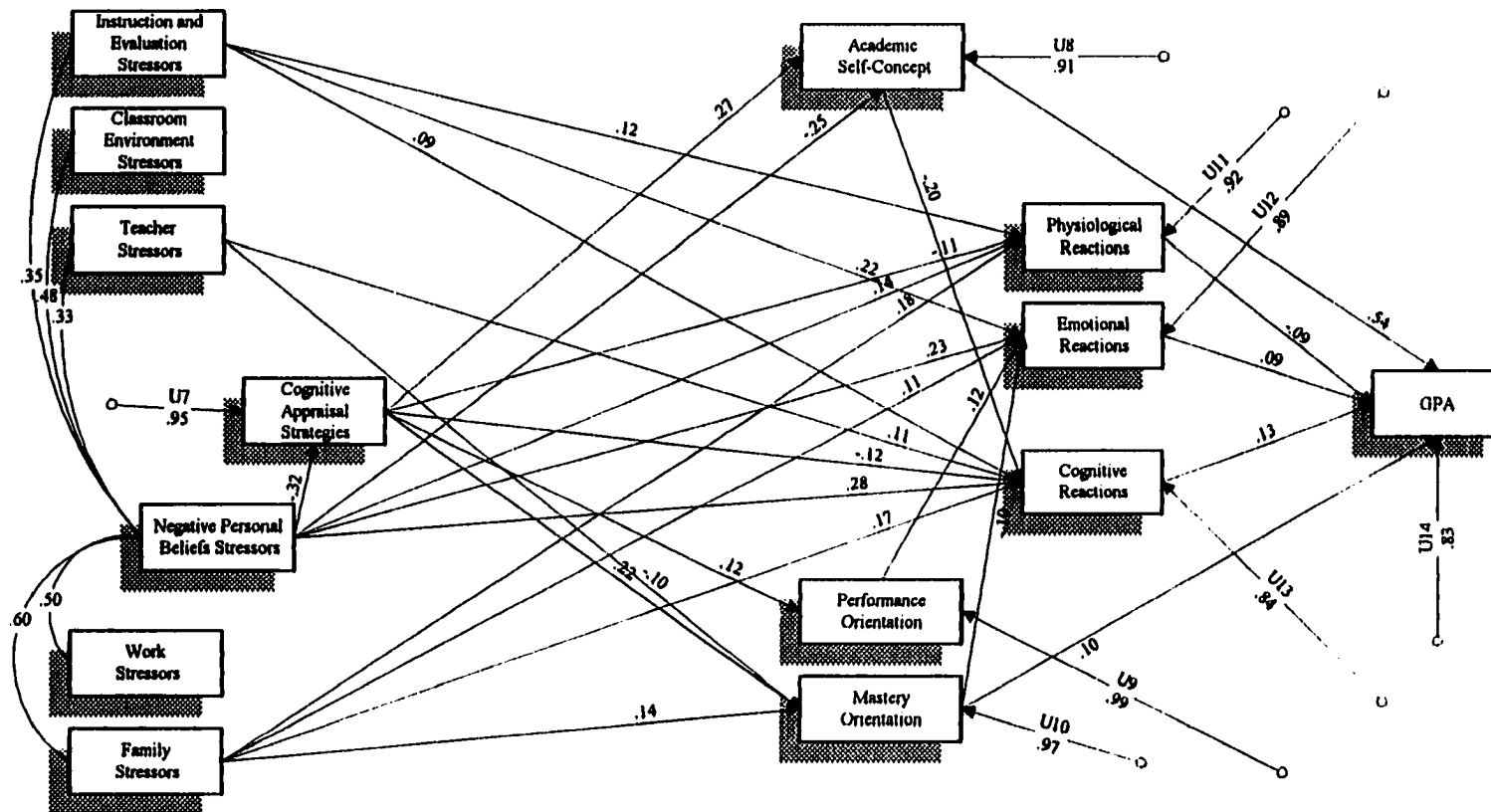
Note:

ns: Indicates that the path coefficients did not reach statistical significance.

U: Represent unexplained variable.

Figure 10

Trimmed Path Model for Explaining GPA



Note:
U: Represent unexplained variable.

Testing the Trimmed Model “goodness of fit”

To test the trimmed model “goodness of fit” the Pedhazur (1982) procedure was applied. Pedhazur (1982) described two tests used to calculate the “goodness of fit”: 1) Q probability; 2) chi-square (X^2). Both of these tests were applied in this study. The larger the probability associated with the chi-square (meaning closer to one), the better the fit of the model to the data.

The result of the first test, which is not a function of the sample size, was $Q = .95$. This is a high probability value suggesting that the model fits the data well. To further examine the “goodness of fit” for the trimmed model, the second test of chi-square, which is a function of the sample size, was applied. The test was not significant [$X^2 = 29.62$, $p = .64$, with 33 df (the number of deleted paths)]; thus, providing additional evidence in support of the trimmed model fitting the data. These results indicated that the relations implied by the trimmed model were consistent with the observed covariances.

CHAPTER FIVE

DISCUSSION, SUMMARY AND CONCLUSIONS, IMPLICATIONS, LIMITATIONS, AND RECOMMENDATIONS

Discussion

The major purpose of this study was to test a hypothetical model of college students' stress (see Figure 1). This purpose led to the investigation of the relationship between students' stressors and their effect on Cognitive Appraisal Strategies, Academic Self-Concept, Mastery Orientation, Performance Orientation, Physiological Reactions, Emotional Reactions, Cognitive Reactions, and GPA. To measure this relationship, the *College Students Stress Inventory* (CSSI) was developed. The investigation of the aforementioned relationship generated the following hypothesis and eight questions.

Hypothesis 1.0

There are no significant relationships between stressors and GPA when mediated by the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies.

The hypothetical model consists of eight criterion variables: GPA, Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies. Accordingly, Hypothesis 1.0 was partitioned into eight questions. The discussion of the results of each question is presented as follows:

Discussion of Question 1.1

What is the nature of the relationship between GPA and the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Cognitive Appraisal Strategies, Performance Orientation, and Mastery Orientation?

The five retained paths were: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, and Mastery Orientation. Results of the trimmed regression indicated that the retained paths had significant direct effects on the GPA variable. Further, Academic Self-Concept, with a beta of .54, had the strongest direct effect on the GPA variable. The positive effect of Academic Self-Concept on the GPA variable was consistent with the pilot study results and the existing literature and theory (Sapp, Farrel, & Durand, 1995; Schunk, 1991; Marsh & Holmes, 1990; Caracosta & Michael, 1986; Bandura, 1986). Further, the results indicated that Cognitive Appraisal Strategies and Negative Personal Beliefs Stressors had direct effects on Academic Self-Concept with betas of .27, -.25, respectively. Thus, Cognitive Appraisal Strategies and Negative Personal Beliefs Stressors had the strongest indirect effects on the GPA variable mediated by the Academic Self-Concept

(Negative Personal Beliefs Stressors → Academic Self-Concept → GPA; Cognitive Appraisal Strategies → Academic Self-Concept → GPA). In other words, Academic Self-Concept is a moderator variable between the Negative Personal Beliefs Stressors and the Cognitive Appraisal Strategies variables, and the GPA variable. These effects can be interpreted as students possessing high Academic Self-Concept are protected from encountering the full strength of stressors because they have the coping means readily available which immediately shortens the stressful response to “what I am going to do next?” As stated earlier, lacking effective cognitive/coping strategies can diminish a learner’s perceptions of ability or Academic Self-Concept (Schunk, 1991). Previous research indicated that Academic Self-Concept moderated the effect of external factors on performance or GPA (Sapp, Farrel, & Durand, 1995).

Unlike Performance Orientation, Mastery Orientation had a direct effect on GPA with a beta of .10. Furthermore, Cognitive Appraisal Strategies had a direct effect on Mastery Orientation with a beta of .22. Therefore, Cognitive Appraisal Strategies had an indirect effect on the GPA operating through Mastery Orientation (Cognitive Appraisal Strategies → Mastery Orientation → GPA.) In other words, students with Mastery Orientation positively influenced their GPAs by using appropriate Cognitive Appraisal Strategies. This result is consistent with the goal orientation research which indicted that students who placed greater emphasis on task-mastery goals reported more active cognitive engagement than performance oriented students (Meece, Blumenfeld, & Hoyle, 1988)

Moreover, Family Stressors and Teacher Stressors also had direct effects on Mastery Orientation with betas of .14 and -.10, respectively. However, the positive effect of Family Stressors on Mastery Orientation was not expected, because this result suggested that Family Stressors caused students to have Mastery Orientation. One possible explanation for this unexpected phenomenon is that the path coefficient reached significance as a result of the large sample size used in this study.

Physiological Reactions had a small negative direct effect on the GPA variable with a beta of -.09. Thus, experiencing physiological stress reactions negatively influenced students' GPAs. Further, Negative Personal Beliefs Stressors, Family Stressors, and Cognitive Appraisal Strategies had small indirect effects on GPA operating through Physiological Reactions. Emotional and Cognitive Reactions had positive direct effects on the GPA with betas of .09, .13, respectively. This result unexpectedly indicated that students with emotional and cognitive reactions positively influenced their GPAs. To explain this result, the correlation matrix was examined for these variables. The examination of correlation matrix indicated that the -.06 correlation between GPA and cognitive reaction was not significant. Furthermore, the examination of the correlation matrix indicated that the .08 correlation between GPA and cognitive reaction was also not significant. Again, one possible explanation for this unexpected phenomenon is that cognitive and emotional reactions paths reached significance as a result of the large sample size used in this study. Therefore, the distinction between practical and statistical significance is important to consider in

this study. Nevertheless, the significant relationships between the variables of interest supported the validity of the overall trimmed model fitting the data.

Discussion of Question 1.2

What is the nature of the relationship between Physiological Reactions and the following variables: Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

As indicated, the Negative Personal Beliefs Stressors, Family Stressors, and Instruction and Evaluation Stressors had significant positive direct effects on Physiological Reactions. Further, Cognitive Appraisal Strategies had a significant negative direct effect on Physiological Reactions. This result can be interpreted as indicating that students who are experiencing physiological reactions as a result of stressors, also have poor Cognitive Appraisal Strategies to cope with those stressors.

Furthermore, Negative Personal Beliefs Stressors had an indirect effect on Physiological Reactions mediated by Cognitive Appraisal Strategies. This result suggested that Negative Personal Beliefs Stressors not only hindered their ability to cope with stressors, but it also caused them Physiological Reactions. In other words, if students' Cognitive Appraisal Strategies are poor and they encounter stressful events, they will experience Physiological Reactions. This result is consistent with the stress research (Selye, 1956, 1974; Lazarus & Folkman, 1984). In short, since there

were significant relationships between the variables of interest, the fit of the trimmed model to the data was supported.

Discussion of Question 1.3

What is the nature of the relationship between Emotional Reactions and the following variables: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

The five significant retained direct paths were: Performance Orientation, Mastery Orientation, Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, and Family Stressors. The five retained direct paths were regressed on Emotional Reactions resulting in betas of .12, -.10, .22, .23, and .11, respectively.

Accordingly, the data are consistent with the hypotheses that the Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, Family Stressors, and Performance Orientation caused or encouraged Emotional Reactions. On the contrary, Mastery Orientation reduced or discouraged Emotional Reactions. This result is consistent with the goal orientation research which claimed that performance oriented students tend to have higher levels of anxiety than mastery students (Roedel, Schraw, & Plake, 1994). Roedel, Schraw, and Plake (1994) indicated that performance orientation increases an individual's stress and performance anxiety due to the possibility of failure. Therefore, the significant relationships between the

variables of interest supported the validity of the overall trimmed model fitting the data.

Discussion of Question 1.4

What is the nature of the relationship between Cognitive Reactions and the following variables: Academic Self-Concept, Performance Orientation, Mastery Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

The six retained paths were: Academic Self-Concept, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, and Family Stressors. The six retained predictors were used to compute the path coefficients for the trimmed model resulting in betas of -.20, -.12, .09, .11, .28, and .17, respectively.

Accordingly, the data are consistent with the claim that the Instruction and Evaluation Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, and Family Stressors encouraged or caused Cognitive Reactions. On the contrary, Academic Self-Concept and Cognitive Appraisal Strategies discouraged or reduced the Cognitive Reactions to stress.

Negative Personal Beliefs Stressors had an indirect effect on Cognitive Reactions mediated by Cognitive Appraisal Strategies (Negative Personal Beliefs Stressors → Cognitive Appraisal Strategies → Cognitive Reactions.) This result can be interpreted as that Negative Personal Beliefs Stressors not only hindered students

ability to cope with stressors, but it also caused them Cognitive Reactions. This result is consistent with the stress research (Lazarus & Folkman, 1984) and supports the proposition by Rutter (1983) that personal characteristics (i.e., sex, age, temperament), as well as past experiences that individuals bring to the stress interaction, play a key role in their appraisal of the interaction and the meaning they assign to it. As a result, the significant relationships between the variables of interest supported the validity of the overall trimmed model fitting the data.

Discussion of Question 1.5

What is the nature of the relationship between Academic Self-Concept and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

The three retained paths were: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, and Negative Personal Beliefs Stressors. The three retained predictors were used to compute the path coefficients and the R square for the trimmed model. The results of this regression indicates that Instruction and Evaluation Stressors was not significant; thus, it was eliminated from the inclusion in the trimmed model equation. Therefore, two direct paths were used to compute the path coefficients and R square for the trimmed model—Cognitive Appraisal Strategies and Negative Personal Beliefs Stressors—which resulted in betas of .27 and -.25.

Accordingly, the data are consistent with the hypotheses that the Cognitive Appraisal Strategies encouraged or caused positive Academic Self-Concept while

Negative Personal Beliefs Stressors discouraged or reduce positive Academic Self-Concept. In other words, students' Academic Self-Concept is enhanced by the presence of Cognitive Appraisal Strategies and hindered by the presence of Negative Personal Beliefs Stressors. This result was consistent with existing research (Lazarus & Folkman, 1984; Sapp, Farrel, & Durand, 1995; Sapp, 1994; Schunk, 1991).

Negative Personal Beliefs Stressors had an indirect effect on Academic Self-Concept mediated by Cognitive Appraisal Strategies. This result can be interpreted to indicate that Negative Personal Beliefs Stressors not only hindered students' ability to cope with stressors, but it also caused them to have poor Academic Self-Concept. In other words, if students' Cognitive Appraisal Strategies are negatively influenced by Negative Personal Beliefs Stressors, then this will in turn result in lower Academic Self-Concept. This result is consistent with the existing stress research (Lazarus & Folkman, 1984; Sapp, Farrel, & Durand, 1995; Sapp, 1994; Schunk, 1991). Based on the aforementioned findings, the validity of the overall trimmed model fitting the data was supported.

Discussion of Question 1.6

What is the nature of the relationship between Performance Orientation and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

Cognitive Appraisal Strategies was the only retained predictor used to compute the path coefficient and the R square for the trimmed model which resulted in

a beta of .12. Furthermore, Negative Personal Beliefs Stressors had indirect effect on Performance Orientation mediated by Cognitive Appraisal Strategies.

This result can be interpreted as showing that students Performance Orientation was directly positively influenced by Cognitive Appraisal Strategies and indirectly negatively influenced by the presence of Negative Personal Beliefs Stressors. The results showed that there were significant relationships between the variables of interest; thus, the validity of the overall trimmed model fitting the data was supported.

Discussion of Question 1.7

What is the nature of the relationship between Mastery Orientation and the following variables: Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

The four retained paths were: Cognitive Appraisal Strategies, Teacher Stressors, Work Stressors, and Family Stressors. These retained paths were used to compute the path coefficients for the trimmed model. The results of this regression equation eliminated Work Stressors, because it did not reach statistical significant. The three retained paths were Cognitive Appraisal Strategies, Teacher Stressors, and Family Stressors with betas of .22, -.09, and .14, respectively.

This result suggest that students' Mastery Orientation was directly enhanced by Cognitive Appraisal Strategies and Family Stressors, and hindered by Teacher Stressors. However, Family Stressors was not expected to foster Mastery Orientation. To evaluate this unexpected relationship, an examination of the correlation matrix

indicated that the correlation coefficient .07 between Mastery Orientation and Family Stressors was not significant. Again, the large sample size used in this study could be an explanation as to how this relationship reached significance in the regression model. Negative Personal Beliefs Stressors had an indirect effect on Mastery Orientation mediated by Cognitive Appraisal Strategies. The results can be interpreted as students' Negative Personal Beliefs Stressors not only hindered their ability to cope with stressors, but it also hindered them to become Mastery Oriented.

One important difference to note is that Cognitive Appraisal Strategies had a direct effect on Performance Orientation with a beta of .12; whereas, Cognitive Appraisal Strategies had a direct effect on Mastery Orientation with a beta of .22. This can be interpreted as students with Mastery Orientation tend to be more influenced by the Cognitive Appraisal Strategies than students with Performance Orientation. This result supports the goal orientation theory (Greene & Miller, 1996; Meece, Blumenfeld & Hoyle, 1988). Moreover, Mastery Orientation and Performance Orientation were positively correlated with a correlation coefficient of .23 providing additional support for the goal orientation theory. This result indicated that students with a mastery orientation may have a modest performance orientation. Nonetheless, results provided further evidence in support for the validity of the overall trimmed model fitting the data.

Discussion of Question 1.8

What is the nature of the relationship between Cognitive Appraisal Strategies and the following variables: Instruction and Evaluation Stressors, Classroom

Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, and Family Stressors?

The two retained paths of Negative Personal Beliefs Stressors and Classroom Environment Stressors were used to compute the path coefficients and the R square for the trimmed model. The results of this regression equation indicated that Classroom Environment Stressors variable was not significant, thus it was eliminated. Therefore, Negative Personal Beliefs Stressors was the only direct path that was retained with a beta of -.32.

Results revealed that Cognitive Appraisal Strategies were largely hindered by Negative Personal Beliefs Stressors. In other words, it is mainly students' Negative Personal Beliefs Stressors that hindered these students from effectively coping with the stressors. This result supports Folkman and Lazarus (1991) proposition that "Appraisals of person-environment relationships are influenced by antecedent person characteristics such as pattern of motivation (e.g., values, commitments, and goal), beliefs about oneself and the world, and recognition of personal resources for coping such as financial means, social and problem-solving skills, and health and energy." Further, as stated earlier, Negative Personal Beliefs Stressors correlated strongly with all the stressors. This result provides further evidence in support of interactional or transactional theories of stress that defines stress as a function of the ongoing, active relationship between the person's adaptive and coping mechanisms and the conditions of the environment (Lazarus, 1966; Derogatis & Coons, 1993). Interactional theories emphasize the characteristics of the individual as mediator between the conditions of

the environment and the responses of an individual (Lazarus, 1966; Derogatis & Coons, 1993).

The aforementioned strong relationships indicated that if a student perceives Negative Personal Beliefs Stressors as high, then Family Stressors, Work Stressors, Teacher Stressors, Classroom Environment Stressors, and Instruction and Evaluation Stressors are perceived as high, as well. This result supports the stress theories that indicate stress as being either additive (Selye, 1974) or multiplicative (Rutter, 1983). Stressful events do not have to be real for stress to occur, it is students' perception and construction of these events that make them stressful. Negative Personal Beliefs Stressors (e.g., lack of ability, lack of skills, lack of security, lack of resources, low self-confidence, sense of hopelessness, unpleasant past experiences) determine in large the meaning of stressful events. Since stress is either multiplicative or additive, eliminating one stressors can have a significant improvement on the learning and the performance of students (Lazarus, 1966; Derogatis & Coons, 1993). Lastly, the validity of the trimmed model fitting the data was again supported since there were significant relationships between the variables of interest.

Summary and Conclusions

This exploratory study discovered significant stressors and mediator paths leading to GPA. It was found that environmental stressors do not directly affect GPA; they are mediated by other variables.

The process involved in answering the general hypothesis generated eight questions. To answer the eight questions, each question was treated as separate from the others; however, all questions pertain to the hypothetical model or to the general hypothesis. Of the 64 paths in the saturated model (see Figure 9), 31 significant paths were retained, and 33 non-significant paths were deleted. The 31 significant paths formed the trimmed model (see Figure 10).

Academic Self-Concept, Mastery Orientation, Emotional Reactions, Cognitive Reactions, and Physiological Reactions had significant positive direct effects on GPA. Academic Self-Concept had the strongest positive direct effect on GPA with a beta of .54. As mentioned earlier, the effects of Emotional Reactions and Cognitive Reactions were questionable. Therefore, the best practical and significant predictors of GPA were Academic Self-Concept and Mastery Orientation. This result supported Bandura's (1986) claim that when people know they possess a large number of coping strategies, metacognition improves and strengthens their confidence in meeting environmental demands.

Furthermore, the result of the positive relationship between stressors, Cognitive Appraisal Strategies, and stress reactions is consistent with stress research and theories (Selye, 1974; Lazarus & Folkman, 1984). Also, results of the current

study indicated that Negative Personal Beliefs Stressors, Instruction and Evaluation Stressors, Family Stressors, and Cognitive Appraisal Strategies had significant direct effects on Physiological Reactions. Further, Instruction and Evaluation Stressors, Negative Personal Beliefs Stressors, Family Stressors, Performance Orientation, and Mastery Orientation had significant direct effects on Emotional Reactions. Academic Self-Concept, Instruction and Evaluation Stressors, Teacher Stressors, Cognitive Appraisal Strategies, Negative Personal Beliefs Stressors, and Family Stressors had significant direct effect on Cognitive Reactions. Physiological, Emotional, and Cognitive Reactions scores were strongly correlated. In addition, similar findings were reported on the sources of stress and stress reactions (Archer & Lamnin, 1985; Kohn & Frazer, 1986; Dunkel & Lobel, 1990; Cahir & Morris, 1991). Current research results, that indicated individuals respond to stress producers on various levels (physiological, emotional, behavioral, and cognitive), were consistent with previous research results (Reeve, 1992; Khanna & Khanna, 1990).

Furthermore, Negative Personal Beliefs Stressors and Cognitive Appraisal Strategies had significant direct effects on Academic Self-Concept. This result supports the claim that lack of effective cognitive strategies diminishes a learner's perceptions of ability or a Academic Self-Concept (Schunk, 1991)

Cognitive Appraisal Strategies had the only significant direct effect on Performance Orientation. Cognitive Appraisal Strategies, Teacher Stressors, and Family Stressors had significant direct effects on Mastery Orientation. However, as mentioned earlier, Family Stressors and Teacher Stressors effects were questionable.

Results indicated that students with mastery orientation were more related to the use of Cognitive Appraisal Strategies than students with performance orientation; this is consistent with the goal orientation research and theory (Greene & Miller, 1996; Meece, Blumenfeld & Hoyle, 1988; Dweck, 1986; Dweck & Leggett, 1988).

Negative Personal Beliefs Stressors had the only significant direct effect on Cognitive Appraisal Strategies. This direct effect supported Rutter's (1983) proposition that personal characteristics (i.e., sex, age, temperament) as well as past experience, which individuals bring to the stress interaction, play a key role in their appraisal of the interaction and the meaning they assign to it. Further, this direct effect is also consistent with the interactional theories emphasizing the characteristics of the individual as mediator between the conditions of the environment and the responses of an individual. Negative Personal Beliefs Stressors strongly correlated with Family Stressors, Work Stressors, Teacher Stressors, Classroom Environment Stressors, and Instruction and Evaluation Stressors.

The test of the trimmed models adequacy, which was tested by comparing the R square from the saturated models to that of the trimmed models indicated the trimmed models were adequate. Furthermore, the F test comparisons between the saturated and trimmed models suggested that the trimmed models sustained theoretical parsimony without the loss of predictive power. Finally, there were some discrepancies between the observed and reproduced effects; however, the two tests of the model "goodness of fit" indicated that the trimmed model (Figure 10) fits well with the data.

In conclusion, the trimmed model was supported by the “goodness of fit” tests and the significant relationship between stressors and GPA when mediated by the following variables: Physiological Reactions, Emotional Reactions, Cognitive Reactions, Academic Self-Concept, Performance Orientation, Mastery Orientation, and Cognitive Appraisal Strategies.

Implications of the Study

The major finding of this study indicated that the key factor in predicting GPA was Academic Self-Concept, which was directly influenced by Cognitive Appraisal Strategies and indirectly influenced by Negative Personal Beliefs Stressors. Since Academic Self-Concept was a strong predictor of GPA, evaluating students’ Academic Self-Concept can provide educators with essential insights. The design and application of effective instructional interventions can improve students’ Academic Self-Concept by employing well established instructional strategies. For instance, educators can use Keller’s (1983) four motivational components that include the following instructional strategies: 1) interest; 2) relevance; 3) expectancy, and; 4) satisfaction. For example, to increase the interest and curiosity of instruction, the instructor should guide the learners into a process of question generation and inquiry. Further, to increase the relevance of instruction, the instructor should provide opportunities for choice, responsibility, and interpersonal influence. Moreover, to increase the expectancy for success, the instructor should increase experience opportunities with success, indicate the requirement for success, provide personal

control over success, give students feedback that help them connect success to personal effort and ability. Finally, to increase the intrinsic satisfaction with the instruction, the instructor should employ positive praise and informative feedback instead of threats, surveillance, or external performance evaluation. The use of the aforementioned strategies can reduce the effects of stressors on students by reducing the imposition on their working memory, and by gaining and sustaining the learner's attention through the use of novelty, mystery, and questioning techniques. For example, reducing or even eliminating the threat of evaluation allows for more effort to be placed on the task of learning. Finally, increasing the level of interest, relevance, expectancy, and satisfaction of instruction can strongly enhance students' Academic Self-Concept, Mastery Orientation, Cognitive Appraisal Strategies, and reduce students' Instruction and Evaluation Stressors.

Keller's (1983) theory of motivational design is merely an example of many instructional theories. Educators who are genuinely motivated to reduce students' stress and enhance their performance by using instructional strategies, can read the research and theories of instruction (e.g., Merrill, 1971; Briggs, 1977; Gagne, 1979). These researchers and theorists have proposed theoretical models of the connections between the external events of instruction and the internal events of cognition and learning.

Another important implication of this study indicates the importance of looking beyond the external or observable sources of students' stress. It is important for educators to note that it is not required for an event to occur for it to cause students

stress; it only needs to exist in the mind of the student. The information-processing approach of cognitive psychology can illustrate the process of dealing with stressful events. Stressful events are perceived by students according to their reality-testing capacity. These events are appraised based on prior knowledge and experiences with the similar events. The response is based on the student's available coping skills which may be adaptive (having no or small stress reactions) or maladaptive (having them all). It is the coping skills/Cognitive Appraisal Strategies mediated by other variables (such as, Academic Self-Concept, Mastery Orientation) that impact the academic performance or GPA of the students. Therefore, teaching students well established stress coping strategies is critical and consequential ingredient for success.

Lazarus and Folkman (1984) described two primary coping categories:

1) problem-focused coping, and; 2) emotion-regulation—which is usually indirect or avoidant coping. The problem-focused coping category consists of all strategies intended to deal directly with stressors through overt action or through problem-solving activities. The problem-focused category attributes are similar to the attributes of Mastery Orientation. The emotion-regulation coping category is useful for dealing with the impact of more uncontrollable stressors. The emotion-regulation coping category attributes are similar to the attributes of Performance Orientation. There are two reasons as to why performance oriented students are emotionally-regulated as opposed of being problem-focused: 1) having low Academic Self-Concept and; 2) having perception problem of the stressors as being uncontrollable. As indicated earlier, Performance Orientation correlated lower with Academic Self-Concept than

Mastery Orientation. Further, Performance Orientation was less influenced by the Cognitive Appraisal Strategies than Mastery Orientation. In addition, Emotional Reactions were reduced by Mastery Orientation while intensified by the Performance Orientation. Specifically, Jerusalem and Schwarzer (1989) found that emotion-focused coping students are mainly influenced by anxiety, whereas students' self-concept turned out to be beneficial for problem-focused coping.

Nonetheless, training students to appropriately use both of these strategies can provide them with tools to cope with stressors and enhance their performance level. Further research is needed to investigate the ways cognitive coping strategies can be fostered. For instance, Greene's (1995) study provided an ideal example of investigating the use of strategy knowledge of comprehension as a mean to compensate for insufficient domain knowledge in economics. Students can be "stressed out" if they lack the adequate domain knowledge and the coping means to deal with unfamiliar texts of economics. The automaticity of secondary skills, like reading, plays an important role in reducing students' stress and message comprehension impositions on learning events. Further, Greene indicated that strategy instruction may compensate for insufficient domain knowledge; however, there is not enough evidence to support this assertion. Nonetheless, future research is needed to explore and validate any cognitive coping strategy students could use to cope with the stressors.

Limitations of the Study

The following list highlights some of the current study's limitations.

1. To gather data, questionnaires were used. The layout of the questionnaire was clear and used precise language to avoid obtaining skewed results from respondents. Even though the questionnaires were devised carefully, the study conducted is only as good as the questions it asked. Further, questionnaires only allow for one-way communication. Therefore, it is not known whether the questionnaire was perceived by the respondents as was intended.
2. The major criterion variable in this investigation, reported grade point averages, was based on self-reported data.
3. Academic achievement in the present investigation was not inferred from multiple indicators.
4. This study used convenience sampling for obtaining the sample of college students as respondents. Although this type of non-probability sampling is quicker and more economical than other types of sampling, it is less representative of the overall population.
5. The subjects in this study were primarily Caucasian students (70%). It is unknown whether these subjects represent the general college students population.
6. Some of the relationships in this study reached statistical significance when the magnitudes were small, and this problem can be attributed to the large sample size utilized in this study. Therefore, differentiation between statistical and practical significance is important.

7. The predictor variables did not account for all variations in the criterion variables. The unexplained variations were due to other predictor variables not included the regression models.
8. Finally, the results of this study should be used to project results beyond the specific sample with precaution. Every attempt was made to minimize the effects of the above limitations.

Recommendations for Future Research

Based on this study's attributes and findings, the following recommendations are made for the future research.

1. Future research needs to address the limitations of this study.
2. Future research needs to base student achievement on actual school grades obtained from the school records.
3. Additional research can provide tests of the generalizability of the findings in this investigation and hopefully overcome many of its limitations.
4. Future research should be conducted to examine the validity and reliability of the revised version of CSSI.
5. To increase the reliability of subscales, more items need to be added to the subscales that did not reach coefficient alpha of .80 level.
6. Since Academic Self-Concept was the main predictor of GPA, future research needs to investigate factors that foster high Academic Self-Concept in students.

7. Future investigation needs to examine the causal relationship between stress reactions (emotional, cognitive, and physiological).
8. Future research needs to consider the addition of the shallow and deep cognitive strategies variables to the model to determine if they would mediate the relationship between mastery and performance orientations, and GPA.

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Appendix A

Note: the following instrument was slightly modified to fit the specified margins for dissertation.

CONTENT-VALIDITY RATING

INSTRUCTIONS: The statements that follow are being considered for inclusion in a *student goal orientation and Academic Self-Concept survey*. Please assist us in reviewing the content of the statements by providing two ratings for each statement. The conceptual definitions of the categories these statements are supposed to reflect as well as the rating instructions are listed below. *The following are categories related to goal orientation and Academic Self-Concept of students.*

	Categories	Definition
	<u>Goal orientation:</u>	Refers to students as being either performance or mastery.
I	<u>Performance goal:</u>	Students are appealed to doing better than others, getting high grades, being normative, passing the courses, lacking of focus on learning. Students with performance goal orientation tend to use shallow type of learning strategies.
II	<u>Mastery goal:</u>	Students are appealed to self improvement, working hard, focus on learning processes, and like to learn for the sake of learning. Students with mastery goal orientation tend to use deep type of learning strategies.
III	<u>Academic Self-Concept:</u>	Students' feelings of self-worth, self-esteem, and their Academic ability.

• **Rating Tasks:**

A. Please indicate the category that each statement best fits by circling the appropriate numeral. Statements not fitting any category should be left blank.

B. Please indicate how strongly you feel about your placement of the statement into the category by circling the rating:

- 1 not very sure
- 2 strongly
- 3 no question about it

I = Performance Goal
1 = not very sure

II = Mastery Goal
2 = strongly

III = Academic Self-Concept
3 = no question about

Statements	Categories			Rating		
	Performance Goal	Mastery Goal	Academic Self-Concept	Not very Sure	Strongly	No Question About It
1. I feel that I am a good student	I	II	III	1	2	3
2. I feel that I learn things easily	I	II	III	1	2	3
3. I do good work in school	I	II	III	1	2	3

<i>Statements</i>	<i>Categories</i>			<i>Rating</i>		
	Performance Goal: I	Mastery Goal: II	Academic Self-Concept: III	Not very Sure: 1	Strongly 2	No Question About It 3
4. School work is easy for me	I	II	III	1	2	3
5. I do well and get good grades	I	II	III	1	2	3
6. I like doing classroom assignments	I	II	III	1	2	3
7. I do assignments only to please teachers	I	II	III	1	2	3
8. I like challenging classroom assignments	I	II	III	1	2	3
9. I worry about not doing well in school	I	II	III	1	2	3
10. I do assignments because I have to	I	II	III	1	2	3
11. I like to compete with my peers	I	II	III	1	2	3
12. I do school work only for grades	I	II	III	1	2	3
13. I do assignments because I want to	I	II	III	1	2	3
14. I feel like I can learn anything	I	II	III	1	2	3

CONTENT-VALIDITY RATING

INSTRUCTIONS: The statements that follow are being considered for inclusion in a *student goal orientation and Academic Self-Concept survey*. Please assist us in reviewing the content of the statements by providing two ratings for each statement. The conceptual definitions of the categories these statements are supposed to reflect as well as the rating instructions are listed below. *The following are categories related to stress consequences and stress coping strategies of students.*

Categories	Definition
I <u>Stress Reactions</u>	The students' reaction to external stress sources such as emotional, physiological, and Cognitive Reactions.
II <u>Cognitive Appraisal Strategies</u>	The process of dealing with internal and external demands that are perceived as straining or exceeding an individual's resources.

• **Rating Tasks:**

- A. Please indicate the category that each statement best fits by circling the appropriate numeral. Statements not fitting any category should be left blank.
- B. Please indicate how strongly you feel about your placement of the statement into the category by circling the rating:
 1 not very sure
 2 strongly
 3 no question about it

I = Stress Reactions

II = Cognitive Appraisal Strategies

1 = not very sure

2 = strongly

3 = no question about

Statements	Categories		Rating		
	Stress Reactions	Cognitive Appraisal	Not very Sure	Strongly	No Question About It
1. When I am under stress, I experience anxiety	I	II	1	2	3
2. When I am under stress, I have problem thinking	I	II	1	2	3
3. When I am under stress, I make the wrong decisions	I	II	1	2	3
4. When I am under stress, I experience fatigue	I	II	1	2	3
5. When I am under stress, I experience high blood pressure	I	II	1	2	3
6. When I am under stress, I experience headaches	I	II	1	2	3

	Stress Reactions	Cognitive Appraisal	Not very Sure	Strongly	No Question About It
7. When I am under stress, I experience allergies	I	II	1	2	3
8. When I am under stress, I experience sleeping problems	I	II	1	2	3
9. When I am under stress, I experience confusion	I	II	1	2	3
10. When I am under stress, I experience loss of memory	I	II	1	2	3
11. When I am under stress, I experience loss of attention	I	II	1	2	3
12. When I am under stress, I experience poor concentration	I	II	1	2	3
13. When I am under stress, I have problem understanding	I	II	1	2	3
14. When I am under stress, I experience emotional problems	I	II	1	2	3
15. When I am under stress, I experience nervousness	I	II	1	2	3
16. When I am under stress, I exercise regularly	I	II	1	2	3
17. When problems arise, I I am able to resolve them	I	II	1	2	3
18. When problems arise, I develop a plan to solve them	I	II	1	2	3
19. When I am under stress, I am able to identify the causes	I	II	1	2	3
20. When I am under stress, I accomplish more	I	II	1	2	3
21. When I am under stress, I seek social support	I	II	1	2	3
22. When I am under stress, I set realistic expectations	I	II	1	2	3
23. When I am under stress, I perform better	I	II	1	2	3

INSTRUCTIONS: The statements that follow are being considered for inclusion in a *student stress survey*. Please assist us in reviewing the content of the statements by providing two ratings for each statement. The conceptual definitions of the categories these statements are supposed to reflect as well as the rating instructions are listed below. *The following are categories related to stress levels of students:*

Categories		Definition
I.	Teachers Stressors	Teacher actions, behaviors, and attitudes
II.	Peers Stressors	Peer relationships
III.	School Conditions stressors	School settings, environment
IV.	Negative Personal Beliefs Stressors	Lack of skills, resources, ability, and self-confidence
V.	Family Stressors	Family demands, lack of support, and lack of resources
VI.	Job Stressors	Work demands and resources

• **Rating Tasks:**

- A. Please indicate the category that each statement best fits by circling the appropriate numeral. Statements not fitting any category should be left blank.
- B. Please indicate how strongly you feel about your placement of the statement into the category by circling the rating:
- 1 not very sure
 - 2 strongly
 - 3 no question about it

CLASSROOM RELATED STRESSORS

Statements	Categories						Rating		
	Teachers Stressors	Peers Stressors	School Stressors	Negative Personal Beliefs	Family Stressors	Job Stressors	Not very Sure	Strongly	No question About It
1. Heavy assignment loads	I	II	III	IV	V	VI	1	2	3
2. Meeting deadlines	I	II	III	IV	V	VI	1	2	3
3. Boring assignments	I	II	III	IV	V	VI	1	2	3
4. Unclear class descriptions	I	II	III	IV	V	VI	1	2	3
5. Lack of freedom	I	II	III	IV	V	VI	1	2	3
6. Changing instructions	I	II	III	IV	V	VI	1	2	3
7. Teachers' instructions	I	II	III	IV	V	VI	1	2	3
8. Classroom conditions	I	II	III	IV	V	VI	1	2	3
9. Relationship with teachers	I	II	III	IV	V	VI	1	2	3
10. Relationship with peers	I	II	III	IV	V	VI	1	2	3
11. Long study hours	I	II	III	IV	V	VI	1	2	3
12. School discrimination	I	II	III	IV	V	VI	1	2	3

Statements	Categories						Rating		
	Teachers Stressors	Peers Stressors	School Stressors	Negative Personal Beliefs	Family Stressors	Job Stressors	Not very Sure	Strongly	No question About It
13. Class politics	I	II	III	IV	V	VI	1	2	3
14. Lack of positive feedback	I	II	III	IV	V	VI	1	2	3
15. Teacher's evaluations	I	II	III	IV	V	VI	1	2	3
16. Classrooms settings	I	II	III	IV	V	VI	1	2	3
17. Meeting requirements	I	II	III	IV	V	VI	1	2	3
18. Working groups	I	II	III	IV	V	VI	1	2	3
19. Light work loads	I	II	III	IV	V	VI	1	2	3
20. Class ambiguity	I	II	III	IV	V	VI	1	2	3
21. Teacher's unrealistic goals	I	II	III	IV	V	VI	1	2	3
22. Leadership role	I	II	III	IV	V	VI	1	2	3
23. Exam preparations	I	II	III	IV	V	VI	1	2	3
24. Boring teachers	I	II	III	IV	V	VI	1	2	3
25. Teacher's ability	I	II	III	IV	V	VI	1	2	3
26. Teacher's efforts	I	II	III	IV	V	VI	1	2	3
27. Teacher's resources	I	II	III	IV	V	VI	1	2	3
28. Teacher's attitudes	I	II	III	IV	V	VI	1	2	3
29. Teacher's expectations	I	II	III	IV	V	VI	1	2	3
30. Tests don't reflect what is taught	I	II	III	IV	V	VI	1	2	3
31. Teacher's lack of motivation	I	II	III	IV	V	VI	1	2	3
32. Student's lack of effort	I	II	III	IV	V	VI	1	2	3

NON-CLASSROOM RELATED STRESSORS

<u>Statements</u>	<u>Categories</u>						<u>Rating</u>		
	Teachers Stressors	Peers Stressors	School Stressors	Negative Personal Beliefs	Family Stressors	Job Stressors	Not very Sure	Strongly	No question About It
33. Student's lack of ability	I	II	III	IV	V	VI	1	2	3
34. Student's lack of time	I	II	III	IV	V	VI	1	2	3
35. Student's low self confidence	I	II	III	IV	V	VI	1	2	3
36. Frequent interruptions	I	II	III	IV	V	VI	1	2	3
37. Student lack of security	I	II	III	IV	V	VI	1	2	3
38. Student lack of resources	I	II	III	IV	V	VI	1	2	3
39. Student's lack of interest	I	II	III	IV	V	VI	1	2	3
40. Student's repressed memories	I	II	III	IV	V	VI	1	2	3
41. Student's hopelessness	I	II	III	IV	V	VI	1	2	3
42. Student's communication skills	I	II	III	IV	V	VI	1	2	3
43. Student's social isolation	I	II	III	IV	V	VI	1	2	3
44. Lack of stress reducing strategies	I	II	III	IV	V	VI	1	2	3
45. School activities	I	II	III	IV	V	VI	1	2	3
46. Student's lack of motivation	I	II	III	IV	V	VI	1	2	3
47. Family expectations	I	II	III	IV	V	VI	1	2	3
48. Student's financial problems	I	II	III	IV	V	VI	1	2	3
49. Family responsibility	I	II	III	IV	V	VI	1	2	3
50. Family problems	I	II	III	IV	V	VI	1	2	3
51. Personal health problems	I	II	III	IV	V	VI	1	2	3
52. Illness of family member	I	II	III	IV	V	VI	1	2	3
53. Problems at work	I	II	III	IV	V	VI	1	2	3
54. Heavy work loads	I	II	III	IV	V	VI	1	2	3
55. Student's unrealistic goals	I	II	III	IV	V	VI	1	2	3
56. Unemployment	I	II	III	IV	V	VI	1	2	3

Suggestions:

Appendix B

STUDENT STRESS SURVEY

The College of Education at the University of Oklahoma is conducting a survey to identify the factors related to stress among students. Your responses will be strictly confidential, no individual will be identified. To assure confidentiality, do NOT place your name anywhere on this survey. Please take your time and be honest in answering the questions.

• Age:		Gender:		F	M	
• Major, i.e. Education, Nursing,...:						
• What is your college GPA (please estimate if unsure)?						
• My ethnic background is:		a. African-American c. Caucasian/White e. Other:		b. Hispanic/Latino d. Asian		
• Highest degree held: HS, BA, BS, MA, MS, SIXTH YEAR, PH.D , Other						
• Mother's highest educational level: a. Elementary school (K-6) d. Undergraduate						
		b. Secondary School (7-8) e. Graduate		c. High school (9-12)		
• Father's highest educational level: a. Elementary school (K-6) d. Undergraduate						
		b. Secondary School (7-8) e. Graduate		c. High school (9-12)		
• Combined parents' annual income (please estimate if unsure): a. Less than \$20,000 c. Between \$50,000- \$100,000						
		b. Between \$20,000-50,000 d. Over 100,000				
• Rate the following using this scale? <i>Poor</i> ←  <i>Excellent</i>						
		1	2	3	4	5
Your physical health:		1	2	3	4	5
Your mental health:		1	2	3	4	5
Your emotional health:		1	2	3	4	5

TERMS DEFINITION:

Stress: the pattern of response a student makes to stimulus events that disturb his/her equilibrium and burden or exceed his/her ability to cope. Or a student reaction to anything he/she consciously or unconsciously perceive as a threat, either real or imagined.

Stressors: a stimulus event that places a demand on students for some kind of adaptive response. Or stressors can be defined as situations that are perceived as a threat that causes stress.

DIRECTIONS: In reference to situations in classrooms and non-classrooms, please read each statement and decide how often it describes you. Mark the ward corresponding to your answer with an "X."

1= Never cause me stress

3= Sometimes cause me stress

5= Always cause me stress

2= Rarely cause me stress

4= Often cause me stress

No.	Statements	1	2	3	4	5
♦	Classroom Related Stressors					
1	Heavy assignment loads	Never	Rarely	Sometimes	Often	Always
2	Meeting deadlines	Never	Rarely	Sometimes	Often	Always
3	Boring assignments	Never	Rarely	Sometimes	Often	Always
4	Unclear class descriptions	Never	Rarely	Sometimes	Often	Always
5	Lack of assignment freedom	Never	Rarely	Sometimes	Often	Always
6	Ambiguous instructions	Never	Rarely	Sometimes	Often	Always
7	Teachers' instructions	Never	Rarely	Sometimes	Often	Always
8	Classroom conditions	Never	Rarely	Sometimes	Often	Always
9	Relationship with teachers	Never	Rarely	Sometimes	Often	Always
10	Relationship with peers	Never	Rarely	Sometimes	Often	Always
11	Long study hours	Never	Rarely	Sometimes	Often	Always
12	Prejudice in school	Never	Rarely	Sometimes	Often	Always
13	Lack of teacher's positive feedback	Never	Rarely	Sometimes	Often	Always
14	Teacher's evaluations	Never	Rarely	Sometimes	Often	Always
15	Classroom settings	Never	Rarely	Sometimes	Often	Always
16	Meeting requirements	Never	Rarely	Sometimes	Often	Always
17	Working with a group	Never	Rarely	Sometimes	Often	Always

1= **Never** cause me stress
 3= **Sometimes** cause me stress
 5= **Always** cause me stress

2= **Rarely** cause me stress
 4= **Often** cause me stress

No.	Statements	1	2	3	4	5
18	Ambiguity in class assignments	Never	Rarely	Sometimes	Often	Always
19	Teacher's unrealistic goals	Never	Rarely	Sometimes	Often	Always
20	Leadership role	Never	Rarely	Sometimes	Often	Always
21	Exam preparations	Never	Rarely	Sometimes	Often	Always
22	Boring Teachers	Never	Rarely	Sometimes	Often	Always
23	Teacher's ability	Never	Rarely	Sometimes	Often	Always
24	Teacher's effort	Never	Rarely	Sometimes	Often	Always
25	Teacher's attitudes	Never	Rarely	Sometimes	Often	Always
26	Teacher's expectations	Never	Rarely	Sometimes	Often	Always
27	Tests which don't reflect what is taught	Never	Rarely	Sometimes	Often	Always
28	Teacher's lack of motivation	Never	Rarely	Sometimes	Often	Always
♦	Non-Classroom Related Stressors					
29	Lack of effort	Never	Rarely	Sometimes	Often	Always
30	Lack of time	Never	Rarely	Sometimes	Often	Always
31	Low self confidence	Never	Rarely	Sometimes	Often	Always
32	Frequent interruptions	Never	Rarely	Sometimes	Often	Always
33	Lack of security	Never	Rarely	Sometimes	Often	Always
34	Lack of resources	Never	Rarely	Sometimes	Often	Always
35	Lack of skills	Never	Rarely	Sometimes	Often	Always
36	Hopelessness	Never	Rarely	Sometimes	Often	Always
37	Unpleasant past experiences	Never	Rarely	Sometimes	Often	Always
38	Lack of interest	Never	Rarely	Sometimes	Often	Always
39	Lack of ability	Never	Rarely	Sometimes	Often	Always

1= **Never** cause me stress
 3= **Sometimes** causes me stress
 5= **Always** cause me stress

2= **Rarely** cause me stress
 4= **Often** cause me stress

No.	Statements	1	2	3	4	5
40	Lack of communication skills	Never	Rarely	Sometimes	Often	Always
41	Social isolation	Never	Rarely	Sometimes	Often	Always
42	Lack of stress reducing strategies	Never	Rarely	Sometimes	Often	Always
43	Lack of motivation	Never	Rarely	Sometimes	Often	Always
44	Personal health problems	Never	Rarely	Sometimes	Often	Always
45	Family expectations	Never	Rarely	Sometimes	Often	Always
46	Financial problems	Never	Rarely	Sometimes	Often	Always
47	School activities	Never	Rarely	Sometimes	Often	Always
48	Illness of family member	Never	Rarely	Sometimes	Often	Always
49	Problems at work	Never	Rarely	Sometimes	Often	Always
50	Relationship with boss	Never	Rarely	Sometimes	Often	Always
51	Relationship with peers at work	Never	Rarely	Sometimes	Often	Always
52	Family lack of resources	Never	Rarely	Sometimes	Often	Always
53	Family responsibilities	Never	Rarely	Sometimes	Often	Always
54	Unemployment	Never	Rarely	Sometimes	Often	Always
55	Wrong job	Never	Rarely	Sometimes	Often	Always

DIRECTIONS: A number of statements are listed below which students use to describe themselves. Please read each statement and decide how often it describes you. Mark the word corresponding to your answer with an "X."

No.	Statements	1	2	3	4	5
1	I believe that I am a good student	Never	Rarely	Sometimes	Often	Always
2	I believe that I learn things easily	Never	Rarely	Sometimes	Often	Always
3	I do well in school	Never	Rarely	Sometimes	Often	Always
4	School work is easy for me	Never	Rarely	Sometimes	Often	Always
5	I do well in my classes	Never	Rarely	Sometimes	Often	Always
6	I like doing classroom assignments	Never	Rarely	Sometimes	Often	Always
7	I do assignments only to be recognized by others	Never	Rarely	Sometimes	Often	Always
8	I like challenging classroom assignments	Never	Rarely	Sometimes	Often	Always
9	I worry about not doing well in school	Never	Rarely	Sometimes	Often	Always
10	I do extra exercises to learn material better	Never	Rarely	Sometimes	Often	Always
11	I like to compete with my peers	Never	Rarely	Sometimes	Often	Always
12	I work only for grades	Never	Rarely	Sometimes	Often	Always
13	I believe I can learn anything	Never	Rarely	Sometimes	Often	Always
14	I like to compare my performance with others	Never	Rarely	Sometimes	Often	Always
15	I get good grades in my classes	Never	Rarely	Sometimes	Often	Always
16	I like to prove that I am as capable as others	Never	Rarely	Sometimes	Often	Always
17	When I am under stress, I exercise regularly	Never	Rarely	Sometimes	Often	Always
18	When problems arise, I am able to resolve them	Never	Rarely	Sometimes	Often	Always
19	When problems arise, I develop a plan to solve them	Never	Rarely	Sometimes	Often	Always
20	When I am under stress, I am able to identify the causes	Never	Rarely	Sometimes	Often	Always
21	When I am under stress, I accomplish more	Never	Rarely	Sometimes	Often	Always
22	When I am under stress, I seek social support.	Never	Rarely	Sometimes	Often	Always
23	When I am under stress, I set realistic expectations	Never	Rarely	Sometimes	Often	Always
24	When I am under stress, I perform better	Never	Rarely	Sometimes	Often	Always

No.	Statements	1	2	3	4	5
25	When I am under stress, I experience anxiety	Never	Rarely	Sometimes	Often	Always
26	When I am under stress, I have problems thinking	Never	Rarely	Sometimes	Often	Always
27	When I am under stress, I have problems understanding	Never	Rarely	Sometimes	Often	Always
28	When I am under stress, I make the wrong decisions	Never	Rarely	Sometimes	Often	Always
29	When I am under stress, I experience emotional problems	Never	Rarely	Sometimes	Often	Always
30	When I am under stress, I experience nervousness	Never	Rarely	Sometimes	Often	Always
31	When I am under stress, I experience fatigue	Never	Rarely	Sometimes	Often	Always
32	When I am under stress, I experience high blood pressure	Never	Rarely	Sometimes	Often	Always
33	When I am under stress, I experience headaches	Never	Rarely	Sometimes	Often	Always
34	When I am under stress, I experience allergies	Never	Rarely	Sometimes	Often	Always
35	When I am under stress, I experience sleeping problems	Never	Rarely	Sometimes	Often	Always
36	When I am under stress, I experience confusion	Never	Rarely	Sometimes	Often	Always
37	When I am under stress, I experience loss of memory	Never	Rarely	Sometimes	Often	Always
38	When I am under stress, I experience loss of attention	Never	Rarely	Sometimes	Often	Always
39	When I am under stress, I experience poor concentration	Never	Rarely	Sometimes	Often	Always

Thank you for your cooperation

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Items/Categories Assignments		
Categories		Items
Part I		
1.	Classroom Related Stressors:	1 through 28
2.	Non-Classroom Related Stressors:	29 through 55
Part II		
3.	Academic Self-Concept:	1, 2, 3, 4, 5, 13, 15
4.	Performance Orientation:	7, 9, 11, 12, 14, 16
5.	Mastery Orientation:	6, 8, 10
6.	Coping Strategies:	17 through 24
7.	Stress Reactions:	25 through 39

Appendix C

Human Subjects Approval Letters



The University of Oklahoma

OFFICE OF RESEARCH ADMINISTRATION

April 4, 1996

Mr. Mohammed Ali Akour
Educational Psychology
University of Oklahoma

Dear Mr. Akour:

Your research proposal, "Students' Stress: The Relationship of College Students' Stress to Goal Orientation, Academic Self-Concept, Demographics, School, Work, Family, and Achievement Variables," has been reviewed by Dr. E. Laurette Taylor, Chair of the Institutional Review Board, and found to be exempt from the requirements for full board review and approval under the regulations of the University of Oklahoma-Norman Campus Policies and Procedures for the Protection of Human Subjects in Research Activities.

Should you wish to deviate from the described protocol, you must notify me and obtain prior approval from the Board for the changes. If the research is to extend beyond 12 months, you must contact this office, in writing, noting any changes or revisions in the protocol and/or informed consent form, and request an extension of this ruling.

If you have any questions, please contact me.

Sincerely yours,

Karen M. Petry
Administrative Officer
Institutional Review Board

KMP:sg
96-119

cc: Dr. E. Laurette Taylor, Chair, IRB
Dr. Everett V. Smith, Jr., Educational Psychology



VICE PRESIDENT FOR STUDENT SERVICES

November 22, 1996

To Whom It May Concern:

This letter is to verify that I have reviewed the research proposal by Mr. Ali Akour and have discussed with him the request to circulate it among students at the University of Central Oklahoma.

From our observation, as long as the survey is done voluntarily by our students, it does not violate existing policies.

Sincerely,

A handwritten signature in black ink that reads "Dudley Ryan". The signature is fluid and cursive, with the first name "Dudley" and last name "Ryan" clearly distinguishable.

Dudley Ryan
Vice President for Student Services

Dr/jb

Appendix D

COLLEGE OF EDUCATION, DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

UNIVERSITY OF OKLAHOMA, NORMAN, OKLAHOMA

CONSENT FORM FOR UNIVERSITY STUDENTS

STUDENT STRESS SURVEY

The College of Education at the University of Oklahoma is conducting a survey to identify the factors related to stress among students. Your responses will be strictly confidential. **No individual will be identified.** To assure confidentiality, **do NOT write your name anywhere on this survey.** The measures will be coded so that no individual can be identified. The results of this analysis will be identified only by number (not name) and will be summarized as group statistics rather than individual scores. There are no hidden motives here.

No risk or discomfort from this procedure is anticipated. However, you are free to withdraw any time without consequence or prejudice to you.

Mohammed Ali Akour, Principal Investigator

Doctoral Student, Educational Psychology, University of Oklahoma

(405) 360-1936

**I HAVE READ AND UNDERSTAND THE ABOVE STATEMENT AND
VOLUNTARILY AGREE TO PARTICIPATE IN THIS SURVEY.**

Your Name (Signed)

Date

Your Name (Printed)

Appendix E

DEVELOPMENT OF THE COLLEGE STUDENTS STRESS INVENTORY AND RELATIONSHIP TO GPA

Purpose

The first and major purpose of this pilot study was to develop the *College Student Stress Inventory* (CSSI), a measure of students stressors, stress reactions, Cognitive Appraisal Strategies, goal orientation, and Academic Self-Concept. The second purpose was to examine the relationship between students' GPAs to stressors, stress reactions, coping strategies, goal orientation, and Academic Self-Concept.

Method

Sample

The convenience sample consisted of 85 students enrolled in two educational psychology courses at a large Midwestern university. The sample consisted of 19 men and 66 women. Of the 85 students, 95% were Caucasian. The self-reported age range, mean, and SD, were 19 to 47, 22.57, 4.66, respectively. The self-reported GPA range, mean, and SD, were 2.70 to 4.00, 3.31, 3.3, respectively. The majority of participant were from middle-class backgrounds.

Content Validity

The development of the CSSI instrument involved a review of the related literature concerning college students perception of stress related variables, goal orientations, and Academic Self-Concept. In addition, thirty college students were asked to identify and describe the sources of their stress. As a result, many categories relating to college students perception of stress were identified. One area included: Classroom and Non-Classroom Related Stressors. Classroom Stressors refers to students' perceptions of teachers' attitudes, expectations, evaluations, instructions, etc., as sources of stress. Non-Classroom Stressors refers to students perceptions of problems, such as problems regarding work, family responsibilities, financial problems, lack of ability, etc. Thus, this study attempted to explore the students' perception of stress conditions, and how they relate to goal orientation, Academic Self-Concept, and GPA. To measure these variables, a total of 94 items were generated, respectively. The 94 items included the 28 classroom related stressors items, 27 non-classroom related stressors items, 8 Cognitive Appraisal Strategies items, 15 stress reactions, 7 Academic Self-Concept, 6 Performance Orientation items, and 3 Mastery Orientation items.

The generated items and categories were examined by judges including 30 doctoral students, three educational psychologists, and two educational researchers. The judges were provided operational definitions of the categories and asked to fit each item into these categories using the definitions provided. Additionally, judges were asked to indicate how strongly they felt (strongly, not very strongly, not at all)

about their selections (See Appendix B). Items which did not receive a majority agreement or were considered ambiguous by the judges were deleted or revised. As a result, one item was deleted and five revised.

This process generated seven categories: a) Classroom Related Stressors; b) Non-Classroom Related Stressors; c) Stress Reactions; d) Academic Self-Concept; e) Mastery Goal Orientation; f) Performance Goal Orientation; g) and Cognitive Appraisal Strategies.

Subjects were asked to rate how much stress they perceived, in relation to various events they encountered, using a *never stressful to always stressful* 5-point Likert-type format. Furthermore, subjects were asked to rate how they perceived statements related to their Academic Self-Concept, goal orientation, stress consequences, and coping strategies using a *never agree to always agree* 5-point Likert-type format.

Statistical Analyses

This study provided an examination of the internal consistency and factor structure of responses to the 94 items on the CSSI. Principal component analyses of all seven subscales on the CSSI scores were performed separately, using varimax rotation (SPSS, 1995) to examine the construct validity in relation to the judgmental categories identified in the content validation. For the final analysis, items with .30 load or more on a component were retained. Internal consistency was determined for each subscale using coefficient alpha. Pearson correlation coefficients were used to

examine the relationship between all subscales. To examine the utility of the seven subscales to predict GPA, multiple regression analysis was used.

Results

A total of forty one items were deleted for final analyses because: a) they did not contribute to a unidimensional scale; b) or had factor loading less than .30; c) or did not contribute to a meaningful factor structure. Academic Self-Concept, Mastery Orientation, Performance Orientation, and Cognitive Appraisal Strategies factor structures replicated the original categories posited in the content validation.

However, the analysis of classroom related stress items resulted in three meaningful factor structures. The derived factors were named based on the items content. Factor one was called Instruction and Evaluation Stressors because the items which consisted this factor involved students' perceptions of instructions and evaluations as sources of stress. Factor two was called Classroom Environment Stressors because it consisted of items related to classroom conditions and settings, peer relationships, and prejudice. Factor three was called Teacher Stressors because it consisted of items related to teachers' attitude, expectations, and abilities.

The analysis of Non-Classroom Related Stress items also resulted in three meaningful factor structures. Factor one was called Negative Personal Beliefs Stressors because it consisted of items related to students experiencing low self-confidence, lack of security, hopelessness, and social isolation. Factor two was called Family Stressors because it consisted of items related to students experiencing family

responsibility and lack of resources. Factor three was called Work Stressors because it consisted of items related to students experiencing problems at work, problems regarding relationships with their bosses and peers. Finally, the analysis of stress reactions also resulted in three meaningful factor structures. Factor one was called Physiological Reactions because it consisted of items related to students experiencing headaches, allergies, and sleeping problems. Factor two was called Emotional Reactions because it consisted of items related to students' perception of experiencing anxiety, nervousness, and fatigue. Factor three was called Cognitive Reactions because it consisted of items related to students experiencing poor concentration, poor attention, loss of memory, and confusion.

Table 28 presents the 13 factors with their respective items, factors loading, variances percentage, and coefficients alphas. The structure of the 13 factors were as follows: 1) six items loaded on the Academic Self-Concept factor with alpha .84; 2) two items loaded on the Performance Goal Orientation factor with alpha .76; 3) two items loaded on the Mastery Goal Orientation factor with alpha .78; 4) three items loaded on the Coping Strategies factor with alpha .61; 5) five items loaded on the Instruction and Evaluation Stressors factor with alpha .74; 6) four items loaded on the Classroom Environment Stressors factor with alpha .68; 7) five items loaded on the Teacher Stressors factor with alpha .87; 8) ten items loaded on the Negative Personal Beliefs Stressors factor with alpha .89; 9) three items loaded on the Work Stressors factor with alpha .91; 10) two items loaded on the Family Stressors factor with alpha .73; 11) five items loaded on the Cognitive Reactions factor with alpha .81; 12) three

items loaded on the Emotional Reactions factor with alpha .76; 13) three items loaded on the Physiological Reactions factors with alpha .67.

Table 28
Factor Structure of Scale
Pilot Study

No.	STATEMENTS	FACTOR LOADING	SCALE ALPHA	MEAN	SD
♦	CLASSROOM RELATED STRESSORS				
♦	Instruction and Evaluation Stressors		.74		
1.	Unclear class descriptions	.48		3.66	.93
2.	Ambiguous instructions	.51		3.44	1.02
3.	Teachers' evaluations	.44		2.58	.99
4.	Ambiguity in class assignments	.48		3.50	.96
5.	Tests which don't reflect what is taught	.61		3.99	.93
♦	Classroom Environment Stressors		.68		
6.	Classroom conditions	.48		2.45	.89
7.	Relationship with peers	.34		2.25	1.26
8.	Prejudice in school	.53		2.28	.77
9.	Classroom settings	.60		2.43	.73
♦	Teacher Stressors		.87		
10.	Boring teachers	.62		2.51	1.15
11.	Teachers' ability	.78		2.90	.91
12.	Teachers' effort	.75		2.81	.91
13.	Teachers' attitudes	.78		3.00	.89
14.	Teachers' expectations	.59		3.10	.91
♦	NON-CLASSROOM RELATED STRESSORS				
♦	Negative Personal Beliefs Stressors		.89		
15.	Low self confidence	.65		2.66	1.15
16.	Lack of security	.76		2.57	1.02
17.	Lack of resources	.59		2.88	.98
18.	Lack of skills	.70		2.71	.99
19.	Hopelessness	.73		2.48	.98
20.	Unpleasant past experiences	.58		1.97	1.07
21.	Lack of ability	.71		2.54	.92
22.	Social isolation	.62		2.15	1.13
23.	Lack of stress reducing strategies	.58		2.53	.85
24.	Personal health problems	.50		2.19	1.22
♦	Work Stressors		.91		
25.	Problems at work	.83		2.44	1.15
26.	Relationship with boss	.80		2.07	1.05
27.	Relationship with peers at work	.86		2.14	1.03
♦	Family Stressors		.73		
28.	Family lack of resources	.58		2.44	1.11
29.	Family responsibilities	.58		2.70	1.18
♦	ACADEMIC SELF-CONCEPT		.84		
30.	I believe that I am a good student	.60		4.20	.60
31.	I believe that I learn things easily	.65		3.80	.70
32.	I do well in school	.66		4.10	.60
33.	School work is easy for me	.57		3.70	.71
34.	I do well in my classes	.68		4.05	.56
35.	I get good grades in my classes	.64		4.12	.64
♦	MASTERY ORIENTATION		.78		
36.	I like doing classroom assignments	.65		3.30	.72
37.	I like challenging classroom assignments	.65		3.44	.80
♦	PERFORMANCE ORIENTATION		.76		
38.	I like to compete with my peers	.62		2.70	.99
39.	I like to compare my performance with others	.62		2.90	.99
♦	COGNITIVE APPRAISAL STRATEGIES		.61		
40.	When problems arise, I am able to resolve them	.38		3.90	.73
41.	When problems arise, I develop a plan to solve them	.48		3.72	.78
42.	When I am under stress, I am able to identify the causes	.39		3.78	.71
♦	STRESS REACTIONS				
♦	Cognitive Reactions		.81		
43.	When I am under stress, I make the wrong decisions	.38		2.71	.55

<i>No.</i>	<i>STATEMENTS</i>	<i>FACTOR LOADING</i>	<i>SCALE ALPHA</i>	<i>MEAN</i>	<i>SD</i>
44.	When I am under stress, I experience confusion	.71		2.49	.96
45.	When I am under stress, I experience loss of memory	.61		1.99	.97
46.	When I am under stress, I experience loss of attention	.65		2.80	.94
47.	When I am under stress, I experience poor concentration	.66		3.10	.86
♦	Emotional Reactions		.76		
48.	When I am under stress, I experience anxiety	.70		3.22	.96
49.	When I am under stress, I experience nervousness	.47		3.25	.99
50.	When I am under stress, I experience fatigue	.61		3.39	.91
♦	Physiological Reactions		.67		
51.	When I am under stress, I experience headaches	.47		2.92	1.14
52.	When I am under stress, I experience allergies	.42		2.01	1.14
53.	When I am under stress, I experience sleeping problems	.57		2.76	1.19

Pearson correlation coefficients were used to measure the relationship between the seven subscales in order to test for the presence of specific types of associations (See Table 29). Many correlated variables were significant. GPA scores correlated positively and strongly with the Academic Self-Concept scores suggesting students with high Academic Self-Concept tend to have higher GPAs.

Scores on the Instruction and Evaluation Stressors subscale correlated positively with Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Work Stressors, Family Stressors, Performance Orientation, Cognitive Reactions, Emotional Reactions, and Physiological Reactions scores. Further, the Instruction and Evaluation Stressors scores correlated negatively with Cognitive Appraisal Strategies scores. This suggests that students who perceive instructions and evaluations as a source of stress, tend to perceive all other stressors as stressful, and tend to have Cognitive Appraisal Strategies problems with stressors.

Students' scores on the Classroom Environment Stressors scale correlated positively with Teacher Stressors, Work Stressors, Mastery Orientation, Cognitive Reactions, and Physiological Reaction scores. Students' scores on the Teacher Stressors scale correlated positively with the Negative Personal Beliefs Stressors and Physiological Reactions scores. Moreover, the scores correlated negatively with Cognitive Appraisal Strategies scores.

Students' scores on Negative Personal Beliefs Stressors scale correlated positively with Work Stressors, Family Stressors, Cognitive Reactions, Emotional Reactions, Physiological Reactions scores and correlated negatively with Academic

Self-Concept and Cognitive Appraisal Strategies scores. Work Stressors scores correlated positively with Family Stressors, Cognitive Reactions, and Emotional Reactions scores. Family Stressors scores correlated positively with Cognitive Reactions suggesting the higher the Family Stressors the higher the Cognitive Reactions to stress.

Academic Self-Concept scores correlated positively with Mastery Orientation and Cognitive Appraisal Strategies scores and negatively with Cognitive Reactions to stress scores. Mastery Orientation scores correlated positively with Physiological Reactions to stress scores. Finally, Cognitive Reactions scores correlated positively with Emotional Reactions and Physiological Reactions scores.

In summary, stressors and stress reactions correlated positively. Stressors correlated negatively with Academic Self-Concept, Cognitive Appraisal Strategies, and GPA.

Table 29

**Pearson Product-Moment Correlations Among All
Variables Under Consideration-Pilot Study**

N o.	VARIABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	GPA	—													
2.	Instruction and Evaluation Stressors	-.04 ns	—												
3.	Classroom Environment Stressors	-.01 ns	.49 ***	—											
4.	Teacher Stressors	-.02 ns	.41 ***	.41 ***	—										
5.	Negative Personal Beliefs Stressors	.04 ns	.51 ***	.04 ns	.25 *	—									
6.	Work Stressors	.04 ns	.29 **	.24 *	-.04 ns	.39 ***	—								
7.	Family Stressors	.09 ns	.24 *	.13 ns	.15 ns	.37 ***	.42 ***	—							
8.	Academic Self-Concept	.50 ***	-.10 ns	-.19 ns	-.08 ns	-.26 **	-.01 ns	-.07 ns	—						
9.	Mastery Orientation	.07 ns	.12 ns	.23 *	.11 ns	-.00 ns	-.02 ns	.20 ns	.26 **	—					
10.	Performance Orientation	.11 ns	.21 *	.09 ns	-.08 ns	.04 ns	.15 ns	.04 ns	.14 ns	.05 ns	—				
11.	Cognitive Appraisal Strategies	.07 ns	-.27 **	-.09 ns	-.26 **	-.39 ***	-.19 ns	-.19 ns	.31 **	.14 ns	-.08 ns	—			
12.	Cognitive Reactions	.04 ns	.42 ***	.24 *	.14 ns	.52 ***	.45 ***	.30 ***	-.23 *	-.06 ns	.16 ns	-.35 ***	—		
13.	Emotional Reactions	.04 ns	.25 *	.12 ns	-.15 ns	.44 ***	.20 ***	.20 ns	-.00 ns	.13 ns	.02 ns	-.20 ns	.34 ***	—	
14.	Physiological Reactions	.07 ns	.36 ***	.23 *	.23 *	.36 ***	.01 ns	-.07 ns	-.02 ns	.21 *	.13 ns	-.19 ns	.45 ***	.35 ***	—

* $p < .05$

** $p < .01$

*** $p < .001$

ns = not significant

Self-reported GPA was regressed on the Academic Self-Concept, Cognitive Reactions, Emotional Reactions, Physiological Reactions, Mastery Orientation, Performance Orientation, Cognitive Appraisal Strategies, Instruction and Evaluation Stressors, Classroom Environment Stressors, Teacher Stressors, Negative Personal Beliefs Stressors, Family Stressors, and Work Stressors scores. The results of this analysis are presented in Table 30. An inspection of Table 30 reveals an R square of .33 which indicates that approximately 33% of the variance in GPA is explained by this set of predictor variables. The probability of obtaining an F value at least as large as 2.71 was .0036. This relation is found to be statistically significant at the .01 level which means that the seven subscales taken simultaneously are important component in predicting GPA. However, Academic Self-Concept showed to be the most significant predictor of GPA at the .01 level.

Because multiple regression techniques capitalize on chance relationships among variables, it is necessary to obtain a more accurate estimate of R square. Adjusted R square corrects the optimistic bias of the sample R square by taking the sample size and the number of predictors into account. Unlike R square, adjusted R square does not necessarily increase as additional variables are added to an equation. The observed R square of .33 yields an adjusted R square of .21.

However, not all predictors and relationships were statistically significant which is possibly due to the presence of strong relationships between the significant variables or severe multicollinearity problem. The multicollinearity problem could lead

to the instability of the regression coefficients, where the estimates bounced around in terms of magnitude. This happened when the standard errors of the regression coefficients got larger, thus it is difficult to attain statistical significant across all components. Furthermore, this problem could be attributed to the small sample size utilized in the pilot study. Larger sample size, perhaps, could enhance some of the predictors' significance.

Table 30

**Summary Statistics for GPA Regression on Saturated
Model Variable Set Under Consideration**

Variable	B	SE B	Beta	T	Sig. T
Classroom Environment					
Stressors	6.5973	6.738534	.132862	.979	.3309
Cognitive Appraisal					
Strategies	-3.0340	7.065294	-.050518	-.429	.6689
Cognitive Reactions	7.2628	7.025188	.142872	1.034	.3047
Emotional Reactions	-3.1532	5.255431	-.074181	-.600	.5504
Family Stressors	4.4411	3.846087	.136263	1.155	.2521
Instruction and Evaluation					
Stressors	7.0236	6.551103	-.143125	-1.072	.2873
Mastery Orientation	-5.0329	5.554822	-.104196	-.906	.3680
Performance Orientation	1.0143	3.951974	.027151	.257	.7982
Physiological Reactions	.7578	4.639586	.020537	.163	.8707
Academic Self-Concept	43.7521	8.044957	.631722	5.438	.0000
Negative Personal Beliefs					
Stressors	7.266272	6.580361	.166710	1.104	.2732
Teacher Stressors	-2.973457	5.607823	-.069762	-.530	.5976
Work Stressors	-4.288499	4.379060	-.128685	-.979	.3307
(Constant)	170.428422	47.208535		3.610	.0006
Multiple R	.57646				
R Square	.33231				
Adjusted R Square	.21005				
Standard Error	29.60778				

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	13	30976.67165	2382.82090
Residual	71	62240.08129	876.62086
F =	2.71819	Signif F = .0036	

Conclusions

The general purpose of this study was to develop and validate the College Students Stress Inventory (CSSI). The results of this pilot study suggested that there were weak, moderate, and strong relationships between the variables under consideration. One purpose of this study was to examine the relationship between all the aforementioned variables, and how specifically, they related to GPA. The results suggested that Academic Self-Concept tends to be the most predictive of GPA and have the strongest relationship with GPA. The results are similar to Pajares and Miller (1994) who found that Self-Concept was only modest predictor of GPA. Students with high Academic Self-Concept tend to have low stress conditions as suggested by the negative correlations of $-.26$. Negative Personal Beliefs Stressors has a positive relationship with all the stressors, the stressors reactions, and a negative relationship with Cognitive Appraisal Strategies. Overall, the statistical analyses used in this study indicated that the instrument used appeared to be promising and an appropriate measure for evaluating students' Academic Self-Concept, stressors, stress reactions, Cognitive Appraisal Strategies, goal orientations, and GPA.

However, application of this instrument is limited due to the limitations of the study. There were two main limitations that need consideration: 1) lack of a large sample size, and 2) lack of adequate sample representation. These two limitations could have affected the validity of the study. Future research should attempt to replicate the results utilizing a large and diverse sample. Since GPA was mostly predicted by Academic Self-Concept and Academic Self-Concept has weak, moderate,

and strong relationships with the other variables, a path analysis should be considered to further examine relationships between these variables.

Appendix F

CSSI Revised Form

STUDENT STRESS SURVEY

The College of Education at the University of Oklahoma is conducting a survey to identify the factors related to stress among students. Your responses will be strictly confidential, no individual will be identified. To assure confidentiality, do NOT place your name anywhere on this survey. Please take your time and be honest in answering the questions.

Age:

Gender: F M

What is your college GPA (please estimate if unsure)?

Major, i.e. Education, Nursing,....:

Ethnic background:

a. African-American

b. Hispanic/Latino

c. Caucasian/White

d. Asian

e. Other:

Highest degree held: HS. BA. BS. MA. MS. SIXTH YEAR. PH.D. Other

TERMS DEFINITION:

Stress: the pattern of response a student makes to stimulus events that disturb his/her equilibrium and burden or exceed his/her ability to cope. Or a student reaction to anything he/she consciously or unconsciously perceive as a threat, either real or imagined.

Stressors: a stimulus event that places a demand on students for some kind of adaptive response. Or stressors can be defined as situations that are perceived as a threat that causes stress.

DIRECTIONS: In reference to situations in classrooms and non-classrooms, please read each statement and decide how often it describes you. Mark the word corresponding to your answer with an "X."

1= **Never** cause me stress

2= **Rarely** cause me stress

3= **Sometimes** cause me stress

4= **Often** cause me stress

5= **Always** cause me stress

No.	Statements	1	2	3	4	5
1	Unclear class descriptions	Never	Rarely	Sometimes	Often	Always
2	Ambiguous instructions	Never	Rarely	Sometimes	Often	Always
3	Classroom conditions	Never	Rarely	Sometimes	Often	Always
4	Relationship with peers at school	Never	Rarely	Sometimes	Often	Always
5	Classroom settings	Never	Rarely	Sometimes	Often	Always
6	Ambiguity in class assignments	Never	Rarely	Sometimes	Often	Always
7	Teacher's ability	Never	Rarely	Sometimes	Often	Always
8	Teacher's effort	Never	Rarely	Sometimes	Often	Always
9	Teacher's attitudes	Never	Rarely	Sometimes	Often	Always
10	Teacher's expectations	Never	Rarely	Sometimes	Often	Always
11	Tests which don't reflect what is taught	Never	Rarely	Sometimes	Often	Always
12	Low self confidence	Never	Rarely	Sometimes	Often	Always
13	Lack of security	Never	Rarely	Sometimes	Often	Always
14	Lack of resources	Never	Rarely	Sometimes	Often	Always
15	Lack of skills	Never	Rarely	Sometimes	Often	Always
16	Hopelessness	Never	Rarely	Sometimes	Often	Always
17	Unpleasant past experiences	Never	Rarely	Sometimes	Often	Always
18	Lack of ability	Never	Rarely	Sometimes	Often	Always
19	Personal health problems	Never	Rarely	Sometimes	Often	Always
20	Family expectations	Never	Rarely	Sometimes	Often	Always
21	Illness of family member	Never	Rarely	Sometimes	Often	Always
22	Problems at work	Never	Rarely	Sometimes	Often	Always
23	Relationship with boss	Never	Rarely	Sometimes	Often	Always
24	Relationship with peers at work	Never	Rarely	Sometimes	Often	Always

No.	Statements	1	2	3	4	5
25	Family lack of resource	Never	Rarely	Sometimes	Often	Always
26	Family responsibilities	Never	Rarely	Sometimes	Often	Always
27	Social isolation	Never	Rarely	Sometimes	Often	Always

DIRECTIONS: A number of statements are listed below which students use to describe themselves. Please read each statement and decide how often it describes you. Mark the word corresponding to your answer with an "X."

No.	Statements	1	2	3	4	5
28	I believe that I am a good student	Never	Rarely	Sometimes	Often	Always
29	I believe that I learn things easily	Never	Rarely	Sometimes	Often	Always
30	I do well in school	Never	Rarely	Sometimes	Often	Always
31	School work is easy for me	Never	Rarely	Sometimes	Often	Always
32	I do well in my classes	Never	Rarely	Sometimes	Often	Always
33	I like doing classroom assignments	Never	Rarely	Sometimes	Often	Always
34	I like challenging classroom assignments	Never	Rarely	Sometimes	Often	Always
35	I like to compete with my peers	Never	Rarely	Sometimes	Often	Always
36	I like to compare my performance with others	Never	Rarely	Sometimes	Often	Always
37	I get good grades in my classes	Never	Rarely	Sometimes	Often	Always
38	When problems arise, I am able to resolve them	Never	Rarely	Sometimes	Often	Always
39	When problems arise, I develop a plan to solve them	Never	Rarely	Sometimes	Often	Always
40	When I am under stress, I am able to identify the causes	Never	Rarely	Sometimes	Often	Always
41	When I am under stress, I experience anxiety	Never	Rarely	Sometimes	Often	Always
42	When I am under stress, I make the wrong decisions	Never	Rarely	Sometimes	Often	Always
43	When I am under stress, I experience nervousness	Never	Rarely	Sometimes	Often	Always
44	When I am under stress, I experience fatigue	Never	Rarely	Sometimes	Often	Always
45	When I am under stress, I experience headaches	Never	Rarely	Sometimes	Often	Always
46	When I am under stress, I experience allergies	Never	Rarely	Sometimes	Often	Always
47	When I am under stress, I experience sleeping problems	Never	Rarely	Sometimes	Often	Always
48	When I am under stress, I experience confusion	Never	Rarely	Sometimes	Often	Always
49	When I am under stress, I experience loss of memory	Never	Rarely	Sometimes	Often	Always
50	When I am under stress, I experience loss of attention	Never	Rarely	Sometimes	Often	Always
51	When I am under stress, I experience poor concentration	Never	Rarely	Sometimes	Often	Always

Thank you for your cooperation

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CSSI Revised Form	
Items/Categories Assignments	
Categories/Subscales	Items
1. Instruction and Evaluation Stressors	1 2 6 11
2. Classroom Environment Stressors	3 4 5
3. Teacher Stressors	7 8 9 10
4. Negative Personal Beliefs Stressors	12 through 19 and 27
5. Family Stressors	20 21 25 26
6. Work Stressors	22 23 24
7. Mastery Orientation	33 34
8. Performance Orientation	35 36
9. Academic Self-Concept	28 through 32 and 37
10. Cognitive Appraisal Strategies	38 39 40
11. Cognitive Reactions	42 48 49 50 51
12. Emotional Reactions	41 43 44
13. Physiological Reactions	45 46 47