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ADOLESCENT APPRAISALS AND COPING STRATEGIES
DURING A STRESSFUL EXAM

by

CAROLINE CARRAGHER NEILL

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
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in
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Abstract

One hundred male and female, grade 8, 9, and 10 students, aged 13 to 16, participated in a study to investigate how adolescents appraise and cope during a stressful mathematics exam. Prior to the exam, questionnaires assessing tension, appraisals of control and self-efficacy, and perceptions of state anxiety were administered to the students. Following the exam, a coping questionnaire and a demographic questionnaire was administered, and the state-anxiety inventory was readministered. Test grades from the exam were collected from the teachers. The data were analyzed by Pearson product moment correlations, an independent measures t-test, an analysis of variance, and by a multiple regression analysis. The results indicated that there were no significant relationships between control and total problem-focused coping or between control and total emotion-focused coping. However, the relationships between control and the subscales of problem-focused and emotion-focused coping strategies were significant. As expected, there were significant relationships between self-efficacy and control and between self-efficacy and total problem-focused coping strategies. Further analysis indicated that self-efficacy was positively related to math grade point average and test score. Stepwise multiple regression demonstrated that self-efficacy predicted problem-focused coping and test score more than any other variable. The results were discussed in relation to Lazarus and Folkman's (1984) theory of stress and coping.
Table of Contents

ABSTRACT ii

TABLE OF CONTENTS iii

LIST OF TABLES v

ACKNOWLEDGMENT vi

INTRODUCTION 1

LITERATURE REVIEW 7
  Stress 7
  Cognitive Appraisal 14
  Coping Theory and Adolescence 22
  Age Differences and Coping 29

METHOD 31
  Participants 31
  Procedure 31
  Measures 32
    The Tension Thermometer 32
    The Appraisal Questionnaire 32
    State-Trait Anxiety Inventory 33
    Ways of Coping Questionnaire 35
    Demographic Questionnaire 36
    Grades 36
  Analysis of Data 36

RESULTS 37
  Descriptive Statistics for Dependent Variables 37
  Hypotheses 37
  Table 1: Subject Characteristics for all Participants 38
  Table 2: Means of Outcome Measures of Dependent Variables for Males and Females 39
  Age Relationships on Selected Variables 43
  Stepwise Multiple Regression 44

DISCUSSION 45
  Age Differences on Dependent Variables 51
  Coping and Performance - Gender Differences 53
  Limitations 54
  Implications for Counselling 54

REFERENCES 56
APPENDIX A 64
Letter to Principal 65
Letter to Teacher 66
Parental Consent Form 67

APPENDIX B 68
  Tension Thermometer 69
  Primary and Secondary Appraisal Questionnaire 70
  Self-Evaluation Questionnaire: State-Anxiety Scale 71
  Items on the Modified Version of the Ways of Coping Questionnaire 72
  Modified Version of the Ways of Coping Questionnaire 74
  Demographic Questionnaire 76

APPENDIX C 77
  Table 3: Correlations of all Dependent Variables for Total Group 78
  Table 4: Correlations of all Dependent Variables for Males 79
  Table 5: Correlations of all Dependent Variables for Females 80
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Subject Characteristics for all Participants</td>
<td>38</td>
</tr>
<tr>
<td>Table 2</td>
<td>Means of Outcome Measures of Dependent Variables for Males and Females</td>
<td>39</td>
</tr>
<tr>
<td>Table 3</td>
<td>Correlations of all Dependent Variables for Total Group</td>
<td>78</td>
</tr>
<tr>
<td>Table 4</td>
<td>Correlations of all Dependent Variables for Males</td>
<td>79</td>
</tr>
<tr>
<td>Table 5</td>
<td>Correlations of all Dependent Variables for Females</td>
<td>80</td>
</tr>
</tbody>
</table>
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Introduction

Stress tends to be a common occurrence in the lives of most people today. It is an inescapable condition of life and relief comes only by coping successfully with it (Lazarus & Folkman, 1984). However, most of the research on stress and coping has come from studying adult populations (Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1985; Forsythe & Compas, 1987). It is not known if the results of this research can be adequately applied to adolescents.

The lives of adolescents are not only filled with biological, academic and social changes but on a daily basis adolescents face stressful encounters with peer pressure, conflicts with parents, appearance and acceptance (Grob, Flammer, & Wearing, 1995; Phelps & Jarvis, 1994). This is all in addition to the regular demands of the day that are faced by people of all ages. Sometimes ongoing exposure to stress leads adolescents to depression, suicide and substance abuse (Brown, Stetson, & Beatty, 1989; Wills, 1986). Therefore, this study will investigate the coping strategies of adolescents.

This study is based on Lazarus and Folkman's (1984) transactional model of stress which is process-oriented, contextual, and made up of three interdependent components: stress, appraisal and coping. Psychological stress is defined as "a particular 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" (p.19). Cognitive appraisal is "an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and the environment is stressful" (p.19); and, coping is "the process through which the individual manages the demands of the person-environment relationship that are
appraised as stressful and the emotions they generate" (p.19). Cognitive appraisal and coping are seen as the two critical processes that mediate the person-environment relationship which can change as the encounter unfolds.

Cognitive appraisal is based on a complex, meaning-related cognitive activity. According to Lazarus and Folkman's (1984) model, there are two basic forms of cognitive appraisal: primary appraisal and secondary appraisal. In general, primary appraisal asks whether you are in trouble or being benefited and in what way. These appraisals can be irrelevant, benign-positive, or stressful. Irrelevant and benign appraisals do not threaten one's well-being. However, when an individual encounters harm or loss, threat or challenge, the experience can become stressful.

Secondary appraisals come into play when one is faced with a stressful appraisal of threat or challenge and something needs to be done to manage the encounter. Beliefs about one's ability to control the stressful event show the extent to which he or she feels confident in his or her powers to overcome the event or alternatively feels vulnerable and overwhelmed by it (Lazarus & Folkman, 1984).

Beliefs about personal control over a stressful encounter can be described in light of Bandura's (1977) social learning theory on self-efficacy which refers to the belief that one can have an impact on the environment. Bandura states that when a person encounters a specific situation, he or she will make two types of expectancies: a) an outcome expectancy, which refers to his or her evaluation that a particular behavior will lead to a certain outcome; and, b) an efficacy expectation, which refers to his or her belief that he or she can successfully execute the behavior required to produce the outcome. In keeping with Lazarus and Folkman's (1984)
process-oriented model of stress, appraisal and coping, Bandura's (1977) theory of self-efficacy appears to be an appropriate conception of personal control since it is based on the context of a specific situation.

In Lazarus and Folkman's (1984) model of stress there are two major forms of coping: problem-focused coping and emotion-focused coping. Problem-focused coping strategies are directed at managing or altering the problem causing the distress. This form of coping is more likely to occur when conditions are appraised as amenable to change or under one's control. Emotion focused coping strategies are directed at regulating the emotional response to the problem. This form of coping is more likely to occur when it has been appraised that nothing can be done to modify the harmful, threatening or challenging environmental condition (Lazarus & Folkman, 1984).

Studies have shown that both problem-focused and emotion-focused coping strategies are used in all stressful encounters (Compas, Malcarne, Fondacaro, 1988; Folkman & Lazarus, 1980, 1985). However, when constructive change is possible, greater emphasis tends to be placed on the use of problem-focused strategies; and, conversely, when controlling the situation is not possible, greater emphasis tends to be placed on the use of emotion-focused strategies (Compas et al., 1988; Folkman and Lazarus, 1980, 1985; Forsythe & Compas, 1987).

For coping to be most effective, there must be a good match or fit between the cognitive appraisal of the stressful event and the coping effort. Psychological symptoms, such as depression and anxiety, are highest when emotion-focused coping is emphasized with events appraised as controllable and problem-focused coping is emphasized with uncontrollable events (Forsythe & Compas, 1987).
Most of what has been said about stress, appraisal and coping has come from studies on adult populations (Carver & Scheier, 1994; Folkman & Lazarus, 1980, 1985; Kanner, Coyne, Schaefer, and Lazarus, 1981). Among the few studies on adolescents, it remains clear that stress, appraisal, and coping are still complex and interwoven processes (Cohen, Burt, & Bjorck, 1987; Compas, Orosan, & Grant, 1993; Seiffge-Krenke, 1995). In an attempt to investigate whether appraisals of controllability are determinants of coping among young adolescents, Compas et al. (1988) studied 130 children and young adolescents (73 girls and 57 boys), ranging in age from 10 to 14 years (M = 11.89 years). The participants were given the Child Behavior Checklist and the Youth Self Report where each individual described one particular stressful interpersonal event and one stressful academic event and then rated the degree of control they felt they had over the cause of the event. The results indicated that both girls and boys reported that they had more control over the cause of academic events than social events. Thus, both boys and girls generated more problem-focused alternatives for academic stressors than for social stressors. No differences were found for emotion-focused coping.

Compas et al. (1988) also found in their study of 130 children and young adolescents, that behavior problems were highest when subjects mismatched their appraisals of control with the coping strategy used. This occurred by either generating few problem-focused alternatives when they believed they had control over the stressor or by generating many problem-focused alternatives when they believed they did not have control over the stressor. Conversely, behavior problems were lower when perceptions of control and coping were matched by subjects either generating fewer problem-focused alternatives when they believed they did not have control or by generating more problem-focused alternatives when they believed they had control.
In the past, research has focused on major events (e.g. earthquakes or war) with some attempt to include daily hassles (e.g. school exam or parent conflict). Yet, research findings have shown, in regression-based comparisons of major events and daily hassles, that hassles were far superior to major events in predicting psychological and somatic symptoms (Kanner et al., 1981; Rabkin & Struening, 1976). Compas et al. (1988) showed the influence of a poor match between appraisals of controllability and coping when dealing with the daily stressors of school and interpersonal relationships. Thus, it proves beneficial to examine how adolescents appraise and cope with stress based on a specific situation, where the stressor is daily hassles, not major events.

Therefore, this study focused on adolescents and examined: (a) whether appraisals of stressful situations are influenced by beliefs of controllability, (b) whether appraisals of controllability determine the greater use of problem-focused coping strategies, (c) whether appraisals of uncontrollability determine the greater use of emotion-focused coping strategies, (d) whether self-efficacy is related to coping, and (e) whether emotion-focused coping is related to stress. The hypotheses were:

Hypothesis 1: Control appraisals of the exam situation will be positively correlated with problem-focused coping strategies.

Hypothesis 2: Control appraisals of the exam situation will be negatively correlated with emotion-focused coping strategies.

Hypothesis 3: Self-efficacy will be positively correlated with problem-focused coping strategies.

Hypothesis 4: Self-efficacy will be positively correlated with appraisals of control.

Hypothesis 5: Stress will be positively correlated with emotion-focused coping strategies.
This study also looked at age and gender relationships to further explain the findings in the hypotheses.
Literature Review

Adolescence is a turbulent stage in development which is often characterized by change. In general, adolescents encounter biological changes, such as puberty, academic changes, such as the shift from elementary school to secondary school, and social changes, such as those that define new and more mature relationships. On a daily basis, adolescents face stressful encounters in terms of their friendship patterns, conflicts with parents and siblings, acceptance and appearance (Grob et al., 1995; Phelps & Jarvis, 1994; Rice, Herman, & Petersen, 1993). In the past, the examination of stress, appraisal and coping focused mostly on adult populations. This literature review examines stress, appraisal and coping research, as defined by Lazarus and Folkman (1984), and, examines how stress, appraisal and coping is conceptualized based on adolescent populations.

Stress

Stress is an extensively discussed concept in the health care fields that has led to a vast area of study. Of importance, are the various definitions of stress now prominent in modern times, the various types of stressors now identified and the major area of focus now found in stress research (Lazarus & Folkman, 1984).

Throughout history, stress has generally been referred to as an agent or as a response. There are three classic definitional orientations of stress: stimulus definitions, response definitions and relational definitions (Aldwin, 1994; Appley & Trumbull, 1986; Lazarus & Folkman, 1984).

According to Stimulus-Response psychology, humans and animals are reactive to stimulation. Thus, stress is defined as a stimulus which is thought of as an event that impinges
itself on the subject. Stimulus definitions focused on events in the environment such as natural
disasters, noxious conditions, illness or poverty (Averill, 1973; Lazarus & Folkman, 1984;

In biology and medicine, stress is most commonly defined as a response. Selye (1980)
defined stress as "the non-specific response of the body to any demand" (as cited in Lazarus &
Folkman, 1984, p. 15). In general, Selye believed the organism was stressed when it was
overwhelmed by environmental demands or noxious agents. When stress is defined as a
response, the animal or person is thought of as being in a state of stress, reacting with stress,
being under stress, being disrupted or disturbed (Lazarus & Folkman, 1984).

According to Lazarus and Folkman (1984) the stimulus-response approaches begged the
question of what was it about the stimulus that produced a particular stress response and what
was it about the response that indicated a particular stressor. Also, stimulus definitions assumed
certain situations were normatively stressful and both stimulus and response definitions did not
allow for individual differences in the evaluation of events. For example, Lazarus and Eriksen
(1952) argued that when stress was defined as stimulus or response there were large individual
differences in response to the effects of stress on performance. In their study on failure-induced
stress, they found a marked increase in variance instead of an average increase or decrease in
performance effectiveness. Also, some subjects did much better while others did much worse.

As a result of the limitations for the stimulus and response definitions of stress, many
researchers began to look at the possible effects of mediating variables and their interactions.
The definition shifted toward person factors, and the processes intervening between the stressful
demands of the environment and the short term emotional and performance outcomes. For
example, Lazarus and Folkman (1984) focused on the context of the situation and the relationship between the person and the environment in their definition of stress. They defined psychological stress as "a particular 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" (p.19).

Lazarus and Folkman (1984) developed a transactional model of stress that was process-oriented and consisted of three interdependent components: stress, appraisal and coping. From this model, Lazarus and Folkman (1984) examined two critical processes that they believed mediated the person-environment relationship: cognitive appraisal and coping. Cognitive appraisal was defined as "an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and the environment is stressful" (p.19). Coping was defined as "the process through which the individual manages the demands of the person-environment relationship that are appraised as stressful and the emotions they generate" (p.19).

Lazarus and Folkman (1984) referred to the person-environment relationship as a transactional process where the person and environment are joined together to form a new relational meaning. It is their relational definition of stress that is often relied upon to conduct further studies in the area of stress. Carver and Scheier (1994) stated "most working in this area have taken as their conceptual point of departure the model of stress and coping developed by Lazarus and his colleagues" (p.184). For example, Compas, Davis, Forsythe, and Wagner (1987) relied on Lazarus and Folkman's definition of stress in their development of the Adolescent Perceived Events Scale designed to measure major and daily stressful events during adolescence,
while Forsythe and Compas (1987) investigated the interaction of cognitive appraisals of stressful events and coping. Gamble (1994) based her study on the relational definition of stress when she investigated the perceptions of controllability and other stressor events as determinants of coping among young adolescents and young adults. Haney and Long (1995) as well based their study on the relational definition of stress when they examined coping effectiveness in sport competitions.

The stimuli or stressful environmental events typically cited in stress research are commonly known as stressors. There are three kinds of stressors: major events, often cataclysmic, affecting large numbers of people; major events, also cataclysmic, affecting one or a few people; and, daily hassles. Major events or changes in one's life involving cataclysmic phenomena are usually treated as universally stressful, often viewed as disastrous and outside anyone's control. Examples include natural disasters and man-made catastrophes such as war, imprisonment and relocation. These events may be prolonged or over quickly, like an earthquake or hurricane, however, the physical and psychological aftermath of even a brief encounter of this nature can be extended over a long period of time (Lazarus & Folkman, 1984).

Major cataclysmic events that occur to only one person or to relatively few may also be outside the individual's control. These events are also known as "life events". Examples include such things as the unexpected loss of a loved one, having a terminal illness, poor working conditions (Wrubel, Benner & Lazarus, 1981; Landy, 1989; Moos & Tsu, 1977). The above events are mostly negative experiences, however, there are other writers who maintain that any change, positive or negative, can have a stressful impact on an individual (Holmes & Rahe, 1967).
Daily hassles are often referred to as the far less dramatic stressful experiences that arise in our daily lives from our roles in living. Daily hassles are mostly the little things that irritate and distress people, such as the continual barking of the neighbour's dog, getting pulled over by the Police after running a red light, feeling lonely or writing an exam (Lazarus & Folkman, 1984). Although daily hassles are far less dramatic than major life changes such as divorce or bereavement, some authors have found that they may have more of an impact on adaptation and health than major life events (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Coyne, Schaefer & Lazarus, 1981; Lazarus & Folkman, 1984).

Stressors can also be differentiated by their duration. For example, acute, time-limited stressors (e.g., parachute jumping); a series of events that occur over an extended period of time (e.g., losing one's job, divorce or bereavement); chronic intermittent stressors which may occur once a day, week or month (e.g., conflict-filled visits to in-laws); and, chronic stressors, such as having a permanent disability, which persists continuously for a long period of time (Lazarus & Folkman, 1984).

In general, research has focused on major life events. For example, the death of a loved one (Wrubel et al., 1981); life-threatening or incapacitating illnesses (Moos & Tsu, 1977); being laid off work (Landy, 1989); getting divorced (e.g., Gove, 1973); giving birth (e.g., Austin, 1975); and, taking an important examination (Mechanic, 1962). Focusing on life events allowed researchers to examine stress more closely in order to create a greater understanding of the concept. As a result, many life events measures were developed and these life events measures became a popular way of measuring the effects of stress on somatic and mental health (Holmes & Rahe, 1967).
However, some writers argued that focusing on major life events as the sole metric of stress was inadequate (DeLongis et al., 1982; Kanner et al., 1981). For example, the life events approach to stress measurement made three major assumptions: life events alone were stressful, life events had to be major and have profound adaptational consequences or losses in order to create stress of sufficient magnitude, and psychological stress was a major factor in illness (Lazarus & Folkman, 1984).

The first assumption, that life events alone were stressful was challenged by Neugarten (1977) who argued that change alone did not necessarily generate stress and sometimes stress occurred even in the absence of change. This point was based on his research on aging. Neugarten claimed that life events such as menopause, the empty nest, and retirement did not necessarily pose serious problems for most people when they occurred on schedule, as expected, and the effects of role losses later in life depended more on how they were interpreted and coped with. In general, it was not change itself, or its absence, that was stressful but rather the personal significance of change or no change which, in turn, depended on the person’s history, stage of life and overall present circumstances (Lazarus & DeLongis, 1983; Neugarten, 1977).

The second assumption was that life events had to be major and have profound adaptational consequences or losses in order to create stress of sufficient magnitude to impair health. Hinkle (1977) argued that although this statement seemed reasonable, it was incomplete because simply knowing that life events had occurred ignored their individual meanings.

The third assumption, that psychological stress was a major factor in illness was disputed by Lazarus and Folkman (1984). They argued, illness was produced by a large number of factors that did not fall under the rubric of psychological stress, including one’s genetic constitution and
the environmental conditions. It was possible under extreme conditions of extended psychological harassment but even then the maximum contribution of psychological stress to illness was modest (Hinkle, 1977; Lazarus & Folkman, 1984; Rabkin & Struening, 1976).

In contrast to focusing on major life events in stress research, many researchers developed an approach to stress measurement that was based on the ordinary daily hassles of living (DeLongis et al., 1982; Kanner et al., 1981; Lazarus & DeLongis, 1983). Research findings showed, in regression-based comparisons of life events and daily hassles, that hassles were far superior to life events in predicting psychological and somatic symptoms. Researchers also found that hassles accounted for almost all the outcome variance attributable to life events, whereas life events had little or no impact on health outcomes independent of daily hassles (Kanner et al., 1981; Rabkin & Struening, 1976).

The extent to which daily hassles could result in damaged morale, impaired social and work functioning, psychological symptoms and somatic illness centers on the appraised meaning and salience of hassles and the quality of the coping processes inherent in their management. It is the person who determines whether an incident is a hassle or not. To endorse a hassle reflects how the person appraised the encounter and also reflects the personalized meaning that makes the event salient, noticeable and memorable. Some people may react to a traffic jam as expectable and find it only minimally distressing, whereas another person may become deeply aroused with frustration or fury.

Findings from the research suggest that the basic conditions of the person's life will influence which of the many transactions are going to be viewed and endorsed as hassles and which ones will be endorsed as "uplifts", that are referred to as positive or satisfying experiences,
often conceived of as the opposite of hassles (Kanner & Feldman, 1990). Thus, hassles are not only a reflection of what actually happened but also depend on the baseline conditions of life and how the experiences are appraised (DeLongis et al., 1982; Kanner et al., 1981; Lazarus & DeLongis, 1983). One limitation in the life event research and to some extent, daily hassles, is the focus on adult populations.

Cognitive Appraisal

Initially, cognitive appraisal was seen as a mental activity which involved judgments and discrimination (Lazarus & Folkman, 1984). Eventually, the concept was used more systematically. Arnold (1968) attempted to treat appraisal more systematically when she defined it as determining emotion which could be immediate, especially in response to strong auditory or visual stimuli, or even in response to more subtle or abstract cues, such as facial expressions.

More recently, cognitive appraisal has been based on a more complex, meaning-related cognitive activity that goes way beyond immediate and cognitive-affective responses. Cognitive appraisal has been defined as "an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and the environment is stressful" (Lazarus & Folkman, 1984, p.19). It is assumed that appraisal takes place continuously during waking life but not always (Lazarus & Folkman, 1984).

Two basic forms of cognitive appraisal are primary appraisal and secondary appraisal. Primary appraisal asks whether you are in trouble or being benefited, now or in the future, and in what way. Secondary appraisal asks what can be done about it. It is suggested that these terms, primary and secondary, not be understood as one being more important than the other or that one precedes the other in time (Lazarus & Folkman, 1984).
There are three kinds of primary appraisal: irrelevant, benign-positive, and stressful. An event is appraised as irrelevant when an encounter with the environment does not threaten one's well-being. Nothing will be lost or gained in the transaction, thus, rarely will the event be attended to. Benign-positive appraisals occur if the outcome of an encounter with the environment is perceived as positive, seen as preserving or enhancing the well-being of the person. Although, these appraisals are characterized by pleasurable emotions like joy, love, and happiness, these appraisals still contain a small degree of apprehension. Stress appraisals involve harm or loss, threat and challenge. Stress appraisals that involve harm or loss include some damage to the person, such as an incapacitating injury or illness, damage to self-esteem, or loss of a loved one (Lazarus & Folkman, 1984).

Stress appraisals that imply threat involve harm or loss that has not yet occurred but is anticipated. However, even when harm or loss has occurred there is still some element of threat involved because every loss has negative implications for the future. For example, an individual who has lost a limb faces threats about future functioning. The adaptational significance between threat and harm or loss is that the idea of threat permits anticipatory coping which in turn allows the person to plan for it and work through some of the difficulties in advance (Lazarus & Folkman, 1984).

Stress appraisals that involve a challenge focus on the potential for gain or growth and are characterized by pleasurable emotions such as eagerness, excitement and exhilaration. Like threat appraisals, challenge appraisals require the mobilization of coping efforts. However, unlike threat appraisals, challenge appraisals can have valuable implications for adaptation. For example, people who feel challenged probably have advantages over those who are easily
threatened, in terms of quality of functioning and somatic health. Challenged people are more likely to feel better because to be challenged means feeling positive about demand encounters, even though stress and anxiety may be high. Challenge appraisals are more likely to occur when the person has a sense of control over the troubled person-environment relationship (Lazarus & Folkman, 1984).

Threat and challenge appraisals are not entirely exclusive. For example, a job promotion could be appraised as having the potential for gains in responsibility and financial rewards and at the same time entail the risk of being swamped by new demands and not performing as well as expected. Thus, the promotion is appraised as both a challenge and a threat which can occur simultaneously (Lazarus & Folkman, 1984).

The relationship between threat and challenge appraisals can shift as the encounter unfolds. For example, an encounter may initially be threatening but then become a challenge because of cognitive coping efforts that enabled the person to view the episode more favorably or perhaps because of changes in the environment which occurred that altered the troubled person-environment relationship for the better (Lazarus & Folkman, 1984).

Secondary appraisal comes into play when we are faced with a threat or a challenge and something needs to be done to manage the situation. Secondary appraisal is crucial in every stressful encounter because the outcome depends on what is at stake and what can be done about it. Secondary appraisal is a complex evaluative process that takes into account which coping options are available, the likelihood that a given coping option will accomplish what it is supposed to and the likelihood that one can apply a particular strategy or set of strategies effectively (Lazarus & Folkman, 1984).
Appraisals are influenced by both person factors and situation factors. These variables influence appraisal by determining what is salient for one's well being in a particular encounter. They shape the person's understanding of the event and provide a basis for evaluating the outcomes. The person characteristic that primarily determines appraisal is beliefs. (Lazarus & Folkman, 1984).

Beliefs are personally formed or culturally shared cognitive configurations. There are two major belief categories: beliefs that have to do with the personal control one believes he or she has over events and beliefs that have to do with existential concerns such as God, fate and justice (Lazarus & Folkman, 1984).

Beliefs that have to do with personal control show the extent to which people feel confident in their powers of mastery over the environment or alternatively feel vulnerable to harm in a world conceived of as dangerous and hostile. Beliefs about personal control affect whether an encounter will produce threat or challenge appraisals (Averill, 1973; Lazarus & Folkman, 1984). Beliefs about personal control can also be conceptualized according to Albert Bandura's (1977) social learning theory of self-efficacy.

Bandura's (1977) social learning theory examines the interactions between internal events, the environment, and behavior. Bandura's concept of self-efficacy is a form of appraisal that refers to the belief that one can have an impact on his or her environment. Bandura argues that when people evaluate specific situations they make two types of expectancies: a) outcome expectancies, which refer to the person's evaluation that a particular behavior will lead to a certain outcome; and, b) efficacy expectancies, which refer to the person's conviction that he or she can successfully execute the behavior required to produce the outcome (Bandura, 1977).
Thus, the expectancies made will vary according to the demands of that specific situation.

Lazarus and Folkman (1984) consider beliefs about control and self-efficacy to be similar, however, there are others who would disagree (Haney & Long, 1995; Litt, 1988). Bandura (1986) argues that self-efficacy is a mediator between control appraisals and coping strategies; and, Litt (1988) argues that although both are appraisals, they are independent constructs which interact to determine an effective coping strategy. Therefore, it would be expected that students with a high level of self-efficacy appraise stressful relationships as controllable and would then cope by making attempts to change it rather than accept it.

Situational control appraisals and self-efficacy are products of the individual's evaluations of the demands of the specific situation as well as his or her coping resources, options and ability to implement the needed coping strategies. Bandura and his colleagues found that among people with phobias, the level of fear arousal varied with perceived coping efficacy. Changes in fear level indicated that there were changes in the way the person was appraising his or her relationship with the environment. As efficacy expectancies increased and the person judged his or her resources more adequately for satisfying task demands the relationship was appraised as holding the potential for more control and therefore less threatening (Bandura, 1977; Bandura & Wood, 1989).

Kanner and Feldman (1991) examined 140 sixth graders (54% girls and 46% boys) to determine the role of perceived control over uplifts and hassles. The participants completed the Children's Hassles Scale, the Hassles Control Scale, the Weinberger Adjustment Inventory and the Child Depression Inventory. They then completed the Uplifts Scale and the Uplifts Control Scale.
The results indicated that sixth graders perceived significantly greater control over uplifts than over hassles. The relationship between the intensity of each uplift and the amount of perceived control over that event was examined with correlation coefficients. There was a significant positive correlation for 15 of the 25 items which suggests that the more control adolescents felt they had over an event, the better they reported feeling. Interestingly, if an uplift was perceived as uncontrollable, the adolescents reported more depression and less restraint, a pattern similar to those found for hassles.

The study is limited in the sense that although the authors refer to these students as adolescents, caution should be applied to the conclusions drawn about adolescents in general because this sample is made up of sixth graders who are just approaching adolescence.

Similarly, Forsythe and Compas (1987) studied 82 college students (32 male and 52 female) to assess whether psychological distress varied as a function of the goodness of fit between cognitive appraisal and coping with a variety of life stressors. The students were asked to identify the most distressing major event occurring in the past six months and the most distressing daily event during the past two weeks to assess cognitive appraisals. Then they rated each event as either internal (caused by something about me) or external (caused by something outside myself) to further clarify the nature of the controllability appraisals. Next, the students filled out the Ways of Coping Checklist, which contains a broad range of cognitive and behavioral strategies people use to manage stressful demands, subdivided into eight coping scales. Finally, the students indicated on the Hopkins Symptom Checklist any emotional, behavioral, and somatic problems experienced during the previous week.

The results indicated that the proportion of problem- to emotion-focused coping varied as
a function of appraisals of controllability for major life events with a higher proportion of problem- to emotion-focused coping used for controllable events. Neither problem-focused or emotion-focused nor the proportion of problem- to emotion-focused coping differed as a function of appraisals of control for daily events. A 2 x2 analysis of variance was conducted to assess the relationships of appraisals and coping with symptomatology. There was a significant interaction between appraisal and coping, where lower symptom scores were associated with the use of more problem-focused coping with events perceived as controllable. More emotion-focused coping was used with events perceived as less controllable, which supports the goodness of fit hypothesis, that an accurate match between the appraisal of controllability and coping option reduces the degree of distress experienced by a stressful situation.

One limitation to this study is that although the participants are students, they are old enough to be considered young adults which makes generalizing to adolescents difficult. Therefore, in my study I would like to examine adolescents, aged 13 to 16.

The second major influence on appraisals are situation factors. Situation factors involve novelty, predictability, event uncertainty and situational ambiguity, or temporal factors like imminence, duration, temporal uncertainty and the timing of the stressful event. McGrath (1970) has argued that time may be one of the most important parameters of stressful situations. For example, a temporal factor such as imminence can greatly influence threat and challenge appraisals (Folkins, 1970; Lazarus & Folkman, 1984; Mechanic, 1962; Rakover & Levita, 1973). Imminence refers to how much time there is before an event occurs. It is the interval during which an event is anticipated (Lazarus & Folkman, 1984).

Folkins (1970) found that longer time intervals before an event was associated with less
stress reactions. Folkins argued that an increase in anticipation time provided a greater opportunity for the person to "think through" or reappraise the situation and consider a variety of coping mechanisms by which the threat can be reduced or mastered. Thus, initially there would be a high degree of stress but as the interval increases the event would be associated with lesser rather than greater stress reactions.

From a different perspective, Rakover and Levita (1973) showed that longer time intervals before an event lead to challenge appraisals, rather than threat appraisals, when they used rewarding tasks instead of aversive stimuli like those used by others like Folkins (1970). It has been speculated that by setting up a task where subjects would be rewarded rather than punished, it is possible to have created a challenging situation. Lazarus and Folkman (1984) suggested that the resulting linear relationship between time and arousal represented a physiological display of a vigilant coping strategy that would typically occur in challenge appraisals. Whereas, threat appraisals would elicit more coping complexity involving both avoidant and vigilant strategies, as shown in the curvilinear relationship between time and arousal that was found in Folkin's (1970) study. In my study, I would like to have a small interval of time between a stressful event and reaction in order to examine the adolescents' spontaneous reactions to stress.

In summary, the longer the anticipation time, the more potential there is for complexity in appraisal because of mediating coping processes. Given time, people can reflect, suffer, grieve, or avoid the problem, think about it, take actions or make efforts to gain self-control. Each of these intervening coping processes will affect subsequent appraisals and their accompanying emotions. By implication, some researchers have found that the coping processes involved in
any anticipated stressful encounter involve different types of coping as the encounter unfolds (Folkman et al., 1986; Folkman & Lazarus, 1985; Mechanic, 1962). Thus, the processes involved in appraisals and coping are interactive and interdependent.

Another important factor when discussing primary and secondary appraisal is the concept of reappraisal which is a changed appraisal on the basis of new information from the environment. Reappraisal is a type of feedback. It is an appraisal that follows an earlier appraisal to the same encounter and modifies it. For example, upon further information a threat can be reappraised as unwarranted, or conversely, a benign appraisal may turn into one of threat. As has been shown in the above studies, reappraisals have the power to create a change of emotions toward the situation and towards one's approach to coping (Lazarus & Folkman, 1984).

**Coping Theory and Adolescence**

According to Lazarus and Folkman (1984) there are four major limitations to the traditional approaches to coping. First, by treating coping as a trait or style, it is presumed that coping is a stable disposition and operates in a particular way over the life course. Although there is some degree of stability in coping or preferred modes of coping with similar sources of stress over time, in general, trait conceptualizations and measures are underestimating the complexity and variability of actual coping efforts (Lazarus & Folkman, 1984).

Second, the traditional approaches do not distinguish between coping and automatic adaptive behavior, specifically, between automatic and effortful responses. The skills that people need must be learned through experience. The more quickly people can apply these skills automatically, the more effectively they can manage their relationships with the environment. According to Lazarus and Folkman (1984) these automatic acts should not be called coping. If
they were then coping would consist of almost everything we do. They argued that when there is a nonroutine occurrence, such as a road closed for repairs that requires a decision to take an alternate route, or a flat tire that needs changing, effort is required. In these circumstances coping "efforts" are clearly distinguishable from the automatic adaptive behaviors that occur in routine driving situations. Thus, when a situation is novel, responses are not likely to be automatic, but if that situation should be encountered over and over again, it is likely that the responses will become increasingly automatized through learning (Lazarus & Folkman, 1984).

Third, the traditional approaches to coping confound coping with outcome or more specifically, with adaptational success. For example, to say a person coped with the demands of a situation suggests that the demands were successfully overcome; to say a person did not cope suggests ineffectiveness or inadequacy. When efficacy is implied by coping and inefficacy by defense, there is an inevitable confounding between the process of coping and the outcome of coping. Thus, the study of process and outcome should be independent in order to determine the effectiveness of coping and defense processes (Lazarus & Folkman, 1984).

Finally, the traditional approaches to coping equate coping with mastery over the environment. This assumption implies that coping is that which changes the person-environment relationship for the better. Coping is then viewed as solving problems by eliminating them. The problem with this assumption is that not all sources of stress in living are amenable to mastery or elimination (Lazarus & Folkman, 1984).

Lazarus and Folkman (1984) provide an alternative definition and conceptualization of coping. Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the
Lazarus and Folkman's (1984) definition of coping addresses the limitations that were found among the traditional approaches to coping. First, their definition is process-oriented rather than trait-oriented, which is reflected in the words "constantly changing" and "specific" demands and conflicts, found in the definition. Second, this definition implies a distinction between coping and automatic adaptive behavior by limiting coping to demands that are appraised as taxing or exceeding a person's resources. This excludes automatic behaviors and thoughts that do not require effort. Third, the problem of confounding coping with outcome is addressed by defining coping as "efforts" to manage which allows coping to include anything the person does or thinks, regardless of how well or badly it works. Finally, by using the word "manage", Lazarus and Folkman avoid equating coping with mastery. Managing can then include minimizing, avoiding, tolerating and accepting the stressful conditions as well as attempting to master the environment. Therefore, Lazarus and Folkman's approach to coping is concerned with what the person actually thinks or does, within a specific context which can change as the stressful encounter unfolds.

Many studies have been conducted to illustrate the process of coping, such as coping with bereavement (Wrubel, Benner & Lazarus, 1981), a sport competition (Haney & Long, 1995), examinations (Folkman & Lazarus, 1985), physical illness (Moos & Tsu, 1977); stress management interventions (Haney, 1995; Long & Haney, 1988), and, breast cancer (Carver et al., 1993). However, most of these focus on adult populations.

Folkman and Lazarus (1985) assessed the process of coping among 108 undergraduate students (approximately 60% female, 40% male). The students were asked to complete a Stress
Questionnaire, designed to reflect appraisal, emotion and coping at three stages of a mid-term examination: two days before the midterm (Time 1), five days after the midterm and two days before grades were announced (Time 2) and five days after grades were announced (Time 3). Then, they indicated on a five-point Likert scale the extent to which they felt each of 15 emotions; and, finally, they filled out the Ways of Coping Checklist, which contains a broad range of cognitive and behavioral strategies people use to manage stressful demands, subdivided into eight coping scales.

Using paired t-tests, changes in the eight types of coping across the three time periods indicated a significant decrease from Time 1 to Time 2, where the most dramatic shift was a large decrease in problem-focused coping \[t (122) = 11.36, p < .001\] suggesting that nothing could be done to change the outcome of the exam at Time 2. This is further demonstrated by the second most dramatic shift which was a large increase in distancing, which peaked at Time 2 \[t (124) = -9.28, p < .001\]. Then, wishful thinking and distancing decreased significantly from Time 2 to Time 3 \[t (102) = 4.76, p < .001; \text{ and, } t (104) = 8.55, p < .001, \text{ respectively}\]. The absence of a significant increase in any type of coping from Time 2 to Time 3 suggests that no one situational demand was experienced by the group after grades were announced, further suggesting that coping at Time 3 was influenced by individual differences.

Though an effective study to evaluate the dynamic change in appraisal and coping as an encounter unfolds, it is still limited to an adult population thus providing little information of the mechanisms involved in adolescent coping.

Research that focuses on the process of coping among adolescents include coping with chronic life strain (Mates & Allison, 1992); high risk situations (Brown et al., 1989); stressful
life events (Hoffman, Levy-Shiff, Sohlberg, & Zarizki, 1992); psychological distress (Glyshaw, Cohen, & Towbes, 1989); and, loneliness (Woodward, 1988). These studies are limited in the sense that most investigate major life events, the stressors are not specific, with the exception of loneliness, they are chronic, and the adolescents create their own definitions and descriptions of the stressor.

Lazarus and Folkman’s (1984) model describes two major forms of coping functions: problem-focused coping and emotion-focused coping. Problem-focused coping is defined as "managing or altering the problem causing the distress" (p.150). In general, this form of coping is more likely to occur when the conditions of the event are appraised as amenable to change. Emotion-focused coping is defined as "regulating the emotional response to the problem" (p.150). This form of coping is more likely to occur when it has been appraised that nothing can be done to modify the conditions of the event (Lazarus & Folkman, 1984).

There appears to be substantial empirical support for the distinctions between problem and emotion-focused coping among adults (Compas et al., 1988; Folkman & Lazarus, 1980, 1985; Gamble, 1994). However, it should be noted that although they are distinguishable, Folkman and Lazarus (1980) state that both forms of coping are used, simultaneously, by everyone in virtually every stressful encounter almost 98% of the time.

Compas, Malcarne, and Fondacaro (1988) examined the coping strategies used by 130 children and young adolescents (73 girls and 57 boys) ranging in age from 10 to 14 (mean age = 11.89). To assess coping, the participants described one stressful interpersonal event and one stressful academic event and then rated the cause of the event on a five-point Likert scale. All responses were classified as either problem-focused or emotion-focused coping. Then the Child
Behavior Checklist (CBCL) and the Youth Self Report version of the CBCL were completed to assess emotional and behavioral problems.

As expected the results indicated that the students utilized both problem- and emotion-focused coping in response to academic and interpersonal stressors, though the actual percentage was not provided. Both girls and boys reported that they had more control over the cause of academic events than social events; and both boys and girls generated more problem-focused alternatives for academic stressors than for social stressors. Thus, it appears that appraisals of controllability are related to problem-focused coping.

The MANOVA for the number of strategies used in total for the two events indicated a significant effect for grade. Post hoc analyses indicated that the number of emotion-focused strategies used increased with age with eighth graders using more strategies than sixth and seventh graders.

Finally, behavior problems were highest when subjects mismatched their appraisals of control and coping by either generating few problem-focused alternatives when they believed they had control over the academic stressor or by generating many problem-focused alternatives when they believed they did not have control over the academic stressor ($M = 55.38, n = 13$). Conversely, behavior problems were lowest when perceptions of control and coping were matched by subjects either generating few problem-focused alternatives when they believed they did not have control ($M = 50.24, n = 33$) or by generating more problem-focused alternatives when they believed they had control ($M = 47.93, n = 15$). The findings regarding the match between coping and appraisals of control were found for using problem-focused coping with an academic stressor. No differences were found for emotion-focused coping.
Two limitations of this study include the use of self-reports, which are retrospective, where the reliance on memory to recall reactions can create a source of error in the data. Also, the size of the sample was small. Therefore, it is important to have a sample large enough to make adequate conclusions about adolescents.

To further demonstrate the relationship between control appraisals and coping strategy, Gamble (1994) examined 146 fourth through eighth grade students (mean age = 11.35 years) and 166 undergrad students (mean age = 20.73 years). The younger group was 54% female and the older group was 68% female. The participants completed the Children's and Adolescent's Problem Solving Inventory (CAPSI) while thinking about a conflict with their mother, with a friend and an experience of failure, either academic or athletic. On a three-point Likert scale they reported how much control they felt they had over how things would turn out with these three stress encounters. Next, they rated how frequently they used any of five coping responses, operationally defined in accordance with Lazarus and Folkman's (1984) theory.

To test for the relative contribution of perceptions of controllability compared to other kinds of appraisal in predicting the frequency of using five different coping strategies, hierarchical multiple regression equations were computed. The results, of the young adolescents, indicated that for all five coping responses, the control variables were most predictive of the planful problem solving and support seeking coping strategies, accounting for 8% - 21% of the variance in coping responses.

Interestingly, among the young adults, appraisals of controllability were less predictive of coping strategies than were other appraisals such as, concerns about other people and their own well-being, which accounted for 18% to 41% of the variance in predicting coping variables.
Among the younger group, appraisals of controllability were predictive of problem-focused coping.

Though an effective study, the perceptions of controllability accounting for the variance in coping responses, ranged from 1%-21%. The large range could be due to the large age span used in this study. One limitation of this study is the unequal number of males and females included. Another is that adolescents between the ages of 15 and 18 were not represented, thus making it difficult to generalize the results to all adolescents.

**Age Differences and Coping**

Some studies have found a positive relation between reports of emotion-focused coping and age (Band & Weisz, 1988; Compas et al., 1988, 1993; Hoffman et al, 1992). Developmental increases in emotion-focused coping have been reported in situations including medical, dental, academic and interpersonal stressors. Hauser and Bowlds (1990) explain that as adolescent’s reasoning becomes more complex, they are able to view dilemmas from multiple perspectives, which in turn increases their potential repertoire of coping strategies, especially those that involve appraising events. It appears that the relationship between age and coping, characteristic of older adolescent coping, varies during adolescence and stabilizes during adulthood. Compas et al. (1988) reports that there are no consistent findings in the literature regarding problem-focused coping and age, among adolescents.

One reason that cognitive development may affect coping efforts and their outcomes may be that problem-focused coping involves concrete behaviors that can be observed in adult models. However, emotion-focused coping involves more covert processes of cognitive and emotional self-control that may be less observable to children. Also, emotion-focused coping is
more abstract in nature, and its use requires more cognitive maturity. Thus, the use of emotion-focused coping strategies may be acquired over a longer period of development. In Compas et al. (1988) study of 130 children and adolescents, ranging in age from 10 to 14 years, the use of emotion-focused coping strategies increased with age but the use of problem-focused coping strategies remained stable.

Few studies focus on 15 year old adolescents and the relationship between appraisals and coping. Also, studies do not include the relationship between self-efficacy and problem-focused or emotion-focused coping. Therefore, in my study I would like to examine the coping strategies of 13 to 16 year olds and the relationships between appraisals of controllability and self-efficacy with problem-focused and emotion-focused coping.
Method

Participants

One hundred male and female, Grade 8, 9, and 10 students, aged 13 to 16, from a high school in a small community in British Columbia participated in this study. All students were enrolled in a mathematics course in which a mathematics exam was administered.

Procedure

Permission to approach the principal of the school and the mathematics teachers, to conduct this study, was obtained from the Ethics Committee at the University of Northern British Columbia. The principal and teachers were invited to participate in the study by letter followed by an appointment to meet personally to explain the purpose of the study. See Appendix A for a copy of the letters sent to the principal and teachers. The study was described as an exploration of how students think and feel before and after writing a mathematics exam. The mathematics teachers were asked to distribute letters of consent to the students for parental permission to participate in the study. See Appendix A for a copy of the consent form.

All students were given a mathematics exam, during regular class time, as part of their fulfillment for the requirements of their math course. Prior to the exam, students were administered a tension thermometer (Walk, 1956) assessing their present level of stress, a questionnaire assessing their appraisal of the exam (controllability of the situation and self-efficacy), and the State-Anxiety scale of the State-Trait Anxiety Inventory Form Y (Spielberger, 1983) to assess their present level of anxiety. Following the exam, students were given a modified version of Folkman and Lazarus' (1988) Ways of Coping Questionnaire, a demographic questionnaire, and were readministered the State-Anxiety scale. Finally, the grades from the
exam were collected from the teachers. To ensure anonymity, each student was given a code from 001 to 100.

Measures

The measures included a tension thermometer, an appraisal questionnaire, the State-Anxiety scale of the State-Trait Anxiety Inventory Form Y (Spielberger, 1983), a modified version of the Ways of Coping Questionnaire (Folkman & Lazarus, 1988), a demographic questionnaire, and the assigned grades for the exam. See Appendix B for measures.

The Tension Thermometer. The tension thermometer (Walk, 1956) was a hand-drawn thermometer used to rate the level of tension the student was presently experiencing in regard to the pending examination. The thermometer scale ranged from the scale value 10, which was described as "completely tense, not relaxed at all", to zero which was described as "completely relaxed, not tense at all".

The Appraisal Questionnaire. The appraisal questionnaire consisted of eight items representing primary appraisal (how important is the situation) and secondary appraisals of control and self-efficacy. Primary appraisal was measured by one item previously used by Hart and Cardozo (1988) in a study of 135 college students. The item asked, "is the exam important to me", rated on a scale from zero to three, where zero was "not at all", and three was "very much so".

Control appraisals were measured with two items, also from Hart and Cardozo's (1988) study of 135 college students. The first control item indicated how much control they feel they had over the occurrence of the exam ("I feel in control of the exam situation"). The second item involved control of their emotions ("I feel in control of my emotions"). Respondents indicated
on a five-point Likert scale (0 = not at all, and 4 = very much so) the degree of control they felt they had. Scores ranged from zero to eight, where a high score indicated greater control.

Self-efficacy appraisals were measured using a scale modeled after Bandura (1977), Feltz and Riessinger (1990) and Haney and Long (1995). There were five self-efficacy items asking students to rate, on a scale from zero to 100, how confident they feel about completing and passing the exam ("I feel confident that I can score 10 marks out of 50 on this exam", "I feel confident that I can score 20 marks out of 50 on this exam", "I feel confident that I can score 30 marks out of 50 on this exam", "I feel confident that I can score 40 marks out of 50 on this exam", and, "I feel confident that I can score 50 marks out of 50 on this exam"). Scores ranged from zero to 500, where a high score indicated greater confidence.

**State-Trait Anxiety Inventory.** To assess anxiety, the State-Trait Anxiety Inventory (STAI) developed by Spielberger (1983) was administered to the students. It is one of the most widely used instruments to assess anxiety. The STAI is available in Form X (1970) and Form Y (1983). Form Y was developed in response to some concerns that Form X did not sufficiently differentiate between depression and anxiety. Pearson Product Moment correlations between Form X and Form Y are over .95 for males and females.

The 40-item test is divided into two 20-items parts, one measuring the individual's level of state anxiety and the other measuring the level of trait anxiety. The State-Anxiety (S-Anxiety) scale is designed to measure transitory anxiety or the anxiety the individual is presently experiencing, such as just before a mathematics exam. The Trait-Anxiety (T-Anxiety) scale is designed to assess a relatively stable individual difference in anxiety-proneness, characterized by the disposition to react or behave in a particular, predictable way. Because this study
investigated the level of anxiety experienced just prior to writing a mathematics exam, rather than how an individual generally feels, only the S-Anxiety scale of the STAI was used.

The test-retest reliability of Form Y of the S-Anxiety scale, for college and high school students after 30 days and 60 days was relatively low, ranging from $r = .16$ to $.62$, with a median reliability coefficient of $r = .33$. A low stability coefficient is expected for the S-Anxiety scale because a valid measure of state anxiety should reflect the influence of the unique situational climate (Kline, 1993). Internal consistency, as measured by Cronbach's Formula KR-20 alpha, was calculated on normative samples. The normative samples consisted of 1,838 working adults (ages 19-69), 424 high school students, 855 college students, and 1,964 military recruits. Internal consistency of the S-Anxiety scale showed that all but one group (male high school students) had coefficient alphas over .90. According to Dreger (1978) and Kline (1993) alpha coefficients are a more suitable reliability indicator of S-Anxiety than test-retest coefficients because of the fluctuating nature of S-Anxiety.

Alpha reliability coefficients are higher for the STAI S-Anxiety scale when it is given under conditions of psychological stress. The alpha reliability of the Form X S-Anxiety scale was .92 when given to a group of college males immediately after a difficult intelligence test, and .94 when given immediately after viewing a distressing film. For the same subjects, the alpha reliability dropped to .89 when given after a brief period of relaxation training. Many researchers have found that the reliability of the STAI is as high as one could expect (Dreger, 1978; Katkin, 1978; Kline, 1993).

Evidence of construct validity of the S-Anxiety scale is illustrated in the scores of military recruits tested shortly after they began stressful training programs. Their scores were
much higher than those of college and high school students of about the same age and who were tested under relatively nonstressful conditions. Also, the S-Anxiety scores of college students were significantly higher under examination conditions and significantly lower after relaxation training than when they were tested in a regular class period.

To demonstrate trait anxiety is unrelated to intelligence or aptitude, the STAI scales were compared to four measures of academic aptitude and achievement: high school grade point average, high school rank, scores from the Florida Statewide Twelfth Grade Placement Test and scores from the College Entrance Examination Board. Form X was given to approximately 1,200 freshmen entering Florida State University. The correlations between STAI and the four measures of academic aptitude and achievement were essentially zero, sometimes obtaining small negative correlations of $r = -.04$.

**Ways of Coping Questionnaire.** Coping strategies were assessed with a modified two-factor version of Folkman and Lazarus' (1988) Ways of Coping Questionnaire (WCQ). The two factors were problem-focused and emotion-focused coping strategies. Problem-focused coping strategies involved nine items focusing on changing the problem, such as "I knew what had to be done, so I doubled my efforts to make things work". Emotion-focused coping strategies involved 10 items focusing on dealing with the emotional response to the stressor, such as "I went on as if nothing happened". The modified version contained 19 items that described a wide range of cognitive and behavioral strategies people use to manage stress. The students were asked to "think about the exam you have just written" and then to "indicate the extent to which you used each of the following strategies during the exam". Items were responded to on a four-point Likert scale where zero was "did not apply or not used" and three was "used a great deal".
For the present study, 18 items were taken directly from Folkman and Lazarus' (1988) WCQ; and, one item was taken from Madden, James, and Paton (1993). This modified WCQ version contained two problem-focused subscales (confrontive coping and planful problem solving) and two emotion-focused subscales (distancing and escape-avoidance).

**The Demographic Questionnaire.** The demographic questionnaire contained items requesting the students' age, gender, ethnicity and grade, obtained for descriptive purposes only.

**Grades.** The mathematics teachers graded the exams and provided a score for the number of mathematical questions answered correctly.

**Analysis of Data**

Preliminary analyses of the dependent variables provided descriptive data, such as means, standard deviations, and frequency distributions for male and female students.

Second, the data were analyzed by Pearson product-moment correlation coefficients, an independent measures t-statistic, an analysis of variance (ANOVA), and by a stepwise multiple regression analysis. Pearson product moment correlations were used to analyze the stated hypotheses. An independent measures t-test was used to test for significant differences in coping and appraisal for males and females. An ANOVA was used to test for differences between state-anxiety before and after the math exam for males and females. A multiple regression analysis was used to assess the contribution of control appraisals, self-efficacy appraisals and anxiety on problem-focused coping, emotion-focused coping, and grades, for all the students.
Results

One hundred participants, 43 male and 57 female, aged 13 to 16, participated in this study. The mean age for males was 14.51 years ($SD = .91$) and, for females it was 14.91 years ($SD = .93$). Eighty-six percent of the students were Caucasian, 4% Afro-Canadian or American, 2% East Indian, 2% First Nations, 1% Asian, and 5% were a combination of two or more of the above mentioned distinct ethnic groups. See Table 1 for subject characteristics.

Descriptive Statistics for Dependent Variables

An independent measures t-test was computed on all dependent measures to determine if there were significant differences in coping and appraisal for males and females. The results indicated that there were no significant differences between males and females on the dependent variables, self-efficacy, control, anxiety, tension, importance, problem-focused coping, emotion-focused coping, Math grade point average (GPA), and Math test score, $p > .05$. The means and standard deviations for the outcome measures of dependent variables for the total group by sex are listed in Table 2.

An analysis of variance (ANOVA) was conducted to test for differences between state-anxiety before and after the math exam for males and females. The results indicated that there were no significant main effects for time or gender, nor were there any interaction effects found among these variables, $p > .05$.

Hypotheses

Pearson product moment correlations were computed on all dependent variables to assess the relationships stated in the hypotheses. Hypothesis one stated that control appraisals of the exam situation would be positively correlated with problem-focused coping strategies. The
Table 1.

**Subject Characteristics for all Participants (n = 100)**

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
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<td>Age</td>
<td>14.33 years</td>
<td>.93</td>
<td>13-16</td>
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</tr>
<tr>
<td>Nine (n = 28)</td>
<td>14.04</td>
<td>.19</td>
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<tr>
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<td>.00</td>
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<td>13%</td>
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<tr>
<td>Female (n = 15)</td>
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<td>.26</td>
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<td>15%</td>
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<tr>
<td>Ten (n = 40)</td>
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<td>.55</td>
<td></td>
<td>49%</td>
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<tr>
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<td>15.21</td>
<td>.52</td>
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<td>23%</td>
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<td>.57</td>
<td></td>
<td>26%</td>
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<tr>
<td>Ethnic</td>
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<td></td>
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<tr>
<td>Afro-Canadian/American</td>
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<tr>
<td>Asian</td>
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<td>1%</td>
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<tr>
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<td></td>
<td></td>
<td>86%</td>
</tr>
<tr>
<td>East Indian</td>
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<td></td>
<td></td>
<td>2%</td>
</tr>
<tr>
<td>First Nations</td>
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<td></td>
<td></td>
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</tbody>
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Table 2

Means of Outcome Measures of Dependent Variables for Males (n = 43) and Females (n = 57)

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tension (n = 100)</td>
<td>43.75</td>
<td>26.28</td>
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</tr>
<tr>
<td>Male</td>
<td>42.44</td>
<td>28.46</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>44.74</td>
<td>24.72</td>
<td></td>
</tr>
<tr>
<td>Importance (n = 100)</td>
<td>2.41</td>
<td>0.78</td>
<td>0-3</td>
</tr>
<tr>
<td>Male</td>
<td>2.30</td>
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<tr>
<td>Female</td>
<td>2.48</td>
<td>0.71</td>
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</tr>
<tr>
<td>Self-Efficacy (n = 100)</td>
<td>350.70</td>
<td>97.94</td>
<td>0-500</td>
</tr>
<tr>
<td>Male</td>
<td>360.86</td>
<td>83.13</td>
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</tr>
<tr>
<td>Female</td>
<td>343.04</td>
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<tr>
<td>Control (n = 100)</td>
<td>5.59</td>
<td>1.75</td>
<td>0-8</td>
</tr>
<tr>
<td>Male</td>
<td>5.86</td>
<td>1.60</td>
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</tr>
<tr>
<td>Female</td>
<td>5.38</td>
<td>1.84</td>
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</tr>
<tr>
<td>STAI Pre (n = 100)</td>
<td>42.47</td>
<td>13.57</td>
<td>20-80</td>
</tr>
<tr>
<td>Male</td>
<td>41.28</td>
<td>13.54</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>43.37</td>
<td>13.64</td>
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</tr>
<tr>
<td>Problem-Focused Coping (n = 100)</td>
<td>12.07</td>
<td>4.64</td>
<td>0-27</td>
</tr>
<tr>
<td>Male</td>
<td>12.74</td>
<td>4.45</td>
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</tr>
<tr>
<td>Female</td>
<td>11.56</td>
<td>4.76</td>
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<tr>
<td>Emotion-Focused Coping (n = 100)</td>
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<td>0-30</td>
</tr>
<tr>
<td>Male</td>
<td>11.67</td>
<td>6.01</td>
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</tr>
<tr>
<td>Female</td>
<td>11.47</td>
<td>4.67</td>
<td></td>
</tr>
<tr>
<td>STAI Post (n = 100)</td>
<td>40.42</td>
<td>13.81</td>
<td>20-80</td>
</tr>
<tr>
<td>Male</td>
<td>38.74</td>
<td>14.05</td>
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</tr>
<tr>
<td>Female</td>
<td>41.71</td>
<td>13.61</td>
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</tbody>
</table>

(table continues)
Table 2. (continued)

<table>
<thead>
<tr>
<th>Measure</th>
<th>M</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math GPA (n = 100)</td>
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<td>15.25</td>
<td>30-97</td>
</tr>
<tr>
<td>Male</td>
<td>68.35</td>
<td>14.16</td>
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</tr>
<tr>
<td>Female</td>
<td>71.89</td>
<td>16.00</td>
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<tr>
<td>Math Test Score (n = 100)</td>
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<td>13-100</td>
</tr>
<tr>
<td>Male</td>
<td>68.67</td>
<td>16.72</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>70.49</td>
<td>19.95</td>
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</tbody>
</table>

Note. STAI Pre = State-Anxiety score before the exam; STAI Post = State-Anxiety score after the exam; Math GPA = Math grade point average.
results indicated that, for the entire group, the relationship between control and total problem-focused coping was not significant, \( p > .05 \). However, control was negatively correlated with one subscale of problem-focused coping, confrontive coping, \( r = -.28, p < .01 \), indicating that students who felt more in control used less confrontive coping during the exam. For males, the correlation between control and confrontive coping was \( r = -.33, p < .05 \). For females, the correlation was \( r = -.28, p < .05 \). See Appendix C for Table 3 for the correlations of all dependent variables for the entire group, Table 4 for the correlations of dependent variables for males, and Table 5 for the correlations of dependent variables for females.

Hypothesis two stated that control appraisals of the exam situation would be negatively correlated with emotion-focused coping strategies. The results indicated that the relationship was not significant for total emotion-focused strategies, \( p > .05 \). However, there was a significant negative relationship between control and one subscale of emotion-focused coping, escape-avoidance coping, \( r = -.42, p < .01 \), indicating that students who felt less in control used more escape-avoidance coping. For males and females, the correlation between control and escape-avoidance coping was \( r = -.42, p < .01 \).

Hypothesis three stated that self-efficacy would be positively correlated with problem-focused coping strategies. The results demonstrated that, for the entire group, there was a significant positive correlation between self-efficacy and total problem-focused strategies \( r = .22, p < .05 \), indicating that more self-efficacious students used more problem-focused coping. The significant correlation was found among female students, \( r = .37, p < .01 \), but not among the male students, \( p > .05 \). For the entire group, self-efficacy was positively correlated with one subscale of problem-focused coping, planful problem-solving, \( r = .34, p < .01 \), indicating that
more self-efficacious students used more planful problem-solving coping. For females, self-efficacy was also positively correlated with planful problem-solving, ($r = .45, p < .01$), indicating that girls who felt more self-efficacious used more planful problem-solving to cope with the exam. However, this relationship was not found among the male students, $p > .05$. Finally, there was a significant negative correlation between self-efficacy and one subscale of problem-focused coping, confrontive coping, ($r = -.35, p < .01$), found among male students, indicating that boys used more confrontive coping when they felt less self-efficacious. Interestingly, the correlation between self-efficacy and confrontive coping was not significant for girls nor for the entire group as a whole, $p > .05$.

Hypothesis four stated that self-efficacy would be positively correlated with appraisals of control. The results indicated a significant relationship for the entire group, ($r = .46, p < .01$), indicating that self-efficacious students felt more in control of the exam situation. For males, the correlation between self-efficacy and control was $r = .39, p < .01$; and, for females, the correlation was $r = .48, p < .01$.

Hypothesis five stated that stress would be positively correlated with emotion-focused coping strategies. The dependent variables for stress were tension and state-anxiety before the exam. The results indicated that, for the entire group, tension did not correlate significantly with total emotion-focused coping strategies, $p > .05$. However, tension was positively correlated with the emotion-focused coping subscale, escape-avoidance coping, ($r = .27, p < .01$), indicating that students who felt more tension used more escape-avoidance coping. For females, tension was also positively correlated with escape-avoidance coping, ($r = .41, p < .01$), but for males, there was no significant relationship, $p > .05$. For the entire group, tension was negatively
correlated with the emotion-focused coping subscale, distancing, \( r = -0.35, p < 0.01 \), indicating that students who felt less tension used more distancing to cope with the exam. For males, the correlation between tension and distancing was \( r = -0.29, p < 0.05 \); and, for females, the correlation was \( r = -0.42, p < 0.01 \).

State-anxiety, for the entire group, before the exam did not correlate significantly with total emotion-focused strategies, \( p > 0.05 \). However, state-anxiety correlated positively with the emotion-focused coping subscale, escape-avoidance coping, \( r = 0.51, p < 0.01 \), indicating that students who felt more anxious before the exam used more escape-avoidance coping during the exam. For males, the correlation between state-anxiety before the exam and escape-avoidance coping was \( r = 0.44, p < 0.01 \). For females, the correlation was \( r = 0.57, p < 0.01 \). Finally, state-anxiety, for the entire group, before the exam was negatively correlated with the emotion-focused coping subscale, distancing, \( r = -0.32, p < 0.01 \), indicating that the less anxious students used more distancing. This correlation was also found for females, \( r = -0.35, p < 0.01 \), indicating that when female students felt more anxious before the exam they used less distancing. There was not a significant correlation between state-anxiety before the exam and distancing found for males, \( p > 0.05 \).

**Age Relationships on Selected Variables**

Pearson product moment correlations were conducted to further analyze the significant relationships between age and the dependent variables for the total group. Interestingly, there was a significant negative correlation between age and self-efficacy, \( r = -0.21, p < 0.05 \), indicating that older students felt less self-efficacious before the exam. The significant negative relationship was found for female students, \( r = -0.33, p < 0.01 \), but not for males, \( p > 0.05 \). There
was also a significant negative correlation between age and control, \((r = -.26, p < .01)\), indicating that older students felt less in control of the exam situation. The significant negative relationship was also found for girls \((r = -.35, p < .01)\) but not for boys, \(p > .05\). Finally, age was significantly related to state-anxiety before the exam, \((r = .23, p < .05)\), indicating that the older students felt more anxiety before the exam.

**Stepwise Multiple Regression**

A stepwise multiple regression analysis was done with the dependent variables, problem-focused coping, emotion-focused coping and test score. The independent variables were self-efficacy, control, and state-anxiety before the math exam. The resulting regression models included self-efficacy \((R^2 = .25)\) for the dependent variable test scores, \(F(1, 96) = 31.28, p < .01\); and, self-efficacy and state-anxiety before the exam \((R^2 = .10)\) for the dependent variable problem-focused coping, \(F(2, 97) = 5.48, p < .01\). The other independent variables did not provide any more predictive power than was needed to predict problem-focused coping and test score. None of the independent variables provided sufficient predictive power for emotion-focused coping.
Discussion

Research has repeatedly shown that when people are confronted with a stressful encounter, they will use both problem- and emotion-focused coping strategies, simultaneously, with an emphasis on one strategy over the other, depending on whether the situation is controllable and whether they believe they have the abilities to actually do something about it (Folkman & Lazarus, 1980, 1985; Forsythe & Compas, 1987). The students in this study used both problem- and emotion-focused strategies, 98% of the time, to cope with the stressful Math exam. It was expected that control of the exam situation would be related to problem-focused coping strategies but this did not occur in this study. Compas et al. (1993) suggests that there are inconsistent findings in the literature on adolescents, in regard to problem-focused coping. In Compas et al. (1988) study of 130 children and young adolescents, students who felt more in control of academic stressors used more problem-focused coping strategies. Compas et al. (1991) and Seiffge-Krenke (1995) both found that there is a greater use of problem-focused coping in situations appraised as controllable and changeable than in situations that have to be accepted as they are.

A significant relationship was found between control and confrontive coping, a subscale of problem-focused coping, \( r = .28, p < .01 \). Students who felt in control used less confrontive coping (e.g. expressing feelings). This is supported in the research (Folkman & Lazarus, 1985; Seiffge-Krenke, 1995). Perhaps, at this stage in the exam process, there was nothing more that could be done to change the outcome of the exam and trying something risky or letting their feelings out somehow may have been the only alternatives left to use. These participants were adolescents who were not in a position to change the situation and writing the Math exam was a
The second hypothesis stated that there would be a relationship between control of the exam situation and emotion-focused coping strategies. There was not a significant relationship between total emotion-focused coping strategies and control, \( p > .05 \). However, escape-avoidance coping, a subscale of emotion-focused strategies, was inversely related to control indicating that students who felt less in control used more escape-avoidance coping. The relationship between escape-avoidance and control was \( r = -.42, p < .01 \). This is similar to the results found in other studies (Folkman & Lazarus, 1985; Pearlin & Schooler, 1978; Seiffge-Krenke, 1995; Zeidner, 1996). In Folkman and Lazarus' (1985) study of 108 college students assessed at three stages of a midterm exam, the students used more problem-focused coping strategies when they were preparing for the exam than at any other stage in the exam process, and when the exam was over, there was a significant decrease in problem-focused coping and a significant increase in emotion-focused coping. Folkman and Lazarus suggested that when the exam was over and nothing else could be done, problem-focused coping no longer had a useful function. This demonstrates that when there is a possibility to control the outcome of an exam, students will use more problem-focused coping, and when nothing else can be done, students rely more on avoidance and distancing to cope with the exam.

The third hypothesis stated that there would be a relationship between self-efficacy and problem-focused coping strategies. As expected, self-efficacy was related to problem-focused coping strategies. Self-efficacious students used more problem-focused coping strategies (\( r = .22, p < .05 \)), and more planful problem-solving (\( r = .34, p < .01 \)), in particular. This supports Bandura's (1986) theory of self-efficacy that postulates if people believe they have the ability to
bring about change then they will make attempts to do so. In this study, it is evident that students who believed in their abilities to succeed on the exam used strategies that would enable them to do so. As found in other studies, self-efficacious students received higher grades and performed better on the math exam than did the inefficacious students (Schunk, 1989; Schwarzer, 1993).

Interestingly, the relationship between self-efficacy and planful problem-solving was affected by gender. For females, but not males, there was a significant positive relationship ($r = .45, p < .01$, for females; and, $r = .13, p > .05$, for males) that indicated that confident females used planful problem-solving coping during the exam. Belle (1987) claims that in childhood, girls are more likely than boys to seek help when facing problems, and they are more likely to confide their experiences to at least one other person. Thus, in preparation for the exam, it is possible that the girls in this study felt more comfortable about asking the teacher to clarify math problems and then when it came to writing the exam, they knew what had to be done, were able to concentrate, and followed a plan of action.

The relationship between self-efficacy and confrontive coping was also different for males and females. For males, but not females, confrontive coping was related to self-efficacy ($r = -.35, p < .01$ for males; and, $r = .02, p > .05$ for females). Less efficacious males used more confrontive coping during the exam. One explanation for this gender difference may be sex-role socialization. Compas et al. (1987) argued that gender identity and sex-role socialization may influence the use of different coping strategies used by boys and girls. Another possibility may be that adolescents do not match their appraisals of a situation with coping strategies as effectively as adults do. Forsythe and Compas (1987) found in their study of 84 college students
that when there was a good fit between appraisals of controllability and the use of problem-focused coping strategies, students experienced fewer psychological symptoms, such as anxiety. Similarly, psychological symptoms were experienced less when appraisals of uncontrollability were matched with emotion-focused coping strategies. Folkman and Lazarus (1985) indicated that the coping strategies used by college students, across a variety of stressful episodes, demonstrated considerable variability across situations.

It was hypothesized that self-efficacy would be related to control appraisals. The results demonstrated that self-efficacious students believed they had more control over the exam situation \( (r = .46, p < .01) \). Haney and Long (1995) and Zeidner's (1996) research also support this relationship. It is interesting that since self-efficacy and control are related to each other and self-efficacy is related to problem-focused coping that control was not related to problem-focused coping. It would stand to reason that if self-efficacy led to the greater use of problem-focused coping strategies, then control appraisals would also, but this did not occur in the present study. The results may have been different had a different analysis of the data been used. Perhaps there is an intervening variable, such as self-efficacy that is interfering with the relationship between control and problem-focused strategies. It is possible that before the exam, students actually felt confident that they could control the exam situation but during the exam, they discovered that it was not controllable and selected an alternative strategy, which was confrontive coping and escape-avoidance. Folkman et al. (1986) found that the couples in their study used more confrontive and escape-avoidance when their self-esteem was at stake.

Finally, the fifth hypothesis stated that there would be a positive relationship between stress and emotion-focused coping. Lazarus and Folkman's (1984) theory states that when a
stressful relationship between the person and the environment can be managed then attempts will be made to use more problem-focused coping strategies. But, when the person-environment relationship cannot be altered or managed then attempts to cope with the emotions that are elicited are then the focus. Thus, when stress is high and nothing can be done to control the situation then efforts are made to deal with the emotions. In this study, it was found that when stress was indicated by tension and high levels of anxiety, the students used more escape-avoidance coping (r = .27, p < .01, for tension; and, r = .51, p < .01, for anxiety), which is a subscale of problem-focused coping strategies. Thus, when students were experiencing a great deal of stress they wished for miracles that would end the discomfort, and by doing that it took their minds off the task. The students in Zeidner's (1996) study of 341 Israeli students, those who had high test anxiety reported using more avoidance behavior, and avoidance behaviors, in turn, were positively related to state-anxiety. In this study, stress was negatively correlated to distancing (r = -.35, p < .01, for tension; and, r = -.32, p < .01, for anxiety), a subscale of emotion-focused coping. It appears that when students were experiencing very little stress they would try to make light of the situation and not take the exam very seriously. Both Zeidner and Folkman and Lazarus' (1985) studies indicated that problem-focused coping responses are prevalent at the pre-exam stage because something can still be done to influence the outcome, and, following the exam there would be a dramatic decrease in problem-focused coping and an increase in emotion-focused coping. However, stress and anxiety had a negative relationship with distancing which contradicts both Zeidner's and Folkman and Lazarus' findings. It seems that the results regarding escape-avoidance coping is consistent with the literature, but the results regarding distancing is not. Perhaps the lack of fit is what Compas et al. (1993) were referring to
when they said adolescent coping is not as accurate as adult coping. Another possibility may be that the coping measures used are not appropriate for adolescents. In this study, the students were no longer in the anticipatory stage of the exam process, thus, it would be reasonable that they would not use more problem-focused coping at this time and focus, instead, on the emotions that are elicited by the inability to alter the stressful event.

Another finding in this study was that when stress was low, self-efficacy and appraisals of control were high and as a result low stress was related to higher test scores. This is supported in other studies where self-efficacy is also a key factor in relation to job and sport performance (Bandura & Jourden, 1991; Haney & Long, 1995). According to Bandura's (1977) theory, self-efficacy and performance are related and dependent upon mastery and past performance. The results from this study indicated that there was a relationship between Math GPA (past performance) and exam score ($r = .77, p < .01$). These results suggest that students with high Math GPA's also experienced less anxiety ($r = -.38, p < .01$), less stress ($r = -.27, p < .01$) and, more self-efficacy ($r = .56, p < .01$) and more control ($r = .38, p < .01$). These results are similar to findings by Haney and Long (1995). This is also in keeping with most of the research that indicated that low self-efficacy and higher test anxiety leads to greater decrements in task performance (Bandura, 1977, 1986; Bandalos, Yates, & Thorndike-Christ, 1997; Betz and Hackett, 1983; Yue, 1996). There were significant negative relationships between self-efficacy and anxiety before the exam ($r = -.44, p < .01$), and between self-efficacy and tension ($r = -.29, p < .01$), as expected. Thus, self-efficacious students experienced less stress. Self-efficacious students also received higher scores on the exam ($r = .49, p < .01$).

A stepwise multiple regression indicated that self-efficacy was a better predictor of test
score (25% of the variance accounted for) and problem-focused coping strategies (5% of the variance accounted for) than appraisals of control or state-anxiety. In keeping with the literature on self-efficacy, test anxiety, control, and coping, it appears that confidence in one's ability to succeed leads to the use of more problem-focused coping strategies to deal with the demands of the situation, which in turn, leads to higher performance (Bandura, 1986; Bandalos et al., 1997; Betz and Hackett, 1983; Haney & Long, 1995; Yue, 1996). Thus, it seems then that believing in yourself has more of an impact on how you will do in a stressful situation than whether you feel you can control the situation.

**Age Differences on Dependent Variables**

Age was negatively related to self-efficacy, \( r = -.21, p < .05 \), indicating that older students felt less self-efficacious. Interestingly, this was only significant for female students, \( r = -.33, p < .01 \). The negative relationship is in the opposite direction to what would be expected. Some researchers found that older students were more self-efficacious (Haney & Long, 1995; Hauser & Bowlds, 1990). Houser and Bowlds (1990) suggest that as adolescents mature, their reasoning becomes progressively more complex, they can view dilemmas from multiple perspectives, thus increasing their repertoire of coping strategies, especially those that involve appraising events. However, another study by Band and Weisz (1988), found that among 72 children, aged 6 to 12 years, younger children rated themselves as more self-efficacious than older children when using primary control coping, defined as attempting to change situations. If we followed Bandura's (1977) argument that performance is based on mastery and past performance, then we would expect older students would have had more experience with Math and with writing Math exams. Another possibility for the negative
relationship between self-efficacy and age, may be that some older students had not been successful previously in their math performance and this may have reduced their confidence in how well they perform. Future researchers may want to collect information regarding success and failure with past performance.

Age was negatively related to control ($r = -.26, p < .01$). Older students felt they had less control over the exam situation, whereas younger ones felt they could control it. Band and Weisz (1988) reported that younger children felt more self-efficacious over events they felt they could control and change. Since control and self-efficacy are positively correlated, it is not surprising that the older students who felt less control also felt less efficacious.

Age was also related to escape-avoidance coping, ($r = .19, p < .01$), indicating that older students used more escape-avoidance coping during the exam. This has been found in other studies of children and adolescents (Band & Weisz, 1988; Compas et al., 1993; Haney & Long, 1995; Hauser & Bowlds, 1990; Seiffge-Krenke, 1995). In Compas et al. (1988) study, the use of emotion-focused coping strategies increased from sixth to eighth grade, whereas the use of problem-focused coping remained relatively consistent. In Seiffge-Krenke's (1995) study of 1,028 German students, aged 12 to 19 years, older students reported using more emotion-focused strategies, such as accepting their limitations in changing stressful situations and willingness to make compromises, more than did younger students. It is possible that the relationship between age and coping is characteristic of older adolescent coping that varies during adolescence and stabilizes during adulthood. Compas et al. (1993) suggest that one reason younger children might feel more in control of stressful situations and feel more self-efficacious may be that problem-focused coping can be more easily learned through observation, whereas, emotion-
focused coping is more abstract in nature and its use requires more cognitive maturity. Band and Weisz (1988) suggested that secondary control coping, defined as accepting the situation and dealing with the emotions elicited, had a subtle way of reducing stress among the older students, by lowering one's expectations in order to minimize future disappointment, such as receiving a poor grade on an exam. Thus, the use of emotion-focused coping strategies, such as escape-avoidance may be acquired over a longer period of development, and its use may require more cognitive maturity.

**Coping and Performance - Gender Differences**

The relationship between coping and performance appeared to be more evident among the male students than female students. Although t-tests showed that there were no significant differences between males and females, correlation coefficients indicated that there was a significant relationship between coping and performance for males. For males, but not females, there was a significant negative correlation between Math GPA and confrontive coping, \( (r = -0.35, p < .05) \), indicating that males who performed poorly in Math in the past used more confrontive coping during the exam. For boys, but not girls, there was a significant negative correlation between Math GPA and escape-avoidance coping, \( (r = -0.36, p < .01) \), indicating that boys who had performed poor in Math in the past used more escape-avoidance coping during the exam. For all students, poor Math GPA was associated with a low Math score on the exam, \( (r = 0.77, p < .01) \), indicating that students who performed poorly in the past also performed poorly on the exam. In general, it appeared that when boys had a poor history of Math performance, they used both problem- and emotion-focused strategies simultaneously and regardless of which coping strategy was used, when they had performed poorly in the past, they continued to receive a low
test score in the present. Thus, in keeping with Bandura's (1977) theory, past performance and mastery continues to influence present performance.

Limitations

This study generalizes to students, aged 13 to 16, in grades 8, 9, and 10. One limitation is that appraisals of control could have been more refined to account for which aspect of the situation was being controlled for. For example, are they trying to control the cause or the outcome. In future, it would be beneficial to list a number of items the person may be attempting to control in the situation to see if there are any differential effects. Another limitation may be due to the fact that the age groups were not separated. For example, age was significantly correlated with appraisals of control and self-efficacy. Thus, it was possible that younger students, aged 13, differed from those who were 16, but the sample was not large enough to see the difference.

Implications for Counselling

Among adolescents, a key appraisal variable is self-efficacy. It seems that for adolescents it is more important to believe in one's abilities to execute a particular behavior that will bring about change than it is to feel in control a situation. The importance of self-efficacy is not new because this was clearly established in the 1970's by Albert Bandura. What is different is that self-efficacy remains a key factor, 30 years later, among an adolescent population that is just starting to receive attention in the research literature. For today's youth, it would be recommended that school counsellors continue to hold workshops that teach skills training, such as study skills and skills aimed directly at enhancing a student's self-efficacy. To enhance self-efficacy, school counsellors need to design skills training in a way that will let students
experience frequent successes. Skills training would not only enhance the student's level of self-efficacy but it would also increase their level of self-esteem.

It should also be noted that when students feel they have little control over a stressful academic situation, they tend to experience greater levels of stress and use more emotion-focused coping strategies. School Counsellers could also teach students who are stressed, stress management techniques so that they could learn ways to reduce their stress during an exam so they could concentrate on the content of the exam. Progressive muscle relaxation techniques and cognitive-behavioral intervention techniques, such as reducing negative self-talk, and changing mistaken beliefs, could be taught to the students to help them cope with stress. By increasing self-efficacy and learning to relax, students would feel more confident about their abilities and they would get practice coping. This way they would feel more in control of the situation and would focus more on the exam.

The results in this study indicate that success in past performance leads to future success in similar areas. Thus, teaching students how to cope with stressful situations, both academic and interpersonal, would lead to higher self-esteem and self-efficacy, which in turn, could lead to future successes. The implications being that students may remain in school longer and feel more confident in their abilities to pursue advanced education.
References


Feldman, & G. R. Elliott (Eds.), *At the threshold: The developing adolescent*. Cambridge, Mass: Harvard University Press.


APPENDIX A

Letter to Principal
Letter to Teacher
Parental Consent Form
November 22, 1997.

Dear Mr. Egglestone,

My name is Caroline Neill and I am a Master's of Education student in the Department of Educational Counselling at the University of Northern British Columbia under the supervision of Dr. Colleen Haney (Faculty of Arts, Social, and Health Sciences, phone 960-5639). The university has given me approval for my research thesis to examine Student Stress and Coping.

The purpose of my study is to explore how students think and feel before and after writing a mathematics examination. The information gathered will be used to examine stress and coping as it applies to adolescents. The participants of this study consist of approximately 100 male and female, grade 8, 9 and 10 students, enrolled in a mathematics course.

I asked the mathematics teachers to distribute letters of consent to the students for parental permission to participate in the study. The study will take approximately 15 minutes of class time.

Thank you for your support in this very important issue to improve our understanding of how students deal with stress. If you require any further information, please do not hesitate to contact me.

Sincerely,

Caroline Neill
M.Ed. Student
Faculty of Arts, Social, and Health Sciences
U.N.B.C.
Tel. 562-5710

Dr. Colleen Haney
Faculty of Arts, Social and Health Sciences
Counselling Education Program
U.N.B.C.
November 22, 1997.

Dear Teachers,

My name is Caroline Neill and I am a Master's of Education student in the Department of Educational Counselling at U.N.B.C. under the supervision of Dr. Colleen Haney (Faculty of Arts, Social, and Health Sciences, phone 960-5639). The university has given me approval for my research thesis to examine Student Stress and Coping.

The purpose of my study is to explore how students think and feel before and after writing a mathematics examination. The participants of this study will consist of approximately 100 male and female, grade 8, 9 and 10 students, enrolled in a mathematics course. Participation in this study will require parental consent for each student and we will ask the students to return their consent forms to you. The study involves the completion of questionnaires that will take approximately five minutes before the mathematics examination and ten minutes after the examination. I will collect the questionnaires and the data will be kept anonymous and confidential. The anonymous raw data will be available only to myself and my thesis Supervisor and will be shredded within five years.

Thank you for your consideration of this very important issue to improve our understanding of how students cope with stress. If you require any further information, please do not hesitate to contact me.

Sincerely,

Caroline Neill
M.Ed. Student
Faculty of Arts, Social, and Health Sciences
U.N.B.C.
Tel. 562-5710

Dr. Colleen Haney
Faculty of Arts, Social, and Health Sciences
Counselling Education Program
U.N.B.C.
Dear Parents:

A study entitled "Adolescent Appraisals and Coping Strategies" is being conducted by Caroline Neill, a Master's of Education student of the Department of Educational Counselling at U.N.B.C. under the supervision of Dr. Colleen Haney (Faculty of Arts, Social, and Health Sciences). For the purpose of this study, the students will be asked to complete questionnaires asking them about their thoughts and feelings during a mathematics exam. Your son and/or daughter is being asked to participate in this study by completing a questionnaire before and after the exam. Your child's participation in this study will not affect his/her school grades in any way.

The results of this study will be used to understand how students deal with exam stress. Your child's participation is purely voluntary and strict confidentiality will be maintained throughout this study. This means that your child does not have to participate but will do so only if you consent by signing the bottom of this form, and if your child provides consent also. Your child may withdraw from this study at any time without any penalty. Your child will not be required to write his/her name on the questionnaires, or in any other way identify him/her self in the study.

Should you have any questions about this research, you may call either Caroline Neill at 562-5710 or her Supervisor, Dr. Haney at 960-5639 at U.N.B.C.

PARENTAL CONSENT FORM

I _________________________ have read the above information and I understand the procedures to be used in this study. I also understand that my child's participation in this study is purely voluntary and can be terminated at any time upon my or my child's request without any penalty. My signature below certifies that I consent to my child's participation in this study and I acknowledge receipt of a copy of this consent form.

Name of child __________________________________ Date ____________________________

________________________________________________________ Signature of Parent/Guardian.
APPENDIX B

Tension Thermometer

Primary and Secondary Appraisal Questionnaire

Self-Evaluation Questionnaire: State-Anxiety Scale

Items on the Modified Version of the Ways of Coping Questionnaire

Modified Version of Ways of Coping Questionnaire

Demographic Questionnaire
TENSION THERMOMETER

Rate the level of stress that you are experiencing right now, at this moment.

- 10 completely tense (not relaxed at all)
- 9
- 8 very tense (only slightly relaxed)
- 7
- 6 tense
- 5
- 4 relaxed
- 3
- 2 very relaxed
- 1
- 0 completely relaxed (not tense at all)
PRIMARY AND SECONDARY APPRAISAL QUESTIONNAIRE

The purpose of this questionnaire is to gain a better understanding of how students experience exams.

PRIMARY APPRAISAL (STAKES)

In anticipating the upcoming exam, please answer the following questions.

<table>
<thead>
<tr>
<th>not at all</th>
<th>somewhat</th>
<th>moderately</th>
<th>very much</th>
</tr>
</thead>
<tbody>
<tr>
<td>so</td>
<td>so</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Is this exam important to me 0 1 2 3

SECONDARY APPRAISAL (SELF-EFFICACY/CONTROL)

2. This math exam is worth 50 marks. Please answer each question.
   On a scale of 0 to 100 how confident are you that you can successfully get:

10 marks out of 50?

(Not Confident) (Very Confident)

Write the number out of 100

20 marks out of 50?

(Not Confident) (Very Confident)

Write the number out of 100

30 marks out of 50?

(Not Confident) (Very Confident)

Write the number out of 100

40 marks out of 50?

(Not Confident) (Very Confident)

Write the number out of 100

50 marks out of 50?

(Not Confident) (Very Confident)

Write the number out of 100

3. For this mathematics exam. Please answer each question.

A. I feel in control of the exam situation: (please circle)

<table>
<thead>
<tr>
<th>not at all</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somewhat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>very much so</td>
</tr>
</tbody>
</table>

B. I feel in control of my emotions: (please circle)

<table>
<thead>
<tr>
<th>not at all</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somewhat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>very much so</td>
</tr>
</tbody>
</table>
SELF-EVALUATION QUESTIONNAIRE

Please provide the following information:

Name ___________________________ Date __________ S ______

Age ___________________ Gender (Circle) M F T ______

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate value to the right of the statement to indicate how you feel right now, that is, at this moment. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

1. I feel calm ................................................................. 1 2 3 4
2. I feel secure ................................................................. 1 2 3 4
3. I am tense ................................................................. 1 2 3 4
4. I feel strained ............................................................... 1 2 3 4
5. I feel at ease ................................................................. 1 2 3 4
6. I feel upset ................................................................. 1 2 3 4
7. I am presently worrying over possible misfortunes ................. 1 2 3 4
8. I feel satisfied .............................................................. 1 2 3 4
9. I feel frightened .......................................................... 1 2 3 4
10. I feel comfortable ...................................................... 1 2 3 4
11. I feel self-confident .................................................. 1 2 3 4
12. I feel nervous ........................................................... 1 2 3 4
13. I am jittery ............................................................... 1 2 3 4
14. I feel indecisive ........................................................ 1 2 3 4
15. I am relaxed ............................................................. 1 2 3 4
16. I feel content ............................................................ 1 2 3 4
17. I am worried ............................................................ 1 2 3 4
18. I feel confused .......................................................... 1 2 3 4
19. I feel steady ............................................................. 1 2 3 4
20. I feel pleasant ........................................................... 1 2 3 4

© Copyright 1968, 1977 by Consulting Psychologists Press, Inc. All rights reserved. STAIS-AD Test Form Y
ITEMS ON THE MODIFIED VERSION OF THE WAYS OF COPING QUESTIONNAIRE
(Folkman & Lazarus, 1988)

PROBLEM-FOCUSED COPING STRATEGIES

Confrontive Coping
* - I stood my ground and fought for what I wanted
* - I tried to get the person responsible to change his or her mind.
* - I expressed anger to the person(s) who caused the problem.
   - I let my feelings out somehow.
   - I took a big chance or did something very risky
   - I did something which I didn't think would work, but at least I was doing something.

Planful problem-solving
* - I changed something so things would turn out all right
   - I knew what had to be done, so I doubled my efforts to make things work
   - I made a plan of action and followed it
   - I just concentrated on what I had to do next - the next step
   - I drew on my past experiences when I was in a similar position
   - I came up with a couple of different solutions to the problem
   - I went over in my mind what I would do

EMOTION-FOCUSED COPING STRATEGIES

Distancing
- I made light of the situation; refused to get too serious about it
- I went on as if nothing has happened
- I didn't let it get to me; refused to think about it too much
- I tried to forget the whole thing
- I looked for the silver lining, so to speak; tried to look on the bright side of things.
- I went along with fate; sometimes I just have bad luck.
- I made myself not worry or be upset by the situation (Madden, James, & Paton, 1993).

Escape-Avoidance
- I wished that the situation would go away or somehow be over with
- I hoped a miracle would happen
- I had fantasies about how things might turn out
* - I tried to make myself feel better by eating, drinking, smoking, drugs, medication, and so forth.
* - I avoided being with people in general
* - I refused to believe that it had happened
EMOTION-FOCUSED COPING STRATEGIES, continued

Escape-Avoidance, continued

* - I took it out on other people
* - I slept more than usual

* These items were not used in the modified version of the Ways of Coping Questionnaire because they were not appropriate for an exam situation. See next page for the modified version of the Ways of Coping Questionnaire.
**MODIFIED VERSION OF THE WAYS OF COPING QUESTIONNAIRE**

Think about the math exam you have just written. Read each statement carefully and indicate, by circling the appropriate number, the extent to which you used each of the following during the exam.

<table>
<thead>
<tr>
<th></th>
<th>Did not apply or not used</th>
<th>Used Somewhat</th>
<th>Used Quite a bit</th>
<th>Used a Great Deal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I made light of the situation; refused to get too serious about it.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I knew what had to be done, so I doubled my efforts to make things work.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I went on as if nothing has happened.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I made a plan of action and followed it.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I let my feelings out somehow.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I didn't let it get to me; refused to think about it too much.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. I went over in my mind what I would do.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I just concentrated on what I had to do next - the next step.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I took a big chance or did something very risky.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I tried to forget the whole thing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11. I wished that the situation would go away or somehow be over with.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>12. I drew on my past experiences when I was in a similar position.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>13. I did something which I didn't think would work, but at least I was doing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
something.
MODIFIED VERSION OF THE WAYS OF COPING QUESTIONNAIRE, cont.

<table>
<thead>
<tr>
<th></th>
<th>Did not apply or not used</th>
<th>Used Somewhat</th>
<th>Used Quite a bit</th>
<th>Used a Great Deal</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. I looked for the silver lining, so to speak; tried to look on the bright side of things.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>15. I hoped a miracle would happen.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>16. I came up with a couple of different solutions to the problem.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17. I went along with fate; sometimes I just have bad luck.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>18. I had fantasies about how things might turn out.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. I made myself not worry or be upset by the situation.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
DEMOGRAPHIC QUESTIONNAIRE

For purposes of statistical analysis only, please answer the following questions about yourself. Your answers will remain anonymous and strictly confidential. However, this biographical data is crucial to the study.

Please answer the following questions.

1. What is your age? ______________.

2. What grade are you in? __________.

3. What is your ethnicity? Please circle the most appropriate response.
   Afro-American or Afro-Canadian
   Asian
   Caucasian
   East Indian
   First Nations
   Other (Please specify): ____________________________

4. Sex. Please circle the most appropriate response.
   Male
   Female
APPENDIX C

Table 4: Correlations of all Dependent Variables for Total Group

Table 5: Correlations for all Dependent Variables for Males

Table 6: Correlations for all Dependent Variables for Females
### Table 3.

Correlations of all Dependent Variables for Total Group (n = 100)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Age</th>
<th>Tens</th>
<th>Imp</th>
<th>SEff</th>
<th>Cont</th>
<th>SPre</th>
<th>PFC</th>
<th>Plan</th>
<th>Conf</th>
<th>EFC</th>
<th>EscAv</th>
<th>Dist</th>
<th>S-Post</th>
<th>M-gpa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tens</td>
<td></td>
<td></td>
<td>.23**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imp</td>
<td>-.03</td>
<td></td>
<td>.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEff</td>
<td>-.21*</td>
<td></td>
<td>-.29**</td>
<td>.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cont</td>
<td>-.26**</td>
<td></td>
<td>-.59**</td>
<td></td>
<td>-.07</td>
<td></td>
<td>.46**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPre</td>
<td>.23*</td>
<td></td>
<td>.74**</td>
<td></td>
<td>.08</td>
<td></td>
<td>-.44**</td>
<td></td>
<td>-.81**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>PFC</td>
<td>-.001</td>
<td></td>
<td>.09</td>
<td></td>
<td>.29**</td>
<td></td>
<td>.22*</td>
<td></td>
<td>-.03</td>
<td></td>
<td>.09</td>
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<td></td>
</tr>
<tr>
<td>Plan</td>
<td>-.12</td>
<td></td>
<td>.05</td>
<td></td>
<td>.25**</td>
<td></td>
<td>.34**</td>
<td></td>
<td>.11</td>
<td></td>
<td>-.05</td>
<td></td>
<td>.89**</td>
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<td></td>
<td>.12</td>
<td></td>
<td>.18</td>
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<td>.31**</td>
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<tr>
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<td>-.06</td>
<td></td>
<td>-.02</td>
<td></td>
<td>.35**</td>
<td></td>
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<tr>
<td>EscAv</td>
<td>.19*</td>
<td></td>
<td>.27**</td>
<td></td>
<td>.10</td>
<td></td>
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<td>.51**</td>
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<td>Dist</td>
<td>-.15</td>
<td></td>
<td>-.35**</td>
<td></td>
<td>.003</td>
<td></td>
<td>.09</td>
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<td>.17</td>
<td></td>
<td>-.32**</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>SPost</td>
<td>.28**</td>
<td></td>
<td>.47**</td>
<td></td>
<td>-.003</td>
<td></td>
<td>-.39**</td>
<td></td>
<td>-.56**</td>
<td></td>
<td>.67**</td>
<td></td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>M-gpa</td>
<td>-.30**</td>
<td></td>
<td>-.27**</td>
<td></td>
<td>.04</td>
<td></td>
<td>.56**</td>
<td></td>
<td>.38**</td>
<td></td>
<td>-.38**</td>
<td></td>
<td>-.07</td>
<td></td>
</tr>
<tr>
<td>Test</td>
<td>-.02</td>
<td></td>
<td>-.19*</td>
<td></td>
<td>-.003</td>
<td></td>
<td>.49**</td>
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<td>.32**</td>
<td></td>
<td>-.29**</td>
<td></td>
<td>-.01</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Tens=Tension; Imp=Importance; SEff=Self-Efficacy; Cont=Control; SPre=State-Anxiety before the test; PFC=Total Problem-Focused Coping; Plan=Planful Problem-Solving; Conf=Confrontive Coping; EFC=Total Emotion-Focused Coping; EscAv=Escape-Avoidance Coping; Dist=Distancing; S-Post=State-Anxiety following the exam; M-gpa=Math GPA; Test=Test score on Math exam.

* p < .05; ** p < .01.
Table 4.

Correlations of all Dependent Variables for Males (n = 43)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Age</th>
<th>Tens</th>
<th>Imp</th>
<th>SPre</th>
<th>SEff</th>
<th>Cont</th>
<th>PFC</th>
<th>Plan</th>
<th>Conf</th>
<th>EFC</th>
<th>EscAv</th>
<th>Dist</th>
<th>SPost</th>
<th>M-gpa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tens</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imp</td>
<td>.02</td>
<td>-.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
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Note. Tens=Tension; Imp=Importance; SEff=Self-Efficacy; Cont=Control; SPre=State-Anxiety before the test; PFC>Total Problem-Focused Coping; Plan=Planful Problem-Solving; Conf=Confrontive Coping; EFC>Total Emotion-Focused Coping; EscAv=Escape-Avoidance Coping; Dist=Distancing; S-Post=State-Anxiety following the exam; M-gpa=Math GPA; Test=Test score on Math exam.

* p < .05; ** p < .01.
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