

THE EFFICACY OF TEACHING RELAXATION TRAINING
IN A PREVENTIVE CONTEXT
TO GRADE EIGHT STUDENTS

by

Boelle Ione Kirby

B. A. (Cum Laude), Augustana College, 1974

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS (EDUCATION)
in the Faculty
of
Education

© Boelle Ione Kirby, 1986

SIMON FRASER UNIVERSITY

June, 1986

All rights reserved. This work may not be
reproduced in whole or in part, by photocopy
or any other means, without permission of the author.

APPROVAL

Name: Boelle Ione Kirby
Degree: Master of Arts (Education)
Title of Thesis: The Efficacy of Teaching Relaxation Training
in a Preventive Context to Grade 8 Students

Examining Committee

Chairperson: A. Horvath

B. A. Hiebert
Senior Supervisor

R. W. Marx
Member

P. Wilensky
Sessional Instructor
Faculty of Education
Simon Fraser University
Burnaby, B. C. V5A 1S6
External Examiner

Date approved June 24 1986

PARTIAL COPYRIGHT LICENSE

I hereby grant to Simon Fraser University the right to lend my thesis, project or extended essay (the title of which is shown below) to users of the Simon Fraser University Library, and to make partial or single copies only for such users or in response to a request from the library of any other university, or other educational institution, on its own behalf or for one of its users. I further agree that permission for multiple copying of this work for scholarly purposes may be granted by me or the Dean of Graduate Studies. It is understood that copying or publication of this work for financial gain shall not be allowed without my written permission.

Title of Thesis/Project/Extended Essay

THE EFFICACY OF TEACHING RELAXATION TRAINING IN A PREVENTIVE

CONTEXT TO GRADE 8 STUDENTS

Author:

(signature)

Boelle Ione Kirby

(name)

Aug. 6, 1986

(date)

ABSTRACT

Much of the research on stress suggests that one of the main problems associated with stress is the lack of appropriate individual coping strategies. A further area for concern is the effect of stress on children and adolescents. Rather than waiting for young people to acquire maladaptive behavioural and attitudinal patterns which could almost guarantee the likelihood of their being subject to stress-related disorders as adults, the school could offer stress management as an educational resource to all students. This study was designed to investigate the feasibility of teaching relaxation training within a secondary school setting in a preventive context. It addressed the effect of learning relaxation skills on self-concept, anxiety level, and stress-related symptoms, as well as the feasibility of teaching the relaxation skills within the classroom. The field test included 44 treatment subjects and 35 control students from Grade 8 Guidance classes. Treatment consisted of a 4-week Progressive Relaxation training program with instruction provided by the regular guidance teachers. Students in the control group did a career education unit. The results of the study showed no significant Group \times Time interaction effects favouring a positive effect for the treatment. Significant reductions in stress-related symptoms were found for both groups. Analyses of home practice logs indicated students were able to relax at the start of the study, but this ability did not increase with training. Subjective reports by students indicated widespread use of relaxation in home and school situations. Discussion pertains to use of more appropriate research design and dependent measures for evaluating long-term benefits of preventive programs.

ACKNOWLEDGEMENTS

My appreciation and thanks go to my husband Paul for his reassurance and perseverance. In addition, Dr. Bryan Hiebert offered his expertise, both in the subject and in the preparation of this study. Dr. Ron Marx gave challenging suggestions. My colleagues Marion McLean and Jeffrey Chang offered their assistance, as did other Simon Fraser University faculty, who cannot all be named here. My thanks also to my friends and family for their encouragement.

TABLE OF CONTENTS

TITLE PAGE.....i

APPROVAL.....ii

ABSTRACT.....iii

ACKNOWLEDGEMENTS.....iv

TABLE OF CONTENTS.....v

LIST OF TABLES.....vii

CHAPTER

1. INTRODUCTION.....1

 The Problem: Lack of Coping Strategies.....1

 The Rationale: A School-based Coping Skills
 Training Program.....2

 Overview.....4

2. LITERATURE REVIEW.....5

 The Nature of Stress.....5

 Stress in Adolescents.....10

 Stress Control.....15

 Effects of Relaxation Training.....21

 Conclusion and Research Questions.....23

3. METHODOLOGY.....25

 Sample.....25

 Dependent Measures.....26

 Procedure.....31

4. RESULTS.....36

 Missing Data.....36

 Data Analysis.....36

 Question 1.....36

Question 2.....	39
Question 3.....	39
Question 4.....	40
Additional Findings.....	42
Summary.....	47
5. DISCUSSION.....	49
Summary and Interpretation of Results.....	49
Limitations and Future Directions.....	54
Summary.....	57
APPENDIX A.....	59
APPENDIX B.....	60
APPENDIX C.....	61
APPENDIX D.....	62
APPENDIX E.....	74
APPENDIX F.....	86
APPENDIX G.....	87
APPENDIX H.....	88
APPENDIX I.....	89
APPENDIX J.....	90
APPENDIX K.....	91
APPENDIX L.....	92
APPENDIX M.....	93
REFERENCES.....	94

LIST OF TABLES

TABLE

1. Demographic Characteristics of Grade 8 Students.....27
2. Means and Standard Deviations of Self Description Questionnaire, Academic and Non-Academic Scores; Symptoms of Stress Inventory Total Score; and State-Trait Anxiety Inventory, S- and T-Scales.....37
3. Treatment Group Means and Standard Deviations for Self-Monitored Physiological Indicators Over Four Week Program.....41
4. Means and Standard Deviations for Self Description Questionnaire, Academic and Non-Academic Scores; Symptoms of Stress Inventory Total Score; State-Trait Anxiety Inventory, S- and T-Scales; Grouped According to Teacher.....43
5. Means and Standard Deviations for Self Description Questionnaire, Academic and Non-Academic Scores; Symptoms of Stress Inventory Total Score; State-Trait Anxiety Inventory, S- and T-Scales; Grouped According to Sex...45

CHAPTER 1

INTRODUCTION

The purpose of this study was to explore the possibility that stress management could be included as a curricular unit for instruction in the secondary school setting. In this chapter, a statement of the problem is provided, followed by a rationale for teaching stress management within a preventive context to adolescents. Finally, an overview of the balance of the study is presented.

The Problem

The word "stress" is achieving household use status in society, media, and research (Altmaier, 1983; Dobson, 1982; Hackett & Lonborg, 1983; Selye, 1983). An increasing variety of studies investigates the effects of chronic stress on mental, emotional, and physical health; on work, on personality, and on learning (Cooper, 1983; Dobson, 1982; Elliot & Eisdorfer, 1982; Garmezy & Rutter, 1983; McGuigan, 1980). Much of this research suggests that one of the main problems associated with stress response is the lack of appropriate individual coping strategies (Hackett & Lonborg, 1983; Hiebert, 1983; Meichenbaum & Turk, 1976). As a result, an abundance of articles, special programs, research, treatment interventions, and books featuring stress management topics have been published. Most research has been directed towards specific clinical populations and disorders (Deffenbacher & Shelton, 1978; Dobson, 1982; Feindler & Fremouw, 1983; Hillen-berg & Collins, 1982; King, 1980; Meichenbaum & Jaremko, 1983; Omizo, 1980; Richter, 1984; Stout, Thornton, & Russell, 1980). However, there is some current concern for a focus on prevention.

As information increases about stress, stress-related disorders, and the efficacy of various stress control strategies, it is appropriate to begin to use this knowledge in the preparation and implementation of preventive programs.

A further area for concern is the effects of stress on children and adolescents. Eisen (1979) estimates that "20% of the child population is negatively affected by biological (e.g., chronic disease) and psychological (e.g., divorce) stressors, but a much greater number by stressors which might be termed social, economic, and cultural" (p. 81). Furthermore, for adolescents the transition period of their development adds extra pressures: values conflicts, ambiguity of position and roles, peer pressure, and an unpredictable political, economical, and social future (Chandler, 1982; Garbowsky, 1984; Richardson, Beall, & Jessup, 1983). Whether children today experience more stress than those before them is a debatable issue; what can be seen is that stressors today are different, and that some children lack the support and security which give them greater options and resources for coping (Chandler, 1982; Garbowsky, 1984; Reed & Saunders, 1984). Therefore, as these problems increase, programs and field tests are needed to address the various issues related to stress in children and teenagers (Gullotta, 1983; Ladoucer & Armstrong, 1983; Pfohl, 1979; Ragan, 1984; Richardson, Beall, & Jessup, 1983; Stout, Thornton, & Russell, 1980).

The Rationale

This study was designed to field test a progressive relaxation curriculum within a secondary school setting. Since high schools already are seen to be in the business of preparing young

people to live effectively as adults, a course having the potential to effect changes in health, performance, attitudes, and lifestyle in order to produce long term advantages would be most timely and appropriate (Sylwester, 1983; Zaichkowsky & Zaichkowsky, 1984). Rather than waiting for young people to assimilate and practice maladaptive behavioral and attitudinal patterns which could almost guarantee the likelihood of their being subject to stress-induced disorders as adults (Elkind, 1981; Hiebert, 1983; Hiebert & Eby, 1985; Pfohl, 1979; Ragan, 1984; Thoreson & Eagleston, 1983; Zaichkowsky & Zaichkowsky, 1984), the school could offer stress management as an educational resource available to all students (Thoreson & Eagleston, 1983). This curriculum could be presented as a separate course (Richardson, Beall, & Jessup, 1983; Zaichkowsky & Zaichkowsky, 1984), or as a unit within existing courses. Subject areas of courses such as English, social studies, guidance, and physical education would be suited naturally for instituting a preventive stress control curriculum (Frederick, 1980; Hiebert & Eby, 1985; Williams, 1980).

An additional advantage of a stress management course could be the effect it might have on the relationship between anxiety and academic performance and persistence, cognitive learning, and test performance (Martuza & Kallstrom, 1974; Stout, Thornton, & Russell, 1980; Volpe, 1975). Volpe (1975) maintains that by teaching some form of stress management, educators would be reducing impediments to learning that may occur as a result of anxiety reactions.

Overview

Chapter 1 has presented the problem and rationale for this study. In chapter 2, a review of the literature in the areas of stress and stress management for children and adolescents is undertaken. Chapter 3 includes a description of the sample, the dependent measures, and the procedure for the implementation of the program investigated in this study. The results are presented in chapter 4, and in chapter 5, the study and the results are discussed and evaluated. Suggestions for future research and potential alterations on this program are also included in the fifth chapter.

CHAPTER TWO

LITERATURE REVIEW

This chapter contains five sections. In the first section, a conceptual framework for understanding the interactive nature of stress is presented. In the next section, the symptoms and effects of stress in adolescents are discussed, and the influence of education and society on teenagers' stress is considered. Stress control is the focus of section three, with attention given to techniques and programs directed towards adolescents, particularly those programs using progressive relaxation. In the fourth section, the concentration is on effects of relaxation programs. The chapter concludes with the research hypotheses underlying this study.

The Nature of Stress

In this section, an interactional definition of stress is offered, and the physiological, cognitive, and behavioural components of stress is explored. The distinction between demand, stressor, and stress response is discussed, as is the role of coping and perception.

Definition of Stress

Various theorists have attempted to conceptualize stress in terms of a stimulus (environmental event), and individual response, or the "perceived environment" (interaction between environment and personal response); (Hiebert, 1985; Kasl, 1984; Magnusson, 1982). For the purpose of this paper, an interactional definition is used, involving external or internal demands, personal coping resources available, and people's perceptions of the stressor and their coping resources (Dobson, 1982; Hiebert,

1983; Holroyd, Appel, & Andrasik, 1983; Lazarus, 1974; Meichenbaum & Cameron, 1983; Thoreson & Eagleston, 1983). Powell and Eagleston (1983) define stress as a set of cognitive, behavioural, and physiological responses when there is a perceived imbalance between external or internal demands and an individual's available resources. Almost all interactional theories (Cox, 1978; Hiebert, 1983, 1985; Kasl, 1984; Lazarus, 1974; Magnusson, 1982) agree that the focal point of the definition is the interaction between individuals' perception of the demand and their coping resources (Dobson, 1982; Hiebert, 1983; Holroyd et al, 1983; Lazarus, 1974; Meichenbaum & Cameron, 1983; Thoreson & Eagleston, 1983). That is, there is a cognitive appraisal of the situation together with an evaluation of the person's ability to cope (Hiebert, 1983). An individual's judgment of personal capabilities influences thought patterns, physiological reactions, and behavioural transactions (Bandura, 1982).

In the previous definition of stress, three aspects are included which are important to explain: response, demands, and coping resources.

The Stress Response

The stress response is a complex set of reactions incorporating three components: physiological, cognitive, and behavioural. These are not considered as independent domains, but rather are interconnected, i.e., when one is affected, the others are also involved (Hiebert, 1983; Powell & Eagleston, 1983).

The physiological component is best described by Cannon's (1953) "fight or flight" response and consists of various factors indicating heightened arousal: increased heart and respiration

rate, increased muscle tension and endocrine secretion, decreased blood flow to the stomach and peripheral skin temperature (Hackett & Lonborg, 1983; Hiebert, 1983, 1985).

The cognitive component of the stress reaction consists of the mental evaluation of the degree of threat inherent in the stressor, and the appraisal of the coping resources available (Hackett & Lonborg, 1983; Hiebert, 1983; Holroyd et al, 1983; Meichenbaum & Cameron, 1983). During the course of the stress response, negative statements regarding the magnitude of the stressor, the adequacy of a person's coping resources, and judgments of personal worthiness and abilities can escalate the other components (Jaremko, 1983; Meichenbaum, 1977).

The behavioural component involves the manner in which a person acts while experiencing the stress reaction, e.g., stuttering, tremors, tics, hyperactivity (Chandler, 1982; Hiebert, 1983; Thoreson & Eagleston, 1983).

Demands and Stressors

Demands are placed on people through situations and expectations; these are referred to as either pressures or stressors (Hiebert, 1983, 1985). Demands may be environmental, internal, or external and do not necessarily lead to a stress reaction. Demands that result in a stress response, through the cognitive mediating of inability to cope or misinterpretation, are called stressors (Hackett & Lonberg, 1983; Hiebert, 1983; Thoreson & Eagleston, 1983). Demands that do not give rise to a stress response are called pressures (Hiebert, 1985). Because of the individuality of people's perceptions of stressors, the same demands might stimulate a stress response in one person, while

another might experience no stress (Hiebert, 1983; Holroyd et al, 1983; Kagan, 1983; Thoreson & Eagleston, 1983; Williams, 1980). In addition, there are a number of individual variables which can affect whether or not a demand becomes a stressor. Some of these are: age, heredity, repertoire of skills, values and goals, developmental levels (cognitive and lifestage), familial and social support systems, state of health, amount of sleep, and learning and coping history (Hackett & Lonborg, 1983; Hiebert, 1983; Patterson, 1983; Rutter, 1983; Williams, 1980).

One other issue to address when referring to stressors and the stress response is the difference between transitory and chronic stress (Hiebert, 1983). Most people experience stressors daily, are able to handle them adequately, and their stress reaction returns to normal functioning. This is referred to as transitory stress. "Coping with some stress undoubtedly builds character, prompting the person to enhance and develop resources for responding" (Thoreson & Eagleston, 1983, p. 55). When the stress response continues with frequency, intensity, and persistence, a chronic state is said to be present (Hiebert, 1983). In fact, Thoreson and Eagleston (1982) have added a few words to the original definition to define chronic stress as "the style of a person, over time, resulting from a perceived imbalance between demands and resources to meet demands, coupled with inadequate responses by the person to cope with the demands, " (p. 49). Many physical, mental, and behavioural disorders are related to chronic stress. Some of these include: peptic ulcers, colitis, hypertension, asthma, tension and migraine headaches, skin disorders (Dobson, 1982; Hiebert, 1983; Holroyd et al, 1983);

depression, hopelessness, guilt, eating disorders, chemical dependency (Dobson, 1982; Holroyd et al, 1983); aggression, social withdrawal, hyperactivity (Chandler, 1982; Hiebert, 1983; Thoreson & Eagleston, 1983).

Coping

It has been noted that the ways people cope with stress may be more important in determining stress responses than the type, frequency, and severity of stressors (Holroyd et al, 1983; Rutter, 1983). Coping refers to "efforts, action-oriented (or indirect) and/or intrapsychic, to manage (perceived) environmental and internal demands and conflicts among them, which (are perceived to) tax or exceed a person's resources" (Rutter, 1983, p. 311). Some of these efforts may be information seeking, direct action, inhibition of action (avoidance), or those responses involving cognitive processes or statements (Lazarus & Launier, 1978). It is difficult to separate the concepts of coping, cognitive appraisal, self-esteem, and self-efficacy, as they are all inter-related in actual practice (Bandura, 1977, 1982; Williams, 1980). People may see themselves as more competent because they coped well in previous attempts, and thus have positive expectations about being able to handle the next demand (Dobson, 1982). However, when people have little confidence in their abilities to cope successfully, the negative appraisal of their coping resources will serve to heighten their stress response. Janis (in Williams, 1980, p.21) noted that "an individual's basic attitude of self-confidence about coping could be severely shaken by an accumulation of ...stresses over a long period of time" thereby leading to negative self-concept and lack

of alternatives with which to cope (Dobson, 1982; Williams, 1980).

Summary

Stress has been conceptualized as interactional, involving a multidimensional response that results from a perceived imbalance between demands and the resources available for coping with the demands (Dobson, 1982; Hackett & Lonborg, 1983; Hiebert, 1985; Lazarus & Launier, 1978; Powell & Eagleston, 1983). When the response persists, the susceptibility to various disorders is increased.

Stress in Adolescents

The purpose of this section is to provide a background for understanding the adolescent and stress. Various potential stressors are presented in terms of society and family, education, and a developmental perspective. The effects of stress are discussed regarding achievement, behaviour disorders, self-concept, and physiological symptoms.

Potential Stressors

A recent survey of 3600 Canadian teenagers revealed that their most pressing social problems have to do with personal survival -- unemployment, abuse, crime, sexual assault, suicide, drugs, and alcoholism (Bibby & Posterski, 1985). The major personal concern of Canadian teenagers is what will they do after high school. This concern probably reflects their general uncertainty about their economical, political, and personal future (Bibby & Posterski, 1985). "Students tend to experience more stress if they consider they have little control over their lives or that powerful others or chance factors control their

destinies" (Dobson, 1982, p.347). On the other hand, teenagers are also confronted with the broadest range of choices of any generation (Garbowski, 1984). Whereas in the past limited options were available, today young people must make decisions about nearly everything. There is more information addressing previously "tabooed" subjects -- sexuality, suicide, abuse, alcoholism, divorce, prostitution (Elkind, 1981). Another survey by the Robert Johnson Company (1980) found that the third highest influence in adolescents' lives (after friends and parents) was the media (T.V., radio, records, and cinema). The resultant information overload contributes and influences young people's difficulties in decision making. These are all potential stressors with which teenagers are being presented by society in general.

The family arena is another source of potential stressors. As increasing numbers of families are headed by single parents, adolescents are exposed to "grow up quickly" expectations. These parents look to older children for emotional support, for help with raising the other kids and keeping the house while the parent is working (Elkind, 1981).

Education accounts for additional potential stressors. The change in school format can be extremely disorienting -- going from a basically one teacher, one class elementary school structure to many classes and rotating teachers in secondary school, where the emphasis is more on imparting knowledge than on personal learning and growth (Gullotta, 1983). The educational system teaches students to seek higher grades and achievement, without teaching ways of coping with these potential stressors

(Bird, Cripe, & Morrison, 1980).

Adolescents encounter demands as they move into new developmental stages. Kasl (1983) argues that life events reflect a person's stage in the developmental life cycle; the young are 22.5 times as likely to report 5 or more stressful environmental/physical/relational changes in one year as those 30 or older. Much has been written recently regarding the potential stressors associated with life events, and what makes some youths experience severe stress reactions, while others appear to cope quite well (Forman, Eidson, & Hagan, 1983; Hackett & Lonborg, 1983; Kasl, 1983; Powell & Eagleston, 1983; Schafer, 1978).

Young people are at a transition point in the life cycle and experience this uncertainty in almost all areas: biological and physical, cognitive, and social roles (Richardson, Beall, & Jessup, 1983). They experiment with roles and values and experience the ambiguity of their position. The contradictions of the demands of the child-adult state are their way of life (Chandler, 1982). LeBow (1975) reports that moving from junior high to high school, and leaving school altogether are two transition points that are potential stressors and that other events can be perceived as more stressful around these transition points.

Effects of Stress

When any of the previously mentioned demands are encountered by young people and are perceived as threatening and unable to be handled successfully, stress responses will follow along cognitive, behavioural, and physiological components. These reactions are not limited to a specific component; indeed, most responses involve multidimensional indicators. However, for the purpose

of reviewing the literature, the effects of stress are grouped according to cognitive, behavioural, and physiological categories.

Cognitive responses. Maladaptive cognitive stress responses may be evidenced through learning problems, test performance, academic achievement, and self-esteem (Martuza & Kallstrom, 1974). Volpe (1975) argues that distraction disturbs the learning process, and the most disturbing distraction is anxiety. As well, attention and concentration problems are associated with academic underachievement. Not only do low achievers experience more anxiety, but they lack the persistence to continue trying in an area they perceive as having little success for them (Williams, Decker, & Libassi, 1983). A specific academic stressor that has more implications in view of our increasingly technological society is math anxiety (Bander, Russell, & Zamostny, 1982). As math and science requirements in high school become stiffer and more comprehensive, extra pressure is put on students to perform at higher levels. Additionally, test anxiety is an ever-present stress response to the demand to beat the competition and perform, from which large numbers of the nonclinical population suffer (Barrios & Shigetomi, 1979).

Self-esteem is a topic which has already been mentioned as being affected by stress. The relationship between low self-esteem and academic performance has been reported in various studies (Scheirer & Kraut, 1979; Stanton, 1982; Thomas, 1980; Williams, 1980; Williams et al, 1983; Yadusky-Holahan & Holahan, 1983). The opinions of significant others (friends, family, and teachers) often are perceived negatively (disapproval or

rejection) producing lower self-esteem (Williams, 1980), especially at a time when teenagers tend to have a less stable self-image (Garbowsky, 1984; Gullotta, 1983).

Behavioural responses. Behavioural responses by adolescents to stress are those resulting behaviours associated with the physiological "fight or flight" response (Cannon, 1953). Recently, more research is pointing towards a connection between the type A behaviour of parents and the same elements of type A behaviour (competitive, demanding, highstrung) in their children (Blumenthal, Jesse, Hennekens, Klein, Ferver, & Gourley, 1975). Other inappropriate behaviours have been categorized in response to "fight" (fighting, stealing, vandalism) or "flight" (social withdrawal, failing, skipping school, depression, eating disorders, suicide, and chemical abuse); (Schultz & Heuchert, 1983; Sylwester, 1983).

Physiological responses. Physiological responses to stress stem from continued arousal of the characteristics of the "fight or flight" response. Some disorders commonly associated with the physiological response include headaches, abdominal pain, and insomnia (Garbowski, 1984). Additionally, there may be a physiological link between type A parents and their children (higher levels of cholesterol and body weight), thus exposing a potential risk factor towards coronary artery disease (Blumenthal, Jesse, Hennekens, Klein, Ferver, & Gourley, 1975; Elkind, 1981).

Summary

Being at transition points in most areas of their life cycle, adolescents experience the ambiguity of the child-adult state along with the social and educational stressors which are

concurrent with this state. Teenagers who respond to stressors inappropriately react with academic performance deficiencies, behaviour disorders, self-concept problems, and physiological symptoms that are warning signals of potential stress-related diseases. Because these teenage years can be "proving grounds" for how the adolescent will manage as an adult, it seems appropriate to offer instruction in appropriate ways of coping with present and future stressors. Examples of stress control models are presented in the next section.

Stress Control

In this section, stress and stressor management is differentiated. Stress management strategies for coping through the behavioural and cognitive components of the stress response are mentioned. However, more emphasis is given to coping through the physiological mode, specifically with relaxation training. Various suggestions are presented for utilizing stress management in the schools.

Stressor Management

One approach for controlling stress is referred to as stressor management. The goal of this approach is to reduce demand in order to avoid a stress reaction. This method takes into account the degree to which the person can utilize environmental control. If possible, the person can reduce demand by leaving the stressful situation, or changing organizational or physical structures that pose potential stressors. Another way of controlling stress is to identify the stressor as being a skills deficit, and to implement a skills training program (e.g., time management, parenting, problem solving, assertiveness, or

study skills; Hiebert, 1983).

Stress Management

The other approach in coping with stress is through stress management, in which the reaction that a person has to a stressor is changed. This change may be directed toward one of the different components of the stress reaction (behavioural, cognitive, or physiological), or may involve a combination of component strategies. Generally, a change in one mode will produce changes in the others (Hiebert, 1983).

Cognitive strategies attempt to substitute a positive, accurate appraisal of the threat or demand, as well as supportive statements regarding the person's resources for coping with the stressor (Hiebert, 1983; Meichenbaum & Jaremko, 1983).

Methods dealing with the behavioural component seek to alter the stress reaction by introducing an alternate, competing response (Hiebert, 1983). Instead of trying not to do something, the person is encouraged to do something differently; for example, slowing the pace of eating, working, or playing instead of engaging in typical type A behaviours.

Physiological approaches to coping with stress involve developing a physiological response that is incompatible to the reactions of the fight or flight response (Hiebert, 1983). Most of these utilize some form of relaxation as the incompatible response, and require regular practice in order to acquire and maintain skill at relaxing (Hiebert, 1983). Progressive Relaxation (Jacobson, 1938); Autogenic Training (Dobson, 1982); transcendental meditation (Denniston & McWilliams, 1975); Biofeedback Training (Brown, 1974); and Benson's Relaxation

Response (Benson, 1975) are examples of physiological-based strategies. Two shortened relaxation procedures which are of interest to this study are cue-controlled relaxation and differential relaxation (Barrios & Shigetomi, 1979; Hiebert, 1980; King, 1980). These last two techniques as well as progressive relaxation are examined in greater detail below.

Progressive Relaxation. Relaxation training has been referred to as the "behavioural aspirin" (Hillenberg & Collins, 1982) because of wide usage both as a single treatment and as the core of other treatment programs (Paul, 1980). The ultimate goal of progressive relaxation is to increase the ability to identify, and then eliminate, tension. The skill can then be used to maintain lower levels of physiological activity in general, and in response to environmental stressors in particular (Borkovec & Sides, 1979). The strategy is based on the correlation between stress and muscle tension (Dobson, 1982) and utilizes two principles (Williams, 1980):

1. learn to recognize the state of tension, how muscles feel when tensed;
2. contrast the tension sensation with the state of elimination of tension, how muscles feel when relaxed.

The individual learns to discriminate sensations linked with relaxation and tension, and to use these cues to help achieve control in a variety of situations. It is easier to identify muscle tension than a chronic state of heightened tension, where the physical sensations are not easily recognizable (Lynn, Rhue, & Freeman, 1980). Relaxation is most effective when seen as an active skill that improves with regular practice, which can be

applied to daily situations (Paul, 1980; Shearer & Pass, 1979).

Cue-Controlled Relaxation. Once the relaxation procedure has been learned, a self-produced cue is repeated at the end of the relaxation sequence in order to make the association between the cue and the relaxed state (Martin & Hiebert, 1982). This pairing is practiced until the cue itself elicits the relaxation response (Hiebert, 1983). The user can then employ the cue whenever an increase in arousal level is perceived.

Differential Relaxation. Another use of the initial relaxation training is differential relaxation. The basic principle is to relax selectively various parts of the body which are not in active use, thus allowing for relaxation in some parts of the body during the day (Hiebert, 1980). After skill has been developed in differentiating the muscles to be relaxed, this skill can be used to focus on relaxing chronic tension spots.

Methodology in Research on Stress

There are methodological considerations that must be addressed following a review of studies of relaxation training. Hillenberg and Collins (1982) analyzed studies utilizing relaxation training as the specific technique, evaluating numerous variables: number of sessions, home practice, target problem, and outcome.

Number of sessions. Hillenberg and Collins (1982) noted a relationship between the number of sessions of training and the effectiveness of the program. Generally, the training is most effective when taken over 4-6 sessions. Those studies that found no decrease in stress levels comparing the treatment group with the control averaged only two sessions.

Mode of instruction. Of the 69 studies reported, almost half used live instruction, and half used taped instruction. Although it has generally been found that live instruction is superior (Borkovec & Sides, 1979) when compared to audiotape, there are still significant effects for taped relaxation training instructions when compared to other treatment approaches.

Skills practice. Hillenberg and Collins (1982) noted that 60% of the studies utilized skill practice, while 40% did not. This is surprising, considering the emphasis on the practice of skills for improvement (Borkovec, Grayson, & Cooper, 1978; Day & Sadek, 1982; Suinn, 1983). Two studies assessed the effect of relaxation training on adolescent behavior problems (Mead, 1976; Wright, 1978), but the participants just listened to the tapes; there was neither instruction in the use of relaxation nor opportunity to practice. Not surprisingly, no effects on anxiety were reported. In another study (Peters, Benson, & Porter, 1977), the average practice was 3-5 times per week, with additional practice not associated with additional change; but less practice was associated with less change.

Evaluation of practice. One problem in evaluating practice is the lack of reliability of most assessment tools. Most studies reviewed by Hillenberg and Collins (1982) had no type of compliance assessment. Taylor, Agras, Schneider, and Allen (1983) found that self-report of practice was generally over-reported, and subject to therapist demand. Their method for ascertaining the reliability of self-report data was to install a device in the tape recorder which monitored every time the tape was used. Hiebert, Dumka, Cardinal, & Marx (1983) utilized mon-

itoring logs to record heart rate, respiration rate, and finger temperature which not only provided physiological data indicating that participants acquired the skills, but also served as a type of compliance report.

Summary

Stressor management attempts to reduce the demands potentially eliciting the stress response, while stress management involves a change in the coping reaction to the stressor. Most interventions for stress management are categorized by the components of the stress response: physiological, behavioural, and cognitive. Physiological strategies centre on utilizing the practice of relaxation to interfere with the arousal response. Three techniques investigated in this study were progressive relaxation, cue-controlled relaxation, and differential relaxation.

Stress Control in the School

Elliot and Eisdorfer (1982) conceptualized schools as social organizations by referring to them as "people-processing institutions" (p.98). A function of the school is to prepare adolescents to function as useful members of society. This task includes instruction in coping with present and future stressors. If children do not learn to cope in school, they may experience problems as adults. If they do learn early in life, they can experience an "immunization" effect of coping that can enable them to consistently handle the demands of adulthood in healthy ways (Pfohl, 1979).

Thoreson and Eagleston (1983) state that the first step in stress management in schools is to get information to the adoles-

cents and children, and to help these young people be aware of their stressors and resources. Thoreson and Eagleston (1983) add that more than just information is required -- children need skills training in mental and physical relaxation with the opportunity to practice.

There are several good reasons for the selection of progressive relaxation as an initial stress control strategy in the school (Day & Sadek, 1982; Heibert & Eby, 1985; Williams, 1980).

1. It is simple to learn and practice.
2. It requires little apparatus.
3. It can be taught by counsellors in guidance classes, or by regular classroom teachers trained in the basic curriculum (with audiotapes), with the back-up of the counsellor.

If the school administration is motivated enough to change the general school environment, various aspects of stressor management could also be put into practice: change testing formats and curriculum design; reschedule classes, restructure or redesign some school environments for better physical space, lighting, and noise control (Deffenbacher & McKinley, 1983; Sylwester, 1983).

Effects of Relaxation Training

The purpose of this section is to examine the effects of various programs instituted in the school setting incorporating relaxation training. Although studies have been conducted with adult and university populations, for the purposes of this paper only studies with public school populations are cited.

Academic Performance

General performance. The main arena that relaxation training programs have focused on has been academic performance. Ladoucer and Armstrong (1983) assessed a multi-component program for helping students entering high school "at risk." Study skills and relaxation training were offered for 10, 50-minute sessions. A significant improvement in treatment group grades over the untreated control group was reported. No component analysis was done in this study, but one by Williams et al, (1983) evaluated a relaxation training-study skills group and a study skills only group over seven sessions. The relaxation component seemed to be the superior treatment, especially at the 8 week follow-up, when the study skills plus relaxation group demonstrated significantly higher academic performance and lower stress levels than the study skills group alone.

Specific subjects. Academic performance in reading and writing was significantly enhanced by a 6 week, 30 minute/week relaxation training program (Stout, Thornton, & Russell, 1980). A German study (Elle & Vagt, 1975) with progressive relaxation showed no significant reduction on test and social anxiety, but there were significantly improved scores on intelligence and concentration tests. Bander et al (1982) reported rather significant research on a comparison of cue-controlled relaxation, study skills, and a combined group. They tested for effects on math performance and anxiety, digit symbol performance, and general test anxiety. The combined group was significantly higher on three out of four measures; at the three week follow-up, the relaxation group was superior on all measures. The authors

hypothesize that relaxation skills are more generalizable, therefore affording more opportunities for practice.

Self-Concept

Several studies have already been noted to demonstrate that long-term stress can have a negative effect on self-concept (Bandura, 1982; Dobson, 1982; Williams, 1980). Ballenger (1979) found that self-concept was enhanced by relaxation training with students in grades 6-8. In a study by Stanton (1982), relaxation training was combined with imagery and self-control suggestions. Because a sense of being able to be in control is related to positive self-esteem, Stanton measured only whether the students felt more in control. At post-test, the treatment group reported significant gains in feeling in control, which were reported to be even higher at the 12-month follow-up.

Stress Response

Relatively few studies have investigated the effects of relaxation training on stress responses. Richardson, Beall, and Jessup (1983) took physiological measures in addition to cognitive measures in their study of high school students. The results demonstrated a significant reduction in the physiological stress response, as well as higher performance on the cognitive test. A six-week relaxation training program by Zaichkowsky and Zaichkowsky (1984) measured state anxiety, heart rate, respiration rate, and peripheral skin temperature. The experimental group of adolescents showed significant, positive results on all measures. There was no follow-up testing. In a study conducted through an English class, Hiebert and Eby (1985) field tested a potential preventive stress management curriculum

that could be taught by a regular classroom teacher. Reductions in state-trait anxiety and most stress symptoms were significant.

Conclusion

Since schools are oriented toward equipping students with the skills to function in society, it might be helpful to include relaxation training as the "Fourth R" after "reading, 'riting, and 'rithmetic." It has been demonstrated that adolescents experience stress over a broad spectrum of societal, familial, and educational contexts. For the most part, young people's coping responses are inadequate and haphazard, and do not offer the kind of resources with which to continue to cope with the demands of emerging adulthood. Stress management can be taught to effect general and specific responses, and can be effective both in a restorative and preventive context.

The purpose of this study was to investigate the effectiveness of a progressive relaxation training program offered at the grade eight level. The following questions served as a foundation for the research:

1. What effect does learning progressive relaxation skills have on self-concept?
2. What effect does learning progressive relaxation skills have on anxiety level?
3. What effect does learning progressive relaxation skills have on stress-related symptoms?
4. What is the feasibility of teaching progressive relaxation skills in a classroom setting?

CHAPTER THREE

METHODOLOGY

The purpose of this chapter is to describe the methodology used in the study. The selection and composition of the sample are delineated. Next, the dependent measures are detailed. Following that, an explanation of the procedure is given.

Sample

The subjects for this study were grade eight students from guidance classes at Burnaby North Senior Secondary School. An information sheet (see Appendix A) was sent home with the students notifying parents and students of the project, with an invitation to attend an information meeting during a regularly scheduled parent-teacher conference evening. Approximately one-third of the parents attended. Consent forms (see Appendix B) were signed by all parents and students participating in the study.

Students were assigned randomly to treatment or control conditions by school counsellors. Three regular guidance teachers who expressed interest in the Progressive Relaxation Training program were selected to teach the treatment class. The treatment group received a Progressive Relaxation Training program and the control group participated in a career education unit. The option was given to the students in the treatment group to transfer to the career education unit offered to the control group. Three students transferred from treatment to control group. There were 113 students enrolled in six guidance classes; 62 subjects received treatment and 51 students were in the control group. Data from 34 subjects were omitted from the

study due to their absenteeism during the pre-or-post-testing sessions, resulting in a total of 44 treatment subjects and 35 control students for whom data were available. Most students were 13 or 14 years old; approximately one-third of the sample was of Asian/East Indian descent, the remaining two-thirds were Caucasian. In addition, the treatment group consisted of 28 females and 34 males; the control group had 29 females and 22 males (see Table 1). The project took place from the middle of February through the middle of March, ending just before students were to take spring exams.

Dependent Measures

Three self-report questionnaires were used in this study: the State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, & Lushene, 1970), the Symptoms of Stress Inventory (SOSI) (Thompson & Leckie, 1979), and the Self Description Questionnaire (SDQ) (Marsh & Smith, 1981).

State-Trait Anxiety Inventory

The STAI (State-Trait Anxiety Inventory) is a 40-item self-report questionnaire, consisting of two separate 20-item scales measuring two distinct anxiety concepts: state anxiety (A-State), a transitory state of emotion, fluctuating over time, characterized by subjective feelings of apprehension and tension (Spielberger et al., 1970); and trait anxiety (A-Trait), a relatively stable personality trait differentiating individual anxiety proneness (Spielberg et al., 1970). Subjects are asked to respond on the A-State scale as to how they feel right now, at this moment; on the A-Trait scale, they are asked to report how they generally feel.

Table 1

Demographic Characteristics of Grade 8 Students

Group	Teacher	Gender			Ethnic					Age					
		F	M	Tot.	Af	As	C	S	N	Tot.	12	13	14	15	Tot.
Control	1	5 (13)	6 (8)	11 (21)	1	4	5	0	0	^a 10	0	9	2	0	11
	2	6 (9)	8 (10)	14 (19)	0	6	7	1	0	14	0	11	3	0	14
	3	7 (7)	3 (4)	10 (11)	0	0	10	0	0	10	0	8	2	0	10
	Tot.	18 (29)	17 (22)	35 (51)	1	10	22	1	0	^a 34	0	28	7	0	35
Treatment	4	6 (9)	6 (10)	12 (19)	0	1	8	1	2	12	0	6	5	0	^b 11
	5	7 (7)	9 (12)	16 (19)	1	7	7	1	0	16	1	11	2	2	16
	6	8 (12)	8 (12)	16 (24)	0	4	11	0	1	16	0	13	3	0	16
	Tot.	21 (28)	23 (34)	44 (62)	1	12	26	2	3	44	1	30	10	2	^b 43
Grand Total	39 (57)	40 (56)	79 (113)	2	22	48	3	3	^a 78	1	58	17	2	^b 78	

Note. Af=African; As=Asian; C=Caucasian; S=Spanish; N=Native.

^a One subject did not report ethnic background. ^b One subject did not report age.

Note. While 113 students participated in the study, data were not available for 34 students due to absence for either pre- or posttest. The numbers in parentheses () represent total Possible students. All other numbers refer to students who were actually included in the data analysis.

Subjects' responses are scored based on a four-point rating scale: 1=Not at all; 2=Somewhat; 3=Moderately so; and 4=Very much so. The value of 4 indicates a high level of anxiety; for those items worded in such a way that 4 equals low anxiety, the weights for the responses are reversed. The range varies from a minimum score of 20 to a maximum score of 80 on both subscales (Spielberger et al., 1970).

Reliability of the STAI is reported in the test manual (Spielberger et al., 1970). Test-retest correlations for the A-Trait scale range from .73 to .86, while coefficients for the A-State scale range from .16 to .54. These lower A-State correlations are not surprising, in light of the fluctuating nature of the A-State construct (Spielberger et al., 1970). Internal consistency is reasonably good, with alpha coefficients ranging from .83 to .92 for A-State and .86 to .92 for A-Trait (Spielberger et al., 1970).

Validity data for the STAI have been obtained in several studies (Spielberger et al., 1970). The A-Trait scale correlates moderately with the IPAT Anxiety Scale (Cattell & Scheier, 1963): .75 and .76 for college students (N=206) and .77 for psychiatric patients (N=112) (Spielberger et al., 1970). Evidence for the construct validity of the A-State scale was gathered from a sample of 977 college students during normal conditions, and then during conditions similar to those prior to a final examination. "The mean score for the A-State scale was considerably higher in EXAM condition than in the NORM condition for both males and females," (Spielberger et al., 1970, p. 11). Normative data for high school students (377 grade 11 students in New York) are

presented in the manual (Spielberger et al., 1970).

Symptoms of Stress Inventory

In order to assess changes in stress-related symptoms over time, the Symptoms of Stress Inventory (SOSI) was administered to the subjects. The SOSI consists of 118 items rated on a 5-point frequency scale: 0=Never; 1=Infrequently; 2= Sometimes; 3=Often; 4=Very Frequently. The items reflect various stress-related symptoms (insomnia, cold hands or feet, dry mouth, tension headaches, etc.) and subjects are asked to rate the frequency of occurrence over the last two weeks (Thompson & Leckie, 1979). There are ten subscales which are scored separately and then are added together for the Total Score: Peripheral, Cardio-pulmonary, Neural, Gastro-intestinal, Muscle Tension, Habit Patterns, Depression, Anxiety, Anger, and Cognitive Disorganization. The scores for items 1-94 are tabulated by adding the values circled by the student; items 95-118 are for background and personal information.

Reliability, as reported in the manual (Thompson & Leckie, 1979) was .96 (Chronbach's alpha) for the Total SOSI score, with ranges of .71 to .87 for the subscale scores. Test-retest reliability has not been established. The face validity appears reasonable, but there are no other validity data available. The norming study was based on data from 561 subjects, although the sample was not considered to be truly representative of the general population by the authors of the SOSI (Thompson & Leckie, 1979).

Self Description Questionnaire

Based on suggestions that negative self-esteem and anxiety

are related (Dobson, 1982; Hansen & Maynard, 1973; Williams, 1980), subjects were given the Self Description Questionnaire (SDQ) to assess the effect of the treatment on self-concept. The SDQ is an instrument designed to measure the multi-dimensional construct of self-concept based on Shavelson's (1981) hierarchical model, and yields seven scale scores and three total scores from 72 items: Physical Abilities, Physical Appearance, Relations with Peers, Relations with Parents, Reading, Mathematics, All School Subjects, and Total Nonacademic Self-Concept, Total Academic Self-Concept, Total Self-Concept. Within each scale is a combination of cognitively and affectively focused items, to which students respond on a 5-point response scale: 1=False; 2=Mostly False; 3= Sometimes False, Sometimes True; 4=Mostly True; 5=True. Responses to negatively worded items were reversed so that a score of 5 always represented the most positive response (Marsh, Barnes, & Hocevar, in press).

Internal consistency data of the seven scales by coefficient alphas ranged from .80 to .92 (Marsh, Smith, & Barnes, 1983; Marsh & O'Neill, 1982). Other studies (Marsh, Barnes, & Hocevar, in press; Marsh, Parker, & Barnes, in press; Marsh, Parker, & Smith, 1983) reported assessing convergent validity (agreement between two methods of assessing the same trait, e.g. student-teacher agreement on the same dimensions of self-concept) and discriminant validity (lack of correlation between different traits, attesting to the distinctiveness of the traits). The low correlations found between different scales give good evidence for discriminant validity (median = .09) (Marsh & O'Neill, 1982), while correlations between student and teacher agreement were

statistically significant (mean $r = .58$) providing support for convergent validity (Marsh, Barnes, & Hocevar, in press; Marsh & O'Neill, 1982; Marsh, Smith, & Barnes, 1981).

Procedure

Assessment

On the first and last class day of the unit, subjects were given the three dependent measures previously described. These were administered by the regular classroom teachers who were school counsellors.

During the second instructional day of the treatment group, subjects were instructed on how to take their own pulse, their own respiration rate, and their own peripheral skin temperature, all as noted in the manual, *Self Relaxation: Learn It, Use It* (Hiebert, 1980) of which the instructors each had a copy. This information was to be gathered at the beginning and end of each progressive relaxation practice, and noted on daily log sheets (see Appendix C). The purpose for the recording of this data was three-fold:

1. to help assess whether the students acquired the skills of progressive relaxation. These measures have been noted to be reliable indicators of relaxation (Hiebert, Dumka, Cardinal, & Marx, 1983; Lamat, 1975).
2. to measure compliance with the program.
3. to provide motivation for the continued practice, as students could see measurable difference in the before-and-after data.

Teacher Training

A potential benefit of this program would be that regular

classroom teachers could teach the Progressive Relaxation Training skills (Hiebert & Eby, 1985). This would allow for instruction of the skills within a variety of courses and subject areas (e.g., English, social studies, physical education). Four classroom teachers were involved in the stress control curriculum: three were school counsellors in addition to their teaching roles, and one was a student teacher under the supervision of one of the other teacher-counsellors. A three-hour training session was offered to these teachers. During the training, the teachers were acquainted with the manual, given lesson outline sheets based on the manual, instructed in the administration of the dependent measures, and then taken through the actual presentation on cassette tape (of which they were given a copy). They were shown how to take the three indicators of relaxation and record this on the log sheets for the monitoring of practice.

Control Group

The control group participated in a career education unit. This program consisted of 12 sessions over the 4-week period. The focus of the curriculum was on self-awareness and career-awareness for the students. Students participated in exercises regarding values clarification, their role and place in their family, interests, occupational daydreams, and their family career "tree." A short summary of each lesson follows, with a more complete outline included in Appendix D.

Lesson 1 - Administered dependent measures, introduced Self-Awareness section of Career Education, assigned and discussed family career tree.

2 - Discussed importance of personal interests and as-

signed and evaluated list of activities students prefer.

- 3 - Presented personal strengths and weaknesses checklist to students for completion and discussion.
- 4 - Introduced Maslow's hierarchy of needs, divided the class into small groups to act out hypothetical situations and list personal needs.
- 5 - Discussed values clarification through student completion of checklist on importance of life roles and time and money involved in support of roles.
- 6 - Assigned hypothetical situations to read and evaluate for decision making, divided into small groups for discussion.
- 7 - Assigned and discussed students's work values preferences.
- 8 - Presented Career Awareness section by students brainstorming to identify occupations portrayed on TV shows and those found in specific settings.
- 9 - Discussed job success attributes and assigned personal attributes checklist.
- 10 - Discussed occupational sexual stereotypes.
- 11 - Assigned career crossword and administered dependent measures.

Treatment

The stress control module taught in the guidance classes consisted of 11 lessons over a 4-week period (see Appendix E for the lesson outlines). (Note: Because of differences in the school time table, treatment classes met 11 times and control

classes met 12 times during the 4 weeks set aside for these units.) The classes met three times per week, one hour each time in the regular classroom setting. During the initial lesson, students were told to keep logs (as described earlier) monitoring the three indicators of relaxation before and after practice, as well as any subjective impressions or observations. Before beginning the actual practice for each lesson, the lights were turned off and the suggestion was made to get into a comfortable position in the desk. A short summary of each lesson follows:

- Lesson 1 - Introduced stress control unit, administered dependent measures, defined stress.
- 2 - Reviewed stress and stress response, introduced relaxation response and skills practice (taped practice).
- 3 - Reviewed progressive relaxation as a skill, practiced with tape, recorded self-monitored data.
- 4 - Discussed home practice and keeping a log, practiced with a shortened script (taped), and recorded data.
- 5 - Discussed immunization effects of consistent relaxation practice; shortened script, solicited examples of stressors from students.
- 6 - Introduced cue-controlled relaxation as a method of coping with stressors, reviewed stressors, practiced relaxation and cue.
- 7 - Reviewed cue-controlled relaxation, explained how to use, and practiced with tape.
- 8 - Reviewed uses of progressive relaxation learned thus far, introduced differential relaxation and

- discussed use, then practiced differentially.
- 9 - Reviewed differential relaxation, practiced, explained covert modelling and planned a suggested "mental video tape," then practiced relaxation with covert modelling scene at the end.
 - 10 - Reviewed covert modelling procedure, students selected and planned personal "mental video tape," practiced relaxation with imaging of personal scenes.
 - 11 - Reviewed stress, relaxation, and different uses of Progressive Relaxation Training skills; administered post tests of dependent measures; collected data sheets and logs, solicited personal experiences of usage.

Students were encouraged to continue using the progressive relaxation skills in various situations and to observe their reactions. The logs were handed in to the teachers and then given to the researcher for assessment. These data, as well as the test results, are summarized in chapter four.

CHAPTER IV

RESULTS

In this chapter, the results of the data analyses are reported under headings referring to the research questions listed in chapter II. Following this, additional findings are presented.

Missing Data

Missing data occurred in this study for several reasons. Some students were absent on the days the pre- or posttests were given, and some participants were not able to complete all three dependent measures within the limited class time allowed. Also, some students lost or broke the small thermometers used to record finger temperature and lost the recording sheets, which led to incomplete practice information. This accounts for the variation in cell sizes across the different MANOVA's (see Table 2 and Appendices F-M).

Data analysis

The paper and pencil self-report measures used in this study (i.e., Self Description Questionnaire, State-Trait Anxiety Inventory, S- and T-Scale, and Symptoms of Stress Inventory) to address questions 1-3 were analyzed using a 2 x 2 (Group x Time) multivariate analysis of variance for repeated measures. No significant interaction effects were found, but a significant Time effect was noted, $F(5,73) = 54.38, p < .001$ (see Table 2 for the data and Appendices F & G for the Summary Tables).

Question 1

What effect does learning progressive relaxation skills have on self-concept?

Table 2

Means and Standard Deviations of Self Description Questionnaire,
Academic and Non-Academic Scores; Symptoms of Stress Inventory
Total Score; and State-Trait Anxiety Inventory S- and T- Scales

Dependent Measure	Group	n	Time		Marginal
			Pretest	Posttest	
SDQA	Treatment	44	95.59 (16.55)	100.48 (15.85)	98.04 (16.20)
	Control	35	105.20 (25.04)	103.29 (26.79)	104.25 (25.92)
	Marginal	79	99.85 (21.15)	101.72 (21.29)	
SDQNA	Treatment	44	155.14 (20.28)	155.54 (22.11)	155.34 (21.20)
	Control	35	148.71 (25.73)	148.92 (27.99)	148.82 (26.86)
	Marginal	79	152.29 (22.93)	152.61 (24.94)	
SOSI	Treatment	44	86.41 (48.61)	26.30 (19.50)	56.36 (34.06)
	Control	35	89.69 (44.11)	34.77 (29.02)	62.23 (36.57)
	Marginal	79	87.86 (46.40)	30.05 (24.39)	

Note. Standard deviations are enclosed in brackets here and in all subsequent tables.

Note. SDQA=Self Description Questionnaire, Academic; SDQNA=Self Self Description, Nonacademic; SOSI=Symtoms of Stress Inventory.

Table 2 (continued)

Means and Standard Deviations of Self Description Questionnaire,
Academic and Non-Academic Scores; Symptoms of Stress Inventory
Total Score, and State-Trait Anxiety Inventory S- and T- Scales

Dependent Measures	Group	n	Time		Marginal
			Pretest	Posttest	
STAI-S	Treatment	44	40.02 (7.51)	37.98 (8.30)	39.00 (7.91)
	Control	35	38.31 (7.90)	38.51 (10.57)	38.41 (9.24)
	Marginal	79	39.27 (7.69)	38.22 (9.32)	
STAI-T	Treatment	44	41.05 (7.92)	38.93 (7.88)	39.99 (7.90)
	Control	35	42.23 (8.77)	41.71 (9.91)	41.97 (9.34)
	Marginal	79	41.57 (8.27)	40.16 (8.89)	

Note. STAI-S=State-Trait Anxiety Inventory, S-Scale; STAI-T= State-Trait Anxiety Inventory, T-Scale.

Note. Normative information for the STAI is as follows:

STAI-S: Mean (Male)=36.99, (Female)=37.57; Standard Deviation (Male)=9.07, (Female)=11.76; STAI-T: Mean (Male)=39.37, (Female)=41.61; Standard Deviation (Male)=9.40, (Female)=11.29. Normative data for high school students for the SDQ and SOSI are not available.

Univariate tests following the general MANOVA showed no significant changes for the Self Description Questionnaire (see Table 2). (Note. Normative information for high school students for the Self Description Questionnaire is not available.) The results of this analysis do not support the positive effects of progressive relaxation training on self-concept as measured by the Self Description Questionnaire.

Question 2

What effect does learning progressive relaxation skills have on anxiety level?

Univariate tests following the initial MANOVA indicated no significant changes for the State or Trait scale scores on the State-Trait Anxiety Inventory (see Table 2). (Note. To assist readers in attaching meaning to Tables 2, 4, and 5, the following normative information for the STAI is provided. STAI-T: Mean (Male)=39.37, (Female)=41.61; Standard Deviation (Male)=9.40, (Female)=11.29; STAI-S: Mean (Male)=36.99, (Female)=37.57; Standard Deviation (Male)=9.07, (Female)=11.76.) The results of this analysis do not support the positive effects of progressive relaxation training on anxiety levels as measured by the State-Trait Anxiety Inventory.

Question 3

What effect does learning progressive relaxation skills have on stress-related symptoms?

The initial 2 X 2 MANOVA for repeated measures indicated a significant main effect for Time, $F(5,73) = 54.38, p < .001$. Univariate analyses showed the Time main effect was significant for the Symptoms of Stress Inventory Total score, $F(1,77) =$

241.00, $p < .001$ (see Table 2). (Note. Normative data for high school students for the Symptoms of Stress Inventory are not available.) Because these data show that both the treatment and the control group had lower Symptoms of Stress Inventory scores at posttreatment (and there was no significant interaction effect for Group by Time), the results do not support the positive effect of the progressive relaxation training program (see Appendices F & G). Alternatively, on the average, both groups in the study showed equal improvement.

Question 4

What is the feasibility of teaching progressive relaxation skills in a classroom setting?

As described in Chapter III, treatment subjects were asked to record three physiological measures of relaxation (heart rate, respiration rate, and finger temperature) at the beginning and end of each practice session. The individual data were merged to obtain mean scores for each week on each measure for both prepractice and postpractice. A subsequent 2×4 (Pre-Post \times Week) MANOVA of these data showed a significant main effect for Prepractice/Postpractice, $F(3,10) = 53.36$, $p < .001$ (see Table 3 for the data and Appendices H & I for the Summary Tables). Further univariate testing showed a significant decrease in heart rate, $F(1,12) = 41.25$, $p < .001$, and respiration rate, $F(1,12) = 90.96$, $p < .001$ (see Table 3). These results indicate that treatment subjects were able to relax when they practiced. However, since there were no significant time or interaction effects, it cannot be said that the participants' skill at relaxing increased over time.

Table 3

Treatment Group Means and Standard Deviations for Self-Monitored
Physiological Indicators Over Four Week Program

Indicator	Factor	Week 1	Week 2	Week 3	Week 4	Total
Heart Rate (beats/ min.)	Pre- Practice	78.79 (8.20)	74.98 (7.12)	75.12 (6.46)	74.61 (9.16)	75.88 (7.76)
	Post- Practice	71.48 (5.84)	69.76 (7.26)	70.23 (6.15)	67.92 (7.08)	69.85 (6.58)
	Total	75.14 (7.02)	72.37 (7.19)	72.68 (6.31)	71.27 (8.17)	
Resp. Rate (breaths /min.)	Pre- Practice	22.29 (7.08)	20.94 (6.34)	19.94 (6.90)	20.38 (6.77)	20.89 (6.75)
	Post Practice	18.65 (6.22)	17.68 (5.65)	17.26 (6.82)	16.88 (5.88)	17.62 (6.14)
	Total	20.47 (6.65)	19.31 (5.99)	18.60 (6.81)	18.63 (6.33)	
Finger Temp. (o F)	Pre- Practice	82.00 (8.47)	82.38 (5.61)	81.85 (7.18)	86.14 (6.01)	83.09 (6.82)
	Post- Practice	82.68 (7.18)	83.99 (5.42)	83.94 (6.34)	86.16 (5.52)	84.19 (6.19)
	Total	82.34 (7.83)	83.19 (5.52)	82.90 (6.76)	86.15 (5.77)	

Note. n = 13

In addition to skill acquisition, another issue to check regarding program feasibility was program compliance. Even though only those participants who completed log records for all 4 weeks were analyzed in the MANOVA referred to above (n=13), information from the journals indicated that another 20 students continued with the program for 3 weeks, and nine students completed data for 2 weeks. Data for the remaining students were missing or incomplete for less than 2 weeks of practice. Altogether, 42 out of 62 subjects recorded compliance with the skill practice for at least half the program. This suggests that most students made use of some practice opportunities, but that there was no consistent practice effort by over half of these students.

Additional Findings

Initially, the plan was to test for teacher and gender effects of the treatment. Therefore, separate MANOVA's were conducted for both teacher and sex. The results showed no significant effect for teacher or sex, nor were there any significant interaction effects (Appendices J-M). There was a significant time effect, but these results are not to be trusted, as the original MANOVA results were not significant.

Teacher Effect

To analyze the data for teacher effects, a 3 X 2 (Teacher x Time) MANOVA for repeated measures was conducted with the data for the treatment subjects (see Table 4 for the data and Appendices J & K for the Summary Tables). Since there was no significant Teacher x Time interaction effect, indications are that teachers were equally effective in using the curriculum.

Table 4

Means and Standard Deviations for Self Description Questionnaire
Academic and Non-Academic Scores; Symptoms of Stress Inventory
Total Score; State-Trait Anxiety Inventory, S- and T- Scales;
Grouped According to Teacher

Dependent Measure	Group	n	Time		Marginal
			Pretest	Posttest	
SDQA	Teacher 1	12	96.33 (19.45)	104.00 (17.63)	100.17 (18.54)
	Teacher 2	16	98.56 (17.15)	100.63 (18.53)	99.60 (17.84)
	Teacher 3	16	92.06 (13.82)	97.69 (11.41)	94.88 (12.62)
	Marginal	44	95.59 (16.55)	100.48 (15.85)	
SDQNA	Teacher 1	12	150.33 (17.54)	154.58 (25.41)	152.46 (21.48)
	Teacher 2	16	146.81 (17.99)	145.44 (18.05)	146.13 (18.02)
	Teacher 3	16	167.06 (19.64)	166.38 (19.15)	166.72 (19.40)
	Marginal	44	155.14 (20.28)	155.55 (22.11)	
SOSI	Teacher 1	12	96.33 (59.29)	23.67 (19.32)	60.00 (39.31)
	Teacher 2	16	92.25 (49.99)	30.56 (19.68)	61.41 (34.84)
	Teacher 3	16	73.13 (37.31)	24.00 (19.97)	48.57 (28.64)
	Marginal	44	86.41 (48.61)	26.30 (19.50)	

Table 4 (continued)

Means and Standard Deviations of Self Description Questionnaire, Academic and Non-Academic Scores; Symptoms of Stress Inventory Total Score; and State-Trait Anxiety Inventory, S- and T- Scale Scores; Grouped According to Teacher

Dependent Measure	Group	n	Time		Marginal
			Pretest	Posttest	
STAI-S	Teacher 1	12	39.50 (8.14)	37.67 (9.38)	38.59 (8.76)
	Teacher 2	16	40.56 (8.54)	37.81 (8.26)	39.19 (8.40)
	Teacher 3	16	39.88 (6.29)	38.38 (8.03)	39.13 (7.16)
	Marginal	44	40.02 (7.51)	37.98 (8.30)	
STAI-T	Teacher 1	12	41.17 (8.99)	36.42 (9.39)	38.30 (9.19)
	Teacher 2	16	42.13 (7.59)	39.94 (6.93)	41.04 (7.26)
	Teacher 3	16	39.88 (7.75)	39.81 (7.64)	39.85 (7.70)
	Marginal	44	41.05	38.93	

Note. Normative data for the STAI-S and STAI-T are provided in Table 2. Normative information for high school students for the SDQ and SOSI is not available.

Demographic Variables

Sex. A 2 X 2 (Sex x Time) MANOVA was computed to test for sex differences in treatment effects (see Table 5 for the data and Appendices L & M for the Summary Tables). The lack of significant interaction effect for Sex x Time indicates that boys and girls react in a similar way to the progressive relaxation program.

Subjective Reports

Treatment subjects were each asked to keep a journal during the program. Information gathered from these journals is reported here. In addition, the teachers were asked to comment on their responses to the program.

Most of the students reported using the progressive relaxation exercises during studying and before going to sleep. Several commented on feeling more wide awake and ready to study after the exercises. They also wrote that they felt calmer studying for tests and when taking tests. Many noted that they relaxed before going to sleep and felt very rested when they woke up. Others mentioned not liking the program at the beginning, but reported noticing positive results after several practice sessions and started using the progressive relaxation skills in school and home situations.

The teachers appreciated learning the skills themselves, and found the curriculum quite easy to teach, even for those teachers not previously acquainted with it. They noted that they looked forward to the class as a "nice, restful period" during the day. One commented that grade 8 seemed to be an appropriate age for this unit, and that progressive relaxation training was more useful and relevant than career preparation at this grade

Table 5

Means and Standard Deviations for Self Description Questionnaire
Academic and Non-Academic Scores; Symptoms of Stress Inventory
Total Score; State-Trait Anxiety Inventory, S- and T- Scale
Scores; Grouped According to Sex

Dependent Measure	Group	n	Time		Marginal
			Pretest	Posttest	
SDQA	Female	21	96.71 (17.62)	102.29 (17.52)	99.50 (17.57)
	Male	23	94.57 (15.84)	98.83 (14.35)	96.70 (15.10)
	Marginal	44	95.59 (16.55)	100.48 (15.85)	
SDQNA	Female	21	150.14 (15.38)	150.48 (20.07)	150.31 (17.73)
	Male	23	159.70 (23.31)	160.18 (23.28)	159.94 (23.30)
	Marginal	44	155.14 (20.28)	155.55 (22.11)	
SOSI	Female	21	92.10 (58.65)	30.95 (18.94)	61.53 (38.80)
	Male	23	81.22 (37.84)	22.04 (19.50)	51.63 (28.67)
	Marginal	44	86.41 (48.61)	26.30 (19.50)	

Table 5 (continued)

Means and Standard Deviations for Self Description Questionnaire
Academic and Non-Academic Scores; Symptoms of Stress Inventory
Total Score; State-Trait Anxiety Inventory, S- and T-Scale
Scores; Grouped According to Sex

Dependent Measure	Group	n	Time		Marginal
			Pretest	Posttest	
STAI-S	Female	21	41.52 (8.39)	38.67 (8.06)	40.10 (8.23)
	Male	23	38.65 (6.49)	37.35 (8.65)	38.00 (7.57)
	Marginal	44	40.02 (7.51)	37.98 (8.30)	
STAI-T	Female	21	41.81 (9.21)	40.05 (7.79)	41.93 (8.50)
	Male	23	40.35 (6.66)	37.91 (7.99)	39.13 (7.33)
	Total	44	41.05 (7.92)	38.93 (7.88)	

Note. Normative data for the STAI-S and STAI-T are provided in Table 2. Normative information for high school students for the SDQ and the SOSI is not available.

level.

Summary

The results of this study were reported in five sections. The first four dealt with the measures used to test each of the research questions, and the last concerned additional findings.

Results from analyses of the dependent measures used in this study do not support the efficacy of the progressive relaxation training program. Physiological data analyzed from the practice logs indicated program compliance and that students were able to relax, but the skills did not accentuate over time.

There were no differential teacher effects or gender effects. Subjective reports indicated satisfaction with the treatment by both participants and teachers, and student use of progressive relaxation skills was reported across a wide variety of situations.

CHAPTER V

DISCUSSION

The purpose of this study was to test the efficacy of teaching progressive relaxation skills in a preventive context to high school students. Four research questions were formulated, and the results of the statistical analysis pertaining to these questions were presented in the previous chapter. In this chapter, the results are summarized and interpreted by type of measure. Implications of the results are presented and the chapter is concluded with suggestions for future research directions.

Summary and Interpretation of Results

Results from the Self Description Questionnaire and the State-Trait Anxiety Inventory showed no significant main effects of Group or Time, nor were there any significant Group \times Time effects of the treatment on self-concept or anxiety level. On the Symptoms of Stress Inventory, the data from the analysis of the scores showed that subjects in the pooled treatment and control groups had significantly decreased scores from pretest to posttest, but there was no significant differential reduction across groups. The analysis of physiological data for the treatment group indicated that relaxation can be produced in a classroom setting, as there was a significant decrease in heart rate and respiration rate from prepractice to postpractice. However, there was no increase in progressive relaxation skill competency over the treatment time. No significant differences were found for the the treatment group for teacher or sex, nor were there any significant Teacher \times Time or Sex \times Time 50 interaction effects.

Paper and Pencil Measures

The lack of significant treatment effect (i.e., group by time interactions) on self-report tests may partly be attributed to the use of cognitive measures to assess the effect of a physiologically based program (Dumka, 1982). While it has been noted earlier in the paper that there are three components of the stress response (physiological, behavioural, and cognitive) and that these are interconnected (Hiebert, 1983; Magnusson, 1982; Powell & Eagleston, 1983), it may also be true that changes in the physiological mode do not automatically dictate changes in the cognitive-perceptual mode. Lazarus (1977) refers to the poor correlation among the three components and suggests that changes in physiological factors may not necessarily produce changes in cognitive factors and vice versa. It is possible that even though treatment subjects demonstrated physiological relaxation (i.e., by reduced measures of heart rate and respiration rate), this might not coincide with a change in how they think or feel about their stress response or their ability to cope (McLean, 1986).

Further possibilities for the lack of treatment effect on paper and pencil self-report measures concern the purpose and population of the treatment plan. The focus of the program was on prevention as opposed to addressing specific, demonstrated problems. Because of the emphasis on educating the students on stress and coping strategies, and providing them with a potential tool to use as needed, it may not be appropriate to use the short time span posttesting situation to assess outcome. Rather, a longitudinal design for follow-up at the end of high school may

be a more effective way of measuring effects of treatment. (This issue is discussed in a later section.) Regarding the non-clinical target population of the study, Borkovec and Sides (1979) reviewed progressive relaxation studies and noted that for those studies finding no difference between control and treatment groups, 80% involved normal subjects. Chang (1985) and Richter (1984) have suggested also that normal populations have tended to show fewer significant effects of relaxation training. There is also a concern that self-report measures of anxiety may not be sensitive enough to measure the stress levels of nonclinical populations (Chang, 1985; Ragan & Hiebert, in press).

The significant effect of Time on treatment and control subjects on the Symptoms of Stress Inventory may be a function of the time of year in which the program took place. The study began in mid-winter and ended in spring, just before spring break. It may be that both groups were eagerly anticipating the time away from school and therefore perhaps tended to report their stress-related symptoms at posttest in a more positive manner than at pretest. Another explanation is that the measure itself may not be reliable. Although a study by Hiebert and Eby (1985) found significant decreases in the Symptoms of Stress scores of participants after receiving progressive relaxation training, that study utilized no control group. It therefore cannot be known whether there might also have been a significant decrease in control group scores. The authors of the Symptoms of Stress Inventory reported that test-retest reliability had not been established yet (Thompson & Leckie, 1979), so it is possible that the instrument may not be reliable.

Physiological Measures

The skill practice information was analyzed and results showed that progressive relaxation can be taught in a classroom setting. Although there was a significant difference between prepractice and postpractice physiological data, indicating that the treatment subjects were able to relax, their skills were as good at the beginning as they were at the end, showing no increase in competency. A question of reliability may arise here. The assumption is made that students completed the practice logs reliably. However, based on information from student journals, some students reported falling asleep during practice, and were unable to fill in the accurate data. In addition, many students lost or broke the thermometers for taking finger temperature. It is possible that subjects may have copied data from previous sessions in order to fill in the blank spaces. Moreover, Taylor et al (1983) found that self-report of practice was generally over-reported, and subject to therapist demand. These cautions may likewise apply to the present study.

Regarding treatment compliance, it was noted that a large number (42) of students provided practice data for at least half the program. This result too may be questioned for reliability for the reasons already mentioned. Practice sheets were also easily misplaced, causing gaps in the data reported, or perhaps encouraging made-up information. While over half of the treatment students did report better than average compliance (completed more than half the program), this brings up the question of length of practice time for adequate results of training. Studies by Borkovec et al (1978), Day & Sadek (1982), Shearer &

Pass (1979), and Suinn (1983) emphasize the need for consistent practice of skills for improvement. In another study (Peters et al, 1977), it was found that where the average practice was 3-5 times per week over 4-6 weeks, less than average practice was associated with less change. This may indicate another explanation for the lack of significant Group x Time interaction effects for the present study: subjects may not have practiced the skills enough to become competent or to make a difference on the scores of the dependent measures. Dumka (1982) cites the need for some type of criterion-referenced assessment of relaxation competency which would set minimum practice levels, physiological criteria, and /or competency levels. Subjects could then be evaluated as to their attainment of criteria to measure relaxation skill.

Subjective Reports

Rather than being limited to statistical assessment for results, this study also utilized anecdotal information to determine the use and effectiveness of treatment. As mentioned in chapter IV, subjects kept a journal of their subjective impressions during the program. Although in general, the statistical data do not support the efficacy of the progressive relaxation training program, the subjective evidence mentioned in the previous chapter does testify to the benefit the participants received. Indeed, the personal reflections of both the teachers and the students give support to the relevancy of the program. In order for a more systematic evaluation of the anecdotal data, better means of assessing this information need to be utilized. (Suggestions are made in a later section.)

Limitations and Future Directions

Several limitations of the results of this study concern the context of the treatment, i.e., the school. These include accounting for the timing of the program during the ebb and flow of the school year, the tendency of students to lose recording logs, journals, and thermometers, and the limited time of each classroom session. Since the purpose of the study is to evaluate the program in the school context, a question arises as to whether these normal aspects of school life should be modified to better fit the reliability needs of a research study, or whether the program itself should be modified to fit the purposes of the preventive, educational focus. While the limitations may affect the statistical reliability of the results, it is difficult to assess whether the long-term preventive effects of the program are undermined.

A possibility which must be addressed when considering the limitations and results of the present study is that teaching stress reduction procedures in schools may not be efficacious. Among studies using stress reduction programs in schools, those by Chang (1985), Elle & Vagt (1981), Mead (1976), Ragan (1984), and Stevens & Pihl (1982) failed to show significant effects of the treatment program on anxiety levels. Although in theory the program may be desirable, perhaps in practice stress management is not a tool that should be taught in the schools. Rather, this type of program may be better implemented through other types of community or church agencies.

Another limitation is lack of compliance data for the teachers. Although their subjective reports were submitted, no

provisions were made for structured written or observed assessment of the degree to which the teachers followed the curriculum. Although the results showed no differential teacher effects, this lack of compliance data still remains a design flaw of the present study.

One further limitation is the method of measuring statistical success of treatment. The intent of the program is for use with a nonclinical population in a preventive context. Because of the preventive nature of the program, it is difficult to assess treatment outcome with immediate posttests. Rather, it may be necessary to design a longitudinal study to test the effectiveness of the program accurately. Discussion of ways to achieve this is presented in the next section.

Assessment Procedures

A concern in the study is for the reliability of teacher compliance with the curriculum. If time and money would permit, behavioural observation could be utilized in future studies. Failing that, a structured self-report checklist could be included in the dependent measures.

Because of the speculation regarding the adequacy of solely using statistical results for evaluation of preventive program success, it may be necessary to develop more ways of systematically measuring anecdotal information. A structured evaluation questionnaire might be used to assess participants' immediate and anticipated use of the strategy, situations in which the strategy was used, components found most helpful, and relevance of the program (Dumka, 1982). Additionally, for the present study, it might have been interesting to evaluate student use of the

progressive relaxation strategy prior to and during the spring exams, which followed the program.

The point was made questioning the use of cognitive instruments to measure effects of a physiological coping strategy. One possible solution to explore is to utilize a method of assessing the physiological condition of all subjects on a pre- and posttest basis. The present study only assessed physiological measures of the treatment group, and these were taken before and after each practice session. Studies by Richardson et al (1983) and Zaichkowsky & Zaichkowsky (1984) took measures of heart rate, finger temperature, and respiration rate for all subjects before and after the program. Use of these data would give a more complete assessment of effects of a progressive relaxation program, in addition to being relatively easy to administer.

Another possibility for ensuring that cognitive measures reflect treatment effects is to incorporate a cognitive component into the progressive relaxation curriculum. Students would learn the links between their perceptions of stressors, their appraisal of their abilities to cope, and the physiological effects of the progressive relaxation procedure. Various studies (Decker et al, 1982; Holroyd et al, 1983; Richardson et al, 1983; Tolman & Rose, 1985) support the added benefit of a combined cognitive-relaxation program. Decker et al (1983) found this combination to be particularly useful when working with a preventive program. Holroyd et al (1983) suggest that this "multi-modal" strategy may be more effective in long-term maintenance of coping effects.

Experimental Design

In light of the preventive nature of the program, some type

of follow-up provisions should be made to facilitate evaluation. Ideally, a longitudinal design would assess the students throughout high school, especially if the program was begun in Grade 8. The potential would be there for five years of evaluation, and measures could be administered through guidance or physical education classes.

Most studies that advocate a long-term, follow-up plan for preventive models also encourage providing for occasional "booster" or maintenance sessions (Deffenbacher & McKinley, 1983; Richter, 1984; Suinn, 1983). Richter (1984) also suggests an optimum design is to have maintenance sessions continue over successive school years. Borkovec et al (1978) and Suinn (1983) share the perspective that unless the relaxation skills are actively used and applied, the effects of training will be lost. The school can prove to be an effective agent for reinforcing the continued use of the progressive relaxation skills: once the skills have been learned, only a few class periods each year would be needed for reactivating the skills use and application.

Summary

In conclusion, while the present study failed to provide definitive statistical support for a progressive relaxation training program to be taught in the school context, several considerations were addressed which have implications for future studies. Because of the preventive nature of the treatment, suggestions were made for the use of more appropriate ways of measuring long-term effects. In addition, since subjective reports by participants tended to support progressive relaxation training, it is necessary to provide means of systematically

evaluating this information for more complete assessment of the program.

In theory, while the school seems an ideal place for equipping young people with a potential tool for stress management, additional study is needed to address the cost effectiveness of such curriculums in terms of teacher, class, and learning time. Continued research in the areas suggested may help to determine more effective and efficient methods for designing, implementing, and evaluating stress management programs.

Appendix A

Information Sheet

Beginning on February 13, Dr. Bryan Hiebert of Simon Fraser University will be working with several teachers in Burnaby North Secondary School in a project designed to teach students how to cope with stress. The purpose of the project is to determine whether it is possible for school students to learn various stress management procedures, whether the procedures work as well with school students as with adults, and which procedures seem to be most appropriate for school students.

The stress management procedures will be taught as part of the regular curriculum in some classes of Guidance 8 and Fitness 11 LD. In order to determine the effectiveness of these procedures, the students will be given several paper and pencil tests (measuring self-concept, anxiety, and stress symptoms) and asked to keep a journal of the ways in which they use the procedures. These measures will be taken at the beginning and end of this unit of study. Because the classes are part of the regular curriculum in these courses, all students will be expected to take part in the classes, however, completing the tests described above will be optional. We are hoping that most students will agree to complete the tests, as this will give us the best idea of how the stress management procedures work.

The results of the testing will be strictly confidential. However, any student can receive a copy of his or her own results after the unit is over. The whole process will take approximately ten periods. At the end of the study, the students will have learned a procedure that will help them relax and control stress and anxiety.

This project has been approved by your school district and your school has indicated a willingness to take part in the project. The study has also been approved by the University Ethics Committee at Simon Fraser University.

Dr. Hiebert will be conducting an information evening at your school on Monday, February 6, 7:00 p.m., in room 201 in the North Building. The meeting will last approximately 20 minutes and will precede an information meeting for parents regarding course selection. Any parents and students who wish more information are invited to attend. If you are unable to attend or wish more information you may telephone Dr. Hiebert at 291-3389 or 291-3395.

Appendix B
Consent Form

I, _____ have read the enclosed
student's name
information sheet and would like to participate in the stress
control project.

I understand that all data collected will be confidential
that I can receive a copy of my results at any time.

I also understand that I can withdraw from the study at any
time if I change my mind.

If I wish, I can receive a copy of the final report of the
study by contacting Mr. Bassett at the school.

If I have any concerns about the study or any questions,
either before or during the project I can contact Dr. Hiebert at
291-3389 or 291-3395.

signed _____
student's signature

I have read the information sheet and agree to allow my son/
daughter to take part in the stress control project.

signed _____
parent's signature

Please return this form by February 10.

Appendix C

RELAXATION MONITORING SHEET

<u>DAY</u>	<u>INDICATOR</u>	<u>START</u>	<u>FINISH</u>	<u>DIFFERENCE</u>
1. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____
2. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____
3. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____
4. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____
5. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____
6. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____
7. _____	pulse rate (per minute)	_____	_____	_____
	breathing rate (per minute)	_____	_____	_____
	finger temperature (degrees)	_____	_____	_____

Appendix D

CONTROL GROUP CAREER EDUCATION UNIT LESSON PLANS

Introduction

The three components of a comprehensive life planning/career education program are: Self Awareness - learning about yourself

Career Awareness - learning about the variety of careers in which you may be interested

Decision Making - learning how to make effective decisions

At the grade 8 level our interest is primarily to encourage student awareness of the life planning/career education concept.

The emphasis at this level is on the self-awareness component.

Career education is a developmental process that focuses on:

- the individual rather than work
- the process rather than content
- multiple life roles rather than work roles
- education for life rather than training for employability

With this in mind the content of a career education program concentrates on:

- the interests, values and other characteristics of the individual
- the family and social environment of the individual
- the decision making and communication skills required by individual to understand his or her environment

Lesson 1

SELF-AWARENESS

Introduction

Career Education begins with the students' better understanding of themselves. In this theme students begin to understand that they are physical, psychological, and social individuals and that these areas are affected by both their heredity and social environments. Particular emphasis is given to the clarification of values, roles, and needs. It is hoped that students will gain an appreciation of themselves as unique individuals.

This unit further attempts to develop an awareness of the skills necessary to formulate life plans or goals. Decision making and communication skills are a pre-requisite to goal setting and therefore are examined in this theme.

FAMILY CAREER TREE

OBJECTIVE: Students understand the relationship between family background and career choice.

PROCEDURE: Have students complete the family career tree and discuss similarity of occupations. Does this have any implications for your own career? What can you learn about the occupations held by your ancestors?

Lesson 2

TWENTY THINGS I LOVE TO DO

OBJECTIVE Students are made aware of similarities and differences they have in comparison to familial others, task preference, change and importance.

PROCEDURE Step one

On a sheet students list twenty activities that they enjoy doing.

Step two

The counsellor introduces the "key" to this worksheet (see below) and explains each item to the class. Students examine each of their activities and indicate whether any one of the items in the key apply to that particular activity by ticking the appropriate column.

KEY

\$ -an item or activity costing more than \$3.00

A -an activity done alone

P -a people oriented activity

3 -an activity which would have not been on your list three years ago

R -requires some kind of risk - physical, mental, emotional

F -an item which would have been on your father's list at your age

M -an item which would have been on your mother's list at your age

Date -approximate date you last did this activity

Lesson 3

OBJECTIVE Students learn both personal strengths and weaknesses and the relationship of these to occupations.

Students learn that they can control certain things to maximize their potential.

- PROCEDURE
1. Students complete the following chart: "I want to be a....."
 2. Students then refer to the column headed "things that would stop me" and identify which of those can be changed and in what ways as per the chart.
 3. Students refer to this list and identify those items that could be changed by them.

Lesson 4

WHAT WOULD YOU DO IF.....?

OBJECTIVE Students learn that their behaviour is motivated by needs which may be conscious or subconscious.

PROCEDURE

1. Students break into small groups and are asked to imagine that they have just shipwrecked on a desert island, each group is to list what they would do in order of importance and for each activity they are to explain their purpose behind it
2. The class reassembles and each group reports back to the class. The counsellor explains Maslow's hierarchy of needs and the class attempts to determine what needs are being met by each activity in terms of Maslow's hierarchy of needs.

Note: Students will very probably not suggest activities that satisfy self-esteem or self-actualization without prompting from the counsellor.

Lesson 5

VALUES CLARIFICATION: UNDERSTANDING ROLES

- OBJECTIVE Students learn the relative importance of each role and how their time and money is used to support each role.
- PROCEDURE 1. Students are asked to rank order the following three roles that they play according to importance to them.
- Student
- Friend
- Family member
2. Students then complete the chart:
- 10 ways I spend my time
- 10 things I love to do
3. Students total the number of activities checked off under each column. They are then able to compare what they actually do with what they like to do. Secondly, students are able to check whether or not the activities correspond with their rank order of roles.

Lesson 6

DECISION MAKING IN DAILY LIFE

- OBJECTIVE** Students learn that they are making decisions constantly.
- PROCEDURE**
- Step one
- Pass out copies of a story to class. Read aloud.
- Step two
- Have students rank order the five most important decisions that Mike had to make and state the reason for each.
- Step three
- Divide the class into small groups and have each group arrive at consensus on the five most important decisions
- Step four
- Have each group report back to the class and as a class try to define what makes a decision important.

Lesson 7

WORK VALUES CONTINUUMS

- OBJECTIVE** To have students begin to be aware of their personal preference toward work through rank ordering and continuum.
- PROCEDURE** Have copies of "Continuums for Selected Value Areas" and "Rank Orders for Selected Value Areas" for each student. Have them read through both sheets and make individual selections.
- Have the students get into groups and discuss their individual selections with others. How do some of the selections mirror individual values toward work? How do you account for some of the values that you hold?

Lesson 8

CAREER AWARENESS

7,000 Jobs and How to Find Out What They Are

OBJECTIVE Students will become aware of the multiplicity of occupations that are available within Canada

PROCEDURE Step one

Students are divided into small groups and are asked to nominate one person as recorder. Within each group students first identify a television show and list any occupations portrayed on that show. This procedure is followed for as many TV shows as they list within a five minute time limit. The strategy is competitive - each group tries to list the most jobs. The group's recorder tallies the list and the number is reported to the class.

Step two

In order to further expand upon the list of occupations developed in Step 1, have students repeat this process of brainstorming using one of the methods listed below:

- jobs found in a specific location (ie., school, hospital, airport)
- jobs from a specific occupational field (ie., recreation, forestry, manufacturing)
- jobs from a specific work setting (ie., indoor and outdoor, urban and rural)

Step three

The counsellor summarizes by pointing out that although extensive lists were obtained these only cover a small fraction of the total number of occupations available. There are, in fact, over 7,000 occupations and these are all described in the CCDO. The counsellor may then use this reference to illustrate some other occupations.

Lesson 9

CAREER ATTRIBUTES

OBJECTIVE Students learn that success in occupations is based on non-school abilities as well as other attributes.

PROCEDURE Part 1

Have students complete the attributes chart. Various attributes are listed in the first column. Indicate the importance of each attribute for each of the five occupations in the next five columns. Use the following scale and write the number in the boxes.

1. very important for this occupation
2. would help, but not essential
3. generally not important

Ask yourself, "Is this attribute important for doing this job well?"

Part 2

Now estimate the extent to which you possess each of these attributes or skills by placing the appropriate number for each of them in the self column. Use the following scale:

1. I have this characteristic in most situations
2. I have this characteristic in about half of the situations I can think of
3. I normally don't have this characteristic
4. I don't know the extent to which I have this characteristic

Lesson 10

SEXUAL STEREOTYPES--OCCUPATIONAL AND BEHAVIOURAL STEREOTYPES

OBJECTIVE Students learn that they may tend to relate an occupation or behaviours to a particular sex.

PROCEDURE Step 1

Students examine a list of occupations and characteristics and indicate whether they associate them mostly with men or women.

Step 2

The class votes on each item in order to identify group values.

Lesson 11

CAREER CROSSWORD

OBJECTIVE To learn the terminology associated with career planning and to further expand occupational horizons.

PROCEDURE Students complete the crossword either individually or in very small groups.

Appendix E

TREATMENT GROUP LESSON PLANS

Overview

1. Pretest - STAI, SOSI, SDQ
Introduce unit
2. Stress, progressive relaxation, first skill practice
3. Review progressive relaxation as a skill, parts of the
progressive relaxation program
4. Introduce short relaxation exercise; practice; solicit
stressors
5. Progressive relaxation as immunization, practice short script
6. Cue-controlled relaxation, practice
7. Review cue-controlled relaxation, explain how to use it,
practice
8. Differential relaxation, practice differentially, discuss,
practice short script
9. Covert modeling; explain, practice
10. Covert modelling; how to use it yourself, practice
11. Review (Immunization, cue-controlled, differential, covert
modelling)
Posttest

Lesson 1 - Introduction

I. Introduce project

- learn about stress and how to control stress
- at the same time do some research on how effective the stress control procedures are
- use some paper and pencil tests to tell us the effects
- afterwards, talk about what stress is

II. Administer inventories

- Self-evaluation form (STAI) do the X - 1 side first
- Symptoms of Stress Inventory omit 96-107
- Self Description Questionnaire
- have students put names and block numbers on all tests

III. What is Stress (Manual pp.3-4)

- stress response
 - increased HR, RR, GSR, muscle tension
 - decreased hand temperature, stomach motility
 - shunting of cortical blood flow from rational to motor centers
 - all happens together (integrated response)

IV. Link to next lesson

- in this unit we will learn how to relax deeply to control stress

Lesson 2 - Stress and Progressive Relaxation

I. Overview

- review
- relaxation
- practice progressive relaxation
- talk about it

II. Review stress response

- emphasize physiological effects of the stress response

III. Introduce relaxation response (pp. 4-12)

- opposite of stress response
- decrease HR, RR, etc.
- relaxation is a skill
- how to measure HR, RR, finger temp. (pp. 9-11)
- record this on data sheet

IV. Progressive Relaxation procedure; LEAVE 40-45 MINUTES FOR THIS

- Progressive Relaxation tape
- take data

V. Debrief

- discuss changes
- descriptive praise
- home practice
 - 20 minutes once or twice a day
 - go through script from memory

Lesson 3 - Progressive Relaxation Review

I. Overview

- review progressive relaxation
- practice
- debrief

II. Review progressive relaxation as a skill

- go over 4 parts of the exercise (pp. 17-19)
- importance of practice (pp. 19-22)
- ultimately learn to use progressive relaxation for two purposes:
 - a) to lower our general level of arousal
 - b) to be able to relax on the spot wherever and whenever we want

III. Practice

- take data
- Progressive Relaxation
- take data

IV. Debrief

- discuss changes
- descriptive praise
- emphasize home practice

Lesson 4 - Short Progressive Relaxation Procedure

I. Overview

- home practice
- shorten progressive relaxation exercise
- practice
- debrief

II. Discuss home practice

- emphasize progressive relaxation is a skill, acquired through practice
- discuss difficulty and/or results with home practice
 - a) data sheets
- introduce keeping a log
 - a) record any special thoughts, feelings, insights, etc.
 - b) use diary form

XII. Shorter relaxation

- rationale: a shorter script means more time in the relaxed state; also, we don't want to have to become tense all the time in order to relax
- those who have practiced will find this just as relaxing, but only half as long

IV. Practice

- take data
- Auto-Suggestive Relaxation (1st half of side 2, not imagery)
- take data

V. Debrief

- discuss changes
- compare to previous results
- descriptive praise for practice
- emphasize continued practice, now with short script
- solicit stressors, these are potential situations in which to use progressive relaxation

Lesson 5 - Immunization

I. Overview

- immunization
- practice
- debrief

II. Progressive Relaxation as immunization (pp. 29-30)

- daily relaxation results in lowered arousal levels
- easier to take things in stride because you are less worked up
- need to practice every day (5-6 times per week) for 20 minutes
- especially good for unexpected stress, or constant high pressure

III. Practice

- take data
- Auto-Suggestive Relaxation tape
- take data

IV. Debrief

- discuss changes
- solicit stressors
 - tomorrow we will look at a new way to use progressive relaxation to handle these stressors
- discuss any changes in the amount of stress students feel
- discuss log entries

Lesson 6 - Cue-controlled Relaxation

I. Overview

- review: immunization and stressors
- cue-controlled relaxation: a new use of relaxation
- practice
- debrief

II. Review immunization

- immunization lowers general levels of tension
- immunization helps us cope with unexpected stressors
- immunization helps us generally feel better
- must use 20 minutes each day for immunization effect

III. Review stressors

- list most frequent stressors identified at last class
- today we will learn a new skill to deal with these types of situations

IV. Cue-controlled relaxation (pp. 18, 23, 30, 31)

- explain what is meant by a "cue"
- explain strengthening the cue through association (i.e., the cue is a conditioned stimulus to elicit relaxation
- explain how we strengthen the cue (p. 23)

V. Practice

- take data
- Auto-Suggestive Relaxation tape
- cue down to relaxed state, count out and cue down, count out, etc.; do this 2 or 3 times
- take data

VI. Debrief

- discuss changes
- emphasize practicing the cue 2 or 3 times at the end of daily practice to develop a strong cue

Lesson 7 - Cue-controlled Relaxation (Follow-up)

I. Overview

- review cue-controlled relaxation
- how to link cue with stressors
- practice
- debrief

II. Review cue-controlled relaxation

- explain the cue
- explain how to strengthen the cue
- review the list of stressors

III. How to use the cue

- explain how to use the cue (pp. 30-31)
- with systemic practice, a new habit is formed of catching a rise in tension and automatically using the cue to relax it down

IV. Practice

- take data
- practice with Auto-Suggestive Relaxation
- take data
- practice cueing down, then counting out 2 or 3 times

V. Debrief

- discuss changes
- discuss logs
- have students identify one mild situation in which they will begin practicing using their cue

Lesson 8 - Differential Relaxation

I. Overview

- review uses
- new uses
- practice
- debrief

II. Review uses

- immunization:
 - use every day for 20 minutes
 - lower baseline arousal
- Cue-controlled
 - use in situations where tension is rising
 - use in mild situations first
 - as cue gets stronger, use in more intense situations
 - or use every 15-20 minutes throughout the day as prevention, to help stay relaxed

III. Differential Relaxation

- relax part of the body that we are not using
- relax specific tension spot
- train by practicing with large muscle groups in undemanding situations, progress to small muscle groups in demanding situations

IV. Practice Differentially

- produce the relaxed feeling in your legs; signal with finger when it is there
- as we talk about it, keep legs relaxed
- try same thing with arms
- discuss

V. Practice whole exercise

- take data

X -practice; teacher recites or reads Auto-Suggestive Relaxation

VI. Debrief

Lesson 9 - Covert Modelling

I. Overview

- review differential relaxation
- new procedure
- practice
- debrief

II. Review Differential Relaxation

- go over theory and training guidelines
- practice with legs, and then arms
 - continue this throughout the rest of this class, reminding students periodically to keep legs (or arms) relaxed

III. Covert Modelling (pp. 32-34)

- explain theory
- explain that it works best with vivid imagers
 - vivid imagers can imagine more detail/specifics
- select with students a situation for them to practice with
 - test writing would be a good one to use
 - develop a "mental video tape" as a group
 - plan the script, scenes, etc. using cue-controlled relaxation as the coping strategy (use p. 33 as a guide)
 - where is the exam
 - who is doing what in the scene
 - details of colour, lighting, sounds, smells
 - more specific=more vivid image=better results
 - IT IS IMPERATIVE THAT THIS SCENE REPRESENTS A POSITIVE COPING SITUATION

IV. Practice

- take data
- practice Auto-Suggestive Relaxation tape
- present the Covert Modelling scene (just before the count out at end)
- take data

V. Debrief

- next day we will cover how to set up a program like this for yourself

Lesson 10 - Covert Modelling

I. Overview

- review covert modelling
- describe how to do it for yourself
- practice
- debrief

II. Review Covert Modelling

- review theory
- review procedure
- have students select a situation for themselves
 - prepare a mental video tape
 - jot down (point form) on paper:
 - scene
 - who is doing what
 - specific details, colour, smells, etc.

III. Practice

- take data
- practice Auto-Suggestive Relaxation--teacher presents
- at the end, present the Covert Modelling:

"....now whild you are relaxed, play through your mental video tape,....make it as real and as vivid as you can,....very good, now just relax,....once more, while you remain relaxed, play through your scene again,.... imagine it as real and as vividly as you can,....imagine yourself coping beautifully, using the cue, staying nice and relaxed,....very good,....you have done a good job of relaxing and working on your scene, now it is time for your body to return....(continue with last paragraph of script on p. 48)

- take data

IV. Debrief

Lesson 11 - Review and Posttest

I. Overview

- review
- posttest

II. Review stress, relaxation, and uses

- stress
- progressive relaxation
- immunization
- cue-controlled relaxation
- differential relaxation
- covert modelling

III. Posttest

- STAI
- SOSI
- SDQ
- collect data sheets and logs
- solicit "best usesc, "worst problems"

Appendix F

Multivariate Tests of Significance for Self Description Questionnaire, Academic and Non-Academic Scales; State-Trait Anxiety Inventory, S- and T-Scales; and Symptoms of Stress Inventory

Effect	F	p<
Group	2.12	.07
Time	54.38	.01
Group x Time	2.18	.07

Note. df=5,73

Appendix G

Univariate Test of Significance for Self Description Questionnaire, Academic and Non-Academic Scales; State-Trait Anxiety Inventory, S- and T-Scales; Symptoms of Stress Inventory

Effect, Variable	MS	F	p<
Group			
SDQA	1502.91	1.82	.18
SDQNA	1660.74	1.58	.21
STAI-S	13.38	.12	.73
STAI-T	153.28	1.25	.27
SOSI	1346.27	.61	.44
Time			
SDQA	138.63	2.33	.13
SDQNA	3.96	.04	.84
STAI-S	43.60	1.20	.28
STAI-T	77.98	3.19	.08
SOSI	132009.42	240.99	.01
Group x Time			
SDQA	450.78	7.56	.01
SDQNA	.43	.01	.95
STAI-S	49.14	1.35	.25
STAI-T	24.93	1.02	.32
SOSI	263.49	.48	.49

Note. df=1,77

Appendix H

Multivariate Tests of Significance for Heart Rate,
Respiration Rate, Finger Temperature

Effect	F	p<
PrePost	53.36	.01
Week	1.94	.06
PrePost x Week	.77	.64

Note. df=4,9

Appendix I

Univariate Tests of Significance for Average Heart Rate
Average Respiration Rate, Average Finger Temperature

Effect, Variable	MS	F	p<
PrePost			
AHR	943.94	41.25	.01
ARR	278.02	90.96	.01
AFT	31.68	1.54	.24
Week			
AHR	69.22	1.72	.18
ARR	19.91	1.16	.34
AFT	75.78	2.48	.08
PrePost x Week			
AHR	8.74	.42	.74
ARR	1.17	.45	.72
AFT	5.60	1.96	.14

Note. df=3,12.

Note. AHR=Average Heart Rate; ARR=Average Respiration Rate;
AFT=Average Finger Temperature.

Appendix J

Multivariate Tests of Significance for Self Description Questionnaire, Academic and Non-Academic Scales; State-Trait Anxiety Inventory, S- and T-Scales; Symptoms of Stress Inventory

Effect	F	p<
Teacher	1.92	.06
Time	25.12	.01
Teacher x Time	.71	.72

Note. df=5,37.

Appendix K

Univariate Tests of Significance for Self Description Questionnaire, Academic and Non-Academic Scales; State-Trait Anxiety Inventory, S- and T-Scales; Symptoms of Stress Inventory

Effect, Variable	MS	F	p<
Teacher			
SDQA	253.17	.56	.57
SDQNA	3529.92	5.13	.01
STAI-S	2.90	.03	.97
STAI-T	34.02	.33	.72
SOSI	1539.25	.74	.49
Time			
SDQA	525.28	6.12	.02
SDQNA	3.68	.05	.83
STAI-S	95.05	2.61	.11
STAI-T	98.28	4.66	.04
SOSI	79500.28	119.43	.01
Teacher x Time			
SDQA	57.27	.67	.52
SDQNA	61.80	.77	.47
STAI-S	3.31	.09	.91
STAI-T	37.70	1.79	.18
SOSI	965.64	1.45	.25

Note. df=2,41

Appendix L

Multivariate Tests of Significance for Self Description Questionnaire, Academic and Non-Academic Scales; State-Trait Anxiety Inventory, S- and T-Scales; Symptoms of Stress Inventory

Effect	F	p<
Sex	.92	.48
Time	25.05	.01
Sex x Time	.24	.94

Note. df=5,38.

Appendix M

Univariate Tests of Significance for Self Description Questionnaire, Academic and Non-Academic Scales; State-Trait Anxiety Inventory, S- and T-Scales; Symptoms of Stress Inventory

Effect, Variable	MS	F	p<
Sex			
SDQA	172.66	.39	.54
SDQNA	2033.99	2.57	.12
STAI-S	96.38	1.05	.31
STAI-T	70.99	.68	.41
SOSI	2148.89	1.04	.31
Time			
SDQA	530.61	6.15	.02
SDQNA	3.62	.04	.83
STAI-S	95.05	2.77	.10
STAI-T	96.67	4.33	.04
SOSI	79454.19	114.28	.01
Sex x Time			
SDQA	9.43	.11	.74
SDQNA	.12	.001	.97
STAI-S	13.23	.39	.54
STAI-T	2.49	.11	.74
SOSI	21.29	.03	.86

Note. df=1,42.

References

- Altmaier, E. (Ed.). (1983). Helping students manage stress. San Francisco: Jossey-Bass.
- Ballenger, R. (1979). The effects of relaxation training on self-concept. Dissertation Abstracts International, 41, 2936A.
- Bander, R., Russell, R., & Zamostny, K. (1982). A comparison of cue-controlled relaxation and study skills counseling in the treatment of mathematics anxiety. Journal of Educational Psychology, 74, 96-103.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavior change. Psychological Review, 84, 191-215.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. American Psychologist, 37, 122-147.
- Barrios, B., & Shigetomi, C. (1979). Coping skills training for the management of anxiety: A critical review. Behavior Therapy, 10, 491-522.
- Benson, H. (1975). The relaxation response. New York: Morrow.
- Berglund, B., & Chal, A. (1972). Relaxation training and a junior high behaviour problem. School Counsellor, 19, 288-293.
- Bibby, R., & Posterski, D. (1985). The emerging generation: An inside look at Canadian teenagers. Toronto: Irwin Publishing.
- Bird, A., Cripe, B., & Morrison, N. (1980). Children and stress. Journal of Physical Education, Recreation, and Dance, 62, 28-29.
- Blumenthal, S., Jesse, M., Hennekens, C., Klein, B., Ferver, P., & Gourley, J. (1975). Risk factors for coronary artery disease in children of affected families. Journal of Pediatrics,

87, 1187-1192.

- Borkovec, T., Grayson, J., & Cooper, K. (1978). Treatment of general tension: Subjective and physiological effects of progressive relaxation. Journal of Consulting and Clinical Psychology, 46, 518-528.
- Borkovec, T., & Sides, J. (1979). Critical procedural variables related to physiological effects of progressive relaxation: A review. Behaviour Therapy and Research, 17, 119-125.
- Brown, B. (1974). New mind, new body: Biofeedback, new directions for the mind. New York: Harper & Row.
- Cannon, W. (1953). Bodily changes in pain, hunger, fear and rage. Boston: Branford.
- Cattell, P., & Scheier, I. (1963). Handbook for the IPAT Anxiety Scale (2nd ed.). Champaign, Illinois: Institute for Personality and Ability Testing.
- Chandler, L. A. (1982). Children under stress. Springfield: Charles C. Thomas.
- Chang, J. (1985). Effects of a relaxation curriculum on members of a grade two class. Unpublished Master's Thesis, Simon Fraser University, Burnaby, British Columbia.
- Cooper, C. (1983). Stress research: Issues for the eighties. Chichester: J. Wiley & Sons.
- Cox, T. (1978). Stress. New York: MacMillan.
- Day, R., & Sadek, S. (1982). The effect of Benson's Relaxation Response on the anxiety levels of Lebanese children under stress. Journal of Experimental Child Psychology, 34, 350-356.
- Decker, T., Williams, J., & Hall, D. (1982). Preventive train-

ing in management of stress for reduction of physiological symptoms through increased cognition and behavioral controls. Psychological Reports, 50, 1327-1334.

- Deffenbacher, J., & McKinley, D. (1983). Stress management: Issues in intervention design. In E. Altmaier (Ed.), Helping students manage stress (pp.43-62). San Francisco: Jossey-Bass.
- Deffenbacher, J., & Shelton, J. (1978). Comparison of anxiety management training and desensitization in reducing test and other anxieties. Journal of Counseling Psychology, 25, 277-282.
- Denniston, D., & McWilliams, P. (1975). The TM book. New York: Warner.
- Dobson, C. (1982). Stress: The hidden adversary. Lancaster, England: MTP Press Ltd.
- Dumka, L. (1982). Testing the effectiveness of a self-instructional relaxation training program. Unpublished Master's Thesis, Simon Fraser University, Burnaby, British Columbia.
- Elle, U., & Vagt, G. (1981). {Experimental examination of the effectiveness of relaxation training of students with test and achievement anxiety.} Psychologie und Praxis, 19(4), 172-177. (From Psychological Abstracts, 1981, Abstract No. 4077).
- Elkind, D. (1981). The hurried child. Reading, Massachusetts: Addison-Wesley Publishing Co.
- Elliot, G., & Eisdorfer, C. (Eds.). (1982). Stress and human health. New York: Springer.
- Ellis, D., & Davis, L. (1982). The development of self-concept boundaries across the adolescent years. Adolescence, 17, 695-

710.

- Feindler, E., & Fremouw, W. (1983). Stress inoculation training for adolescent anger problems. In D. Meichenbaum & M. Jaremko (Eds.), Stress reduction and prevention (pp.451-485). New York: Plenum Press.
- Forman, B., Eidson, K., & Hagan, B. (1983). Measuring perceived stress in adolescents. Adolescence, 18, 573-576.
- Frederick, A. (1980). How children learn the skill of tension control. In F. J. McGuigan, W. E. Sime, & J. M. Wallace (Eds.), Stress and tension control (pp. 231-241). New York: Plenum Press.
- Garbowsky, M. (1984). Teaching teens to cope with stress. Curriculum Review, 24, 21-24.
- Gullotta, T. (1983). Early adolescent stresses. Theory into Practice, 22, 151-154.
- Hackett, G., & Lonborg, S. (1983). Models of stress. In E. Altmaier (Ed.), Helping students manage stress (pp. 3-22). San Fransisco: Jossey-Bass.
- Haggerty, R. J. (1983). Forward. In N. Garmezy & M. Rutter (Eds.), Stress, coping, and development in children (pp. xxi-xxii). New York: McGraw-Hill.
- Hiebert, B. (1980). Self-relaxation: Learn it, use it. Coquitlam: Per Man Consultants.
- Hiebert, B. (1983). A framework for planning stress control interventions. Canadian Counsellor, 17, 51-61.
- Hiebert, B. (1985). Stress and teachers: The Canadian scene. Toronto: Canadian Education Association.
- Hiebert, B., Dumka, L., Cardinal, J. (1983). The validity of

- self-monitored physiological indices of relaxation. Canadian Counsellor, 18, 47-48.
- Hiebert, B., & Eby, W. (1985). The effects of relaxation training for grade 12 students. School Counselor, 32, 205-210.
- Hillenberg, J., & Collins, F. (1982). A procedural analysis and review of relaxation training research. Behaviour Research and Therapy, 20, 251-260.
- Holroyd, K., Appel, M., & Andrasik, F. (1983). A cognitive-behavioral approach to psychophysiological disorders. In D. Meichenbaum & M. Jaremko (Eds.), Stress reduction and prevention (pp. 219-260). New York: Plenum Press.
- Jacobson, E. (1938). Progressive relaxation (2nd ed.). Chicago: University Press.
- Jaremko, M. (1983). Stress inoculation training for social anxiety, with emphasis on dating anxiety. In D. Meichenbaum & M. Jaremko (Eds.), Stress reduction and prevention (pp. 419-450). New York: Plenum Press.
- Johns, B., & Johns, M. (1983). Stress burns out kids, too. Education Digest, 49, 44-46.
- Kasl, S. (1983). Pursuing the link between stressful life experiences and disease. In C. Cooper (Ed.), Stress research: Issues for the eighties (pp.79-102). Chichester: J. Wiley & Sons.
- Kagan, J. (1983). Stress and coping in early development. In N. Garnezy & M. Rutter (Eds.), Stress, coping, and development in children (pp. 191-216). New York: McGraw-Hill.
- King, N. (1980). The therapeutic utility of abbreviated progressive relaxation: A critical review with implications for

- clinical practice. In M. Herson, R. Eisler, & P. Miller (Eds.), Progress in Behavior Modification (Vol. 10). New York: Academic Press.
- Ladouceur, R., & Armstrong, J. (1983). Evaluation of a behavioral program for the improvement of grades among high school students. Journal of Counseling Psychology, 30, 100-103.
- Lamott, K. (1975). Escape from stress. New York: Putnam.
- Lazarus, R. (1974). Cognitive and coping processes in emotion. In B. Weiner (Ed.), Cognitive views of human motivation. New York: Academic Press.
- Lazarus, R. (1977). A cognitive analysis of biofeedback control. In G. E. Schwartz & J. Beatty (Eds.), Biofeedback: Theory and research (pp. 67-87). New York: Academic Press.
- Lazarus, R., & Launier, R. (1978). Stress-related transactions between person and environment. In L. A. Pervin & M. Lewis (Eds.), Perspectives in interactional psychology (pp. 308-311). New York: Plenum Press.
- LeBow, J. (1975). Evaluating the seriousness of adolescent anxiety reactions. Primary Care, 2, 281.
- Leckie, M., & Thompson, E. (1979). Symptoms of Stress Inventory: A self-assessment. Seattle: University of Washington.
- Leventhal, H., & Nerenz, D. (1983). A model for stress research with some implications for the control of stress disorders. In D. Meichenbaum & M. Jaremko (Eds.), Stress reduction and prevention (pp. 5-38). New York: Plenum Press.
- Lynn, S., Rhue, J., & Freedman, R. (1980). Biofeedback and stress-related disorders: Enhancing transfer and gain maintenance. In F. MacGuigan, W. Sime, & J. Wallace (Eds.),

Stress and tension control (pp. 187-196). New York: Plenum Press.

- Magnusson, D. (1982). Situational determinants of stress: An interactional perspective. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects. New York: The Free Press.
- Marsh, H., Barnes, J., & Smith, I. (in press). Self-other agreement on multidimensional self-concept ratings: Factor analysis and multitrait-multimethod analysis.
- Marsh, H., & O'Neill, R. (in press). Self-Description Questionnaire III: The construct validity of multidimensional self-concept ratings by late adolescents.
- Marsh, H., Parker, J., & Barnes, J. (in press). Multidimensional adolescent self-concept: Their relationship to age, sex, and academic measure.
- Marsh, H., Parker, J., & Smith, I. (1983). Pre-adolescent self-concept: Its relation to self-concept as inferred by teachers and to academic ability. British Journal of Educational Psychology, 53, 60-78.
- Marsh, H., & Smith, I. (1981). The Self Description Questionnaire. Sydney: University of Sydney Press.
- Marsh, H., Smith, I., & Barnes, J. (1983). Multitrait-multimethod analyses of the Self Description Questionnaire: Student-teacher agreement on multidimensional ratings of student self-concept. American Educational Research Journal, 20, 333-357.
- Martin, J., & Hiebert, B. (1982). Instructional Counseling. Vancouver: Centre for the Study of Curriculum and Instruction.

- Martuza, V., & Kallstrom, D. (1974). Validity of the State-Trait Anxiety Inventory in an academic setting. Psychological Reports, 35, 363-366.
- McGuigan, F. J. (1980). Principles of scientific relaxation. In F. J. McGuigan, W. E. Sime, & J. M. Wallace (Eds.), Stress and tension control (pp. 209-216). New York: Plenum Press.
- McLean, M. (1986). The relationship between self-efficacy and biofeedback training outcome in an anxious population. Unpublished Master's Thesis, Simon Fraser University.
- Mead, J. (1976). Effects of relaxation training on the attitudes and anxiety levels of 9th grade potential dropouts. Dissertation Abstracts International, 37, 5612A.
- Meichenbaum, D. (1977). Cognitive-behavior modification: An integrative approach. New York: Plenum Press.
- Meichenbaum, D., & Cameron, R. (1983). Stress inoculation training: Toward a general paradigm for training coping skills. In D. Meichenbaum and M. Jaremko (Eds.), Stress reduction and prevention (pp. 115-154). New York: Plenum Press.
- Meichenbaum, D., & Jaremko, M. (Eds.). (1983). Stress reduction and prevention. New York: Plenum Press.
- Meichenbaum, D., & Turk, D. (1976). The cognitive-behavioral management of anxiety, anger, and pain. In P. O. Davidson (Ed.), The behavioral management of anxiety, depression, and pain. New York: Brunner/Mazel.
- Omizo, M. (1980). The effects of biofeedback-induced relaxation training in hyperactive adolescent boys. Journal of Psychology, 105, 131-138.
- Patterson, G. (1983). Stress: A change agent for family pro-

- cess. In N. Garmezy and M. Rutter (Eds.), Stress, coping, and development in children (pp. 235-264). New York: McGraw-Hill.
- Peters, R., Benson, H., & Porter, D. (1977). Daily Relaxation Response breaks in a working population: Effects on self-reported measures of health, performance, and well-being. American Journal of Public Health, 67, 946-959.
- Petersen, A., & Spiga, R. (1982). Adolescence and stress. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects (pp. 515-528). New York: MacMillan.
- Pfohl, W. (1979). Children's anxiety management program: A broad based behavioral program teaching children to cope with stress and anxiety. Dissertation Abstracts International, 40, 3905A.
- Powell, L., & Eagleston, J. (1983). The assessment of chronic stress in college students. In E. Altmaier (Ed.), Helping students manage stress (pp. 23-42). San Francisco: Jossey-Bass.
- Ragan, S. L. (1984). Efficacy of implementing Kiddie QR training with primary grade students. Unpublished Master's Thesis, Simon Fraser University, Burnaby, British Columbia.
- Ragan, S. L., & Hiebert, B. (in press). Kiddie QR: Field testing a relaxation program for young children. School Counselor.
- Reed, S., & Saunders, A. (1984). What makes kids vulnerable? Instructor, 93, 28-32.
- Richardson, G., Beall, S., & Jessup, G. (1983). The efficacy of a three-week stress management unit for high school students. Health Education, 14, 12-15.

- Richter, N. (1984). The efficacy of relaxation training with children. Journal of Abnormal Child Psychology, 12, 319-344.
- Rosen, T., Terry, N., & Leventhal, H. (1982). The role of esteem and coping in response to a threat communication. Journal of Research in Personality, 16, 90-107.
- Rutter, M. (1983). Stress, coping, and development: Some issues and some questions. In N. Garmezy and M. Rutter (Eds.), Stress, coping, and development in children (pp. 1-42). New York: McGraw-Hill.
- Schafer, W. (1978). Stress, distress, and growth. California: Responsible Action.
- Scheirer, M., & Kraut, R. (1979). Increasing educational achievement via self-concept change. Review of Educational Research, 49, 131-150.
- Schultz, E., & Heuchert, C. (1983). Child stress and the school experience. New York: Human Sciences Press, Inc.
- Segal, J. (1983). Utilization of stress and coping research: Issues of public education and public policy. In N. Garmezy & M. Rutter (Eds.), Stress, coping, and development in children (pp. 303-334). New York: McGraw-Hill.
- Selye, H. (1983). The stress concept: Past, present, and future. In C. Cooper (Ed.), Stress research: Issues for the eighties (pp. 2-20). Chichester: J. Wiley & Sons.
- Shearer, S., & Pass, L. (1979). Effective use of relaxation: A review. Canadian Counsellor, 14, 3-6.
- Spielberger, C., Gorsuch, R., & Lushene, R. (1970). The State-Trait Anxiety Inventory (STAI) Manual. Palo Alto: Consulting Psychologists Press.

- Stanton, H. (1982). Modification of locus of control: Using the RSI technique in the schools. Contemporary Educational Psychology, 7, 190-194.
- Stevens, R, & Pihl, R. (1982). The remediation of the student at-risk for failure. Journal of Clinical Psychology, 38, 298-301.
- Stout, C., Thornton, B., & Russell, H. (1980). Effect of relaxation training on students' persistence and academic performance. Psychological Reports, 47, 189-190.
- Suinn, R. (1983). Stress management for the competitive performer. In E. Altmaier (Ed.), Helping students manage stress (pp. 76-87). San Francisco: Jossey-Bass.
- Sylwester, R. (1983). The school as a stress reduction agency. Theory into Practice, 22, 3-6.
- Taylor, C., Agras, W., Schneider, J., & Allen, R. (1983). Adherence to instructions to practice relaxation exercises. Journal of Consulting and Clinical Psychology, 51, 952-953.
- Thomas, J. (1980). Agency and achievement: Self-management and self-regard. Review of Educational Research, 50, 213-240.
- Thoresen, C., & Eagleston, J. (1983). Chronic stress in children and adolescents. Theory into Practice, 22, 48-56.
- Tierno, M. (1983). Responding to self-concept disturbance among early adolescents. Adolescence, 18, 577-584.
- Tolman, R., & Rose, S. (1985). Coping with stress: A multimodal approach. Social Work, 30, 151-158.
- Volpe, R. (1975). Feedback facilitated relaxation training in school counselling. Canadian Counsellor, 9, 202-205.
- Walker, C. (1979). Treatment of children's disorders by relaxa-

- tion training: The poor man's biofeedback. Journal of Clinical Child Psychology, 8, 22-25.
- Williams, J., Decker, T., & Libassi, A. (1983). The impact of stress management training on academic performance of low achieving college students. Journal of College Student Personnel, 24, 491-494.
- Williams, W. G. (1980). Civic education in a stressful society: A program of value clarity and tension reduction. In F. J. McGuigan, W. E. Sime, & J. M. Wallace (Eds.), Stress and tension control (pp. 17-36). New York: Plenum Press.
- Wright, J. (1978). An investigation of the effectiveness of a relaxation training model on discipline referrals. Dissertation Abstracts International, 39, 2162A.
- Yadusky-Holahan, M., & Holahan, W. (1983). The effect of academic stress upon the anxiety and depression levels of gifted high school students. Gifted Child Quarterly, 27, 42-46.
- Zaichkowsky, L. B., & Zaichkowsky, L. D. (1984). The effects of a school-based relaxation training program on fourth grade children. Journal of Clinical Child Psychology, 13, 81-85.