The Effect of Relaxation Procedures on Test Anxiety & Test Performance

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THE EFFECT OF RELAXATION PROCEDURES
ON TEST ANXIETY AND TEST PERFORMANCE

A Thesis
Presented to
the Faculty of the Department of Psychology
Western Kentucky University
Bowling Green, Kentucky

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts

by
Mary Jane Thompson
May, 1984
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THE EFFECT OF RELAXATION PROCEDURES
ON TEST ANXIETY AND TEST PERFORMANCE

Recommended April 26, 1984
Livingston Alexander
Director of Thesis

Approved May 16, 1984
Dean of the Graduate College
ACKNOWLEDGEMENTS

As a child, I was a poor reader. As a daughter of a European, I was kept at home, having very little social life outside of school. These two factors, I believe, contributed to a difficulty in verbal expression, written as well as oral. For this reason, I found writing this thesis extremely difficult. Therefore, I am especially grateful to have been able to complete it. And it is only with the help of special people that this was accomplished.

I wish to acknowledge my thesis committee head, Livingston Alexander. Thank you, "Liv," for your continual patience, faith, gentleness and encouragement, as well as your professional manner, knowledge, and guidance.

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THE EFFECT OF RELAXATION PROCEDURES 
ON TEST ANXIETY AND TEST PERFORMANCE

Mary Jane Thompson May 1984 58 pages

Directed by: Livingston Alexander, Doris Redfield, and Harry Robe

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The purposes of this study were (a) to determine if relaxation procedures, consisting of meditation and cognitive self-statements, were effective in improving test performance and in reducing test anxiety and (b) to investigate the relationship between test anxiety and test performance. Thirty-six students in an undergraduate psychology class were administered a self-report anxiety inventory, the Test Anxiety Scale-Revised (TASC-R). The students were then matched according to test anxiety level and randomly assigned to an experimental group or a control group. The experimental group received 20 minutes of relaxation treatments immediately prior to the third, fourth, and fifth course content exams. The control group spent an equal amount of time before these three course content exams in unstructured review. Students in both groups were asked to respond to the TASC-R prior to taking the initial relaxation treatment and following the final relaxation treatment.

Analysis of variance procedures were used to assess the effects of the relaxation procedures on anxiety and test performance. The results showed no significant difference between the treatment and control groups on either anxiety or test performance. Thus, no evidence is
presented in this study to indicate that relaxation procedures do in fact improve test performance, or reduce test anxiety.

Correlational procedures were used to assess the relationship between test anxiety and test performance. No meaningful significant relationships were demonstrated for either group or both groups combined.
CHAPTER I

Introduction

Students who presently matriculate through the educational system seldom make any progression without having to submit to some form of assessment. From their initial experience in elementary school to completion of college, students are tested to determine if they have mastered academic content. Sufficient mastery has typically meant unconditional movement to the next highest level of education. Failure to master academic content has usually resulted in remediation or retention until mastery is achieved. Tests are a necessary routine in the academic process.

Beyond such routine assessment of academic progress, tests are utilized to determine if students are sufficiently competent to receive a high school diploma (Woellner, 1976). Colleges and universities across the country are requiring that students exceed specified levels on college entrance exams (Graduate Records Exam Board, 1979). State certification agencies are assessing the basic skills and the literacy of both new and experienced teachers to determine if they are competent enough to continue on in their profession (Woellner, 1976). Thus, standardized procedures of assessment are more widespread now than they have ever been.

Extensive research (Mandler and Sarason, 1952; Wine, 1971; Sarason, 1965; Speilberger, 1966) has suggested that the pressures associated with doing well and exceeding specified levels on tests contribute to
high levels of anxiety and poor performance. One test anxiety theory, proposed by Mandler and Sarason (1952), conceptualized responses in a testing situation as fitting into one of two categories. Each category involves a learned drive which is a function of the response to the testing situation. The two categories are (a) learned drives, including needs to achieve and finish tasks, which are natural responses to the task, test materials and instructions, and (b) learned anxiety drives which are functions of anxiety reactions previously learned in response to stimuli present in testing situations. The learned anxiety drives are self- rather than task-centered and may be manifested as feelings of inadequacy, helplessness, heightened somatic reaction, anticipation of punishment or loss of status and esteem.

The notion of test anxiety detailed by Mandler and Sarason (1952) suggested treatment procedures similar to the systematic desensitization procedures that were popularly used by psychologists during the 1950s and early 1960s. Systematic desensitization was first developed by Wolpe (Mandler & Sarason, 1952). Wolpe conceptualized systematic desensitization as a passive reconditioning process by which responses antagonistic to anxiety (e.g. muscular relaxation) were paired with increasingly threatening levels of the feared (phobic) stimuli. Over a number of trials the competing physiological state, relaxation, eventually displaced the fear. For several years systematic desensitization remained the most successful treatment used to reduce test anxiety (Cohen, 1969; Crighton & Jehu, 1969; Donner, 1970; Donner & Guerney, 1969; Emery and Krumboltz, 1967; Freeling & Shember, 1970; Garlington & Cotler, 1968; Ihli and Garlington, 1969; Johnson & Sechrest, 1968; Suinn, 1968).
Though systematic desensitization seemed to be successful in reducing self-reported test anxiety, there was no consistent evidence that this method improved test performance (Denny, 1978; Kirkland & Hollandsworth, 1980). Systematic desensitization seemed to be too narrowly focused on the emotional rather than the cognitive component of test anxiety. Researchers began to realise that such a narrow focus failed to address the issue comprehensively enough—that is, exclusive focus on the emotional component of anxiety effectively ignored the self-defeating thoughts that often interfered with performance.

Recent explanations of test anxiety indicate that it consists of two components: one emotional, the other cognitive (Liebert & Morris, 1967). The emotional component, referred to as emotionality, concerns the physiological and affective stress reactions to the test situation. The cognitive component involves expressions of cognitive concern about one's performance, such as thoughts about the consequences of failure and doubts about one's ability to perform adequately.

Such a concept of test anxiety, recognizing a cognitive aspect, seems to be consistent with one proposed by Wine (1971). According to Wine, anxiety can be conceptualized as an attentional deficit. The test anxious individual tends to focus attention on self-inadequacies rather than on the task at hand. Three implications of the attentional analysis of test anxiety are addressed by Wine (1971, p. 99):

1. An attentional approach is explicitly concerned with how the subject used task time—cognitive activity, what is thought about and attended to.

2. This approach implies little interest in autonomic arousal per se. In this context, degree of arousal is irrelevant
unless the subject is attending to being aroused. When arousal becomes quite extreme, it is attentionally demanding.

3. Finally, this analysis implies that the test anxious person's performance may be improved by directing his or her attention to task-relevant variables, and away from self-evaluative rumination.

Acknowledging the cognitive component of test anxiety, researchers compared a cognitive treatment (addressing the attentional or cognitive component of test anxiety) with systematic desensitization as a procedure for treating test anxiety. They found a cognitive method to be superior (Holroyd et al., 1978; Denny, 1978; Denny and Rupert, 1977; Holroyd, 1976; and Meichenbaum, 1972). Moreover, it was found that a cognitive treatment can address both cognitive and physiological components of test anxiety (Meichenbaum, 1972; and Holroyd et al., 1978).

Meichenbaum (1972) used a treatment which addressed both the cognitive and physiological components of test anxiety—called a cognitive behavior modification treatment. This treatment combined (a) an insight-oriented therapy, designed to make test-anxious subjects aware of their anxiety engendering thoughts, and (b) a modified desensitization procedure which employed imagery on coping with anxiety and self-instructional training to attend to the task and not ruminate about oneself. Meichenbaum compared this cognitive behavior modification treatment with a single treatment of systematic desensitization and a nontreatment control group.

Results of Meichenbaum's (1972) study indicated that the cognitive behavior modification was more effective than systematic desensitization or no treatment at all. The cognitive behavior modification group
demonstrated a significant reduction in test anxiety and significantly improved performance, as measured by an analogue test situation and later indicated by grade point average. Following treatment, the test anxious subjects in the cognitive behavior modification group did not differ from a group of low test anxious subjects; and, in fact, the cognitive modification subjects reported a significant increase in facilitative or functional anxiety.

Success in reducing test anxiety and in improving test performance by addressing both components of test anxiety was found by Meichenbaum's cognitive behavior modification treatment program (Meichenbaum, 1972). A treatment other than cognitive modification, addressing both components of test anxiety, was used successfully by Fiebert and Mead (1981) for improving test performance of college students. Fiebert and Mead (1981) used Actualism Meditation to facilitate improvement on test performance. Actualism Meditation involves specific meditation techniques for increasing awareness, directing and controlling attention, and channeling energy throughout the mind and body (Fiebert & Mead, 1981). Fiebert and Mead found that those who practiced such techniques before examination performed on a significantly higher level than a control group who also practiced the techniques, but at a time other than directly before exams.

The purpose of this study is to reduce test anxiety and improve test performance by using a meditative type procedure similar to that of Fiebert and Mead (1981) and also employing self-instructional statements similar to those used by Meichenbaum (1972). Specifically, the questions addressed are as follows:

1. Do relaxation procedures involving meditation and
self-statements lower self-reported test anxiety?

2. Do relaxation procedures help improve test performance?

3. Are test anxiety and test performance related?

The following hypotheses are made: (a) Students who employ relaxation procedures before exams will experience significantly lower levels of test anxiety than students in a control group who receive nonstructured review sessions before exams, (b) Students who employ relaxation procedures before testing situations will demonstrate higher test performance than students in a control group who receive non-structured review sessions, and (c) Test anxiety and test performance are related.
CHAPTER II

Literature Review

The phenomenon of test anxiety has been an important subject of research as far back as 1932 when Alexandria Luria began studying motor disturbance and disorganized behavior exhibited by students during examinations (Billingham & Rupert, 1982). There is currently a fairly extensive body of research directed toward the understanding of test anxiety and the development of interventions for alleviating test anxiety when it interferes with test performance. The research literature on test anxiety can be conceptualized as emerging in distinct phases. Each phase represented the current concern of researchers at the time of its emergence. This review of the literature will be organized to reflect those phases. Accordingly, the following broad concerns will comprise this literature review:

1. Does test anxiety negatively impact test performance?
2. Can systematic desensitization effectively lower test anxiety as measured by self-report?
3. Does lowering test anxiety necessarily lead to improved test performance?
4. Are there alternative treatment approaches to systematic desensitization that counter the effects of test anxiety and improve test performance?

Test Anxiety and Performance

The extensive literature on test anxiety includes varying
definitions of test anxiety. The particular definition of test anxiety proposed by an investigator often dictates the kind of effect this phenomenon has on a subject. According to Spielberger (1972), test anxiety can be conceptualized as a type of anxiety state. He described state anxiety as a transitory emotional reaction which consists of feelings of apprehension, tension, nervousness, worry, and heightened activity of the autonomic nervous system. These emotional states vary in intensity and duration and may fluctuate over time as a function of (a) the stresses that impinge upon the individual and (b) the persistence of the individual's interpretation of the stressful situation as personally dangerous or threatening. Thus, stress experienced during tests may be a function of the subjectively interpreted stimulus properties of test situations. The more difficult the test and the more important the consequences of test performance, the more likely will the test situation be perceived as threatening, and the more likely will anxiety be aroused.

Mandler and Sarason (1952) developed the first scale used in the United States to measure test anxiety, the Test Anxiety Questionnaire (TAQ). The TAQ is a 39-item instrument designed to measure anxiety experienced by individuals when taking a test. A series of experiments by Mandler and Sarason using this scale indicated that college students with high test anxiety performed more poorly in evaluative situations than low test-anxious students. Decrements in the performance of test-anxious students were attributed to the arousal of task-irrelevant responses in test situations. Mandler and Sarason theorized that test-anxious people tend to react to the stress associated with evaluative situations by emitting negative, self-centered responses. Because these
anxiety-mediated task-irrelevant responses are incompatible with good performance, high test-anxious individuals do more poorly than low test-anxious individuals on intelligence tests and learning tasks.

Liebert and Morris (1967) conceptualized test anxiety as consisting of two major components, worry and emotionality, and developed scales for measuring each of these components. Worry was described as primarily cognitive concern about the consequences of failure, and emotionality as the autonomic reactions evoked by evaluative stress. In a later study, Morris and Liebert (1970) reported evidence that worry was associated with performance decrements on cognitive and intellectual tasks, whereas emotionality was unrelated to task performance, except for students with low worry scores. Thus, even though test anxiety was conceptualized as consisting of worry and emotionality, only worry seems to affect test performance.

In a detailed review of the test anxiety literature, Wine (1971) suggested an attentional interpretation to explain the adverse effects of test anxiety on test performance. According to Wine, during task performance, highly test-anxious people divide their attention between task-relevant and task-irrelevant cognitive activities, such as worry and self criticism. These worry cognitions distract students from task requirements and interfere with effective use of their time, thereby contributing to performance decrements. In contrast, low test-anxious people focus their attention more fully on the task and, therefore, perform better on the task.

Sarason (1958) has investigated the combined influence of situational factors and personality characteristics on the performance
of high and low test-anxious individuals in evaluative situations. When achievement is emphasized, test-anxious individuals perform more poorly than individuals who are low in test anxiety. However, when instructions for an exam are designed to alleviate anxiety, high test-anxious subjects improved performance while low test-anxious subjects perform more poorly (Sarason, 1958). On the basis of extensive research evidence, Sarason concludes that high test-anxious individuals tend to be more self-centered and self-critical than individuals who are low in test anxiety, and are more likely to emit personalized, derogatory responses that interfere with task performance.

In summary, test anxiety has been conceptualized by researchers as an anxiety state involving task-irrelevant cognitive and emotional distractions in examination situations. These researchers seem to agree that test-anxious people are likely (a) to perceive examination situations as more dangerous or threatening than do people who are low in test anxiety; (b) to experience worry cognitions and dramatic increases in state anxiety in situations in which they are being evaluated; and (c) to experience performance decrements as a result of high anxiety level.

**Decreasing Test Anxiety Through Systematic Desensitization**

The most widely used behavior therapy technique during the 1950s and 1960s was systematic desensitization (Grossberg, 1964; Rachman, 1968). Because systematic desensitization was effective in the treatment of a wide variety of neurotic disorders, it seemed highly appropriate for treatment of test anxiety. Systematic desensitization is a passive reconditioning process in which responses antagonistic to anxiety (e.g. muscular relaxation) are paired with increasingly
threatening levels of the feared stimulus. Over a number of trials the competing physiological state, relaxation, eventually replaces the fear (Wolpe, 1958).

The focus of research has progressed from simple demonstrations of the efficiency of systematic desensitization (e.g. Garlington & Cotler, 1968; Paul, 1964), through systematic manipulations of the desensitization process (e.g. Suinn, 1968; Cohen, 1969; Ihli & Carlington, 1969) to comparison of competing behavioral treatment strategies (e.g. Allen, 1971; Crighton & Jehu, 1969). Garlington and Cotler (1968) conducted a study using simple systematic desensitization. Thirty-two female students who had obtained extremely high scores on a self-report test anxiety inventory were assigned to either a treatment or control group. Treatment subjects were taught progressive relaxation and trained to visualize, while relaxed, increasingly threatening test situations. The remaining subjects were assigned to a no-contact control group. Results showed that there was a significant decrease in reported test anxiety in the treatment group, while the control group showed relatively little change. The reported changes in test anxiety were not reflected in better performance on course examinations or on final grades by either group.

Analysis of various manipulations of systematic desensitization has yielded several clinically useful findings. Suin (1968) found that self-reported test anxiety could be alleviated in clients who were taught systematic relaxation in groups, thus saving therapist contact time. Cohen (1969) reported that exposing subjects to either a graded hierarchy or a series of high anxiety items resulted in similar reductions in self-reported anxiety. Ihli and Carlington (1969)
assigned subjects to three groups. One group received group
desensitization to a composite hierarchy of increasingly threatening
anxiety-provoking testing situations. A second group received
individually arranged items of the composite, i.e. subjects treated
individually using a general composite arranged for the particular
individual. A third group received individually administered
desensitization, i.e. each individual received originally constructed,
personal hierarchies for reconditioning. All three groups reported
significant reductions in test anxiety.

Systematic desensitization, in varying forms, was effectively used
to reduce test anxiety. To determine if systematic desensitization
was more effective than another modality for treating test anxiety, as
defined by Mandler and Sarason (1952), Allen (1971) conducted a study
comparing systematic desensitization to study skills training. Study
skills training involves counseling subjects on effective methods for
studying. Seventy-five volunteers were assigned randomly to four
treatment conditions: (a) desensitization alone, (b) study counseling
alone, (c) a combination of study counseling and desensitization, or
(d) a placebo procedure. One of two therapists was randomly assigned to
each treatment condition. The experimental design was a repeated-
measures design involving pre- and post-treatment assessment of self-
reported anxiety and academic performance variables. Data were collected
during an interview at three different times: (a) at the beginning of
the experiment, (b) immediately before the midterm exam, and (c)
immediately before the final examination. Results indicated that a
combination of desensitization and study counseling was more effective
than either technique alone in (a) reducing physiological anxiety as
measured by changes in pulse rate and palm sweat and (b) improving academic performance. Desensitization and study counseling were not significantly different from each other in reducing test anxiety, nor significantly more effective than the placebo in improving academic performance.

Thus, Allen's study confirmed the findings of many other researchers who have reported systematic desensitization to be an effective treatment for test anxiety (Speilberger, Anton & Bedell, 1976; Paul, 1964; Garlington & Cotler, 1968; Aponte & Aponte, 1971). Systematic desensitization has been used effectively in varying forms, e.g. individually and in groups) and in combination with other treatment modalities to reduce self-reported test anxiety.

Systematic Desensitization and Test Performance

Although a number of studies have found systematic desensitization to be effective in reducing self-reported test anxiety, there is no consistent evidence that systematic desensitization improves test performance (Allen, 1972; Sarason, 1980). In addition, when desensitization is compared with a placebo control procedure, it appears that systematic desensitization may be no more effective in improving test performance than an equally credible and convincing placebo (Allen, 1971).

Allen (1972) and Sarason (1980) have conducted two major reviews of the literature on test anxiety involving college students. Each author concluded that lowering self-reported test anxiety did not necessarily lead to improved test performance. Most of the studies Allen examined employed systematic desensitization as the major treatment modality, either alone or in combination with some other procedure.
Sarason (1980) reviewed all the investigations of therapeutic manipulations aimed at alleviating test anxiety in college students since the time of Allen's review. Of 47 studies reviewed by Sarason, 20 reported improved test performance. Of these 20, four studies used a form of systematic desensitization, and the rest used other treatment modalities. Thus, although systematic desensitization may lower test anxiety, students may still be sufficiently distracted by task-irrelevant thoughts to perform poorly on tests. Thus, despite experiencing less anxiety, they may still be test-anxious.

In summary, the ability of systematic desensitization and other anxiety-reduction techniques to improve test performance has not been consistently demonstrated. Though these techniques are clearly useful in reducing subjectively experienced anxiety, by themselves they seem to have little impact on academic performance.

Alternative Treatment Approaches

Cognitive Therapy. When it became clear that using systematic desensitization for reducing the emotional, physiological component of test anxiety was not sufficient in alleviating the debilitating problem of test anxiety, researchers began experimenting with other approaches. The most promising among these approaches seemed to be those treatments that addressed both the cognitive (or worry) and physiological aspects of test anxiety. One approach was Meichenbaum's cognitive behavior modification (1972). The cognitive behavior modification treatment was designed to deal with the two major components of test anxiety (worry and emotionality) by employing therapy which (a) facilitated an awareness of anxiety-provoking thoughts, (b) employed imagery to reduce anxiety, and (c) introduced task-relevant self-instructions.
Meichenbaum (1972) assessed the efficacy of the cognitive behavior modification procedure by comparing it with a standard systematic desensitization treatment group and a waiting list control group. Scheduling problems resulted in some subjects from each treatment group receiving individual treatment rather than group treatment. Thus, a secondary purpose of the study was to compare the relative efficacy of group versus individual administration of the two treatment conditions—namely, cognitive behavior modification versus systematic desensitization.

Findings from Meichenbaum's study indicated that the cognitive behavior modification procedure was effective in significantly reducing test anxiety and improving test performance. Following treatment, the test anxious subjects in the cognitive behavior modification group did not differ from a group of low test-anxious subjects, and in fact, the cognitive behavior modification subjects reported a significant increase in facilitative or functional anxiety. The group administration of the cognitive behavior modification treatment was easier to administer and more time-efficient than when individually administered (Meichenbaum, 1972).

Precise reasons as to why the cognitive behavior modification procedure was effective are difficult to determine from Meichenbaum's study because the therapies were combined in his treatment. Thus each of the critical aspects of the experiment's treatment—relaxation, coping imagery and task-relevant self instruction—by themselves cannot be said to reduce test anxiety. However, it is when these are combined that they seem to provide their beneficial effects on test anxiety.

Wine (1971) concentrated on one aspect of cognitive behavior
modification. Wine (1971) reported findings which suggest that simply concentrating on and being made aware of anxiety-laden self statements are not sufficient for reducing test anxiety and improving test performance. Rather, subjects seem to gain the most benefits through rehearsing the use of incompatible self-instructions and behaviors. In his study, one group of high test anxious subjects was given six hours of attentional training consisting of modeling and behavioral rehearsal to self-instruct in a task-relevant manner. A second group of high test anxious subjects received insight training which consisted of simple exploration of these anxiety-laden thoughts subjects tended to experience in test situations. The subjects in the attentional training group improved significantly on test performance and self-report measures of anxiety when compared with the group which received the insight training.

According to Holroyd (1976) cognitive therapy can be effectively used as a solitary treatment method for improving grade point average as well as lowering test anxiety. Cognitive therapy derived from Wine's (1971) cognitive attentional model of test anxiety and focuses on correcting maladaptive cognitive responses to test-taking, i.e. eliminates task-irrelevant ruminations and attentional focus.

In Holroyd's (1976) study, 47 test-anxious volunteers were randomly assigned to one of two therapists who provided (a) cognitive therapy, (b) systematic desensitization, (c) a combination of cognitive therapy and systematic desensitization, and (d) a pseudo-therapy control procedure. Twelve subjects were also assigned to a waiting-list control group. Two therapists were used to check for possible therapist differences in effect. Each therapist administered all four treatments.
Results indicated that the therapist variable did not account for a significant portion of obtained variance in outcome. Test anxiety was assessed both on self-report measures and in an analogue testing situation prior to treatment, at the completion of treatment, and at a one-month follow-up. The analogue testing was an evaluative situation which involved stress-inducing instructions to identify digit symbol tests as measures of intelligence and academic ability. The results indicated that cognitive therapy alone was significantly more effective in reducing anxiety in the analogue testing situation and in improving grade point average than the other treatment and control procedures. Such results would seem to represent firm support for a cognitive approach to the treatment of test anxiety.

**Study Skills Training.** Study skills training is a method of treatment that has been used separately or in combination with other methods to treat test anxiety and improve test performance. Study skills training consists of teaching effective strategies for studying and test-taking. Findings regarding study skills training are inconsistent. Although it is generally agreed that study skills training is effective in reducing test anxiety (Allen, 1971; Kirkland & Hollandsworth, 1980), results vary as to its effectiveness in improving academic performance.

Harris and Johnson (1980) assessed the comparative efficacy of individualized covert modeling combined with study skills training, self-control desensitization combined with study skills training, and study skills training alone as treatments for test anxiety. Forty-eight test-anxious students were randomly assigned to one of the three treatment conditions or to a waiting list control group. All treatment groups met for eight one-hour sessions. The assessment of test anxiety
was made on the basis of self-report measures administered prior to
treatment and at the completion of treatment. Academic performance was
measured by cumulative grade point average. At the time of posttesting,
all treatment groups significantly outperformed waiting list controls on
at least one of the two dependent variable measures, namely the
Debilitating Anxiety subscale of the Achievement Anxiety Test (Alpert &
Haber, 1960) and cumulative GPA. Individualized covert modeling and
self-control desensitization both substantially reduced self-reported
test anxiety. However, the individualized covert modeling group was the
only treatment group that showed significant improvement in academic
performance. A replication of the individualized covert modeling
procedure produced similar positive results (Harris & Johnson, 1980).

Allen (1971) obtained some interesting findings regarding study-
skills when he assessed the comparative effectiveness of systematic
desensitization and study counseling techniques in reducing self-
reported and physiological indicants of test anxiety and increasing
the academic performance of test-anxious undergraduates. Seventy-five
volunteers from an introductory psychology course were assigned
randomly to one of two therapists, each of whom provided training in
(a) desensitization alone, (b) study counseling alone, (c) a combination
of study counseling and desensitization, and (d) a placebo procedure.
Some volunteers were also assigned to a control group. The results
indicated that a combination of desensitization and study counseling
was more effective in reducing physiologically measured anxiety and in
improving academic and examination performance than either technique
alone. Desensitization and study counseling were not significantly
different from each other, nor significantly more effective than the
placebo procedure in improving academic performance.

Thus, findings regarding study-skills training as a procedure for reducing test anxiety and improving performance are inconclusive. Combined with other treatment methods, study-skills training generally serves to reduce self-reported or physiologically measured test anxiety and to improve performance. However, as a solitary treatment, study-skills training seems to have relatively little effect.

Meditation. Another area of growing interest in test anxiety research involves the use of meditation. Fiebert and Mead (1981) assessed the effectiveness of Actualism Meditation in directing attention to modification of test performance. Actualism Meditation consists of a set of specific meditation techniques for increasing awareness, directing and controlling attention, and channeling energy throughout the mind and body (Fiebert, 1980; Mead, 1980). Twenty students in an introductory psychology class were randomly assigned to either an experimental treatment group or a control group. Baseline measures of examination grades and study time were obtained for both groups. The experimental group was then taught and asked to practice Actualism Meditation techniques before studying and before examinations. The control group was then taught and asked to practice Actualism meditation techniques at times other than before studying and before exams. Results indicated that the experimental group performed significantly better on the examinations than the control group despite similar amounts of study time reported by each group. Thus, Fiebert and Mead (1981) suggest that meditation can be effectively used prior to taking a test to improve test performance.

Through the literature review, the stage is now set for
exploring whether the use of relaxation procedures, namely meditation and cognitive self-statements, are effective in reducing test anxiety and in improving academic performance. That the combined use of such procedures is effective in reducing test anxiety and in improving test performance has not yet been established.

The purposes of this study are (a) to determine if college students who employ meditation, relaxation, and cognitive self-statements experience reduced test anxiety and improved test performance, and (b) to examine the relationship between test anxiety and test performance. Such a study seems warranted for the many students whose test performance is adversely affected by anxiety as they anticipate being tested. By combining meditation and relaxation with cognitive self-statements, the relaxation procedures promote student awareness and control of task-irrelevant thoughts during the testing situations.

Specifically, this study is an attempt to evaluate the effect of procedures involving meditation and cognitive self-statements upon: (a) self-reported test anxiety, and (b) academic performance. In addition, the relationship between test anxiety and test performance will be examined.
Subjects

Subjects were 36 undergraduate-level college students enrolled in two sections of a lower division psychology course entitled Personal Adjustment and Mental Hygiene. Although 75 students enrolled in the two class sections, only those who were present for every class test were included in the present study. Ten males and eight females were in the experimental group, while nine males and nine females were in the control group. Subjects were matched on the basis of an anxiety measure and then randomly assigned to treatment conditions. Students in the experimental group were told before the experiment that they did not have to participate in the relaxation procedures if they so chose. One student in the experimental group chose not to participate in the relaxation procedures; he was then assigned to the control group.

Both sections of the course were taught by the same instructor, an associate professor of psychology, and were taught at similar times of the day, i.e., 9:10 and 10:30 a.m. The course instructor was assisted by a psychologist-in-training. The Personal Adjustment and Mental Hygiene course is offered every semester, but this study was conducted during the Spring semester of 1982-83.

Instruments

A modified version of Sarason's (1958) Test Anxiety Scale for Children (TASC) was used for measuring test anxiety in the present
study. The TASC has test-retest reliability of .82 and a Spearman-Brown split-half reliability of .88 (Sarason et al., 1958). Sarason's TASC is a 29 true-false item scale. Robe (1967) modified the TASC by changing it from a true-false item scale to a Likert scale. A choice of four answers were scored in the following manner: (a) Often = one point; (b) Sometimes = two points; (c) Once in a while = three points; and (d) Never = four points. A copy of Robe's version of the TASC is presented in Appendix A.

The anxiety scale used in the present study is a slightly modified form of Robe's converted TASC. The modification involved changing the words "pupil" and "teacher" to "student" and "instructor," respectively. Responses to this 29-item self-report scale are entered directly on the test form which provides four choices for each item, similar to Robe's method. The scale used for this study will be referred to as the Test Anxiety Scale for Children-Revised (TASC-R). A copy of the TASC-R is presented in Appendix B.

Six course content exams, each over two chapters of the textbook, were constructed by the course instructor and the psychologist-in-training to measure knowledge of course content. The instructor constructed tests one and six. The psychologist-in-training constructed tests two, three, four and five. Each of the six exams consisted of 35 multiple choice items selected from an item-bank provided by the textbook publisher (Rathus & Nevid, 1983). Items for each test were selected to test a general knowledge of information presented in the assigned chapters. Each correct response was worth two points.

Coefficient alpha, item discrimination, and average item difficulty of course content exams three, four, five and six were determined using
subprogram Reliability of the Statistical Package for the Social Sciences (Nie et al., 1975). Coefficient alphas ranged from .68 on exams three and four, to .79 on exam six, and .82 on exam five. Test difficulty ranged from a mean of 23.69 on exam four, to 24.47 on exam five, to 25.89 on exam six and to 27.03 on exam three. Average item difficulties were 70% for exams four and five and 76% and 79% for exams six and three, respectively. The results of these findings indicate that there were some differences in test difficulty among the various course content exams; however, the differences do not appear to be significant. See Table 1 for the coefficient alphas, item discriminations, and average test difficulties of course content exams three, four, five and six.

**TABLE 1**

<table>
<thead>
<tr>
<th>Content Exam Administration</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient Alpha</td>
<td>.68</td>
<td>.68</td>
<td>.82</td>
<td>.79</td>
</tr>
<tr>
<td>Mean no. of items correct</td>
<td>27.03</td>
<td>23.69</td>
<td>24.47</td>
<td>25.89</td>
</tr>
<tr>
<td>Average item difficulty</td>
<td>.79</td>
<td>.70</td>
<td>.70</td>
<td>.76</td>
</tr>
</tbody>
</table>

At the time of data analysis, the results of tests one and two were not available from the course instructor. However, since tests three through six were similar in difficulty and internal consistency, it was assumed that tests one and two also were similar in difficulty and internal consistency.
Procedures

Class format for both classes included much discussion regarding cognitive awareness. Both classes contained experimental and control subjects, i.e., intact classes did not function as experimental and control groups. Students were often seated in circle formation for face-to-face interaction. The class format also included the use of six films. The purpose for using the films was to reduce cognitive limitations and expand acceptance of broad viewpoints. Film content included topics which exemplified self-actualizing. For example, one film was about a woman with no arms or hands, who lived a happy and productive life as a mother and wife. It showed how she used her feet instead of her hands to cook food, wash dishes, cut hair, drive and shop. Film content emphasized a broad acceptance of humanity and one's unlimited potentials. The self-actualizing theme was also integrated into class lectures and discussions. The class content was an expansion of the subject matter presented in the textbook but was not necessarily a direct reflection of the content contained in the text. Class tests were over the textbook material only and did not attempt to measure knowledge of material only and did not attempt to measure knowledge of material presented in class.

Integrated into the class format also was a presentation and practice of relaxation procedures. These procedures involved (a) a method of passively suggesting relaxation and release of tension to the various parts of the body in a progressive manner, i.e. from toes on up progressively to the head; and once a state of relaxation is attained, (b) affirmations of self-statements (Meichenbaum, 1972) are made, e.g. "I am calm," and "I am confident." These self affirmations
are repeated quietly and slowly for four minutes. A detailed description of the relaxation procedures are presented in Appendix C.

The independent variable was the condition, relaxation versus review, to which subjects were exposed prior to each of six content exams. The treatment level of the independent variable, relaxation, was presented to the experimental group for 20 minutes just prior to the administration of the course content exams.

The nontreatment level of the independent variable was review. The control group received a nondirective or unstructured review session during the 20 minutes preceding each course content exam. During each 20 minute review session, the control group received an opportunity to ask questions about the material to be covered by the particular course content exam for which they were preparing, or to sit quietly and study. They typically asked very few questions. The course instructor and graduate assistant alternated in leading the treatment session and the review session.

There were two dependent variables: (a) test anxiety as measured by the TASC-R and (b) achievement as measured by the experimenter-developed course content exam to all students. In order to assign the students into two groups, the experimental and control groups, the TASC-R was administered before the first course content exam to all students. The anxiety scores yielded were then used to rank and match the students and randomly assign each student from each matched pair into one of the two groups. This grouping occurred between tests one and two.

Scores from the first administration of the TASC-R were also used to control for practice effect, i.e. a familiarity of a test may be gained from the first administrations of that test. Scores from the
first administration of the TASC-R were also used to control for regression toward the mean, i.e. the tendency of scores to regress toward an average. The TASC-R was given again before the second course content exam to be used as a pretreatment measure of anxiety level. Test two functioned as the pretest measure.

Between administration of the second and third course content exams, all students were instructed in relaxation training and encouraged to practice it outside of class. Treatment (i.e., 20 minutes of relaxation versus 20 minutes of review) was administered before the third, fourth, and fifth exams. The sixth exam was at the end of the semester and aroused connotations of being the "final exam," so was not included for treatment. The two groups, experimental and control, met in separate classrooms for the treatment sessions. Scores from the fifth course content exam and the third administration of the TASC-R functioned as posttest scores and were compared with pretreatment test scores provided by test two.

Analyses

A 2 (experimental vs control groups) by 3 (TASC-R administrations prior to the first, second and fifth course content exams) repeated measures analysis of variance (ANOVA) was calculated to determine if (a) the two groups (experimental and control) significantly differed on their mean scores for any administration of the TASC-R; (b) there were significant changes in scores, regardless of group, across administrations of the TASC-R; and (c) the group by trials interaction was significant.

A 2 (experimental vs control groups) by 3 (course content exam administrations one, two, three and five) repeated measures ANOVA was
calculated to determine if (a) the two groups (experimental and control) significantly differed on their mean scores for any administration of the course content exams; (b) there were significant changes in scores, regardless of group, across administrations of course content exams; and (c) the groups by trials interaction was significant. Exam four was omitted in the ANOVA because it served only as a practice treatment. Exam six was also omitted in the ANOVA because it was the final exam and carried a different significance to the students. P values of .05 or less were considered to reflect statistically significant differences.

Pearson Product-Moment correlation coefficients were computed to demonstrate the relationship between the two dependent variable measures, test anxiety and test performance, for the first, second, and fifth test administrations. The correlations were calculated for each group, experimental and control, separately and then for all subjects combined to verify the results of the ANOVA. The ANOVAs yielded no significant difference between groups (experimental and control) for either the anxiety or course content measures. Therefore, groups were combined to test the overall relationship between test anxiety and test performance at the various testing administrations. P values of .05 or less were considered to reflect statistically significant differences.
CHAPTER IV

Results

TASC-R

The first hypothesis stated that students who received relaxation procedures would experience lowered test anxiety. An ANOVA was performed to test this hypothesis. Results of a 2 (experimental groups vs control group) by 3 (administrations of the TASC-R) repeated measures ANOVA indicated no significant main effect for groups, $F(1, 107) = .73$, no significant interaction for groups by trials, $F(2, 107) = .28$, and a significant effect for repeated administrations of the TASC-R, $F(2, 107) = 13.76, p < .01$. This hypothesis was rejected. A summary of the ANOVA for TASC-R performance is shown in Table 2.
TABLE 2

Analysis of Variance: TASC-R Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>107</td>
<td>17,159.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>35</td>
<td>11,314.19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups (A)</td>
<td>1</td>
<td>237.04</td>
<td>237.04</td>
<td>.73</td>
</tr>
<tr>
<td>Error</td>
<td>34</td>
<td>11,077.15</td>
<td>325.80</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>72</td>
<td>5,845.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trials</td>
<td>2</td>
<td>1,674.13</td>
<td>837.07</td>
<td>13.79*</td>
</tr>
<tr>
<td>A X B</td>
<td>2</td>
<td>33.58</td>
<td>16.79</td>
<td>.28</td>
</tr>
<tr>
<td>Error</td>
<td>68</td>
<td>4,137.29</td>
<td>60.84</td>
<td></td>
</tr>
</tbody>
</table>

*P < .01

In order to understand the significant effect for the repeated administrations of the TASC-R, a Tukey Post Hoc analysis (Lee, 1975) was performed. It indicated that the third administration of the TASC-R yielded self-reported anxiety level scores which were significantly lower than those for the first (p < .05) and second (p < .05) administrations of the TASC-R. The means of the TASC-R scores are presented in Table 3 and the between-group differences are in Table 4.
TABLE 3
Tukey Post Hoc Means on TASC-R

<table>
<thead>
<tr>
<th>TASC-R Administration</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental and Control Groups</td>
<td>64.08</td>
<td>60.92</td>
<td>54.61</td>
</tr>
</tbody>
</table>

TABLE 4
Tukey Post Hoc Between Groups Mean Differences for TASC-R

<table>
<thead>
<tr>
<th>TASC-R Administrations</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.00</td>
<td>3.16</td>
<td>9.47*</td>
</tr>
<tr>
<td>2</td>
<td>3.16</td>
<td>0.00</td>
<td>6.31*</td>
</tr>
<tr>
<td>3</td>
<td>9.47*</td>
<td>6.31*</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*p < .05

Knowledge of Course Content

To test the second hypothesis that relaxation procedures would improve test performance in students, a repeated measures ANOVA was performed. Results of a 2 (experimental group vs control group) by 4 (administrations of course content exams) repeated measures ANOVA indicated no significant main effect for groups, F (1, 143) = .01, no significant interactions for groups by trials, F (3, 145) = 2.11, and a significant effect for repeated administrations of the course content exams, F (3, 143) = 7.26, p < .01. The second
hypothesis was rejected. A summary of the ANOVA for course content exam performance is shown in Table 5.

TABLE 5

Analysis of Variance: Course Content Exam Scores

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>143</td>
<td>14,779.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between</td>
<td>35</td>
<td>6,621.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups (A)</td>
<td>1</td>
<td>1.78</td>
<td>1.78</td>
<td>.01</td>
</tr>
<tr>
<td>Error</td>
<td>34</td>
<td>6,620.11</td>
<td>194.71</td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>108</td>
<td>8,158.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trials</td>
<td>3</td>
<td>1,365.00</td>
<td>455.00</td>
<td>7.27*</td>
</tr>
<tr>
<td>A X B</td>
<td>3</td>
<td>397.55</td>
<td>132.52</td>
<td>2.11</td>
</tr>
<tr>
<td>Error</td>
<td>102</td>
<td>6,395.34</td>
<td>62.70</td>
<td></td>
</tr>
</tbody>
</table>

*p < .01

A Tukey Post Hoc analysis (Lee, 1975) was performed to understand the significance of the main effect for repeated administrations of the course content exams. Results indicated that the first and fifth administrations of the course content exams yielded scores which were significantly higher than those for the second (p < .05) and third (p < .05) administrations of the course content exams. The means of the course content exams are presented in Table 6 and the between-group mean differences are in Table 7.
### TABLE 6

**Tukey Post Hoc Means of Content Exams**

<table>
<thead>
<tr>
<th>Content Exam Administration</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental and Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groups</td>
<td>49.44</td>
<td>56.28</td>
<td>55.78</td>
<td>50.39</td>
</tr>
</tbody>
</table>

### TABLE 7

**Tukey Post Hoc Between Group Mean Differences for Course Content**

<table>
<thead>
<tr>
<th>Content Exam</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.00</td>
<td>6.84*</td>
<td>6.34*</td>
<td>.95</td>
</tr>
<tr>
<td>2</td>
<td>6.84*</td>
<td>0.00</td>
<td>.50</td>
<td>5.89*</td>
</tr>
<tr>
<td>3</td>
<td>6.34*</td>
<td>.50</td>
<td>0.00</td>
<td>5.39*</td>
</tr>
<tr>
<td>5</td>
<td>.95</td>
<td>5.89*</td>
<td>5.39*</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*p < .05

The Relationship Between Test Anxiety and Test Performance

Pearson Product-Moment correlation coefficients were computed to demonstrate the relationship between the two dependent variables, test anxiety and test performance for course content exams one, two, and five. Correlation coefficients for the experimental group were -.29, -.21 and +.13, respectively. Correlation coefficients yielded by the control group were +.07, +.44, and +.18 for content exams one, two, and five,
respectively. None of the correlations for the experimental group were
significant at the $p < .05$ level. One of the correlation coefficients
was significant for the control group.

Since the results of both ANOVA's (for test anxiety and test
performance) showed no significant between group differences, the
Pearson Product-Moment correlations were computed for combined groups
to obtain one general correlation between test anxiety and test
performance at test administrations one, two, and five. Correlation
coefficients for combined groups were $-.13$, $+.29$, and $+.15$, for tests
one, two, and five, respectively. None of these correlations were
significant at the $p < .05$ level. The correlation coefficients of test
anxiety and test performance are presented separately for the experimental
and control groups in Table 8. The correlation coefficients of test
anxiety and test performance for the experimental and control groups
combined are presented in Table 9.

**TABLE 8**

Pearson Product-Moment Correlation Coefficients
for Measures of Anxiety Level and Course Content

<table>
<thead>
<tr>
<th>Course Content Exam</th>
<th>1</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>-.29</td>
<td>-.21</td>
<td>+.13</td>
</tr>
<tr>
<td>Control Group</td>
<td>+.07</td>
<td>+.44*</td>
<td>+.18</td>
</tr>
</tbody>
</table>

*p < .05
<table>
<thead>
<tr>
<th>Course Content Exam</th>
<th>1</th>
<th>2</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined Groups</td>
<td>-.12</td>
<td>+.29</td>
<td>+.15</td>
</tr>
</tbody>
</table>
CHAPTER V

Discussion

The principal problem addressed in this study was reducing test anxiety and improving test performance. Although most students experience some anxiety when taking a test, it was hypothesized that some experience the anxiety to such a high degree that it detracts from their performing optimally. The purpose of this study was to determine if relaxation procedures, comprised of meditation and cognitive statements, were effective in reducing test anxiety and in improving test performance. The study was guided by two major hypotheses: (a) students who employed the relaxation and cognitive self-statements before a test would experience and report significantly lower levels of anxiety during the test than students in a control group who received review sessions before the tests; and (b) students who received relaxation treatments before a test would score significantly higher on course content exams than a control group receiving non-structured review sessions before course content exams. Analysis of Variance (ANOVA) procedures were used to assess the effects of the relaxation treatments on anxiety and test performance. Additionally, Pearson Product-Moment correlation coefficients were calculated to assess the relation between test performance and test anxiety.

Test Anxiety

The results of the ANOVA on the TASC-R (Test Anxiety Scale for Children--Revised) scores showed no significant difference between the
treatment and control groups. The first hypothesis, that students receiving relaxation procedures would experience lower levels of test anxiety than a control group using non-structured review sessions, was rejected. The results of the ANOVA on TASC-R scores did show a significant main effect across the three administrations of the test anxiety scale. Follow-up procedures indicated significantly lower scores on the posttest (third administration of the TASC-R) for both the treatment and control groups. It is impossible to determine from these data why anxiety seemed to decrease for both treatment and control groups. On the surface it would appear that both relaxation procedures and review sessions are equally effective in lowering anxiety. A close look at the mean anxiety scores of each of the treatment and control groups at the posttreatment test administrations indicated a numerical advantage for the treatment group. Such a trend may suggest that there is indeed some advantage to using relaxation treatment procedures to reduce test anxiety. Future studies in this area may seek to confirm that advantage.

Test Performance

Results of the ANOVA on the course content exams indicated that the second hypothesis, predicting improved performance after relaxation procedures, should be rejected. The results are confusing and inconsistent. A meaningful interpretation of the results cannot be made.

Relation Between Test Anxiety and Test Performance

The correlation coefficients computed to demonstrate the relationship between the dependent variables yielded inconclusive results. Inasmuch as the only significant relationship involved the control group, the correlations were deemed to have little meaningful value for this study.
Limitations

Methodology. Conceivably the distinctions between the treatment and control group would have been more clearly defined had the experiment been conducted differently. One strategy that would have improved the experiment would have been to allow more time for students to practice the relaxation procedures outside of class. According to Benson (1968), relaxation procedures should be practiced daily for at least one full month before they can have their full impact. Such procedures would ensure that the relaxation response can be elicited in a relatively brief period of time when it is needed.

Another feature of this experiment that blurred the distinction between the experimental treatment and the control procedure was the introduction of the relaxation procedures to both groups, experimental and control. A more realistic test of the effect of each procedure would be to expose each group to no more than one procedure, either the relaxation or the review procedure. Had such a procedure been followed in this experiment, quite possibly the distinctions between the experimental and control groups would have been more well defined.

Thus, researchers interested in studying this issue should take measures to assure that treatment and comparison groups receive treatments that are clearly and distinctly different. In addition, a test of the effects of relaxation is not complete if provisions are not made for subjects to practice the relaxation techniques sufficiently before evaluating their effect.

Population. Two other threats to the internal validity of the study involved (a) using students enrolled in an elective psychology course which is self-growth oriented, and (b) having an
instructor who may have had a calming, therapeutic effect. The course goals include development and understanding of the self, including emotional maturity. Therefore, the population may not have been representative of the general college population. Also the instructor, being a therapist-counselor, in addition to being class instructor, emits a calmness and assurance to his class population. Therefore, therapist personality may have had an influence in reducing anxiety in all the students, thereby deflating the power of the experiment. The restricted generalizability of the results is an important limitation. The overall function of the course may have had the effect of reducing anxiety, as the class situation was a relatively low stress situation. Another more stressful course would possibly have shown different results.

Implications for Further Research

Suggestions for future researchers using relaxation procedures for improvement of test performance and reducing anxiety are

1. Population. Use a required course which arouses much anxiety. Choose a class where the instructor is more academically oriented rather than therapeutically oriented.

2. Method. Plan a design where treatment and control groups are distinctly different (except for being matched for anxiety level). Do not give control group subjects instruction in relaxation procedures as that blurs the distinction between the experimental and control groups. Use less time for treatment sessions before tests so students are not distracted from their readiness to take the test. Long treatment sessions become more of a distraction than a benefit for the students.

3. Treatment. Have students practice relaxation procedures every
day at least a month before the posttest is done. According to Benson (1975), practicing relaxation procedures for an extended period allows one to elicit the relaxation response in progressively shorter time periods.

4. Test anxiety inventories. The self-report inventories are time-consuming and an anxiety-provoking distraction in themselves. Possibly use one at the beginning of a study, to match groups randomly according to anxiety level. An alternative test anxiety instrument would be a physiological measure rather than a self-report measure.

5. Determine the difficulty of content exams by administering them to subjects naive to the course content.

Conclusion

No evidence was found, in this study, to indicate that relaxation procedures lower test anxiety or improve test performance on course content exams. However, such results should not be interpreted as an attempt to discount the possibility of future success in employing relaxation procedures with a more carefully designed and controlled procedure for study. Several studies cited throughout this thesis revealed beneficial effects of meditation and relaxation procedures. Those findings stimulated this attempt to validate the usefulness of relaxation procedures for treating test anxiety. A subsequent study is needed which (a) requires more time for students to practice the relaxation procedures outside of class; (b) exposes each group being studied to no more than one procedure, either the relaxation or the review procedure; (c) uses a course which induces a stressful situation; and (d) is more time-efficient, using less treatment time before tests and using a shorter or alternate anxiety measure.
APPENDIX A

Robe's (1967) Modification of Sarason's Test Anxiety Scale for Children

HOW DO YOU FEEL ABOUT THINGS IN CLASS

I am going to be asking you some questions--questions different from the usual school questions, for these are about how you feel and so these questions have no right or wrong answers. People think and feel differently. The person next to you might answer a question in one way. You might answer the same question in another way but both would be all right because you feel differently about the matter.

Remember, I shall read each question, including the kinds of answers you can give. Wait until I finish reading the question and then answer. Give only one answer for each question.

1. Do you worry when the teachers says that she is going to ask you questions to find out how much you know about the lesson?
   A. Worry a lot   C. Worry a little
   B. Worry some   D. Never worry

2. Do you worry about whether you will be promoted, that is, passing from this class to the next class at the end of the year?
   A. Worry a lot   C. Worry a little
   B. Worry some   D. Never worry

3. When the teacher asks you to recite in front of the class, are you afraid that you are going to make some bad mistakes?
   A. Often   C. Once in a while
   B. Sometimes   D. Never
4. When the teacher says that she is going to call on pupils to do some problems, do you hope that she will call on someone else?
   A. Often   C. Once in a while
   B. Sometimes   D. Never

5. Do you dream at night that you are in school and cannot answer the teacher's question?
   A. Often   C. Once in a while
   B. Sometimes   D. Never

6. When you think you are going to be called on by the teacher, does your heart begin to beat fast?
   A. Often   C. Once in a while
   B. Sometimes   D. Never

7. When the teacher is explaining a hard subject, do you feel that others in the class understand it better than you do?
   A. Often   C. Once in a while
   B. Sometimes   D. Never

8. When you are in bed at night, do you worry about how well you are going to do in class the next day?
   A. A lot   C. A little
   B. Some   D. Never

9. When the teacher asks you to write on the blackboard in front of the class, does the hand you write with shake?
   A. Never   C. Some
   B. A little   D. A lot

10. Do you think that you worry more about school than other pupils?
    A. A lot more than others   C. A little more than others
    B. More than others   D. About the same as others
11. When you are at home and you are thinking about your school work for the next day, do you become afraid that you will get the answers wrong when the teacher calls on you?
   A. Often       C. Once in a while
   B. Sometimes    D. Never

12. If you are sick and miss school, are you afraid you will be way behind the other pupils when you return to school?
   A. Very much    C. A little
   B. Some         D. No

13. Do you dream at night that others in your class can do things that you cannot do?
   A. Often       C. Once in a while
   B. Sometimes    D. Never

14. When you are home and thinking about your classwork for the next day, do you worry that you will do poorly on the classwork?
   A. Often       C. A little
   B. Sometimes    D. Never

15. When you think you are going to be called on by the teacher, do you get a funny feeling in your stomach?
   A. Often       C. Once in a while
   B. Sometimes    D. Never

16. If you did very poorly when the teacher called on you, did it bother you and make you feel unhappy?
   A. Very much    C. Once in a while
   B. Some         D. Never

17. Do you dream at night that the teacher is angry because you do not know your lessons?
18. Are you afraid of school tests?
   A. A lot   B. Some
   C. Some   D. Never

19. Do you worry before you take a test?
   A. A lot   B. Some
   C. A little   D. Never

20. Do you worry while you are taking a test?
   A. A lot   C. A little
   B. Some   D. Never

21. After you have taken a test, do you worry about how well you did on the test?
   A. A lot   C. A little
   B. Some   D. Never

22. Do you dream at night that you did poorly on a test you had in school that day?
   A. Often   C. Once in a while
   B. Sometimes   D. Never

23. When you are taking a test, does the hand you write with shake?
   A. A lot   C. A little
   B. Some   D. Never

24. When your teacher says that she is going to give the class a test, do you become afraid that you will do poorly?
   A. A lot   C. A little
   B. Some   D. Never

25. When you are taking a difficult test, do you forget some things you knew well before you started taking the test?
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td></td>
<td>B. Sometimes  D. Never</td>
</tr>
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<td>get a nervous feeling?</td>
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<td>28. While you are taking a test, do you usually think you are doing poorly?</td>
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<td>29. While you are on your way to school, do you worry that you might</td>
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</tbody>
</table>
APPENDIX B

Test Anxiety Scale for Children-Revised

HOW DO YOU FEEL ABOUT THINGS IN CLASS?

These are questions about how you feel. There are no right or wrong answers. People think and feel differently. The person next to you might answer the same question in another way but both would be right because you feel differently about the matter. Read each question and the kinds of answers you can give. Give only one answer for each question.

1. Do you worry when the instructor says that he is going to ask you questions to find out how much you know about the lesson?
   A. Worry a lot  C. Worry a little
   B. Worry some  D. Never worry

2. Do you worry about whether you will pass this class?
   A. Worry a lot  C. Worry a little
   B. Worry some  D. Never worry

3. When the instructor asks you to speak in front of the class, are you afraid that you are going to make some bad mistake?
   A. Often  C. Sometimes
   B. Once in a while  D. Never

4. When the instructor says that he is going to call on students, do you hope that he will call on someone else?
   A. Often  C. Once in a while
   B. Sometimes  D. Never
5. Do you dream at night that you are in school and cannot answer the instructor's question?
   A. Often  C. Once in a while
   B. Sometimes  D. Never

6. When you think you are going to be called on by the instructor, does your heart begin to beat fast?
   A. Often  C. Once in a while
   B. Sometimes  D. Never

7. When the instructor is explaining a hard subject, do you feel that others in the class understand it better than you do?
   A. Often  C. Once in a while
   B. Sometimes  D. Never

8. When you are in bed at night, do you worry about how well you are going to do in class the next day?
   A. A lot  C. A little
   B. Some  D. Never

9. When the instructor asks you to write on the blackboard in front of the class, does the hand you write with shake?
   A. Never  C. Some
   B. A little  D. A lot

10. Do you think that you worry more about school than other students?
    A. A lot more than others  C. A little more than others
    B. More than others  D. About the same as others

11. When you are at home and you are thinking about the class for the next day, do you become afraid that you will get the answers wrong if the instructor calls on you?
    A. Often  C. Once in a while
    B. Sometimes  D. Never
12. If you are sick and miss school, are you afraid you will be way behind the other students when you return to school?
   A. Very much  
   B. Some  
   C. A little  
   D. No

13. Do you dream at night that others in your class can do things that you cannot do?
   A. Often  
   B. Sometimes  
   C. Once in a while  
   D. Never

14. When you are home and thinking about your classwork for the next day, do you worry that you will do poorly on the classwork?
   A. Often  
   B. Sometimes  
   C. A little  
   D. Never

15. When you think you are going to be called on by the instructor, do you get a funny feeling in your stomach?
   A. Often  
   B. Sometimes  
   C. Once in a while  
   D. Never

16. If you did very poorly when the instructor called on you, did it bother you and make you feel unhappy?
   A. Very much  
   B. Some  
   C. Once in a while  
   D. Never

17. Do you dream at night that the instructor is angry because you do not know your lessons?
   A. Often  
   B. Sometimes  
   C. Once in a while  
   D. Never

18. Are you afraid of class exams?
   A. A lot  
   B. Some  
   C. A little  
   D. Never
19. Do you worry before you take an exam?
   A. A lot
   B. Some
   C. A little
   D. Never

20. Do you worry while you are taking an exam?
   A. A lot
   B. Some
   C. A little
   D. Never

21. After you have taken an exam, do you worry about how well you did?
   A. A lot
   B. Some
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22. Do you dream at night that you did poorly on an exam that you had in school that day?
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25. When you are taking a difficult exam, do you forget some things you knew well before you started?
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   A. Often
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   A. Often   C. A little
   B. Sometimes   D. Never
APPENDIX C

Relaxation Procedures

Begin by saying very softly and slowly, "First, get into a comfortable position. Close your eyes. I'd like you to become aware of your little fingers, feel the relaxation flow through them. Tension is gone. You notice the wave of relaxation flowing through your other fingers. The tension just disappears as your fingers are relaxed. Now become aware of your thumbs. Relaxation is taking over your thumbs. Tension is released. Your whole hands are experiencing the soothing, warming relaxation sensation.

"Center your awareness on your wrists, and lower arm. Feel the relaxing sensation flow up your arms, from your hands, through your wrists, through your lower arms and into your elbows. Tension moving out, relaxation moving in. Gently, it flows up your arms into your shoulders... until your whole arms are completely relaxed. Warm, soothing, gentle relaxation. You are becoming more and more relaxed. If you aren't experiencing a wave of relaxation moving as fast as we are progressing, it's OK, don't worry, don't force, it'll catch up.

"Become aware of your little toes. Center your awareness on your little toes. As you do, notice the sensation of relaxation moving into the little toes, as tension moves out.

"Notice this sensation moving into the next toes. Center your awareness on your next toes. Notice the sensation of relaxation moving into these toes. Center your awareness on your next toes. Notice the
sensation of relaxation moving into the big toes. As relaxation moves in, tension moves out."

Then proceed progressively in a similar manner to the bottoms of feet, tops of feet, heels, and whole feet. Having done that, say, "You are becoming more and more relaxed. If you aren't experiencing a wave of relaxation moving as fast as we're progressing, it's OK, don't worry, don't force, it'll catch up.

"You're now experiencing a warm relaxing sensation of quiet stillness in your body." Then speak about the relaxing and lifting of tension in the ankles, lower legs, knees, thighs, upper legs, and hips. Continuing, say, "Center your awareness on the base of the spine. The relaxation flow is moving on the base of the spine up through the lower back, branching out into the rest of your back. Tension is released, as relaxation flows up the spine through the upper back and shoulders. A wave of relaxation flows through the spinal cord, branching out to all the back and shoulders, as tension moves out. Soothing, warming, comforting, relaxation. This sensation flows around to your front, to your chest muscles. Tension moves out as relaxation flows into these muscles and through-out all your chest.

"Now focus on your breathing. Center your attention on breathing--don't change it, but become aware of it. As you inhale, you relax, as you exhale, you exhale tension so that you become more and more relaxed.

"Now focus your awareness on your abdomen, so that sensations of relaxation move through-out all the muscles of the abdomen as you become more and more relaxed. You are becoming very, very relaxed.

"Notice the wave of relaxation penetrating throughout your body. The abdomen and chest are completely relaxed. Now you are more deeply
relaxed from the tip of the toes to your shoulders.

"Notice the warm sensations of relaxation penetrating the muscles in your neck, all the tissue in the muscle fibers throughout your neck so that your neck is becoming more and more relaxed. Sensations of relaxation move up the muscles in your neck, over the back of your head, then they move up the sides of your neck around the sides of your head. This relaxation flows to your ears, to your temples, to your jaw, your chin, mouth and tongue. Tension dissolves. Waves of relaxation go through your lips, nose, and eyes and forehead.

"It's as though you're feeling a cool gentle relaxing breeze flowing directly on your forehead. This cool, comforting, soothing, gentle, breeze blowing on your forehead relaxes your whole body. This wave of relaxation penetrates to the bone.

"I would like you to focus your attention on your breathing now. Don't try to change it. Just become aware of it. Breath in more relaxation, exhale any tension that is left. Breath in more relaxation. Exhale tension.

"Now repeat to yourself, 'I am confident in taking my test. I am relaxed and confident.' Repeat this to yourself as you breath in more relaxation. While you repeat this, visualize yourself taking the exam. See yourself, at ease but very alert, readily recognizing and marking the correct answers. Repeat to yourselves, 'I am confident.'

"Now as I count to five, squeeze your hands three times. Then you will open your eyes, feeling fully relaxed, refreshed, and alert, ready to take your test. 'One, two,' squeeze your hand, 'three,' squeeze your hand, 'four,' squeeze hands, 'five.' Open your eyes.
REFERENCES


