

1991

## **Efficacy of self-instructional training in the management of test anxiety: A primary prevention model**

Rita Schreyer Wagner

*College of William & Mary - School of Education*

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**Efficacy of self-instructional training in the management of test anxiety: A primary prevention model**

**Wagner, Rita Schreyer, Ed.D.**

**The College of William and Mary, 1991**

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**EFFICACY OF SELF-INSTRUCTIONAL TRAINING  
IN THE MANAGEMENT OF TEST ANXIETY:  
A PRIMARY PREVENTION MODEL**

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**A Dissertation  
Presented to  
The Faculty of the School of Education  
The College of William and Mary in Virginia**

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**In Partial Fulfillment  
Of the Requirements for the Degree  
Doctor of Education**

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**by  
Rita Schreyer Wagner  
May 1991**


**EFFICACY OF SELF-INSTRUCTIONAL TRAINING  
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by

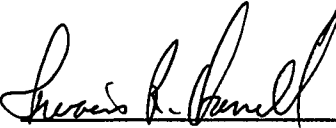
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To a loving family,  
my husband, Armand,  
whose patience and love supported me  
through the years of this endeavor;  
and children, Katharine, David, Richard, Thomas and Victoria,  
who never let me lose sight of my goal;

and my dear mother, Katharine Power Schreyer,  
and the loving memory of my father, Henry Troian Schreyer



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**EFFICACY OF SELF-INSTRUCTIONAL TRAINING IN THE  
MANAGEMENT OF TEST ANXIETY:  
A PRIMARY PREVENTION MODEL**

**ABSTRACT**

The purpose of this study was to evaluate the effectiveness of a program of self-instructional training, presented as part of the regular classroom guidance curriculum, in the reduction of test anxiety and improvement of test performance in third grade children.

The sample consisted of 88 third grade students enrolled in regular education in an elementary school. Intact classes were randomly assigned to treatment and control groups. A nonequivalent control group research design was used. Dependent variables were test anxiety, academic achievement, and test performance and were measured by the Test Anxiety Scale for Children, the Kaufman Test of Educational Achievement, and the Coding subtest of the WISC-R. Data was analyzed using an analysis of covariance (ANCOVA). Four null hypotheses provided the basis for testing whether or not there would be a significant difference (.05 level) between the treatment and control groups.

The results of this data analysis indicated that students in the experimental group achieved lower scores on the self-report test anxiety questionnaire than did students in the control group. The

4-week program of self-instructional training was effective in reducing test anxiety. In contrast, the treatment program was not effective on the variables of test performance and academic achievement.

Recommendations include using a larger sample across more grade levels, having the teachers present in the classroom during the self-instructional training, replication of the study with younger children, and follow-up testing to determine the stability of results over time.

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## Chapter 1

### Introduction

#### Justification for Study

An area of emotional difficulty which has been of concern to educators is that of anxiety. It has a profound influence on affective as well as cognitive development, thereby making early detection of excessive anxiety essential if children are to receive treatment (Dusek, 1980; Hembree, 1988). Of even greater importance is the need for prevention which implies a change in the paradigm which controls current psychological practice in schools. There is noted a transition from an evaluation-intervention model to one of prevention, thus promoting positive developmental growth (Argulewicz, Abel, & Schuster, 1985; Argulewicz & Miller, 1985).

The arguments for prevention are many. First, prevention is much easier than crisis intervention. Once conditions that are likely to develop into crises are identified, remediation may be relatively easy and may take the form of increasing peer and teacher support. Second, primary prevention is cost effective. A primary prevention model emphasizes short-term interventions, provided by school personnel in real-life settings. Finally, a psychology of prevention provides an opportunity for school psychologists to work with teachers on a relaxed personal basis.

Teachers and counselors may not be used to receiving attention from specialists in the schools except under conditions of stress and crisis (Barclay, 1983; Zeidner, Klingman, & Papko, 1988).

Traditionally, test coping and test anxiety treatment programs have been clinically oriented, therapeutic in nature, and directed at test-anxious subjects. Few programs have been developed for "normal" students within the framework of a primary prevention psychological health education program (Zeidner, et al., 1988). Even fewer studies have been conducted with 7, 8 and 9 year-old children.

The research in test anxiety indicates that children in the early primary grades are at risk for developing test anxiety. Hill and Wigfield (1984) estimate that test anxiety affects five to ten million students at the elementary and secondary levels coming from all socioeconomic backgrounds. Wilson and Rotter (1986) also estimate a high incidence of test anxiety, with 20% of school children and 25% of college students subject to performance-debilitating text anxiety. Researchers generally agree that test anxiety results from the child's reactions to evaluative experiences occurring as early as preschool and kindergarten (Dusek, 1980; Sarason, Davidson, Lighthall, Waite & Ruebush, 1960). These children report increased levels of test anxiety across the elementary school years as there develops reliance on testing as the primary tool for evaluating academic achievement (Phillips, Pitcher, Worsham & Miller, 1980). "At about the second grade,

children begin to compare their performance with other children, which can lead to competition and pressure to do better than most others" (Hill & Wigfield, 1984, p. 106). Most researchers recognize the condition of test anxiety as a type of behavior that often results in poor performance on tests. The prevention and management of test anxiety are topics that can easily be addressed in the regular classroom setting, however (Sycamore, Corey, & Coker, 1990; Wilkinson, 1990). Children can be directly taught such test-taking skills as paying attention to teacher directions, solving familiar problems first, checking answers, and working at a moderate rate (Hill & Wigfield, 1984; Zins, Curtis, Graden & Ponti, 1988). These specific strategies can be presented in a self-instructional training format, which can be particularly effective when implemented with children as young as seven, eight, and nine (Fish & Mendola, 1986; Gemmer, Harris & Wyckoff, 1989; Meichenbaum & Goodman, 1971). This study investigated the efficacy of such a program.

#### Statement of the Problem

The purpose of the study was to determine the effectiveness of a program of self-instructional training, presented as part of the regular classroom guidance curriculum, in the reduction of test anxiety and improvement in test performance in third grade children.

#### Theoretical Rationale

Cognitive behavior therapy with children had its beginnings in the late 1960's and evolved out of an attempt to combine the

technology of behavior therapy with new procedures emphasizing internal or cognitive variables as the target and mechanism of therapeutic behavior change (Craighead, 1982; Meichenbaum, 1979). Three major factors led the shift from primarily operant to more cognitive interventions. The first was the impact of cognitive therapy which assumes that maladaptive thought processes produce psychological distress which is, therefore, best alleviated by the modification of those cognitive processes (Craighead, 1982). A central premise is that "the way we view or interpret events in our environment influences how we behave" (Spiegler, 1983, p. 261). Of this approach to therapy, Albert Ellis, Aaron Beck, and Donald Meichenbaum should be considered the major contributors to what has come to be known as the cognitive system.

The oldest of the rational psychotherapies is Ellis's (1961) rational emotive therapy (RET) which advocates the application of cognitive, emotive and behavioral approaches to treatment and has as its goal the development of rational, adaptive thought patterns. It stresses thinking, judging, deciding, and doing, and is highly didactic in that the primary focus of treatment is concerned more with thinking than with feeling. Similarly, Beck's (1976) approach focuses on directing clients to identify distortions in their thinking in order to understand that emotional experiences and maladaptive behaviors are the result of thinking processes which are subject to modification and control. As in RET, the ultimate goal of therapy is the development of rational adaptive thought patterns; however,

Beck's cognitive therapy places greater emphasis on the modification of irrational beliefs rather than specific self-statements as outlined in RET (Craighead, 1982; Wilson, 1978). Many similarities exist between the cognitive therapies of Beck, Ellis and Meichenbaum, whose self-instructional training will be described in some detail later.

A second factor in the evolution of cognitive-behavior therapy was the development of self-control interventions designed to change behavior by modifying covert thought processes. Self-control refers to the process in which clients take primary responsibility for their therapy. Clients are thus trained to initiate, conduct, monitor, and evaluate their own therapy. A major issue in the literature on self-control has been the controversy over the role of internal and external factors in effecting self-controlled responses. It was in the resolution of this issue that Bandura (1977) developed the notion of reciprocal determinism, which maintains that the individual and the environment mutually interact to influence each other. Self-control now, however, seems to be conceptualized as more cognitive in nature. The three basic functions of self-control procedures are: (1) assessment, or self-monitoring; (2) stimulus control procedures which change the antecedent conditions that monitor target behaviors; and (3) changing consequences (Craighead, 1982; Spiegler, 1983).

A third factor was the influence of cognitive psychology which made its impact by using information processing to explain

modeling effects, by introducing problem solving as a clinical procedure, and by developing the concept of self-instructional training. Historically, modeling procedures have been identified with behavior therapy, which can be viewed as the clinical application of principles of learning. Albert Bandura's (1971, 1977) social learning theory emphasized the critical role that imitation, cognitions, and self-regulatory processes could play in the development and modification of human behavior. Modeling, a well known and widely used social learning method, provides an excellent example of cognitive learning. Bandura suggested that two of the major factors which influenced observational learning, or modeling, were the cognitive processes of attention and retention, which are drawn largely from an information processing model of cognitive psychology. This approach focuses on the specific mental processes involved in the acquisition, storage, and retrieval of information (Bandura, 1971, 1977; Craighead, 1982; Spiegler, 1983; Wilson, 1978).

Problem-solving as a clinical procedure was developed from the cognitive psychology literature and has as its focus internal thought processes as the mechanism of change. Problem-solving therapies include a heterogeneous collection of procedures and principles and are designed to teach problem-solving skills as a means of enhancing clients' coping skills. This strategy includes the following sequential steps: identification and statement of the problem in terms of behavioral goals; generation of possible

solutions; evaluation of alternate courses of action; rehearsal of strategies; and evaluation of the effectiveness of solutions (Craighead, 1982; Meichenbaum, 1985; Wilson, 1978).

Self-instructional training was developed in the early 1970's by Donald Meichenbaum. This guided self dialogue is composed of modeling, prompts, overt and covert rehearsal, feedback and social reinforcement. A multifaceted training format is employed in order to teach clients how to think, not what to think (Meichenbaum, 1979, 1985). Meichenbaum's self-instructional training derives from two sources: (1) Ellis's RET and its emphasis on irrational self-talk as the cause of emotional problems; and (2) the developmental perspectives of language in the Russian psychological literature which emphasizes the function of self-verbalization in the control of nonverbal behavior (Luria, 1959, 1961; Stone, 1980; Vygotsky, 1962; Wilson, 1978). The literature on test anxiety is replete with research studies employing desensitization as a treatment of choice. Meichenbaum (1979) suggested that it was used not because it was particularly suited for the test-anxious client's deficit, but rather because such clients were available for research. A more effective means of intervention would be one that focused on the test-anxious client's cognitive style, rather than on the reduction of tension by means of desensitization. The Zeitgeist is moving in the direction of prevention. Cognitive-behavioral modification strategies may therefore provide a useful format for teaching problem-solving and

coping skills. This study attempted to determine the effectiveness of self-instructional training in the management of test anxiety in children in a primary prevention model.

### Definition of Terms

Terms important to the understanding of the research are operationally defined to achieve consistency in interpretation.

#### Test Anxiety:

Test anxiety is a special type of general anxiety which encompasses those phenomenological, behavioral, and physiological responses that accompany concern about possible failure in evaluative situations. It has traditionally been measured in children by student self-report questionnaires and also by teacher ratings.

#### Cognitive-Behavior Therapy:

This type of behavior therapy emphasizes the role of thinking and "self-talk" as a factor in behavior. It consists of teaching children to change what they are thinking in order to change how they are acting.

#### Self-Instructional Training:

This technique is a form of cognitive-behavior therapy developed by Donald Meichenbaum which emphasizes the function of self-verbalizations in the control of nonverbal behavior. In terms of this study, children's behavior is first regulated by the instructions of the counselor; subsequently they acquire control



over their own behavior through the use of overt self-instructions that they ultimately internalize in covert self-instruction.

Modeling:

Modeling is an essential component of self-instructional training in that behavior is acquired by watching the counselor and is reinforced the more the behavior approximates that of the counselor (Bandura, 1971, 1977).

Primary Prevention:

Primary prevention aims at reducing the incidence or number of new cases of a disorder which occur within a population. By contrast, secondary prevention emphasizes early identification and treatment of a disorder, and tertiary prevention is a rehabilitative effort directed toward preventing further deterioration in those with serious problems (Zins, Coyne & Ponti, 1988).

Research Hypotheses

1. Post-treatment scores achieved on the Test Anxiety Scale for Children will show children in the experimental group to be less anxious than subjects in the control group.
2. Children in the experimental group will achieve higher post-treatment scores on the Spelling subtest of the Kaufman Test of Educational Achievement than subjects in the control group.
3. Children in the experimental group will achieve higher post-treatment scores on the Mathematics subtest of the

Kaufman Test of Educational Achievement than subjects in the control group.

4. Children in the experimental group will achieve higher post-treatment scores on the Coding subtest of the WISC-R than subjects in the control group.

#### Sample Description and General Data Gathering Procedures

The experimentally accessible population consisted of all third grade students enrolled in regular education classes in Smith Elementary School in Hampton, Virginia. Once school division and parental permission was obtained, intact classrooms were randomly assigned to experimental and control conditions. The treatment was a part of the regular classroom guidance program and was implemented by the elementary guidance counselor assigned to the school. The treatment and control groups met for 4 consecutive weeks, twice weekly, for a total of eight meetings.

The treatment incorporated test-taking skills in a self-instructional training technique as outlined by Meichenbaum and Goodman (1971). The treatment followed the developmental sequence including overt self-verbalizations of an adult (the counselor), followed by the children's overt self-verbalizations, followed by whispering and finally, covert self-verbalizations.

Data gathering was accomplished by three instruments selected to measure treatment effects on test anxiety, academic achievement, and test performance. Test Anxiety was measured using the Test Anxiety Scale for Children (TASC), a self-report

questionnaire designed for use with young children. The Coding subtest of the WISC-R was administered to determine the relationship between test performance and test anxiety. Academic achievement was measured by the Kaufman Test of Educational Achievement, Brief Form, used as pre- and posttest respectively.

#### Limitations

There are several limitations in the study. The population in the study is not truly representative of the racial and socioeconomic distribution of public school children in the United States. The third graders in the study were 56% white, 40% black, and 4% other minority. In terms of SES, they represented the bottom one-third of the school population. Results, therefore, can only be generalized to that segment of the general population.

A threat to internal validity centered around the effectiveness of the school counselor in implementing the technique. An effort was made to compensate for this variable by using a counselor with extensive teaching and counseling experience. The counselor was also provided with training by the investigator prior to beginning the study.

A major concern was whether or not the proposed treatment was represented in the actual sessions. Staff psychologists were given outlines of the treatment sessions. Using a checklist of expected behaviors, the psychologists observed the sessions at random times in order to ensure treatment fidelity.

## Chapter 2

### Review of the Literature

#### Historical and Theoretical Development

Anxiety in children historically has been a topic of interest among researchers. The relation between test anxiety specifically, and impaired academic performance has been well documented (Dusek, 1980; Hill & Wigfield, 1984; Horn & Dollinger, 1989; Meichenbaum & Butler, 1980; Phillips, et al., 1980; Sarason, 1980; Wilson & Rotter, 1986). The belief that test anxiety causes poor performance has prompted attempts to improve academic performance by the direct alleviation of test anxiety. Recent research goes one step further and proposes that young children respond well to certain cognitive strategies and can actually be taught specific techniques designed to prevent test anxiety and its debilitating effects (Bander, Russell & Zamostny, 1982; Dendato & Diener, 1986; Forman & O'Malley, 1984; Grindler, 1988; Wilson & Rotter, 1986; Zeidner, et al., 1988).

This study investigated the effectiveness of a program of self-instructional training presented as part of the regular classroom guidance curriculum and implemented by an elementary guidance counselor. This chapter is divided into three sections which will summarize both theory and research relevant to the study and cover the following topics: test anxiety; self-instructional training;

and the population under investigation and its needs. A summary will conclude Chapter 2.

### Test Anxiety and Relevant Research

Test anxiety has been defined as a special type of general anxiety which encompasses those phenomenological, behavioral, and physiological responses that accompany concern about possible failure (Seiber, 1980). As a topic of educational research, test anxiety was first investigated by Seymour Sarason and his colleagues at Yale University in the early 1950's. As determined by their responses to an anxiety questionnaire, students were classified as high- or low-test-anxious. On subsequent intelligence tests, the low-anxious students outperformed the high-anxious students. It was hypothesized that the difference in performance was related to learned psychological drives: (1) task-directed drives which stimulate behaviors in order to reduce the drive by completing the task; and (2) anxiety drives, which stimulate not only task-relevant efforts to finish the task and thereby reduce the anxiety, but also task-irrelevant responses manifested by feelings of helplessness and inadequacy (Hembree, 1988).

Building on this behavioral interpretation, later theorists labeled these drives as facilitating and debilitating anxieties. The latter then came to be known as test anxiety (TA), which itself consisted of the components worry and emotionality (Hembree, 1988). Wine (1980, 1982) proposed a cognitive-attentional interpretation of test anxiety. Test-anxious individuals divide their

attention between self-preoccupied worry and task cues, while the less anxious person focuses on task relevant variables. Spielberger (1972) discussed the nature and measurement of anxiety as "a transitory emotional state (A-State) which consists of feelings of apprehension and tension" (p. 10). In contrast, trait anxiety (A-Trait) refers to a chronic anxiety proneness. According to trait-state theory, TA is a form of trait anxiety. These theories all propose an interference model of test anxiety, which in TA disturbs the recall of prior learning and thus depresses performance. An alternate deficits model of TA has also been conceptualized wherein the reverse is true: awareness of past poor performance causes test anxiety (Hembree, 1988).

In an effort to resolve this conflict and to integrate the findings of the research on test anxiety, Hembree (1988) conducted a meta-analysis of 562 studies, which included journal articles, ERIC documents, monographs, reports in research anthologies, master's theses, and doctoral dissertations. This meta-analysis included studies conducted from 1950 through 1986. It is important to note, however, that only 5 of the 562 studies used a population of first and second grade children. The majority of research on test anxiety is done with older children and college students. Hembree's study was designed to investigate the nature, effects, and treatment variables of academic test anxiety, using English-speaking subjects in mainstream education. In order to be included in this meta-analysis, studies met the following criteria:

Test anxiety was measured by validated instruments; and treatments used at least two groups of at least 10 subjects; including a control. In the investigation of theoretical issues, test anxiety has been hypothesized as possessing two factors: worry, or the cognitive concern about performance; and emotionality, or the autonomic reaction to the test situation. The results of this meta-analysis showed that behavioral treatments were more effective in reducing test anxiety than were purely cognitive treatments. Thus, TA seems to be a behavioral rather than a cognitive construct. In the attempt to determine causality in the TA/performance relationship, test anxiety was found to be an attributive cause of poor performance. In the comparison of behavioral and cognitive-behavioral treatments, both were found to be effective in TA reduction. Behavioral treatments included systematic desensitization, relaxation training and modeling, while cognitive-behavioral treatments included cognitive modification, anxiety management training, and stress inoculation. Study skills training was found to be not as effective, thus supporting an interference rather than a deficits model of test anxiety. Hembree also investigated the relationship between test anxiety and performance. A significant relationship was found at grade 3 and above. Across grade levels, females were found to be more test anxious than were males. Test anxiety appears to be "a learned condition, small to nonexistent in the very early grades but firmly in place by grade 5" (Hembree, 1988, p. 75).

Wilson and Rotter (1986) noted the rising incidence of test anxiety in students. In a review of the literature, the authors cited research using such techniques as systematic desensitization and progressive muscle relaxation. These approaches seem to reduce test anxiety but appear to be relatively inefficient in producing changes in academic achievement. In addition, while these treatments have proven successful in some school settings, a major shortcoming has been the lack of generalization to nontargeted situations. The authors stated a need for more research at the elementary school level and stressed a preventive approach to test anxiety. In a study of the effects of anxiety management training and study skills counseling, Wilson and Rotter (1986) attempted to demonstrate the effects of these strategies on self-esteem, test anxiety, and performance. Their sample consisted of 60 sixth- and seventh-grade students enrolled in regular education where test anxiety scores, as measured by the Test Anxiety Scale for Children, were in the upper third of all sixth- and seventh-grade students. Reading scores ranged from 3 to 9 on the Comprehensive Tests of Basic Skills. The Coopersmith Self-Esteem Inventory was used to determine the students' self-reported level of self-esteem. An adaptation of the Coding test of the Wechsler Intelligence Scale for Children-Revised (WISC-R) was administered to determine the relationship between test anxiety and test performance. Students were randomly assigned to one of five groups. The groups were then randomly assigned to one of three experimental treatments or



two control groups. A primary strength of this design was the initial randomization, thus controlling for most extraneous variables that might threaten the internal validity. The experiment consisted of three treatments: the anxiety management group included relaxation training and imagery to induce anxiety; the study skills counseling involved a cognitive approach to the problem of test anxiety and covered time management and instruction on how to study course material and prepare for examinations; the modified anxiety management group combined the training described above along with suggestions for developing concentration and memory, with an emphasis on study habits. The groups met twice a week for 3 consecutive weeks for 45-minute sessions. All three experimental treatments reduced levels of test anxiety but were less effective in changing levels of self-esteem and test performance. The results were consistent with the majority of research findings in test anxiety in that changes in performance measures have been the exception, rather than the rule.

Grindler (1988) studied the effects of cognitive monitoring strategies on the test anxieties of elementary students. The author cited research documenting the negative relationship between test anxiety and academic performance and the need for early intervention with elementary age children. The rationale for this study was founded on the premise that test anxiety can be treated using problem-solving strategies. The treatment procedures

emphasized the modification of cognitive and attentional factors using Meichenbaum's Stress Inoculation Training (SIT). The subjects for this study were 66 fourth- and fifth-grade students who were randomly assigned to either the treatment or control groups. All subjects were pretested on two measures: The Digit Span subtest of the WISC-R and The Survey of Feelings About Tests (SFAT). Following the completion of treatment, all subjects were administered the SFAT and the Comprehension subtest of the Metropolitan Achievement Test. Six weeks later, the SFAT and the Vocabulary in Context subtest of the Metropolitan Achievement Test were administered. The groups met for 4 consecutive weeks, 40 minutes twice weekly. Two additional sessions were used for posttesting, and follow-up testing was done 6 weeks after treatment. The training program followed Meichenbaum's developmental sequence and initiated overt verbalizations of an adult model, followed by the child's overt self-verbalizations, followed by whispering, and finally covert self-verbalizations. This approach combines "didactic teaching, discussion, cognitive restructuring, problem-solving and relaxation training, and self-instruction with reinforcement" (p. 431). Results of this study indicated that there were no significant differences between groups on either the test anxiety measure or the academic measures. In view of the evidence for reduction of test anxiety using cognitive strategies in other studies, the total absence of such evidence in this study was surprising. That there were no changes on the

performance measures was consistent with the majority of research findings on test anxiety. There was noted a need for future research to study the effectiveness of a similar treatment on younger children, who might be better candidates for self-instructional training. It was also suggested that study-skills training be included in the treatment program.

In a study investigating the use of cognitive-behavior therapy for reducing math anxiety, Genshaft (1982) used self-instructional training procedures to teach seventh grade girls a general strategy for controlling their anxious behavior. The 36 subjects were of average intelligence and at an age where decreased mathematics performance and heightened anxiety become established. In addition, their mathematics achievement was at least 1 year lower than reading achievement. The students were randomly assigned to one of three groups. The subjects in the control group attended regular classes, including mathematics, and received no remediation services. Those in the tutoring group met twice a week for 8 weeks and received 40 minutes of tutoring in addition to their regular mathematics class. The students assigned to the self-instruction group, in addition to tutoring and regular classes in mathematics, were trained to use self-instruction to reduce anxiety and to avoid making critical self-evaluative statements. The effectiveness of this program was evaluated using the Stanford Diagnostic Mathematics Test. All three groups improved on the application section, however only the self-instruction group

improved significantly on the computations section. As a result of the treatment, there was noted a more favorable attitude toward mathematics, however. In that attitudes are related to anxiety, it would seem reasonable to conclude that more positive attitudes would accompany lowered levels of anxiety, which could be conducive to future academic gains. Genshaft suggested that classroom teachers might be taught to apply this technique in earlier grades in a prevention model, in an "attempt to develop expectations of mastery and success in young students, before they become hindered by expectations of failure and anxiety" (p. 34).

Dendato and Diener (1986) investigated the effectiveness of cognitive/relaxation therapy and study skills training in reducing anxiety and improving academic performance. Because behavioral and cognitive therapies have a poor record in improving academic performance, yet are effective in reducing anxiety, researchers question the notion that test anxiety is the major cause of poor test performance. An alternate hypothesis is proposed: test anxiety is the result of past failure and the student's knowledge that he or she is not prepared for the test situation. It has been shown that the test anxious students have both inefficient study habits and inadequate test-taking strategies. Contrary to what might be expected, however, study skills training usually is found to be not effective in either reducing test anxiety or enhancing test performance. What has been found to be effective is a combination of study skills training and cognitive-behavioral strategies.

Dendato & Diener (1986) designed their study to determine whether study skills training would contribute to a treatment program that included both cognitive therapy and relaxation training. Forty-five college students who scored above the 75th percentile on a measure of test anxiety agreed to participate in the study. They were randomly assigned to one of three treatment groups or to a no-treatment group. The three treatment groups were described as follows:

(a) the relaxation/cognitive therapy group was taught a deep muscle relaxation technique and was familiarized with rational-emotive psychotherapy; (b) the study skills group was given strategies for improving study habits such as time-management, goal setting, note taking and test-taking strategies; (c) the relaxation/cognitive therapy with study-skills training group was taught both strategies outlined above. The results were consistent with the findings of previous research in that the combined therapy was more effective than was either component alone.

Bander et al. (1982) also used a combined approach in the treatment of mathematics anxiety. Participants for this research were 53 university students who scored more than one standard deviation below the mean on the Mathematics Anxiety Scale. They were randomly assigned to one of three treatment groups (study skills training, cue-controlled relaxation, and a combined treatment) or to the no-treatment control group. The results at posttreatment indicated that the study-skills treatment produced

significant improvement on both anxiety and performance measures. Follow-up testing results suggested that the relaxation group was superior to both the study skills and combination treatment groups. The deterioration in effectiveness for the study-skills group, from posttest to follow-up assessment, may have resulted from a failure of the members to use the skills and techniques once the program ended.

Hill and Wigfield (1984) conducted a program of research on test anxiety in young children. They developed an eight session classroom teaching program, the purpose of which was to familiarize students with the demands and pressures of standardized achievement testing. With an emphasis on test-taking strategies and positive test motivation, second-grade students learned about the general purposes of testing and then were familiarized with general kinds of test instructions and question and answer formats. This program was implemented by two teachers with 34 second graders in their classrooms. Three teachers with 31 second graders served as a comparison control group. The group receiving the teaching program performed significantly better than the control group.

Zeidner et al. (1988) noted that the recent trends in school and counseling psychology point to the replacement of a treatment and intervention model by a primary prevention model of psychological health. "Mitigating potential sources of psychological stress while strengthening students' coping skills is construed to be totally

compatible with the very goals of the educational process aimed at optimizing student adjustment and improving the quality of life for many students" (p. 95). The goal of their research was to test the effectiveness of a teacher-based training program designed to enhance test coping skills among students placed in regular education. Using a program based on cognitive modification principles, it was hypothesized that students would show a decrease in test anxiety and a concomitant improvement in test performance. The sample consisted of 497 students in northern Israel placed in 24 fifth- and sixth-grade classes. The intact classes were randomly assigned to treatment and control conditions. The Test Anxiety Inventory served as the criterion measure of test anxiety. The WISC Digit Symbol Coding Scale and the Vocabulary and the Mathematics subtest of the Milta Intelligence Scale served as both the pretest and the posttest. The Teacher Awareness Inventory was also used to assess the effectiveness of the program on teachers' awareness of, and sensitivity to, test anxiety as a classroom phenomenon. The treatment program was based on Meichenbaum's cognitive modification model and consisted of five 1-hour sessions held 2 weeks apart. The results of this study showed an increase in cognitive test scores. In contrast, the test coping program did not appear to have any effect on highly test-anxious students. The authors attribute the success of their program in increasing test performance to the transference of test coping skills acquired in the intervention setting to actual test

settings. The unique aspect of this study was that it was implemented in the regular classroom setting by specially trained classroom teachers. While it might not be feasible to replicate this study in most educational settings, there are practical applications. Elementary guidance counselors, rather than classroom teachers, could implement this program as part of the regular guidance curriculum.

A summary of the research on the treatment of test anxiety seems to show conflicting results regarding the success of cognitive-behavioral strategies in the reduction of test anxiety and improvement of academic performance. When non-significant results were reported, researchers had either not used a combined approach, or subjects in the study failed to implement the strategies once the treatment ended (Bander et al., 1982; Grindler, 1988). Studies reporting significant results utilized treatment programs combining test-taking strategies and cognitive-behavior techniques. In addition to using a combined treatment approach, the studies reporting the most significant results used total sample sizes of at least 45 students and all employed control groups. The number of subjects in treatment and control groups did not exceed 17 students per group. A larger number of subjects per group would be more desirable in that the treatment utilized in this study was implemented in regular public school classrooms where the number of students usually exceeds 17 children. In addition, investigators documented the inverse relationship between test



anxiety and test performance and stated the need for research with young children (Genshaft, 1982; Wilson & Rotter, 1986). The majority of studies, however, limited their investigations of the effectiveness of treatment to children in the fourth grade and above, with the majority of programs addressing the needs of college undergraduate students. When designing a program for young elementary school children, treatments need to be individualized and tailored to address the specific skill level and particular needs of the population under investigation.

#### Self-Instructional Training Research

Cognitive-behavior modification (CBM) evolved from the efforts of researchers who investigated ways to improve the treatment efficacy of behavior therapy. It was found that traditional behavior modification procedures could be enhanced by attending to the role of cognitive factors in the treatment of such diverse problems as impulsivity, test anxiety and aggression.

Self-instructional training, a cognitive behavioral strategy, has been used successfully to effect change in children's behavior in educational settings. This technique was developed by Donald Meichenbaum and can be defined as a process whereby children are taught how to use verbalizations to direct their own behavior. Therapy progresses through three stages and is based on the research of the Russian psychologists Luria (1959; 1961) and Vygotsky (1962). During the first stage, the speech of others, usually an adult model, controls and directs the child's behavior.

The second stage is characterized by the child's overt speech becoming a regulator of his or her behavior. Finally, in the stage of covert self-instruction, the child's inner speech assumes a self-governing role.

From this developmental sequence, Meichenbaum and Goodman (1971) designed a treatment paradigm which included the following five steps: (1) an adult model performed a task talking aloud while the child observed (cognitive modeling); (2) the child performed the same task while the model provided instructions (overt, external guidance); (3) the child performed the task again while instructing himself aloud (overt self-guidance); (4) the child performed the task while whispering the instructions to himself (faded, overt self-guidance); and finally, (5) the child performed the task while guiding his performance using inaudible or private speech (covert self-instruction).

Meichenbaum and Goodman (1971) investigated the effectiveness of this self-instructional training procedure in altering the behavior of 15 impulsive second-grade children. Following a pretreatment assessment of the children's behavior both in class and on performance measures, the children were assigned to one of three groups. One group comprised the cognitive self-guidance group, while the remaining two groups were control groups. The cognitive training group subjects were seen for four one-half hour treatment sessions over a 2-week period. Posttreatment effectiveness was assessed using the Porteus Maze

Test and the Coding subtest of the Wechsler Intelligence Scale for Children (WISC) to measure sensorimotor abilities. The Matching Familiar Figures Test (MFFT), and the WISC Block Design and Picture Arrangement subtests were used to measure cognitive ability. The results suggested that a cognitive self-guidance program can significantly alter behavior of impulsive children.

Meichenbaum and Goodman (1971) conducted a second study with 15 impulsive children selected from a larger group of 30 kindergarten and 30 first-grade public school children on the basis of their performance on a measure of cognitive impulsivity. These 15 children were randomly assigned to one of the treatment groups (modeling alone or modeling plus self-instructional training) or to the control group. The results of the second study indicated that the addition of explicit self-instructional training to modeling procedures significantly altered the impulsive behavior and facilitated behavior change. In both studies the goal of bringing overt behavior under control using the self-regulatory function of private speech was realized.

Using a direct instruction method, Argulewicz, Elliott, and Spencer (1982) integrated behavioral and cognitive strategies to teach children with severe attentional deficits specific behaviors important to attending. Their treatment first trained the students in overt attending behaviors and then incorporated cognitive self-instruction, as outlined by Meichenbaum and Burland (1979). Two fourth-grade boys participated in this study. One student was

described as being impulsive and distractible; the second student displayed good attending behaviors and served as a control. The intervention took place over 4 days and involved a total of 50 minutes of direct interaction between the therapist and the student. Using a sequential observational system, a trained observer recorded the frequency of attending behaviors of the two students. Baseline data was obtained prior to treatment and then observations were made over the 4 day treatment program. Agreement between the trained observer and the second author was checked on two occasions and resulted in a reliability coefficient of .78. Attending behaviors for the target student increased dramatically over the course of treatment. Follow-up data was also collected on the seventh and the fifteenth day after training and results indicated that the target student was attending at rates comparable to the control student. Unfortunately, the authors did not investigate whether the improvement in overt attention effected a concomitant improvement in academic performance, other than an anecdotal report from the child's teacher.

In a well designed study examining the use of cognitive behavior therapy for reducing math anxiety, Genshaft (1982) used Meichenbaum's self-instruction training program for 36 adolescent girls who were randomly assigned to one of three groups. As described in greater detail in an earlier section on test anxiety, the subjects assigned to the self-instruction group were trained to use

this strategy both to reduce their anxiety and to help them attend to academic tasks. Subjects in the tutoring group received tutoring in mathematics in addition to the instruction provided by their regular mathematics class. Those subjects in the control group attended their regular mathematics class and received no other treatment. The program was 8 weeks in duration and was evaluated using the Stanford Diagnostic Mathematics Test. Only the self-instruction group improved on the computational section of the test, however, all three groups showed improvement in math application. The author recommended the implementation of this strategy in younger subjects in a prevention model.

Using the Meichenbaum and Goodman (1971) model, Fish and Mendola (1986) investigated the effectiveness of self-instruction training for increasing homework completion in an elementary special education classroom. Three children who were classified as emotionally disturbed and who ranged in age from 8 years 11 months to 9 years 11 months participated in the study. They were selected from a class of ten students and had the lowest percent of homework completion in the class. The self-instruction training sessions were 15 minutes in duration, one session per day for 7 weeks. The results of the study showed that homework completion increased and was maintained for two of the three subjects during a follow-up period 13 weeks later. That the behavior was maintained following a lengthy lapse of time is an important practical finding. Several issues were raised, however. Homework

completion may have increased because of the individual attention the children received rather than to the actual self-instruction strategy. For this reason, attention control subjects should have been included in this study. A second issue raised by the author is the effect of the treatment on homework accuracy. Completion, rather than accuracy, was targeted. Finally, the efficacy of group self-instruction might be explored. It was noted by the classroom teacher that two of the three subjects, upon completion of the training sessions, attempted to teach the self-instruction strategy to classmates.

In an intervention designed to improve the social behavior of a 14 year old girl, Groenewald and Der (1987) devised a step-by-step teaching technique utilizing self-instruction training as a counseling strategy. The student had been referred for counseling because of a low self-concept, poor motivation, and low achievement. The treatment included the rehearsal of self-verbalizations, first overtly and then covertly, as outlined by Meichenbaum and Goodman (1971). Written and behavioral homework assignments were also part of the strategy, as were ongoing consultations and collaborations with the parents and the teacher. Over the course of the intervention, there was a noticeable change in the subject's behavior, speech, and general outlook. Further, peer relationships improved dramatically. The authors concluded that "self-instructional training, as opposed to behavioral techniques, provides students with a skill they can use in a variety of

situations and tasks" (p. 123). While case studies have the potential to generate data that can aid in research, this particular study failed to employ either in-depth interviews or any method of objective data collection such as systematic behavioral observations or performance on standardized tests.

In summary, cognitive behavior modification, or more explicitly, self-instructional training, represents a shift from purely behavioral strategies to more cognitively oriented interventions in the treatment of behavior disorders and academic problems in school children.

With the notable exception of the Meichenbaum and Goodman research, the majority of studies employed subjects in the fourth grade and above. Additionally, self-instructional training was used primarily with either small groups or in a single subject or case study design. A summary of the research on the efficacy of self-instructional training underscores the need for research using larger sample sizes.

Of the five studies cited, two failed to include control groups of subjects. All subjects in the studies exhibited behavioral, emotional, and/or academic problems. The authors of several studies noted that self-instructional training can be implemented through either a prevention or treatment approach. Because of the widespread nature of school related problems, it might therefore be beneficial to design intervention programs for younger children using a prevention model. Finally, and at a practical level,

intervention programs should be designed so that existing school personnel (i.e., counselors and classroom teachers) could implement the strategy as part of the regular curriculum.

#### Population Characteristics and Needs

The subjects in this study were 7, 8 and 9 year old students enrolled in regular education. Research indicates that children of this age are at risk for developing debilitating test anxiety. Further, the research shows that young children respond well to cognitive-behavioral strategies designed to effect change in children's behavior in school settings. This section will summarize the research relevant to these two issues.

The research in test anxiety suggests that children experience stress and feelings of apprehension when they are exposed to evaluative situations. S. B. Sarason and his colleagues (as cited in Dusek, 1980) generally agree that test anxiety develops during the preschool years when the child's performance does not live up to the parents' expectations. Parental judgments of the child's performance are often negative and as the child internalizes these feelings, a hostile view of the rejecting parent develops. Guilt is produced in the child which may lead to behaviors aimed at pleasing the parents and satisfying their wishes. The high-test-anxious child thus develops great dependence upon adult direction and support in evaluative situations (Dusek, 1980). School situations arouse test anxiety primarily because of the similarities between the parent and the teacher. Both are adult authority



figures who not only perform evaluative functions, but also dispense rewards and punishments (Gaudry & Spielberger, 1971).

Anxiety traditionally has been measured by student self-report questionnaires. Reliable measurement devices have been developed for use with young children. Argulewicz et al. (1985) examined one such instrument, the Children's Anxiety Scale (CAS). The authors investigated the reliability and content validity in an effort to investigate the possibility that very young children might not understand all test items consistently. The CAS was found to be reliable for use with kindergarten students.

Teacher ratings are also used as a way of assessing anxiety. Argulewicz and Miller (1985) investigated the relationship between teachers' perceptions of their students' anxiety and the students ranking of anxiety as determined by two self-report measures, the Revised Children's Manifest Anxiety Scale (RCMAS) and the Children's Anxiety Scale. Subjects were 97 students in five first grade classes. Rank-order correlations between rankings revealed nonsignificant relationships between teachers rankings and children's anxiety rankings on either self-report measure. Rankings of scores between the RCMAS and the CAS were significant in two classrooms, with a third classroom approaching significance. The results suggested that students who report feelings of anxiety may not be identified by their teachers as having problems that are disturbing. As teacher referral is the most important decision leading to special education placement,

these students may therefore not receive services from which they might benefit.

Considerable research has explored the negative relationship between children's test anxiety and their test and school performance. In an investigation of the educational problem of test anxiety, Hill and Wigfield (1984) studied ways to eliminate its interfering effects in the school setting. They found that test anxiety is present in some children in the early elementary school years when parents make unrealistic demands, and then react negatively when their children fail to meet their expectations. The children in turn become fearful of evaluation, which becomes increasingly more formal, frequent and complex as they progress through school. At about the second grade, children begin to compare their performance with peers, which leads to competition and pressure to perform better than the other children.

Hill and Wigfield (1984) developed their program for use in the second grade as this is the grade level at which children in many schools are first exposed to standardized testing. It has been found that these children are unprepared for the demands of formal testing, to include time limits, lengthy testing session, and unfamiliar question and answer formats. Examples would include such things as reading a paragraph and then answering multiple-choice questions. Achievement tests have multiple sets of instructions that students must read and comprehend on their own. Computer answer sheets are also introduced in the elementary

school and may compound a student's test-taking difficulties. Using a study-skills format, the authors' program consisted of an eight session teaching program given over a 4-week period. Two teachers with 34 second graders in their classrooms implemented the program; teachers with 31 second grade children served as a comparison control group. All children were given a teacher-made pretest to assess academic skills. The children in the treatment groups were familiarized with test-taking strategies and given practice on questions and problems frequently included on achievement tests. The program was assessed in an analysis of covariance and found to be effective in improving the children's performance on a full-scale achievement test.

The second issue under investigation in this study is the effectiveness of self-instructional training in the management of test anxiety. This strategy involves the manipulation of a child's inner speech in order to effect a change in nonverbal behavior. There is a complex developmental relationship among thought, language, and behavior, however. On the basis of his work with children, Luria (1959, 1961) proposed three stages by which the initiation and inhibition of voluntary motor behaviors come under verbal control. Initially, the speech of others controls the child's behavior, and finally, the child's inner speech assumes a self-governing role. Luria found that the regulatory function of speech shifts from the external to the internal speech of the child at the age of 4 1/2 to 5 1/2.

Vygotsky (1962) pointed out the role played by the words of adults on the development of the child's mental processes. What the child initially does with the help of adults he later does by himself, supporting himself with his own speech. While speech is at first a means to communicate with adults, it later becomes a means of organizing the child's own behavior. That function previously divided between two people later becomes an internal function of human behavior. Vygotsky defined inner speech as a function in itself and not the interior aspect of external speech. "While in external speech thought is embodied in words, in inner speech words die as they bring forth thought. Inner speech is to a large extent thinking in pure meanings" (p. 149).

Data from research provides support for the progression from external to internal control, and the self-guiding function of inner speech. Meichenbaum and Goodman (1971) tested this hypothesis and designed a study to examine the efficacy of a cognitive self-guidance treatment program which followed the developmental sequence by which overt verbalizations of an adult, followed by the child's overt verbalizations, followed by the child's covert self-verbalizations would result in the child's own verbal control of his or her nonverbal behavior. Using this fading procedure, the authors studied impulsive children whose ages ranged from 7 to 9 years and who were enrolled in the second grade in a remedial class for children with behavioral problems. Following a pretreatment assessment, the children were assigned to one of

three groups: a treatment group and two control groups. The children in the cognitive training group were seen individually for four 1/2-hour sessions over a 2 week period. Three different psychometric tests were used to assess changes in behavior. The Porteus Maze Test and the Coding subtest of the Wechsler Intelligence Scale for Children (WISC) were used to measure sensorimotor abilities. The WISC Block Design and Picture Arrangement subtests and the Matching Familiar Figures Test (MFFT) were used to assess cognitive ability. An analysis of variance and multiple t-test comparisons were performed on the change scores for each of the dependent measures. The self-instruction training program was effective in training these children to talk to themselves as a way of modifying their behavior. "The self-instructional training approach permits the educator to get into the business of teaching 'thinking' directly and explicitly. Thus, teaching by example rather than by exhortation permits the teacher to cognitively model various strategies and coping responses" (Meichenbaum, 1977, p. 100).

Using the Meichenbaum and Goodman (1971) model, Fish and Mendola (1986) investigated the effectiveness of self-instruction training for increasing homework completion. The subjects were three children who ranged in age from 8 years 11 months to 9 years 11 months, who were seen individually for eight half hour training sessions over a 2 week period. Weekly percentages of homework completed were calculated. Prior to treatment,

homework completion ranged from 29.1% to 40%. Posttreatment means were 66.6%, 90%, and 91.7%. A cognitive-behavioral analysis of the findings suggested that the children learned to self-instruct during the treatment phases and were then able to apply the strategy effectively for mathematics, reading, and language arts homework.

A key function of self-instruction training is the use of cognitive modeling plus self-rehearsal. This was compared with exemplary modeling in a study by Denney (1975) who found that the child's age interacted with the modeling condition. Children who were 6, 8, and 10, were exposed to three types of training procedures aimed at increasing their use of constraint-seeking questions and enhancing their problem-solving efficiency. A constraint-seeking question allows for the elimination of more than one alternative from an array of possible answers, thus permitting the child to "narrow in" on the correct answer. Within each age group, 6 boys and 6 girls were randomly assigned to three treatment groups and a control group. The 20-Questions Procedure was administered as a pre-, post-, and follow-up test. The study conformed to a mixed factorial analysis of variance. Cognitive modeling was found to be most effective among the youngest children who required the additional guidance afforded through the verbalizations of the cognitive model. Denney also found that the addition of self-instructional rehearsal added little to the cognitive modeling condition. This latter finding is in contradiction

to the Meichenbaum and Goodman (1971) study, however, the populations were quite different. In an effort to reconcile the difference in findings, Meichenbaum (1977) hypothesized an interaction between subject characteristics and the usefulness of the self-rehearsal component of self-instructional training.

In this summary of the special needs and characteristics of the population under investigation, it is essential to keep in mind the purpose of this study which was to investigate the effectiveness of self-instructional training in the management of text anxiety. In that a prevention model was utilized, it became necessary to establish at what age anxiety could be identified in children, to find ways to measure test anxiety, and finally, to determine whether the treatment was appropriate for this age child.

In studies examining the use of self-report questionnaires designed to measure test anxiety, results suggested that these measurement devices are suitable for use with young children (Argulewicz et al., 1985). Interestingly, the results of one study reported that the children's self-report measures were unrelated to teacher ratings (Argulewicz & Miller, 1985). Students who are reporting feelings of anxiety may therefore not be identified by their teachers, and subsequently not receive needed services. The prevention model used in this study may therefore be a viable alternative to relying on teacher referral.

The research also supported the use of self-instruction training and study-skills training (Fish & Mendola, 1986; Hill & Wigfield,

1984; Meichenbaum & Goodman, 1971). It is noteworthy that all subjects in the studies cited were at or below the second grade level. The use of inner speech to control nonverbal behavior was proved to be effective, as was the use of a cognitive model. Both are essential components of self-instructional training. This strategy effected behavior change in not only impulsive children but youngsters who were having academic problems. The sample sizes were small, however. The success of the self-instructional training program had practical implications in that school personnel other than psychologists can be trained in its use. Additionally, all materials used were readily available and relatively inexpensive.

A study skills program developed for use with second grade children was outlined and also found to be effective. A strength of this teaching program is that it can be tailored to the specific needs of students at different grade levels and can be presented as part of the regular curriculum.

#### Summary of Previous Research and its Relationship to the Problem

The problem under investigation in this study is how to prevent test anxiety in young children utilizing existing public school personnel in a regular guidance curriculum. A concern with the reviewed research is that very few studies were conducted with children below the fourth grade, and of these studies, none used a model of primary prevention.



Numerous investigations have examined the efficacy of using cognitive-behavioral approaches in the treatment of test anxiety. Noted in many of these studies was an inconsistent improvement in academic performance accompanying the reduction of test anxiety. While the results of a meta-analysis of more than 500 studies reported that improved test performance consistently accompanied test anxiety reduction (Hembree, 1988), other research reported that changes on performance measures have been the exception (Grindler, 1988; Wilson & Rotter, 1986).

In a comparison of the effectiveness of treatment methods, most researchers reported significant results when a combined approach was used (Bander et al., 1982; Dendato & Diener, 1986; Wilson & Rotter, 1986). Cognitive-behavioral interventions were found to be most effective when implemented in conjunction with study skills training and test taking techniques. A need for further research using younger children and larger sample sizes was cited repeatedly. Also emphasized was the need for prevention programs in an effort to provide children with strategies designed to promote psychological health. Intervention programs designed for children enrolled in regular education and implemented by classroom teachers and guidance counselors as part of the regular curriculum would be both feasible and useful.

In conclusion, the reviews of the research on test anxiety consistently demonstrate the existence and debilitating effects of test anxiety in elementary age school children. Recent studies

underscore the need for further research using a combined treatment approach with younger subjects. A controlled examination investigating the efficacy of such a program thus seems a logical step.

## Chapter 3

### Methodology

The purpose of this study was to assess the effectiveness of self-instructional training in the reduction of test anxiety and improvement of test performance in third grade children. This chapter presents the research methods that were used in the investigation.

#### Subject Population and Selection of the Sample

The location of this study was an elementary school in Hampton, Virginia. Smith Elementary School has approximately 613 students in grades K, 1, 2, 3, 4, and 5. In terms of socioeconomic status (SES), and as determined by eligibility for free or reduced lunch, 37% of the Smith students come from low SES families. A similar proportion of children from low SES families exists in the total school population in Hampton. The accessible population consisted of 38 male and 50 female third grade students who were enrolled in regular education classes. The students involved were 56% white, 40% black, and 4% other minority, and ranged in age from 7 to 10. This specific age group was chosen for the study in view of the significant relationship found between test anxiety and performance at grade three and above (Hembree, 1988). Research indicates that children of this age are at risk for developing test anxiety. Instruments have been developed that

reliably and consistently measure anxiety in children as young as 5 and 6 (Argulewicz et al., 1985; Reynolds & Paget, 1983).

Because breaking up intact classes for experimental purposes was not feasible, intact classrooms were randomly assigned to two experimental and two control conditions within the school. Both groups within the school had, therefore, equal socioeconomic status as determined by the school district's reduced lunch data.

Participating teachers were told prior to the administration of the pretest that the treatment would be available to all third grade classes during the semester. The students and the teachers were not informed as to the nature of the treatment. The treatment was a part of the regular classroom guidance program and was implemented by the elementary guidance counselor assigned to the school. The guidance counselor also met with the control group and provided them with classroom guidance sessions similar in frequency and duration but not in curriculum content. Upon completion of the experimental study, the treatment program was implemented in the classrooms assigned to the control group. Treatment effectiveness for the control group was not assessed.

### Procedures

#### Data Gathering

The data gathering of the study employed three instruments to measure treatment effects on academic achievement, test anxiety, and test performance. Academic achievement was measured pre- and posttest by the Kaufman Test of Educational

Achievement (K-TEA), Brief Form. The Spelling and the Mathematics subtests were administered.

Test anxiety was assessed using the Test Anxiety Scale for Children (TASC) which was administered pre- and posttest. The TASC is a group administered paper and pencil test consisting of 30 items and purports to measure anxiety about test performance.

The Coding subtest of the Wechsler Intelligence Scale for Children-Revised (WISC-R) was administered pre- and posttest to determine the relationship between test performance and test anxiety. Performance tests of this nature have been shown to be significantly negatively affected by test anxiety (Boor and Schill, 1967).

Greater detail regarding the above instruments will be provided in the section on instrumentation.

### Treatment

The treatment program assessed in this study incorporated test taking strategies in a self-instructional training technique as outlined by Meichenbaum (1977) and Meichenbaum and Goodman (1971). It was implemented by the school's elementary guidance counselor as part of the regular classroom guidance curriculum.

The dependent measures, the Kaufman Test of Educational Achievement, the Test Anxiety Scale for Children, and the Coding subtest of the WISC-R, were administered by a graduate student in school psychology both before and after the treatment, during regular homeroom class period.

The treatment and control groups met for 4 consecutive weeks, 30 minutes twice weekly, for a total of eight meetings. The actual setting of treatment was the regular classroom. The number and length of sessions and duration of treatment are consistent with similar studies using elementary school age children (Grindler, 1988; Hill & Wigfield, 1984; Meichenbaum & Goodman, 1971; Zeidner et al., 1988).

The investigator trained the counselor in the self-instructional training technique in a two-session pre-experimental workshop. The eight-session program was outlined in detail in order to maximize treatment fidelity. A check for the proper implementation of the experimental program was carried out during treatment by two certified school psychologists to ensure congruence between behavior and treatment specifications.

#### Experimental Group

The eight-session classroom program consisted of an introductory session in which the children were familiarized with the general purposes of testing. Topics covered included the following: instruction on such test-taking skills as paying attention to teacher directions and finding a comfortable work place; providing motivation and encouragement to the children to do their best, check and re-check answers, work quietly, and not disturb others; reassure the children that guessing is permissible, that difficult problems will be encountered, and that test completion may not be possible for all students; specify such logistics as

solving familiar problems first, avoiding careless errors, and attending closely to various tasks.

The major goal of the second session was to provide the children with an understanding of test anxiety. Through discussion and guided imagery, the children were encouraged to talk about how they feel under test conditions. The children were told that anxiety can result from negative thoughts and self-statements that occur before and during a test.

In the third session, the children were provided with specific instructions in the self-instructional training technique as outlined by Meichenbaum and Goodman (1971). The treatment followed the developmental sequence, including overt verbalizations of an adult (the counselor), followed by the children's overt self-verbalizations, followed by whispering, and finally covert self-verbalizations. The following is an example of the counselor's modeled verbalizations which the children used first overtly and then covertly:

Okay, what is it that I have to do? This is a special test we have to take every year (Iowa Test of Basic Skills - ITBS). I have to go slow and careful. I have to check my answers. It's OK to guess. I have to try hard, but it's OK if I don't finish. I don't know the answer to this one, so I'll move on and come back to this later. I'm not going to rush, but I'm not going to work too slowly either. There, I'm finished.

In order to achieve mastery of the self-instructional training technique, the counselor modeled the technique using a fine-motor design copying task in the fourth session. A geometrical design was drawn on the board and the counselor copied the figure while talking aloud. All children were given the opportunity for practice. In this session, the second phase of the technique was introduced wherein the children performed the task while the counselor instructed them aloud. The children then performed the same task, also while talking aloud. This was followed by whispering and finally, the children performed the task covertly (without lip movements).

In the remaining four sessions, the children practiced the self-instructional training technique in a variety of situations to include arithmetic computation and word problems, multiple choice questions in various subject areas, and "matching" problems similar to those encountered on teacher-made and standardized achievement tests. Rehearsal included modeling and student role playing.

#### Control Group

The control group met for 30 minutes twice weekly for 4 consecutive weeks, for a total of eight meetings. The sessions were described as classroom guidance and involved the counselor's presenting a program of vocational guidance appropriate to the age level. The children were involved in discussion and role playing.



The control group was used to control for general factors associated with interaction and expectancy of improvement.

It was expected that all third grade teachers would want their classes to have access to a program designed to teach study skills and reduce test anxiety. They were, therefore, assured that all classes would receive the treatment over the course of the semester. The teachers were not in their classrooms during the guidance sessions and were not informed as to whether their class had been assigned to the treatment or control groups.

To control for such internal validity threats as compensatory rivalry and resentful demoralization of the control group, the control group participants received the treatment after the study was concluded and all data collected.

#### Instrumentation

Three methods of instrumentation served as measures of the effect of treatment. The following describes each instrument and discusses its reliability and validity.

The Test Anxiety Scale for Children (TASC) is a self-report questionnaire developed by S. Sarason et al. (1960) to measure anxiety concerning test-like situations, and differs from general anxiety scales in that it is a measure of subjective experiences of anxiety in a specific situation rather than a variety of situations. The TASC is a group administered paper and pencil test consisting of 30 items to which the child responds "yes" or "no" by circling the appropriate response as the questions are read by an examiner.

All 30 test items concern reactions to a variety of evaluative and test-like questions. Twelve of the items specifically mention the word "test." Other questions ask about "worry" over classroom performance (Dusek, 1980; Ruebush, 1963; Sarason, Davidson, Lighthall & Waite, 1958; Sarason et al., 1960).

The initial reliability studies were conducted by Sarason and his colleagues in 1958 using a sample of 1697 children in grades 2, 3, 4, and 5. Test-retest 2 month interval reliability coefficients ranged from .65 to .82. Split-half reliability coefficients ranged from .70 to .80. In a second reliability study using a sample of sixth grade children, Sarason et al. (1960) employed a test-retest design. The TASC was administered twice with a 4 month interval between administrations. Eight experimental groups of children were composed, each with 40 children. Four of the groups were made up of girls and four of boys. Test-retest correlations ranged from .55 to .78, and averaged .67.

In a routine statistical control, Sarason et al. (1960) encountered a phenomenon they refer to as the "position effect," or the tendency of children and adults to score lower on a structured personality scale when it is presented in second position of a dual administration. The authors construed the position effect to be a reflection of a build-up in defensiveness against admitting fears or worries. In order to have some control over this defensiveness against admitting to worries and fears, the authors also developed a lie scale. In an investigation of the position effect, the authors

again used eight groups of children, each with 40 children. Two types of administrators were used: the teacher, a familiar administrator, and one of the authors, who was unfamiliar to the pupils. Administrator sequence varied. An overall F-test in the analysis of variance was employed. The data indicated that the average drop in TASC scores was 2.68 points. The largest position effect occurred when both the first and second administrations were by the teacher. There also was found to be an overall effect of administration sequence. Defensiveness, as measured by the lie scale, was greater with teacher administration. It was hypothesized that the children may have been suspicious that they were being evaluated by the teacher in that the administration format was similar to test-taking situations in the classroom. The children, therefore, may have attempted to find the correct answers to the questions, in that wrong answers might incur punishment.

The implications are great, both for research with and the applied use of anxiety questionnaires. A common object of research with self-rating scales is to obtain a measure of some variable (for example, test anxiety) before the application of an intervention assumed to affect that variable, and again after the intervention to evaluate the changes brought about by the intervention. If a rise or fall in scale mean occurs on the second administration, then the scale is useless. The position effect, therefore, places a serious restriction upon research with

structured personality instruments. In that investigations of personality variables are rarely concerned with single traits, the authors state that it may be "necessary to employ more than one structured personality scale to meet the requirements of the design" (Sarason, et al., 1960, p. 304).

In their validity studies, Sarason and his colleagues reported a consistently positive relation between scores on the TASC and the General Anxiety Scale for Children (GASC). In a sample of 555 boys and 565 girls enrolled in grades 1 through 6, correlations ranged from .33 to .69. The authors considered the data as strongly supporting their hypothesis that the child who is test anxious is one who also experiences anxiety in a variety of situations (Sarason et al., 1960).

Dunn (1964) conducted a study to investigate whether or not the TASC was a homogeneous measure of test anxiety. A slightly modified version of the TASC was administered to 633 students from the fourth, fifth, and sixth grades of five public schools. The data were analyzed by means of a principal-axes factor analysis rotated to a normalized varimax solution and four factors were obtained: test anxiety, generalized school anxiety, recitation anxiety, and physiological arousal in anticipated recitation situations. In general, it was found that the TASC is not a unidimensional measure of anxiety, and that a TASC score appropriately can be considered a measure of school anxiety rather than general anxiety.

In an investigation of the stability of the factor structure of the TASC across different sample groups, Dunn (1965) collected data from groups of subjects. Groups 1 and 2 were 191 girls and 223 boys drawn from the fourth and fifth grades of a public school system. Groups 3 and 4 were 226 boys and 226 girls from the seventh and ninth grades of the same school system. The data were analyzed using Hotelling's principal-axes method coupled with a normalized varimax rotation. The first factor identified was test anxiety which accounted for 50% of the total common variance for preadolescent boys but only 35% of the variance for the other subjects. The second factor was dream anxiety, which accounted for 15% to 20% of the total common variance for the various groups. It was concluded that although the factor structure of the TASC appeared to be stable enough for use across different groups, there were sufficient age and sex differences in the factor structure to warrant caution in its research utilization. An important consideration in this study, however, is the finding that the TASC did have greater predictive validity for the younger boys.

The second instrument utilized in this study was the Kaufman Test of Educational Achievement (K-TEA), Brief Form, developed by A. S. Kaufman and N. L. Kaufman (1985). The K-TEA is an individually administered measure of school achievement of children and adolescents in grades 1 through 12. The test offers standard scores in the global areas of reading, math, and spelling, with a mean of 100 and a standard deviation of 15. Test-retest

reliability is reported in the technical manual. The K-TEA Brief Form was administered twice to 153 students across grades 1 through 12. The interval between testings ranged from 1 to 25 days, with a mean interval of 7.0 days (S.D.=4.7). Data were combined for grades 1-6 (n=79) and grades 7-12 (n=74). In the area of spelling for grades 1 through 6, the test-retest coefficient=.90 (Gain=2.8). In the area of math for grades 1 through 6, the test-retest coefficient=.88 (Gain=3.9). All students given the Brief Form during standardization were also given the Comprehensive Form of the K-TEA. The interval between the two tests ranged from 1 day to 51 days. For grades 1 to 6, correlations ranged from .84 to .94.

The reviews of the Kaufman Test of Educational Achievement in the 1989 Mental Measurements Yearbook (Conoley & Kramer, 1989) were quite positive. Jerome Sattler stated that the K-TEA is a well normed standardized test of educational achievement and provides reliable and valid scores for the basic achievement areas covered in school.

Elizabeth Doll provided a second review of the K-TEA in the Tenth Mental Measurements Yearbook. She noted that an essential feature of the K-TEA includes the provision of two parallel forms which are independent measures. The Brief Form shares no items in common with the Comprehensive Form and can therefore be used as pre- and posttest measures. Concurrent validity studies report moderate correlations (between .75 and .85) between the

K-TEA and other achievement batteries, to include the Wide Range Achievement Test (WRAT) and the Peabody Individual Achievement Test (PIAT). Doll concluded that the K-TEA is a well standardized and reliable instrument.

The Coding subtest of the Wechsler Intelligence Scale for Children-Revised was included as a performance measure, following Boor and Schill's (1967) finding that anxiety has a debilitating effect on coding task performance. The WISC-R Coding subtest consists of 100 items; the first seven are used for practice purposes only. Two minutes are allowed for test administration.

As reported in the WISC-R manual, the reliability coefficients of the individual test are obtained by the split-half technique, with appropriate correction for the full length of the test by the Spearman-Brown formula. The split-half procedure, which provides a measure of internal consistency, was not appropriate for Coding because it is a speeded test. The reliability coefficients for this test is a test-retest or stability coefficient. There were 50 children in each age group. The reliability coefficient for Coding was reported as .63.

Kaufman (1979) noted that whenever children are retested on the WISC-R after one or several months, a gain of about 9.5 points can be expected on the Performance Scale, of which Coding is a subtest. This gain relates to the relative familiarity of the tasks. While the experience gained with the use of such concrete test materials as assembling blocks to match a design, solve puzzles, or

tell a story with pictures may contribute to an increase in performance on the retest, it is unlikely that a child would be affected significantly from practice on a symbol copying task of 100 items administered after a one month period.

Boor and Schill (1967) investigated Wechsler Digit Symbol performance as a function of anxiety as measured by the Taylor Manifest Anxiety Scale and the Marlow-Crowne Social Desirability scale. The Wechsler Adult Intelligence Scale (WAIS) Digit Symbol subtest is nearly identical in content and method of administration to the WISC-R Coding subtest. The subjects in this study consisted of 159 male and 187 female undergraduate students who were tested in large group settings using standard Wechsler instructions. Performance curves for the various anxiety groups on the Digit Symbol test were analyzed separately for males and females. Results indicated that a significant difference in performance on the WAIS Digit Symbol subtest was found between high and low anxious subjects.

A number of studies have used the WISC-R Coding subtest as a dependent variable and a measure of cognitive test performance. In an experiment designed to test the effectiveness of a psychological health education program, Zeidner et al. (1988) used the following three cognitive measures to evaluate their training program: The WISC Coding Scale, the Vocabulary Subtest of the Milta Intelligence Scale, and the Mathematics subtest of the Milta Intelligence Scale. All instruments were group administered by



classroom teachers both before and after the treatment. A MANOVA performed on the cognitive posttest scores was highly significant. Univariate analyses of variance indicated significant effects for each of the three cognitive tests.

In an investigation of the effects of anxiety management training and study skills counseling on self-esteem, test anxiety, and performance, Wilson and Rotter (1986) designed a treatment program for 60 sixth- and seventh-grade students. Of the four instruments used to gather data, the WISC-R Coding subtest was administered to determine the relationship between test performance and test anxiety. Between-group changes were statistically examined by analysis of variance procedures and Scheffe post hoc paired comparisons. Within group changes were analyzed by a dependent t-test. Variables were examined in pretest, posttest, and follow-up conditions, with the level of confidence set at .05. Results indicated that the experimental treatment approach which combined anxiety management with study skills training resulted in short-term as well as long-term effectiveness on all dependent measures.

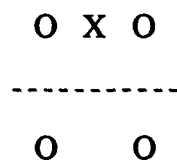
Meichenbaum and Goodman (1971) examined the efficacy of a cognitive self-instructional training procedure in altering the behavior of impulsive second grade children. Two general classes of dependent measures were used to assess changes in behavioral and cognitive impulsivity during pretreatment, posttreatment, and follow-up periods. Included in the performance measures were the

WISC Coding and Picture Arrangement subtests. Multiple t-test comparisons were performed on the change scores for each of the dependent measures. A significant Group X Trials interaction on the Picture Arrangement subtest was noted, while a strong trend toward significance on the Coding subtest was revealed.

### Research Design

The Nonequivalent Control Group Design, as outlined by Campbell and Stanley (1963), was used in this study. This design is often used in educational research when random assignment of individuals is not possible and intact groups must be considered as the unit of analysis. This design uses an experimental group and a control group in which both are given a pretest and a posttest. The control group and the experimental group do not have pre-experimental sampling equivalence, however.

The design is represented by the following diagram:



where X represents the experimental treatment, O represents pretest and posttest measurement of the dependent variables, and the broken line indicates that the experimental and control groups are not formed randomly.

This design controlled for numerous threats to internal validity, as identified by Campbell and Stanley (1963). History was controlled since events in time which influenced the treatment

groups also influenced the control groups. Maturity, testing and instrumentation were basically the same for the experimental and control groups. Statistical regression could be a possible threat to internal validity, however, participant selection was not based on extreme scores on any measure. Selection was not an internal threat because the classes were randomly assigned to treatment and control groups. Mortality can be a problem for all pretest/posttest designs, however testing was done in classrooms where attendance is compulsory.

Reactive arrangements can be a threat to the external validity of the non-equivalent control-group design. To control for this threat, the treatment was a part of the regular classroom guidance program and was implemented by the elementary guidance counselor assigned to the school.

#### Statistical Hypotheses

For statistical purposes, the following null hypotheses provided the basis for testing whether there were significant differences at the .05 level of significance:

1. There will be no significant difference in anxiety between the treatment group and the control group as measured by the Test Anxiety Scale for Children.
2. There will be no significant difference in academic achievement in the area of Spelling between the treatment group and the control group as measured by the Kaufman Test of Educational Achievement.

3. There will be no significant difference in academic achievement in the area of mathematics between the treatment group and the control group as measured by the Kaufman Test of Educational Achievement.
4. There will be no significant difference in test performance between the treatment group and the control group as measured by the Coding subtest of the WISC-R.

#### Statistical Analysis

Collected data was analyzed by analysis of covariance (ANCOVA) to discern statistically significant difference (.05 level) between groups. Analysis of covariance was chosen to control for the main threat to the internal validity of nonequivalent control-group experiments which is the possibility that group differences on the posttest were due to initial group differences rather than to a treatment effect (Borg and Gall, 1989). The dependent variables examined were posttest scores of the Test Anxiety Scale for Children, and the Kaufman Test of Educational Achievement (Spelling and Mathematics subtests), and the Coding subtest of the WISC-R. The independent variable was the treatment intervention, and the covariates were the pretest scores. It was necessary to covary the pretest scores due to non-random differences between groups that cannot be controlled for by sampling procedures.

#### Summary of Methodology

The purpose of this study was to evaluate the effectiveness of a program of self-instructional training, presented as part of the

regular classroom guidance curriculum, in the reduction of test anxiety and improvement of test performance in third grade children. The sample consisted of 88 third grade students enrolled in regular education in an elementary school. Intact classes were randomly assigned to treatment and control groups. A nonequivalent control group research design was used. Dependent variables were test anxiety, academic achievement, and test performance and were measured by the Test Anxiety Scale for Children, the Kaufman Test of Educational Achievement, and the Coding subtest of the WISC-R. Data was analyzed using an analysis of covariance (ANCOVA). Four null hypotheses provided the basis for testing whether or not there would be a significant difference (.05 level) between the treatment and control groups.

#### Ethical Safeguards and Considerations

Ethical considerations set forth by the American Psychological Association and National Association of School Psychologists were followed to ensure that the rights of all subjects participating in this study were protected. Additionally, this proposal was submitted for review and approval by the Human Subjects Research Committee of the College of William and Mary, and the Research Committee of the Hampton School Division, to include all appropriate personnel involved in this study.

Permission to experiment and conduct the groups was obtained from the parents of the students involved. Parents were told that the goal of this research project was to provide the

students with training designed to improve test-taking skills and reduce test anxiety. The general findings of this study were made available to the school division, and also to any specific participant upon request.

## Chapter 4

### Analysis of Results

The purpose of this study was to determine the effectiveness of a program of self-instructional training in the reduction of test anxiety and improvement in test performance in third grade children.

There were four variables assessed for each of the 88 subjects in this study:

1. Total raw scores in test anxiety from the Test Anxiety Scale for Children;
2. Achievement on the Spelling subtest of the Kaufman Test of Educational Achievement;
3. Achievement on the Mathematics subtest of the Kaufman Test of Educational Achievement;
4. Performance on the WISC-R Coding subtest.

To control for the possibility that group differences on the posttest were due to initial group differences rather than to a treatment effect, analysis of covariance (ANCOVA) was conducted on each variable to discern statistically significant differences between groups. The .05 level of confidence was applied for acceptance or rejection of hypotheses.

The means and standard deviations for pretest and posttest were computed for both groups (see Table 4.1). The finding that

there were no significant differences between groups on performance on the two subtests of the K-TEA and on Coding was consistent with the majority of research findings on test anxiety (Denney, 1975; Grindler, 1988; Wilson & Rotter, 1986). On Coding, the gain of 7.40 points for the experimental group and 7.36 points for the control group was expected. Kaufman's (1979) research noted that whenever children are retested on this measure after one or several months gains can be expected and are related to the familiarity of the task.

TABLE 4.1

Raw Score Means and Standard Deviations of Dependent Measures for Experimental (n=47) and Control (n=41) Conditions

Measures	Experimental Group				Control Group			
	<u>Pre-test</u>		<u>Posttest</u>		<u>Pre-test</u>		<u>Posttest</u>	
	M	SD	M	SD	M	SD	M	SD
TASC	15.468	6.156	10.617	6.774	13.75	6.560	12.19	9.801
Spelling	13.270	4.220	14.460	3.769	13.17	3.700	13.60	3.885
Math	15.276	1.919	15.319	2.256	13.90	2.557	14.34	2.903
Coding	31.617	6.923	39.020	7.671	30.00	9.055	37.36	10.382



**Hypothesis H:1**

There will be no significant difference in anxiety between the treatment group and the control group as measured by the Test Anxiety Scale for Children.

Table 4.2 contains the adjusted posttest means used in the analysis of covariance, with gender, Iowa Test of Basic Skills (ITBS) scores, ages and the pretest as covariates.

TABLE 4.2

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Posttest and Adjusted Posttest Means on the TASC for Control and Treatment Conditions

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	Treatment Group		Control Group	
	Posttest	Adj. Posttest	Posttest	Adj. Posttest
N of Cases	47	47	41	41
Minimum	0.000	9.882	0.000	13.038
Maximum	27.000	9.882	30.000	13.038
Mean	10.617	9.882	12.195	13.038
SD	6.774	0.000	9.801	0.000

---

The results of the analysis of covariance are reported in Table 4.3. The treatment effect was significant ( $F=5.368$ ,  $df=1$ ,  $p<0.023$ ). On the basis of the difference in the posttest scores in favor of the treatment group, Hypothesis H:1 was rejected. Thus, the groups did differ significantly at posttesting on the variable of test anxiety, and the program was effective in reducing test anxiety.

TABLE 4.3

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 Analysis of Covariance Summary Table on TASC Posttest
 

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	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean-Square</u>	<u>F-Ratio</u>	<u>P</u>
Sex	11.847	1	11.847	0.298	0.586
ITBS	2.160	1	2.160	0.054	0.816
CA	211.333	1	211.333	5.324	0.024
Pretest	2358.030	1	2358.030	59.409	0.000
Treatment	213.048	1	213.048	5.368	0.023

---

Hypothesis H:2

There will be no significant difference in academic achievement in the area of Spelling between the treatment group and the control group as measured by the Kaufman Test of Educational Achievement.

The results of the analysis of covariance are reported in Table 4.4. In addition to using the pretest as a covariate, age, gender, and ITBS scores were also used as covariates. Results indicated that a difference that approached significance ( $F=2.981$ ,  $df=1$ ,  $p<0.088$ ) was found between the treatment and control groups. The difference was not significant at the .05 confidence level, however. Hypothesis H:2 was therefore accepted.

TABLE 4.4

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Analysis of Covariance Summary Table on K-TEA Spelling Posttest

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	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean-Square</u>	<u>F-Ratio</u>	<u>P</u>
Sex	0.252	1	0.252	0.056	0.814
ITBS	4.921	1	4.921	1.084	0.301
CA	2.448	1	2.448	0.539	0.465
Pretest	519.410	1	519.410	114.433	0.000
Treatment	13.529	1	13.529	2.981	0.088

---

**Hypothesis H:3**

There will be no significant difference in academic achievement in the area of mathematics between the treatment group and the control group as measured by the Kaufman Test of Educational Achievement.

The results of the analysis of covariance are reported in Table 4.5. Gender, age, ITBS scores and the pretest were used as covariates. There was found to be no significant difference ( $F=0.154$ ,  $df=1$ ,  $p<.696$ ) between the treatment and control groups. Hypothesis H:3 was accepted.

TABLE 4.5

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 Analysis of Covariance Summary Table on K-TEA Math Posttest
 

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	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean-Square</u>	<u>F-Ratio</u>	<u>P</u>
Sex	0.581	1	0.581	0.133	0.716
ITBS	11.321	1	11.321	2.598	0.111
CA	7.021	1	7.021	1.611	0.208
Pretest	126.735	1	126.735	29.087	0.000
Treatment	0.671	1	0.671	0.154	0.696

---

**Hypothesis H:4**

There will be no significant difference in test performance between the treatment group and the control group as measured by the Coding subtest of the WISC-R.

The results of analysis of covariance are reported in Table 4.6. Age, gender, ITBS scores and the pretest were used as covariates. Statistical analysis revealed no significant difference ( $F=0.194$ ,  $df=1$ ,  $p<0.661$ ) between the treatment group and the control group. Hypothesis H:4 was therefore accepted.

TABLE 4.6

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Analysis of Covariance Summary Table on WISC-R Coding Posttest

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	<u>Sum of Squares</u>	<u>DF</u>	<u>Mean-Square</u>	<u>F-Ratio</u>	<u>P</u>
Sex	0.516	1	0.516	0.009	0.925
ITBS	1.530	1	1.530	0.026	0.871
CA	106.848	1	106.848	1.844	0.178
Pretest	2215.962	1	2215.962	38.253	0.000
Treatment	11.227	1	11.227	0.194	0.661

---

### Summary

Analysis of covariance conducted to determine statistical significance between groups indicated that students in the experimental treatment group achieved lower scores on a self-report test anxiety questionnaire than did students in the control group. The 4-week program of self-instructional training, presented as part of the regular guidance curriculum, was effective in reducing test anxiety.

In contrast, the program did not appear to be effective on the variables of test performance and academic achievement. The results of this study indicated that there was no significant difference between groups at posttesting.

## Chapter 5

### Summary and Conclusions

This chapter is organized into three major sections. A summary of this study is presented, followed by conclusions based upon data analysis. Finally, recommendations for future research are proposed.

#### Summary

Test anxiety has been a topic of interest of researchers for the past four decades. The negative relationship between test anxiety and academic performance has been well documented (Dusek, 1980; Hill & Wigfield, 1984; Horn & Dollinger, 1989; Meichenbaum & Butler, 1980; Phillips et al., 1980; Sarason, 1980; Wilson & Rotter, 1986).

Cognitive-behavioral approaches have been used with varying degrees of success. The results of a meta-analysis of more than 500 studies reported that improved test performance consistently accompanied a reduction in test anxiety (Hembree, 1988). In contrast, other research reported that changes on performance measures have been the exception (Grindler, 1988; Wilson & Rotter, 1986). Most researchers have reported significant results when the treatment method implemented cognitive-behavioral interventions in conjunction with test-taking techniques (Bander et al., 1982, Dendato & Diener, 1986; Wilson & Rotter, 1986).

Major research efforts, however, have been directed toward treating subjects identified as test anxious, and of these, the majority of programs have addressed the needs of college undergraduate students (Allen, Elias & Zlotlow, 1980; Hembree, 1988). There have been relatively few studies conducted with "normal" students, and even less research has been done with elementary school age children.

A need for further research using younger children has been cited repeatedly (Genshaft, 1982; Grindler, 1988; Hill & Wigfield, 1984; Wilson & Rotter, 1986). Also emphasized was the need for a prevention model in an effort to provide children with strategies designed to promote psychological health and deter test anxiety from progressing through the school years (Grindler, 1988; Wilson & Rotter, 1986; Zeidner et al., 1988).

This study was therefore designed to determine the effectiveness of self-instructional training in the reduction of test anxiety and improvement of test performance in third grade children. The sample was taken from one public school in Hampton, Virginia and was comprised of all third grade students. After obtaining parental permission, 4 intact classrooms were randomly assigned to two experimental and two control conditions within the school. This resulted in a sample of 88 third grade students, with 47 students in the experimental condition and 41 students in the control conditions.



A nonequivalent control group research design was used. Dependent variables were test anxiety, academic performance, and test performance. Data was analyzed using an analysis of covariance (ANCOVA). Four null hypotheses provided the basis for testing whether or not there would be a significant difference (.05 level) between the treatment and control groups.

The results of this data analysis indicated that students in the experimental treatment group achieved lower scores on a self-report test anxiety questionnaire than did students in the control group. The 4-week program of self-instructional training was effective in reducing test anxiety. In contrast, the treatment program was not effective on the variables of test performance and academic achievement.

### Conclusions

The major findings of the present study suggested that using a self-instructional training program does effectively reduce test anxiety in a sample of third grade children. These findings are in contrast to the results obtained on two fairly recent studies (Grindler, 1988; Zeidner et al., 1988).

As a result of her research with fourth and fifth grade children, Grindler (1988) hypothesized that children of that age who had had no previous experience with cognitive monitoring might be hesitant in becoming involved in self-talk activities. That hesitance, of course, would not be conducive to the training. She proposed that younger children might, therefore, be better

candidates for self-instructional training, and she cited the need for research to determine at what age children are able to identify test anxiety in themselves.

The results of the present study showed that not only can children as young as 8 and 9 identify the feelings associated with test anxiety as measured by their responses to the self-report test anxiety questionnaire, but that they were appropriate candidates for the training. It was reported by the counselor who conducted the training that the children participated readily in the self-talk activities. Further, they appeared to enjoy providing examples and modeling the activity for the other children.

In further support of the use of the self-instructional training strategy with young children, Zeidner et al. (1988) found that while their cognitive-behavioral training was effective in improving test performance, it had no effect on test anxiety. They hypothesized that "the cognitive demands of the study-skills training program counteracted the anxiety-reducing effects of treatment" (p. 100). While this author does not necessarily disagree with this hypothesis, the present study was conducted with younger students who may not have perceived the self-talk technique as cognitively demanding.

The ineffectiveness of the program in improving scores on either the test performance or academic achievement is consistent with research findings on test anxiety in children (Allen et al., 1980; Grindler, 1988; Wilson & Rotter, 1986). An exception is the

Zeidner et al. (1988) study, which showed, in direct contrast, that cognitive training meaningfully affected test performance. Of particular note is the length of treatment in this study which was over a ten-week period and implemented by classroom teachers in the course of five 1-hour sessions held two weeks apart. The length of the treatment program may indeed be a significant factor. The authors suggested that the success of the intervention may have been accounted for by the possibility that the children were able to transfer test coping skills acquired in the true-to-life classroom setting.

Using a self-instructional training format, the students in the present study were taught specific test-taking skills in a 30 minute eight-session program, presented in a 4 week time period. The training was sufficient enough in duration to reduce scores on the anxiety measure, however, there were no changes on the performance and academic measures. It therefore might be necessary to present the instruction over a longer period of time, perhaps even a semester, in order to maximize the possibility for a transfer effect. If the strategy was presented at 2 week intervals and if the specific technique were reinforced by the classroom teacher over all subject areas in the time between sessions, academic and performance gains might be noted at posttesting.

That there was no significant improvement noted on the Coding subtest was not surprising. The seven point gain made by both the experimental and control groups was expected, as noted

earlier, and probably was due to the familiarity of the task. If there had been a longer interval between the pre- and posttest, the children may have made fewer errors on both Coding and the achievement subtests of the K-TEA as they became more proficient in their test-taking skills. Forman and O'Malley (1984) noted that treatment intervention length is an important variable. Successful programs not only use a number of sessions over time, but emphasize the continued practice of the particular strategies taught in the program.

#### Recommendations for Future Research

As a result of the analysis of data from this study, several recommendations are offered for consideration in future research. The first suggestion is that research should be conducted over a longer period of time to maximize the possibility of academic achievement and test performance gains.

Follow-up testing to determine the stability of results over time is strongly recommended.

There are very few studies conducted among "normal" school populations. The external validity of the present research findings should therefore be tested in future research on students not identified as handicapped, and in other sociocultural groups, as recommended by Zeidner et al. (1988).

Further research should also include a larger sample size, across more grade levels, in order to determine if treatment effectiveness varies at different grade levels.

Teachers should be present in the classroom during the time that the counselor is teaching the self-instructional training strategy to the children. The strategy could then be reinforced by the regular classroom teacher across all subject areas.

It is recommended that this study be replicated with even younger children. In the development of the TASC, Sarason et al. (1958) found that children in the second grade could identify test anxiety in themselves. In that a primary prevention model has been proposed, it is important to determine the youngest age child for which this intervention would be successful.

A further recommendation addresses the measurement of variables in this study. In addition to the use of standardized achievement tests, it might be useful to include teacher-made tests pre- and posttest so that actual gains in classroom performance might be more accurately assessed.

A final recommendation is one that does not necessarily involve research. Meichenbaum and Goodman (1971) initially demonstrated the effectiveness of self-instructional training in helping impulsive children modify their behavior. Subsequent research, as well as the present study, have demonstrated the usefulness of this strategy in reducing test anxiety and teaching test-taking skills. This program is one that could easily be introduced into the regular classroom guidance curriculum at all grade levels. Educational programs that eliminated the harmful effects of test anxiety could make an enormous contribution to the

general educational progress of all students. As Hill and Wigfield (1984) concluded: "Test results would then . . . provide a more valid assessment of the effectiveness of our educational system" (p. 123).

## APPENDIX A

September 10, 1990

Dear Parent:

Your child will be given the opportunity to participate in a project designed to improve test taking skills and reduce test anxiety. This four week program will be offered as part of the regular classroom guidance curriculum during the fall semester. This project is part of research being conducted by Mrs. Rita S. Wagner, School Psychologist at Smith School, as part of her doctoral dissertation. Please explain to your child that he/she will be given several short tests as part of our effort to evaluate the program. Because the study is designed to guarantee your child's anonymity, all data will remain confidential and will be used for research purposes only. Statistical analysis will be done on groups and no individual scores will be reported.

Please detach the permission form and have your child return it to his/her teacher by Friday, September 14. If you have any questions, please call Mrs. Wagner at 850-5352 or either of her advisors at the College of William and Mary: Dr. Roger R. Ries at 221-2345 and Dr. Thomas Ward at 221-2358.

Sincerely,

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Principal



CONSENT FORM

\_\_\_\_\_ I give permission for \_\_\_\_\_ to participate in the test taking skill improvement program. I understand that the Kaufman Test of Educational Achievement, the Coding subtest of the WISC-R, and the Test Anxiety Scale for Children will be administered for the purpose of program evaluation.

---

NAME

DATE

\_\_\_\_\_ I do not give permission for \_\_\_\_\_ to participate in the test taking improvement program.

---

NAME

DATE

## **APPENDIX B**

**Self-instructional Training Treatment**  
**Session One**

**Purpose:** Familiarize the students with the purpose of testing; provide instruction on specific test-taking skills.

1. Ask the children:
  - (a) How many know what a test is? Raise your hand.
  - (b) Tell me what a test is (write answers on the board).
  - (c) Why do you think your teacher gives tests?
2. Present rationale of the test-taking skills program. Explain how they will learn to be relaxed in test-taking situations. Some children are not relaxed because of
  - (a) physical concerns - forgot glasses, did not have pen or paper, too hot or too cold in the classroom; felt tired;
  - (b) academic or intellectual concerns - had not studied, grade would be poor and bring average down, wondering what had been covered that they could be tested on;
  - (c) psychological concerns - fear of failure, emotionally upset, felt nervous and shaky, felt pressure to do well.

3. Ask for examples of different kinds of tests, in and out of school (Cub Scouts and Brownies, athletic events, piano recitals, etc.).
4. Describe how classroom tests differ from standardized achievement tests.
5. Go over the following test-taking skills:
  - (a) Sit comfortably. Remove extra papers, books, etc. so you can write easily;
  - (b) Pay attention when the teacher gives directions;
  - (c) The teacher can help you solve sample problems but she can't give you an answer once the test begins;
  - (d) Try to do your best;
  - (e) Check your answers. Go over each problem a second time;
  - (f) All tests have different problems. Don't worry if you see a hard problem. Skip over it and work on the easy ones first. Then go back and look at the difficult ones;
  - (g) If you don't know the answer, it's OK to guess. Choose the answer you think is best;
  - (h) If the time is up and you haven't finished, that's OK. Just try and do your best.

## Session Two

**Purpose:** Develop an awareness in the children of feelings experienced in test-taking situations: provide coping strategies.

1. Simulate a test-taking situation. Tell the students to put away all books and papers, take out a clean sheet of paper, and prepare for a test. Be business-like; do not engage in discussions about how "fair" this situation is. When all students are ready, have them number their pages from 1 to 3. Skip 2 spaces between each number. Ask the following questions:
  - (a) How are you feeling about taking the test?
  - (b) How did you feel when the test was announced?
  - (c) How would you get ready for a regular test?
2. On the board, make 2 lists for the feelings the students identified in questions 1 and 2.
3. Introduce the term "self-talk" (i.e., what the children were "saying to themselves" when they thought they had to take a test).
4. Introduce the term "negative self-talk." Are negative self statements listed on the board? - "I can't do this," "I didn't study", I have to get a good grade or I'll probably fail."
5. Advise the students to listen to their own self-talk and teach them to replace the negative statements with positive ones: "I'm going to try and do my best." "I'm going to listen

carefully to my teacher." "I'm going to try to study every night." "When I complete my homework, I do better in class."

### Session Three

**Purpose:** Provide specific instructions for self-instructional training techniques.

1. The cognitive training process as follows:
  - (a) The counselor performs a task while talking aloud while the students observe;
  - (b) The students perform the same task while the counselor instructs them aloud;
  - (c) The students perform the task while instructing themselves aloud;
  - (d) The students perform the task while whispering to themselves;
  - (e) the students perform the task silently.
2. Using a design copying task, proceed through the first two steps as outlined above.
3. Draw a six-pointed star of two triangles superimposed in opposite directions upon each other. Model the following:

Okay, what is it I'm supposed to do? I have to copy the picture of the star. I have to go slow and careful. First I'll draw one triangle. No, I have to make the sides equal. There, good. Now I'll draw the next triangle, only it has to be upside down. Wait, I made a mistake. I'll erase that, and draw that line again. It's OK if I make a mistake. I'll just go ahead carefully. Good, now I'm finished.

4. Have the children copy the geometric figure while instructing them aloud.
5. Practice the second step using various geometric designs.



### Session Four

**Purpose:** Familiarize the students with the remaining three steps of the self-instructional training technique.

1. Review first two steps.
2. Draw various geometric shapes on the board, of increasing complexity (i.e. circle within a square within an octagon).
3. Designate several students to demonstrate the technique to the other members of the class.
4. Have the students practice steps three, four and five. Provide the students with encouragement and guidance as they first instruct themselves aloud, then whisper, then complete the tasks silently.

### Session Five

**Purpose:** Practice the self-instructional training (SIT) technique using math problems.

1. Write an addition problem involving regrouping on the board, and model the SIT technique as follows.
2. What kind of problem is this?
 
$$\begin{array}{r} 527 \\ + 231 \\ \hline \end{array}$$
3. I must look at the sign. It's a plus sign so I know that I must add.
4. The first thing to do is look at the column of numbers on the right, the farthest away from the plus sign. OK, first I'll add 7 + 1 and that is 8.
5. Now I add 2+3 and that is 6. And 5+2 is 7.
6. OK, now I'll check my answer by changing the numbers:
 
$$\begin{array}{r} 231 \\ + 527 \\ \hline \end{array}$$
7. I'll add again. 1+7 is 8. Now I add 3+2, and that is 5. Next, 2+5 is 7. The answers are different: 768 is not the same as 758. Uh oh, I better check my addition steps. 7+1 is 8; 2+3 is 5, and 5+2 is 7.
8. Good, now I have the right answer.
9. I took my time and thought about each step. I really did a great job on this problem.
10. Write additional math problems on the board.

11. Have the students practice steps 3, 4, and 5 of SIT.

Problems:

$$\begin{array}{r} 24 \\ 43 \\ + 12 \end{array} \quad \begin{array}{r} 4103 \\ + 3861 \end{array} \quad \begin{array}{r} 967 \\ - 716 \end{array} \quad \begin{array}{r} 3869 \\ - 2855 \end{array}$$

**Session Six**

**Purpose:** Practice the SIT technique using math word problems.

1. Write the following problem on the board:

Mother gave John 33 pennies. His sister gave him 6 more.

How many pennies did John receive?

- a. 14
  - b. 39
  - c. 25
  - d. 35
2. Model the SIT technique as follows:  
I won't look at the answers. I'll first try to solve the problem.  
OK - I think the answer is 39. Let's see. Yes, "b" is 39.
  3. Using a variety of problems appropriate to the students' math level, have the students practice the SIT technique.

**Problems:**

Jack had 9 marble. He gave 4 marbles to Bill. How many were left?

- a. 13
- b. 4
- c. 2
- d. 5

The teacher had 23 crayons. Jack gave her 14 crayons, and Mary gave her 12 more. How many did she have altogether?

- a. 35
- b. 37
- c. 26
- d. 49

### Session Seven

**Purpose:** Practice the SIT technique using multiple choice questions in various subject areas.

1. Write the following problem on the board:

The children ate \_\_\_\_\_ for breakfast.

- a. corn
  - b. ice cream
  - c. apples
  - d. eggs
2. Model the SIT technique:

First I'll read the problem carefully. Now I'll read all the answers. OK, I have to figure out the best answer. What did the children eat for breakfast? Corn - you can eat corn, but usually not for breakfast. Ice cream - No, Mom would never let the children eat ice cream in the morning. Apples - Sometimes Grandma cooks apples for breakfast. But I'd better look at all the answers. Eggs - that's it. That's the best answer!

3. Using multiple choice questions in various subject areas, have the children practice the SIT technique.

**Problems:**

Father raked the \_\_\_\_\_ in the yard.

- a. dogs
- b. trees
- c. leaves
- d. rocks

Mary got a \_\_\_\_\_ for her birthday.

- a. tree
- b. pencil
- c. cake
- d. friend

### Session Eight

**Purpose:** Practice the SIT technique using "matching" problems.

1. Write the following problem on the board:

Match the "opposites":

hot	old
dull	cold
new	shiny

2. Model the SIT technique:

First I'll read all the words. Hot, doll - no, maybe it's dull but I don't know what that word means. Well I'll read the rest.

New, old, cold, - Oh, that looks like shine, but it's not. I'll come back to that. OK - I'll do the ones I know first. Ok - opposites.

Hot is the opposite of cold, so I'll draw a line connecting those two words. New is the opposite of old, so I'll connect those two. Now, doll or dull must go with shine, because that's the only one left. Now I'll check my work. There, I'm finished.

3. Provide additional problems of increasing complexity.
4. Have the children practice the SIT technique.

Problems:

up	over	dark	empty	lost	outside
black	down	full	after	inside	young
under	white	before	light	old	found

## References

- Allen, G. J., Elias, N. J. & Zlotlow, S. F. (1980). Behavioral interventions for alleviating test anxiety: A methodological overview of current therapeutic practices. In I. G. Sarason (Ed.). Test anxiety: Theory, research and applications (pp. 155-186). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Argulewicz, E. N., Abel, R. R., & Schuster, S. A. (1985). Reliability and content validity of the Children's Anxiety Scale for Anglo-American and Mexican-American kindergarten children. School Psychology Review, 14(2), 235-238.
- Argulewicz, E. N., Elliott, S. N., & Spencer, D. (1982). Application of a cognitive-behavioral intervention for improving classroom attention. School Psychology Review, 11(1), 90-95.
- Argulewicz, E. N. & Miller, D. C. (1985). Self-reported and teacher's rankings of anxiety among first-grade children. School Psychology Review, 14(1), 75-78.
- Bander, R. S., Russell, R. K., & Zamostny, K. P. (1982). A comparison of cue-controlled relaxation and study skills counseling in the treatment of mathematics anxiety. Journal of Educational Psychology, 74(1), 96-103.
- Bandura, A. (1971). Analysis of modeling process. In A. Bandura (Ed.), Psychological modeling (pp. 1-62). Chicago: Aldine Atherton, Inc.

- Bandura, A. (1977). Social learning theory. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.
- Barclay, J. R. (1983). Moving toward a technology of prevention: a model and some tentative findings. School Psychology Review, 12(3), 228-239.
- Beck, A. T. (1976). Cognitive therapy and the emotional disorders. New York: International Universities Press, Inc.
- Boor, M. & Schill, T. (1967). Digit symbol performances of subjects varying in anxiety and defensiveness. Journal of Consulting Psychology, 31, 600-603.
- Borg, W. R. and Gall, M. D. (1989). Educational research: an introduction (5th ed.). New York: Longman, Inc.
- Campbell, D. T. and Stanley, J. C. (1963). Experimental and quasi-experimental designs for research. Boston: Houghton Mifflin Company.
- Conoley, J. C. & Kramer, J. J. (1989). The tenth mental measurement yearbook. Lincoln, NE: University of Nebraska Press.
- Corey, G. (1982). Theory and practice of counseling and psychotherapy (2nd ed.). Monterey, CA: Brooks/Cole Publishing Company.
- Craighead, W. E. (1982). A brief clinical history of cognitive-behavior therapy with children. School Psychology Review, 11(1), 5-13.
- Denney, D. R. (1975). The effects of exemplary and cognitive models and self-rehearsal on children's interrogative



- strategies. Journal of Experimental Child Psychology, 19, 476-478.
- Dendato, K. M. & Diener, D. (1986). Effectiveness of cognitive relaxation therapy and study-skills training in reducing self-reported anxiety and improving the academic performance of test-anxious students. Journal of Counseling Psychology, 33(2), 131-135.
- Dunn, J. A. (1964). Factor structure of the Test Anxiety Scale for Children. Journal of Consulting Psychology, 28(1), 92.
- Dunn, J. A. (1965). Stability of the factor structure of the Test Anxiety Scale for Children across age and sex norms. Journal of Consulting Psychology, 29, 187.
- Dusek, J. B. (1980). The development of test anxiety in children, In I. G. Sarason (Ed.), Test anxiety: Theory, research and applications (pp. 87-110). Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.
- Ellis, A. & Harper, R. A. (1961). A new guide to rational living. North Hollywood, CA: Wilshire Book Company.
- Fish, M. C. & Mendola, L. R. (1986). The effect of self-instruction training on homework completion in an elementary special education class. School Psychology Review, 15(2), 162-170.
- Forman, S. G. & O'Malley, P. L. (1984). School stress and anxiety interventions. School Psychology Review, 13(2), 162-170.
- Gaudry, E. & Spielberger, C. D. (1971). Anxiety and educational achievement. Sydney: John Wiley & Sons.

- Gemmer, T. C., Harris, S. R., & Wyckoff, G. M. (1989). Teacher consultation and cognitive-behavioral interventions with aggressive boys. Psychology in the Schools, 26, 179-188.
- Genshaft, J. L. (1982). The use of cognitive behavior therapy for reducing math anxiety. School Psychology Review, 11(1), 32-34.
- Gillis, J. S. (1980). Child Anxiety Scale manual, Champaign, IL: Institute for Personality and Ability Testing, Inc.
- Grindler, M. (1988). Effects of cognitive monitoring strategies on the test anxieties of elementary students. Psychology in the Schools, 25, 428-436.
- Groenwald, G. F. & Der, D. (1987). Self-instructional training: a case study. Elementary School Guidance and Counseling, 22(2), 117-123.
- Hembree, R. (1988). Correlates, causes, effects, and treatments of test anxiety. Review of Educational Research, 58(1), 47-77.
- Hill, K. T. & Wigfield, A. (1984). Test anxiety: a major educational problem and what can be done about it. The Elementary School Journal, 85(1), 105-126.
- Horn, J. L. & Dollinger, S. J. (1989). Effects of test anxiety, tests, and sleep on children's performance. Journal of School Psychology, 27, 373-382.
- Hughes, J. N. (1988). Cognitive behavior therapy with children in schools. New York: Pergamon Press.

- Kaufman, A. S. (1979). Intelligent testing with the WISC-R. New York: John Wiley & Sons.
- Kaufman, A. S. & Kaufman, N. L. (1985). Kaufman Test of Educational Achievement: Brief Form Manual. Circle Pines, MN: American Guidance Service.
- Luria, A. R. (1959). The directive function of speech in development and dissolution. Word, 15, 341-352.
- Luria, A. R. (1961). The role of speech in the regulation of normal and abnormal behavior. New York: Liveright Publishing Corporation.
- Meichenbaum, D. (1977). Cognitive-behavior modification: an integrative approach. New York: Plenum Press.
- Meichenbaum, D. (1979). Cognitive-behavioral modification: future directions, In P. Sjoden, S. Bates & W. S. Dockens (Eds.). Trends in behavior therapy, New York: Academic Press.
- Meichenbaum, D. (1985). Stress-innocation training. New York: Pergamon Press.
- Meichenbaum, D. & Burland, S. (1979). Cognitive behavior modification with children. School Psychology Digest, 8(4), 426-433.
- Meichenbaum, D. & Butler, L. (1980). Toward a conceptual model for the treatment of test anxiety: implications for research and treatment. In I. G. Sarason (Ed.) Test anxiety: theory research and applications (pp. 187-208). Hillsdale, NJ: Lawrence Erlbaum & Associates.

- Meichenbaum, D. & Goodman, J. (1971). Training impulsive children to talk to themselves. Journal of Abnormal Psychology, *77*(2), 115-125.
- Meichenbaum, D., Henshaw, D. & Himel, N. (1982). Coping with stress as a problem-solving process. In H. W. Krohne & L. Laux (Eds.), Achievement, stress and anxiety (pp. 127-142). New York: Hemisphere Publishing Company.
- Phillips, B. N., Pitcher, G. D., Worsham, M. E., & Miller, S. C. (1980). Test anxiety and the school environment. In I. G. Sarason (Ed.) Test anxiety: theory, research and applications (pp. 327-346). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Reynolds, C. R. & Paget, K. D. (1985). National normative and reliability data for the revised Children's Manifest Anxiety Scale. School Psychology Review, *12*(3), 324-336.
- Ruebush, B. K. (1963). Anxiety. In H. W. Stevenson, J. Kagan, & C. Spiker (Eds.), NSSE sixty-second yearbook, Part I: Child psychology. Chicago: University of Chicago Press, 460-516.
- Sarason, I. G. (1980). Introduction to the study of test anxiety. In I. G. Sarason (Ed.), Test anxiety: theory, research and applications (pp. 3-14). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Sarason, I. G. (1986). Test anxiety, worry and cognitive interference. In R. Schwarzer (Ed.), Self-related cognitions in anxiety and motivation (pp. 19-35). Hillsdale, NJ: Lawrence Erlbaum Associates.

- Sarason, S. B., Davidson, K., Lighthall, F., & Waite, R. (1958). A test anxiety scale for children. Child Development, 29(1), 107-113.
- Sarason, S. B., Davidson, K., Lighthall, F., Waite, R., & Ruebush, B. (1960). Anxiety in elementary school children. New York: John Wiley & Sons.
- Sieber, J. E. (1980). Defining test anxiety: problems and approaches. In S. G. Sarason (Ed.), Test anxiety: theory, research and application (pp. 15-40). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Spiegler, M. D., (1983). Contemporary behavioral therapy. Palo Alto, CA: Mayfield Publishing Company.
- Spielberger, C. D. (1972). Current trends in theory and research on anxiety. In C. D. Spielberger (Ed.), Anxiety: current trends in theory and research (pp. 3-19). New York: Academic Press.
- Stone, G. L. (1980). A cognitive-behavioral approach to counseling psychology: implications for practice, research, and training. New York: Praeger Publishers.
- Sycamore, J. E., Corey, A. L., & Coker, D. H. (1990). Reducing test anxiety. Elementary School Guidance and Counseling, 24, 231-233.
- Vygotsky, L. S. (1962). Thought and language. New York: John Wiley & Sons.
- Wechsler, D. (1974). Wechsler Intelligence Scale for Children-Revised manual. New York: The Psychological Corporation.

- Wilkinson, C. M. (1990). Techniques for overcoming test anxiety. Elementary School Guidance and Counseling, 24, 234-237.
- Wilson, G. T. (1978). Cognitive behavior therapy: paradigm shift or passing phase? In J. P. Foreyt & D. Rathjen (Eds.), Cognitive behavior therapy: research and application. New York: Plenum Press.
- Wilson, N. H. & Rotter, J. C. (1986). Anxiety management training and study skills counseling on self-esteem and test anxiety and performance. The School Counselor, 34, 18-31.
- Wine, J. D. (1980). Cognitive-attentional theory of test anxiety. In I. G. Sarason (Ed.), Test anxiety: theory, research and applications (pp. 349-385). Hillsdale, NJ: Lawrence Erlbasum Associates.
- Wine, J. D. (1982). Evaluation anxiety: a cognitive-attentional construct. In H. W. Krohne & L. Laux (Eds.), Achievement, stress and anxiety (pp. 207-219). New York: Hemisphere Publishing Company.
- Zeidner, M., Klingman, A., & Papko, O. (1988). Enhancing students' test coping skills: report of a psychological health education program. Journal of Educational Psychology, 80(1), 95-101.
- Zins, J. E., Coyne, R. K., & Ponti, C. R. (1988). Primary prevention: expanding the impact of psychological services in the schools. School Psychology Review, 17(4), 542-549.

Zins, J. E., Curtis, M. J., Graden, J. L., & Ponti, C. R. (1988). Helping students succeed in the regular classroom. San Francisco, CA: Josey-Bass Publishers.

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