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EFFECTS OF A RELAXATION CURRICULUM

ON MEMBERS OF A GRADE TWO CLASS

by

Jeffrey C. Chang

B.A., Trinity Western College, 1982

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS (EDUCATION)

in the Faculty

of

Education

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ABSTRACT

Data on stress management programs with school-aged populations are relatively scarce. A number of recent studies have offered promising support for the implementation of such programs in school settings. At the same time, evidence is mounting that children are experiencing stress and are not coping well, resulting in physiological disorders, learning difficulties, and behavior problems. This study investigated the implementation of a relaxation program, Kiddie QR, with Grade 2 children. An experimental group consisting of a self-contained Grade 2 class (n=26; 10 boys, 16 girls) was exposed to taped instruction, and supplementary instructional activities over 11 school weeks, while an untreated Grade 1 class (n=25; 13 boys, 12 girls) received pre- and posttesting only. There were significant main effects for time and group, but no significant group x time interactions were found on dependent measures of stress and anxiety, and no significant improvement occurred in the self-concepts of children receiving training. Also, no stable reduction in off-task behavior was observed in three selected children who were judged by their teacher to have behavior problems, and high stress levels. However, significant improvement was found in a nonverbal performance task (the WISC Block Design), among children in the experimental group, but not among control group children. No significant relationships were found between pretest measures of anxiety and improvement on the performance task beyond an expected practice effect, or between an index of skill acquisition and improvement on the performance task. Discussion centers on the appropriateness of the dependent measures used, ways in which the delivery of instruction might be improved, and the capability of the typical classroom teacher to give children sufficient attention in order to ensure that they actually do learn the skills involved.

DEDICATION

This work is dedicated to the memory of my father, Paul Y.P. Chang.

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My wife Cheryl is due more thanks than can be conveyed here, for her practical help, perseverance, and sacrifice during the preparation of this thesis. Dr. Bryan Hiebert, my Senior Supervisor, offered many "nuts and bolts" suggestions for the design and operation of the study. He and Dr. Ron Marx, my Second Member, challenged me with their comments to think and write clearly. Mr. Reg Nelligan, Mrs. Elinor Verkerk, and Mrs. Doreen Walker at Mt. Crescent Elementary, gave me their utmost cooperation. Friends, family, and colleagues, who can not all be named here, offered their help and support in countless ways.

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CHAPTER 1

STATEMENT OF THE PROBLEM

This chapter provides a rationale for providing stress management training as a preventive measure with the regular classroom teacher performing the instruction. The inadequacy of traditional, problem-focused approaches to mental health and adjustment is presented. The view that maladjustment is the result of skill deficiencies is posited, and the advantages of providing skill training in a preventive context are listed. The school is proposed as a strategic and advantageous location from which to teach skills for personal competence, including stress management. Preliminary empirical support for the effectiveness of teacher-instructed stress management programs is given, a rationale for this study is stated, and the rest of this thesis is overviewed.

The Problem: Downstream Helping

A person walking alongside a river sees someone drowning. This person jumps in, pulls the victim out, and begins artificial respiration. While this is going on, another person calls for help; the rescuer jumps into the water again and pulls the new victim out. This process repeats itself several times until the rescuer gets up and walks away from the scene. A bystander approaches and asks in surprise where he is going, to which the rescuer replies, "I'm going upstream to find out who's pushing all these people in and see if I can stop it!" (Egan & Cowan, 1979, pp. 3-4)

Opening their book with this anecdote, Gerard Egan and Michael Cowan call for a total reexamination of societal structures responsible for the socialization and development of people. They point out that institutions responsible for the development of people -- family, school, workplace, friends, and church -- may execute their other functions well, but behave pretty much randomly when it comes to the development of people. Beginning their examination with the helping professions, they

note that only 13% of money spent on mental health in the United States is spent on preventive efforts. The helping professions, in the view of Egan and Cowan, tend to concentrate their efforts overwhelmingly on the problems of clients, while neglecting efforts to alter the way in which social systems meet people's needs.

Other authors suggest that it is by no means clear that these problem-oriented helping efforts are actually helping. Rachman and Wilson (1980) note that although there is "modest" support for the effectiveness of psychotherapy, studies yielding negative results outnumber the positive, and the number of uninterpretable results outnumbers both negative and positive. Stuart (1970) attributes iatrogenic effects to the dispositional diagnoses used by traditional practitioners. While Egan and Cowan (1979) feel helping efforts are inefficiently targetted, Rachman and Wilson (1980) and Stuart (1970) believe them to be not even helpful.

A Proposed Solution: Skill Training in a Preventive Context

A number of recent authors have emphasized the role of the client in learning certain adaptive skills and strategies (Cormier & Cormier, 1979; Ivey, 1978; Kanfer & Goldstein, 1980; Krumboltz & Thoreson, 1976; Martin & Hiebert, 1985). Some skills that enhance personal competence and adjustment are: problem-solving and decision-making (Dixon & Glover, 1984; D'Zurilla & Goldfried, 1971), assertiveness and social interactions (Goldstein, Sprafkin, & Gershaw, 1976; Lange & Jakubowski, 1976; Perry & Furukawa, 1980), self-management (Kanfer, 1980; Martin & Martin, 1983; Rudestam, 1980), and anxiety and stress management (Barrios & Shigatomi, 1979; Meichenbaum, 1977; Wolfe, 1958). Practitioners, such as those mentioned above, have concentrated their clinical efforts on training clients in the specific skills required for competence in each specific

area. For example, Martin and Hiebert (1985) have specified a generic five-stage framework that could be used to plan such interventions: general goal-setting; a preassessment in which entering skill competencies are evaluated; setting of specific, incremental objectives; instructional activities to meet these objectives, including information-sharing, modelling, practice, feedback, and training for transfer; and evaluation (both formative and summative). Psychological adjustment is seen as having a sufficient skill repertoire to handle the demands one encounters. Maladjustment, then, is seen largely as a manifestation of skill deficiencies, and is best remediated through a well planned, goal-oriented instruction in the required skills.

Other current sources are suggesting that education, social service, and health professionals can intervene in such a way as to prevent the occurrence of psychological disorders (American School Counselors' Association, 1979; Cowen, 1983; Felner, Jason, Moritsugu, & Farber, 1983; Price, Ketterer, Bader, & Monahan, 1980). The emphasis is often on primary prevention strategies which have the following defining characteristics: they are aimed at populations not presently displaying maladjustment; they have as their objective both the prevention of future psychological distress, and the promotion of optimal functioning; and they are primarily group oriented (Cowen, 1983; Shaw & Goodyear, 1984). These interventions may be aimed at a variety of levels of society including the environment, the economy, social networks, families, and individuals (Felner, et al., 1983; Price, et al., 1980), but counsellors typically concern themselves with those preventive interventions aimed at individuals. These preventive interventions most often take the form of skill training programs like those mentioned above, administered in a variety of settings (Danish, Galambos, & Laquatra, 1983; Durlak, 1983).

Logical support can be gathered in favor of adopting a preventive approach toward mental health. First, the supply of mental health professionals available is not meeting the current demands of the present distressed population, while the growth of the distressed population is outstripping the growth of the supply of mental health professionals (Cowen, 1973). Secondly, since the success of traditional problem focused approaches has certainly been questioned (Rachman & Wilson, 1980; Stuart, 1970), it seems appropriate to examine others, including preventive ones. Third, preventive programs are potentially more cost effective. For example, Currie and Pishalski (1984) compared the cost of a preventive skill training program (the defunct Family Support Worker program) with problem-focused approaches. The cost of offering service under the program ranged from \$600 to \$1200 per family, while the cost of traditional services ranged from \$5,000 to \$10,000 annually for an alternate school placement, \$15,000 to \$18,000 annually for a special care foster home, to \$28,000, the average cost of an admission to Youth Detention Centre. If effective, substantial savings could have been realized by the Family Support Worker program. Fourth, Allen and colleagues (Allen, Chinsky, Larcen, Lachman, & Sellinger, 1976) have suggested that preventive programs, if indeed they are effective in preventing the occurrence of psychological distress, would save a certain amount of pain and suffering to those afflicted. Thus a preventive approach would be ultimately more humane. Finally, evidence is growing that people who have problems early in life continue to do so (Cowen, Pederson, Babigian, Izzo, & Trost, 1973). Early intervention offers the hope of preventing problems with less intensive effort than would be necessary if problems had been allowed to develop. Logical arguments suggest a number of potential benefits resulting from a preventive

approach: decreased demand on practitioners, possibly more effective interventions, cost effectiveness, and decreased client suffering. In view of this potential, preventive approaches should be put to the empirical test. ✓

The School: A Strategic Location for Preventive Skill-Training

The school has been suggested as a strategic location from which to offer these preventive skill training interventions (Allen, et al., 1976; Clarizio, 1979). The students' acquisition of skills for personal competence may be seen as a means to an academic end (e.g., eliminating test anxiety to facilitate better achievement), or as an end in itself, as those who favor a holistic approach to education advocate (ASCA, 1979; Dinkmeyer & Dinkmeyer, 1979; Morgan, 1984; Valine & Valine, 1981). Regardless of which approach is taken, the school offers advantages over other institutions such as churches, recreational groups, and the justice system, as dispensers of preventive services. Allen, et al. (1976) note that schools are one of the only socialization systems which involve almost all children. Clarizio (1979) points to the prolonged availability of young people, and the school's "culturally sanctioned right to 'interfere'" (p. 311) in a child's life, at least with respect to the child's educability. Also, the school child has access to a number of teachers who are skilled in relating to children and in facilitating children's development.

Besides those arguments in favor of a preventive approach to mental health in general, and using the school as the locus from which to offer these services in particular, recent sources suggest that stress management skills could be taught as a primary prevention strategy in the school (Greenberg, 1977; Schultz & Walton, 1979). A number of different rationales are given. Philosophically, Dinkmeyer and Dinkmeyer (1979)

believe that learning to control stress is a legitimate educational function in and of itself. Physical education (Koeppen, 1974; Lajoie, 1984) and health curricula (Greenberg, 1977; Richardson, Beall, & Jessup, 1982) offer natural opportunities to give stress management instruction, and such instruction has been successfully performed in the context of an English literature class (Hiebert & Eby, 1985). Others point to the evidence that children are under stress and not coping well. Ironically, the school frequently has a role in creating situations which students experience as stressful. Phillips (1978) listed academic stressors such as ineffective teacher communication, competition, making mistakes in oral work, test-taking, and parents' and teachers' expectations. Jackson (1968) adds overcrowding in schools. Apart from school, major transitions (hospitalization, separation from parents, death of a parent, or birth of a sibling) are cited as childhood stressors (Moore, 1975). Other stressful stimuli seem to be peculiar to our times: the threat of nuclear war (Simon, 1984), parents' unemployment (Seidman & Rapkin, 1983), changing family structures (Felner, Farber & Primavera, 1980; Groen, 1975). Moreover, stress-related physiological disorders (see Chapter 2) are certainly not restricted to adults (Groen, 1975). The need for child stress management training is demonstrable and the school is a viable dispenser of such training.

The Teacher as "Counsellor"

Practically speaking, the most pervasive way to instruct children in stress management skills would be for classroom teachers to do it with their own classes. The use of regular classroom teachers to provide guidance services has been supported on the basis of more efficient and responsive service delivery (Costar, 1980; Hiebert & Eby, 1985; Kornick, 1984). The provision of guidance services by the teacher would mesh well

with a preventive philosophy as well. The vast majority of students in a regular classroom could be described as not yet displaying maladjustment. Furthermore, a regular class, especially in elementary school, provides a ready-made, natural group setting for preventive interventions. Using the regular classroom teacher would take maximum advantage of the school's prolonged access to large numbers of young people.

In the area of stress management, several recent studies give some empirical support for the effectiveness of preventive stress management programs, some taught by regular teachers to normal children, but evidence appears mixed. Hiebert and Eby (1985) found that volunteer Grade 12 students practicing relaxation thirty minutes a day over two weeks significantly reduced their anxiety on two self-report measures. Guyer and Guyer (1984) found no differences between groups trained in progressive relaxation training and placebo and no-treatment controls. Zaichovsky and Zaichovsky (1984) found improvement on physiological measures and state anxiety following relaxation training with Grade 4 students. Ragan and Hiebert (in press) found that Grade 3 children trained with the Kiddie QR program showed lower anxiety levels from pre- to posttest although other grades showed no treatment effects. Day and Sadek (1982) found that Grade 5 Lebanese children trained in Benson's relaxation response had reduced anxiety levels from pre- to posttest, although treatment effects eroded in three weeks after the teacher ceased classroom instruction of the program. Ballenger (1981) demonstrated enhanced self-concept in sixth to eighth graders following muscle relaxation combined with autogenic training. Promising support exists for the effectiveness of preventive but this empirical evidence is scarce, mixed, and of a preliminary nature.

Summary, Rationale, and Overview

It has been argued that traditional problem-focused approaches to mental health and adjustment are lacking. A suggested solution is to train people in the skills needed for personal competence in order to prevent psychological maladjustment. This preventive approach was described, and some potential advantages were listed. The potential advantages suggested that empirical investigation into the effectiveness of preventive programs is warranted. The school was then described as a strategic location from which to give preventive instruction in general, and stress management instruction in particular. The use of the regular classroom teacher as provider of guidance services was cited as a way of improving service delivery, and empirical evidence that regular teachers can be effective stress management instructors was reviewed briefly. Although there is substantial evidence that children can learn self-regulation skills, and that clinical populations can benefit from the many relaxation modes (see Chapter 2), the data on populations of the normal children taught a preventive strategy by their own teachers was found to be relatively scarce. Moreover, the treatments in research with clinical populations are, of course, inconsistent with the conditions commonly found in regular classrooms in that they use biofeedback equipment, or have highly trained psychologists, counsellors, or graduate students performing the training.

This thesis is concerned with the question: What is the effect when children are exposed to a stress management curriculum, taught to them by their own teacher as a preventive measure? In examining this question, this study will extend the empirical data base on preventive programs. Also, it will add to the small number of available studies on preventive stress management with children done in a regular classroom environment

free of special equipment or personnel. The next chapter provides a theoretical framework of stress and stress management, describes various relaxation procedures and reviews the research on the various relaxation procedures with children. Chapter 3 describes the research design, subjects, treatment, and dependent measures. Chapter 4 summarizes the research findings. The final chapter provides an evaluation of the findings, and further implications for research and clinical practice pertaining to child stress management.

CHAPTER 2

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

In this chapter, the behavioral, cognitive, and physiological components of the stress response are described, and some key terms are presented. Approaches to stress control are then classified into stressor management strategies and stress management strategies. Relaxation approaches to stress management are described and the research on the use of those strategies with children is reviewed and analyzed critically. Finally, the hypotheses guiding this study are listed.

Stress: Usages and Definitions

The word "stress", in the psychological literature, has generally been used in one of three different ways (Cox, 1978; Lazarus & Launier, 1978). First, "stress" has been used to represent a response by an organism. Selye (1974), representative of this position, states that stress is "the nonspecific response of the body to any demand" (p. 14), i.e., stress is equated to physiological arousal or the mobilization of the body to meet demands. Although certain physiological features of the stress response are fairly uniform, the nonspecificity of the organism's response has been called into question. Both Elliott and Eisendorfer (1982), and Everly and Rosenfeld (1981) list several instances where different stressors yield differential physiological effects. Also, to characterize stress as wear and tear on the body is of little meaning to clients in a clinical setting (Hiebert, 1983).

A second use of the word "stress" is to describe stimulus events. The studies of Holmes and Rahe (1967) on the effect on health of major life events such as bereavement, job change, and divorce, is one such example. A difficulty in this approach is that no account of coping efforts is taken (Lazarus & Laurier, 1978). Also, although it certainly

is useful in clinical practice to know what major transitions a client has experienced, the focus of counselling is usually on the improvement of coping efforts.

Both of the above usages of "stress" are somewhat mechanistic. They presuppose a person to be a passive receptor of a demanding stimulus, responding in a nonspecific way, ignoring individual differences (Cox, 1978). More appealing, more useful in clinical practice, and probably more accurate is a third conceptualization, the interactional model of stress proposed by several recent authors (Cox, 1978; Coyne & Lazarus, 1980; Hiebert, 1983, 1985; Holroyd & Lazarus, 1980; Kasl, 1984; Lazarus & Launier, 1978; Magnuson, 1982).

Stress: An Interactional Definition

Stress is a "complex psychological and physiological reaction to a situation that approaches or exceeds a person's self-perceived ability to cope with that situation" (Hiebert, 1985, p. 14). Although certain situations are so noxious that they almost always elicit a stress reaction (e.g., extreme heat, cold, trauma, or bereavement), and some people display greater vulnerability than others to demanding situations, the emphasis in the interactional model is the perceived imbalance between the demand in a situation and coping ability (Magnusson, 1982). The process through which this judgment regarding demand and coping ability is arrived is known as appraisal. Appraisal is a dynamic process in which people are continually evaluating the flow of events around them with reference to their own well-being. Primary appraisal refers to the process of classifying situations as relevant or irrelevant, benign or positive, or harmful or threatening (Lazarus & Launier, 1978). The question, "Am I okay or in trouble?" (Holroyd & Lazarus, 1982, p. 23) summarizes the primary appraisal process. If the situation is demanding,

there is an automatic striving to cope and restore homeostasis (Shaffer, 1982). Secondary appraisal consists of evaluating coping resources, and feedback from coping efforts (Coyne & Lazarus, 1980). It is represented by the questions, "What can be done about the situation?" (Holroyd & Lazaus, 1982, p. 23), and "How well am I handling it?". If demand abates, or if the coping efforts are perceived as successful, homeostasis is restored and the person feels better. If not, the demand becomes a stressor and the person's experience is said to be stressful (Hiebert & Basserman, 1985).

"Coping" refers to "efforts, both action oriented and intrapsychic, to manage (that is, to master, tolerate, reduce, minimize) environmental demands... which tax or exceed a person's resources" (Lazarus & Launier, 1978, p. 311). Coping efforts may also be classified as the problem-oriented, aimed directly at the demanding situation itself, or palliative, aimed at regulating the stress experience (Lazarus & Launier, 1978).

Transitory and Chronic Stress

As stated above, a person experiencing a demand automatically strives to restore homeostasis by attempting various coping strategies (Shaffer, 1982). When a demand is experienced as stressful, and coping attempts are perceived to be effective, and/or demand decreases, one's stress reactions abate. In this case, a state of transitory stress is said to occur. Typically, transitory stressors are coped with, and few, if any, ill effects accrue. If the stress response is elicited frequently, or for long duration, a state of chronic stress exists (Hiebert, 1983). The effects of chronic stress are more serious than those of transitory stress, and are discussed below.

Summary

Although stress has been defined both as a stimulus and a response, in this paper stress is defined as an interactional event, resulting when perceived demand exceeds perceived coping resources. Appraisal is the cognitive process by which this perception of coping ability and demand is reached. Coping is an effort, overt or covert, to manage demands or the stress experience. Transitory stress occurs when, as a result of successful coping or reduced demand, one's stress reactions abate.

Chronic stress is a prolonged or repeated elicitation of the stress response, and is more serious in its long-term effects than transitory stress.

Characteristics of the Stress Response

The integrated constellation of responses which accompanies a stressful experience is called the stress response. The stress response has behavioral, cognitive and physiological components (Hiebert, 1983; — 1985; Lazarus, 1974; Parrino, 1979).

Behavioral Component

The stress response has several overt behavioral manifestations: heavy breathing, tremors, moistening or biting lips, facial grimaces, pacing, stammering, reduced motor dexterity, and speech blocks (Nietzel & Bernstein, 1981). Highly active behavior is often a feature of the stress response. One example is seen in the syndrome known as Type A behavior pattern. Type A behavior pattern is "an action-emotion complex that can be observed in any person who is aggressively involved in a chronic, incessant struggle to achieve more and more in less and less time...." (Friedman & Rosenman, 1974, p. 67). Having affective, behavioral, and cognitive features, Type A behavior pattern includes explosive accelerated speech, a heightened pace of living, impatience

with slowness, polyphasic activity, self-preoccupation, dissatisfaction with life, inappropriate competitiveness, and free-floating hostility (Matthews, 1982). Occurrence of Type A behavior is positively correlated with reactivity of the sympathetic adrenal medullary system, and with reactivity of heart rate and blood pressure (Siegel, 1984), two systems which are activated as part of the stress response. It ought to be emphasized that Type A behavior should not be equated with the stress response (Jenkins, Zyzanski, & Rosenman, 1979). However, it is clear that Type A behavior and physiological symptoms of stress occur together frequently in some individuals (Howard, Cunningham, & Rechnitzer, 1979; Shaffer, 1982).

Cognitive Component

The main feature of the cognitive component of the stress response is the appraisal that the stressful situation taxes or exceeds the coping resources of the individual (Lazarus & Launier, 1978), or anticipation of potential harm (Magnusson, 1982). Other authors have elaborated upon the cognitive appraisal of inability to cope an anticipated harm. For instance, Meichenbaum's (1977) Stress Inoculation Training addresses itself directly to negative, self-defeating self-talk. Janis (1982), examining one of the features of the cognitive component of the stress response, decision-making under stress, found four maladaptive decision-making styles which people adopt when stressed: unconflicted inertia, in which people continue in their present actions without critical evaluation; unconflicted change, a change in course without critical evaluation; defensive avoidance; or hypervigilance, characterized by impulsive behavior and panic. In people experiencing chronic stress, Beck (1984) has found extreme one-sided, absolutistic, global judgments; the personalizing of irrelevant events; polarization

and overgeneralization; cognitive disorganization; and impairment of voluntary control over aggressive impulses and self-statements. Many of Beck's (1984) findings resemble Ellis' (1973) description of irrational beliefs.

Physiological Component

Parrino (1979) cites the work of Cannon (1953) in describing the physiological component of the stress response. Cannon originated the phrase "fight or flight response," characterized by increased blood pressure, respiration, heart rate, cardiac output, and increased blood flow to the skeletal muscles. Everly and Rosenfeld (1981) add decreased blood flow to the kidneys, peripheral vasoconstriction, and increases in muscle tension, plasma levels of free fatty acids, of tryglycerides, and of cholesterol.

Chronic stress has still other effects. Selye (1974) found that chronic stress in animals results in enlargement and hyperactivity of the adrenal cortex; shrinkage of the thymus and lymph nodes, affecting the immune system; and gastrointestinal ulcers. Other disorders to which chronic stress contributes are: cardiovascular disorders (essential hypertension, arrhythmia, migraine headache, Raynaud's syndrome); respiratory disorders (allergy, bronchial asthma, hyperventilation); musculoskeletal disorders (low back pain, tension headache); and skin disorders (Everly & Rosenfeld, 1981).

Summary

The integrated response known as the stress response has three components. The behavioral component is characterized by motor activity which is the result of physiological arousal, and hyperactivity. The cognitive component involves appraisal of threat and inability to cope, negative self-talk, irrational beliefs and processes, and impaired

decision-making. The physiological component includes increased respiration, heart rate, blood pressure, and endocrine secretions which would facilitate a "fight or flight" response. Chronic stress contributes to physiological disorders in a number of broad areas.

Approaches to Stress Control

The conceptual framework given above can serve as a guide to planning stress control interventions. Recalling that coping efforts can be problem-oriented (dealing directly with the demanding situation), or palliative (aimed at regulating the experience of stress) (Lazarus & Launier, 1978) we can similarly classify our approaches to stress control. Problem-oriented approaches are called stressor management techniques, while palliative approaches are called stress management strategies. Stress management strategies can be further classified as behavioral, cognitive, or physiological depending upon the component of the stress response at which they are aimed.

Stressor Management

Stressor management strategies are used to intervene directly in a stressful situation in order to reduce demand to a level which is perceived as manageable. Simple procedures to reduce demand are to leave the situation until arousal subsides (Hiebert, 1983), or to enlist social support (Seashore, 1980). Learning new skills such as parenting, problem-solving, time management, assertiveness and social interactions, communication, and money management may also reduce demand, although empirical support for skill training as a stressor management strategy is lacking (Hiebert, 1983).

Stress Management

Stress management strategies aim to alter one's experience of stress by targetting one or more of the components of the stress response.

Treatment in one of the components usually brings improvement in the other two (Hiebert, 1983). However, it is often the case that secondary improvement does not occur as early, or in as great a magnitude, as the direct treatment effect. This desynchrony between response channels is thought to diminish over time (Schwartz, Davidson, & Goleman, 1978).

This review will focus on physiological approaches to stress management, that is, procedures to induce a state of relaxation. For examples of approaches to stress management which target the behavioral component of the stress response, the reader is referred to Schilling and Poppen (1983) and Suinn (1975). For approaches which target the cognitive features of the stress response, see Beck (1984), Ellis (1973), or Meichenbaum (1977). Hiebert (1983) provides a comprehensive taxonomy of stress management strategies.

Relaxation Procedures

In this section, procedures to induce relaxation are described. Although some of those methods operate with cognitive mediation (Lehrer & Woolfolk, 1984), their defining characteristic is that they are used to induce a wakened state of low physiological arousal (Everly & Rosenfeld, 1981). Meditation, hypnosis, biofeedback, progressive relaxation, and abbreviated relaxation methods are discussed here.

Meditation Procedures

Shapiro (1980) defines meditation as: "... A family of techniques which have in common a conscious attempt to focus attention in a nonanalytical way, and attempt not to dwell on discursive, ruminating thought" (p. 14). Thus meditation is intentional, not necessarily religious in nature, and process (not content) oriented. The emphasis in the research and clinical literature is on meditation as a self-regulation procedure, as opposed to a way of attaining moral or

spiritual transformation. For procedural details of various meditation techniques, see Benson (1975), Carrington (1984), Patel (1984), and Shapiro (1980).

Hypnosis

According to Clarke and Jackson (1983), hypnosis is "a state or condition marked by low arousal, reductions in patterned input, focal attention, and lowered awareness of peripheral events" (p. 36). Increased suggestibility also characterizes the hypnotic state (Gardner & Olness, 1983). Hypnosis, the hypoaroused state, should be distinguished from hypnotherapy, a subset of psychotherapy which utilizes the suggestibility in the hypnotic state to facilitate affective, behavioral, and cognitive change.

Although self-hypnosis is often taught through tapes or books (e.g., LeCron, 1964), most practitioners who use hypnosis train clients first through the use of therapist-induced hypnosis (Clarke & Jackson, 1983; Coe, 1980; Udolf, 1981). Following a number of hypnotherapy sessions, the therapist might train the client by having the client repeat and personalize the suggestion in the induction overtly or covertly (Clarke & Jackson, 1983).

Autogenic training. Autogenic training (Luthe, 1977) is a particular subset of self-hypnosis. Six standard exercises, which entail autosuggestions regarding limb heaviness, limb warmth, heart rate, respiration, abdominal warmth, and forehead cooling, form the basic program.

Biofeedback Training

Biofeedback procedures utilize instrumentation, usually electronic, to measure bodily processes of which the subject is usually unaware. This information about bodily processes is visually or audibly relayed to

the subject, who attempts to exercise voluntary control over the processes (Cobb & Evans, 1981). Although several physiological indices of arousal or relaxation can be used, the two most frequently used are peripheral skin temperature and electrical activity in muscle fibres as measured by electromyography (EMG). While using biofeedback instrumentation a number of vehicles can be used to facilitate relaxation (autogenic suggestions, imagery, instructions to be passive).

Progressive Relaxation

Jacobson (1938, 1966) developed progressive relaxation, which is probably the most widely used relaxation procedure. Jacobson's long painstaking procedure was condensed by Wolpe (1958) in the development of systematic desensitization. Methods currently used (Bernstein & Borkovec, 1973; Cautela & Groden, 1978) resemble Wolpe's and contain a certain amount of suggestion, which Jacobson (1966) shunned. In general terms, the procedure consists of tensing and relaxing various muscle groups in sequence, as the client attends to the contrast between tension and relaxation. Gradually, the muscle groups are combined, and the ability to relax without first tensing is shaped.

Abbreviated Methods

Cue-controlled relaxation. Cue-controlled relaxation (Barrios, 1978; Russell & Sipich, 1973) was developed because of the need to generalize the relaxation obtained in the counselling or home practice session into an active coping skill, which could be used within a stressful or demanding situation. Upon achieving a relaxed state (usually, but not necessarily, through progressive relaxation), a cue (the word "calm" or "relax", or a specified breathing pattern) is paired with the relaxed state and repeated several times. It is as yet unclear whether cue-controlled relaxation operates via a cognitive mechanism (the

cue blocking negative self-statements in the stress-producing situation, thus facilitating arousal shifting), or through a conditioned association (Barrios, Ginter, Scalise, & Miller, 1980).

Quieting Response training. Quieting Response training also was developed because of the need for a procedure which could be used in vivo within stressful situations. The training is built around the Quieting Response (QR) a six-second response which is operationally very similar to cue-controlled relaxation. Tension, annoyance, anxiety, or alteration of breathing acts as a cue for the QR. The QR is then done by smiling inwardly and outwardly, giving a self-suggestions ("Alert amused mind, calm body."), taking a deep abdominal breath with jaw, tongue, and shoulders relaxed, and a sensation of heaviness and warmth spreading as the breath is taken. Didactic and experimental exercises teach behavioral and bodily cues for tension awareness, abdominal breathing, awareness of skeletal and smooth muscles, and generalization to other situations. Elements of progressive relaxation and autogenic training are incorporated. Stroebel (1982) prescribes use of the QR intermittently during the day as demands or stressors are encountered, 50 to 100 times daily if needed. Rather than functioning as a relaxation procedure per se, QR works as arousal shifting technique to allow the user to make a decision in each demanding situation regarding whether or not increased arousal is beneficial or necessary.

Relaxation with Children

In this section, studies which utilize relaxation procedures in treating children are discussed. Studies which use biofeedback (thermal and EMG), progressive relaxation, meditation procedures, autogenic training and Quieting Response training are presented with reference to hypotheses, findings and methodological issues relevant to this study.

Biofeedback Training

The majority of publications on relaxation with children report on biofeedback procedures. The practical problems inherent in incorporating biofeedback training into a school setting, the availability of equipment and the availability of trained personnel, have been mentioned in the previous chapter. For this reason, this discussion of biofeedback methods will focus on hypotheses and findings of groups of studies. For comprehensive review of biofeedback research with children, the reader is referred to Cobb and Evans (1981) and Masterton and Turley (1980).

Thermal biofeedback. Thermal biofeedback has been used successfully with children suffering migraine headaches (Andrasik, Blanchard, Edlund, & Rosenblum, 1982; Houts, 1982; Labbe & Williamson, 1984; Rosensky & Pasternak, 1985), with normal children to assess their ability to learn handwarming (Kelton & Belar, 1983; Suter & Loughry-Machado, 1981), and learning disabled children (Hunter, 1974; Hunter, Russell, Russell, & Zimmerman, 1976). Suter and Loughry-Machado (1981) found that children learned handwarming better and more quickly than their parents. Kelton and Belar (1983) had poor success in teaching children handwarming. They attribute this to fatigue and boredom, and suggest that age-appropriate and meaningful wording and imagery be used in biofeedback procedures with children. Rosensky and Pasternak (1985) applied meaningful imagery (the "Star Wars" notion of "The Force") to augment thermal biofeedback training with six boys experiencing migraine.

EMG biofeedback. The bulk of biofeedback research with children has used EMG feedback, and the majority of these studies deal with hyperactive children. Whatever the presenting problem, it has been clearly demonstrated that children are able to regulate willfully their EMG readings to statistically significant levels (e.g., Braud, Lupin, &

Braud, 1975; Flemings, 1978; Hampstead, 1979; Khan, 1978). With hyperactive children, claims of improved classroom or in-home behavior are made, but not one of the studies located used behavioral observation data to support the claim. Instead, behavioral rating scales were used (e.g., Braud, 1978; Braud, et al., 1975; Dunn & Howell, 1982; Flemings, 1978; Hampstead, 1979; Hershey, 1983; Johnson, 1977; Rivera & Omizo, 1980). In one study where follow-up ratings were taken, hyperactive behavior had returned to pretreatment levels (Bhatara, Arnold, Lorange, & Gupta, 1979). Improved task performance, on nonverbal tests such as WISC or WISC-R performance scales, Matching Familiar Figures Test, or Porteus Mazes, is often claimed following biofeedback training with hyperactive children (Braud, 1978; Hampstead, 1979; Omizo & Michael, 1982; Rivera & Omizo, 1980), learning disabled children (Carter, Russell, & Wharton, 1978; Omizo & Williams, 1982), and anxious children (Khan, 1978). However, two studies hypothesized this effect, but did not find it (Childress, 1978; Johnson, 1977). Improved academic achievement in learning disabled children was a result found by Carter, et al. (1978) and Cunningham and Murphy (1978), but not by Gracenin and Cook (1977). Enhanced self-concept is another hypothesized treatment effect which has been found in some studies (Omizo, 1980; Lietz, 1978), but not in others (Denkowski, Denkowski, & Omizo, 1983).

Certain studies bear mentioning here because of unique substantive or methodological features. Khan (1978), already noted above, was the only study located which used EMG biofeedback in the treatment of general anxiety in children. He found lower state anxiety among children who were treated with EMG biofeedback, or EMG biofeedback and an unspecified counselling procedure, than among no treatment controls. Walton (1979), in an uncontrolled study with five acting out elementary children, used

behavioral observation procedures to assess improved behavior following EMG training. Walton's report thoroughly specifies the treatment protocols used. Craig and Cleary (1982) trained three male stutterers (aged 10, 13, and 14) with EMG biofeedback. Their study was the only EMG study located in which the children were trained to a predetermined criterion level. Also, if the subjects did not meet a 95% criterion level of clear speech in the generalization stage of treatment, training resumed at the previous stage. Their intervention also included an extensive and well-planned maintenance stage.

Progressive Relaxation Training

The other widely-used method for training children to relax is progressive relaxation training. There are a number of extant studies dealing with nonschool-based or physiological complaints which will not be cited here. This section will focus on school-based or group-oriented studies. For a review of nonschool-based interventions, the reader is referred to Richter (1984).

Test anxiety. The efficacy of progressive relaxation training on test anxiety is equivocal. Schuchman (1977) compared EMG biofeedback, progressive relaxation training, and unspecified "non-directive counseling" in the treatment of test anxiety in senior secondary students. Reduction in test anxiety and improvement in Scholastic Aptitude Test scores occurred in all three groups. In an uncontrolled study, Deffenbacher and Kemper (1974) found increased grade point average in treated subjects. Little and Jackson (1979) found reduced test anxiety, but not improved test performance. No differential treatment effects were found when compared to an attentional training group. Grant (1980) found that both a values clarification group and progressive relaxation training group had reduced test anxiety.

Unspecified behavior problems. Wright (1980) studied the frequency of discipline referrals in intermediate and junior secondary students before and after daily 15-minute exposures to a progressive relaxation training tape. No significant results were found. Mead (1976) studied attitudes and anxiety levels of potential high school dropouts before and after progressive relaxation training. Training consisted of daily exposure to a taped presentation for 20 days. No significant results were found. Elitzer (1976) and McBrien (1978) give anecdotal reports of the effectiveness of progressive relaxation training with juvenile offenders and a Grade 1 boy respectively.

General anxiety. Rossman and Kahnweiler (1977) reported reduction of anxiety in grade 4 and 5 students following five progressive relaxation training sessions. They based their conclusion on anecdotal observations that "frequency of physical reactions to stress appeared to diminish" (p. 269).

Emotional handicaps. Vacc and Greenleaf (1980) exposed emotionally handicapped children aged 6 to 12 to one of four conditions (progressive relaxation training, progressive relaxation training and covert positive reinforcement, experimenter attention control, and no treatment control) for one-half hour twice a week for 4 weeks. Although progressive relaxation training subjects were asked to practice at home, no home practice data were collected. No differential treatment effects or significant within group changes were found on teacher-completed behavior ratings and self-reports of anxiety. The authors conclude that progressive relaxation training with or without covert positive reinforcement did not improve upon the help these children were already getting in special classes. They also suggest that more training time might improve results.

Hyperactivity. A number of studies report the use of progressive relaxation training as a behavior management strategy with hyperactive children (Braud, 1978; Brown, 1977; Klein & Deffenbacher, 1977; Loffredo, Omizo, & Hammett, 1984; Lupin, Braud, Braud, & Duer, 1976; Porter & Omizo, 1984). Klein and Deffenbacher (1977), Loffredo, et al. (1984), and Porter and Omizo (1984) combine a modified progressive relaxation training procedure with large muscle exercise (mostly stretching). The latter two studies were successful in involving parents in relaxation training. Loffredo, et al. (1984) found improved self-concept, while Porter & Omizo (1984) found improved locus of control and task performance.

Brown (1977) found differential treatment effects between a progressive relaxation training only group and a group given progressive relaxation training and "task motivational instructions," the latter being significantly more effective than the former in bringing about changes on a behavior rating scale and a self-concept measure. Brown (1977) concludes that additional measures, including parental support and cognitive strategies are necessary to augment the effects of progressive relaxation training.

Lupin, et al. (1976) studied the effect of progressive relaxation training on 13 minimally brain injured children and their families. Parents received instruction in behavior management and were instructed to listen to progressive relaxation tapes. Children listened to progressive relaxation training tapes utilizing age-appropriate language. Home practice was assigned and practice data were collected. Parental behavior ratings, Digit Span and Coding subtests of the WISC, and behavioral observation demonstrated significant improvement. The importance of parental involvement was stressed. Another important

finding was that frequency of practice was positively correlated to improvement in dependent measures.

Braud (1978) compared EMG biofeedback and progressive relaxation training with hyperactive children. Both EMG and progressive relaxation training groups were able to reduce EMG-measured muscle tension. On most dependent measures (behavior rating scales, Bender Gestalt, WISC-R Digit Span and Coding), the EMG and progressive relaxation training groups did not differ from each other, nor did they differ from a group of normal control children. They did differ from a no-treatment hyperactive control group at posttest, but not at pretest.

Learning and academic problems. Successful results in treating children with learning and academic problems have been obtained by several authors (Amerikaner & Summerlin, 1982; Bruno-Golden, 1978; Padawer, 1977). Padawer (1977) used progressive relaxation training with poor elementary school readers. Teachers and children in the experimental group received a 2-week pretraining period, in which conceptual instruction and relaxation practice was given. Progressive relaxation training was then incorporated into the classroom routine, but only experimental subjects were found to benefit in terms of improved reading achievement. Spillios and Janzen (1983) studied the effects of progressive relaxation training on anxious learning disabled children. Although no significant treatment effects were found when data were analyzed for the treatment group as a whole, as compared to the control group, a significant group x time x anxiety level interaction was found for some academic achievement scales, indicating that highly anxious treated children improved more.

Normal populations. Preventive progressive relaxation training programs with normal populations have been tested only recently (Guyer &

Guyer, 1984; Hiebert & Eby, 1985; Richardson, Beall, & Jessup, 1982; Zaichovsky & Zaichovsky, 1984). Guyer and Guyer (1984) compared four groups of adolescents (progressive relaxation training taped in subject's own voice, progressive relaxation training taped in same sex therapist's voice, quiet music tape placebo, and no-treatment control). No between group differences were found on the State-Trait Anxiety Inventory, Adjective Checklist, and the Inventory of Mood States. They suggest that progressive relaxation training may not be appropriate for emotionally healthy clients, although they collected no data on the extent to which their subjects actually gained the ability to relax. Hiebert and Eby (1985) found that volunteer Grade 12 students practicing progressive relaxation training for 30 minutes a day for 2 weeks experienced a significant reduction in self-reported anxiety. Subjects logged their home practice sessions and physiological readings (heart rate, respiration, skin temperature) and those not following the treatment were omitted from the analysis. Richardson, et al. (1982) found that Grade 9 students receiving progressive relaxation training were able to regulate heart rate, but not trapezeus muscle tension, compared to no-treatment controls. Zaichovsky and Zaichovsky (1984) evaluated progressive relaxation training with 24 Grade 4 children, receiving 18, 10-20 minute lessons. Home practice was encouraged, but not logged. Experimental subjects improved significantly pre- to posttest on skin temperature, respiration, heart rate, and state anxiety. Experimental subjects differed significantly from control subjects on heart rate, and respiration at posttest, but not at pretest.

Meditation Procedures

Childs (1974) found a decrease in anxiety in five juvenile offenders following meditation training, but other indices of improvement

(behavioral ratings or observation, recidivism) are not reported. Linden (1973) found that Grade 3 children who practiced meditation became less field dependent and less test anxious, but reading achievement was unchanged.

Benson's Relaxation Response. A small number of studies were located which utilized Benson's Relaxation Response as a relaxation training technique (Culbertson & Wille, 1978; Day & Sadek, 1982; Redferring & Bowman, 1981). Studying the effect of relaxation on reading achievement, Culbertson & Wille (1978) trained three children from 1 to 3 weeks, and had one control subject. Two of the three treated subjects actually declined in achievement, while modest changes were noted via behavioral observation. Following training Redferring and Bowman (1981) found decreased off-task behavior and a significant difference between the experimental and treatment group using a behavioral observation schedule developed by Becker, Madsen, Arnold, and Thomas (1967). Day and Sadek (1982) found decreased anxiety in 10-12 year old Lebanese children following treatment, but treatment effects eroded in 3 weeks once the teacher stopped in-class practice.

Autogenic training

Ballenger (1981) found enhanced self-concept following autogenic training, while a control group remained unchanged. Harlem (1976) studied the effect of autogenic training on task performance with 7-year olds. EMG readings indicated they did acquire the ability to relax. All dependent measures (Matching Familiar Figures Test, a relaxation scale, and several other performance tasks) improved pre- to posttest.

Abbreviated Relaxation Method: Quieting Response Training

Three studies were located which tested Quieting Response training with children. Danielson (1984) reported on a program in which

elementary counsellors gave Quietening Response training, using the packaged program QR for Young People (Holland, Stroebel, & Stroebel, 1980), to an unspecified number of Grade 5 children. Training was directed at an annual district-wide achievement test, and test scores were significantly higher than for untrained children. Ragan and Hiebert (in press) assessed the effects of Kiddie QR training on primary students. No significant treatment effects were found among most grades, but significant reduction in trait anxiety was found in a Grade 3 group. Bristowe (1982) found no difference in dependent measures of anxiety and self-concept when comparing Kiddie QR, a taped progressive relaxation program, and a no-treatment control.

Summary of Findings and Methodological Issues

Relaxation procedures have been used with normal populations, and with children displaying a host of school-related problems: hyperactivity, behavior and attention problems associated with learning disabilities, general anxiety, test anxiety, unspecified behavior problems, and emotional handicaps. The claims made for relaxation procedures are varied and some are still doubtful. Claims of behavioral improvement, in the case of hyperactive and learning disabled children, made on the basis of behavioral rating scales, must be eyed dubiously since these scales function mainly as indices of rater attitude toward the child. Improved task performance is a consistent result, but the mechanism through which this occurs (decreasing anxiety, focusing attention, decreasing impulsivity) is explained differently for different problem groups. In some cases, the available evidence suggests that enhanced self-concept is the result of an acquired ability to relax. Relaxation training seems as good as other treatments for test anxiety, but whether test performance is improved is not clear. Relaxation

procedures are ineffective when treating vaguely defined problems which are not clearly stress or anxiety related, such as school discipline referrals, poor school attitudes, or delinquency (Childs, 1974; Mead, 1976, Wright, 1980). Merely playing relaxation training tapes for children seems to be ineffective (Mead, 1976; Wright, 1980), but instruction which emphasizes transfer of learning seems to be helpful (Padawer, 1977). It seems that age-appropriate imagery (Rosensky & Pasternak, 1985), concurrent cognitive intervention (Brown, 1977), and support from parents and teachers (Day & Sadek, 1982; Loffredo, et al., 1984; Lupin et al., 1976; Porter & Omizo, 1984) enhance the effectiveness of relaxation training. In one study with anxious learning disabled children (Spillios & Janzen, 1983) highly anxious children improved significantly following relaxation training on a dependent measure of academic achievement, while less anxious children did not. This is consistent with Borkovec and Sides' (1979) review of adult relaxation studies, in which they conclude that normal populations tend to show fewer significant results than clinical populations.

Certain methodological problems have been cited in connection with child relaxation studies (Cobb & Evans, 1981; Richter, 1984). The suggestions of Cobb and Evans (1981), initially addressed to biofeedback training, apply equally as well to relaxation procedures in general. The lack of placebo controlled studies is noted. Only two of the biofeedback studies discussed above (Bhatara, et al., 1979; Hampstead, 1979) used placebo (sham feedback) control conditions, while two other studies (Guyer & Guyer, 1984; Vacc & Greenleaf, 1980) had placebo conditions (music and experimenter attention, respectively). Also, the confounding of treatments makes it difficult to discern with accuracy the efficacy of relaxation treatments. Cobb and Evans (1981) are specifically referring

to the pairing of biofeedback with other treatments such as counselling of some type (Johnson, 1977), combinations of biofeedback treatment (Lietz, 1978), or monetary reinforcers (Lubar & Shouse, 1976), for example. Just as problematic are variations among different applications of the same treatment. For example, EMG biofeedback has been practiced with relaxation tapes (Braud, 1978), without tapes (Hampstead, 1979), and with specific live relaxation exercise instructions (Haight, Jampolsky, & Irvine, 1976). These differences make the treatments received in each study substantively different from each other, despite the fact that all three are "EMG biofeedback". Other sources (Lusielli, Marholin, Steinman, & Steinman, 1979; Richter, 1984) point out that assessing the effects of relaxation is a problem in these studies. They discuss this problem in terms of the extent to which the client's or subject's relaxation can be determined in the session. Only a few studies have paid attention to generalization of skills to home practice or in vivo use of skills (Hiebert & Eby, 1985; Lupin, et al., 1975). Any skill has both a "how-to" and a "when-to" component and both must be present to say that a client/subject has acquired the skill. Lack of adequate controls, confounded and unspecified treatments, and the assessment of skill acquisition are some methodological difficulties in extant child relaxation research.

Program Evaluation Model

Hiebert (1984) proposed a model for increasing counsellor accountability. This program evaluation model would not just evaluate outcome, that is, change in the desired client affect, behavior, or cognition. Evaluation in counselling should also include some way of assessing whether or not the client is actually using the intervention procedure or learning the skills toward which the intervention is

targetted (Hiebert, 1984; Morgan, 1984). Counsellor behavior would be another focus of data collection. It must be demonstrated that the counsellor is using skills and strategies appropriately (Hiebert, 1984; Robertson, 1980). If all three conditions are met -- the counsellor was delivering the treatment appropriately, the client was following the program and actually learned the skills, and the client changed -- a strong argument can be made that the change resulted from the treatment.

The methodological difficulties mentioned above can be remediated, in part, by the adoption of Hiebert's program evaluation model. In the absence of placebo control conditions, strong causal inferences could still be made if it could be demonstrated that skills were actually acquired by subjects and counsellor appropriately instructed the interventions. Adequate specification of treatments, including client practice data, which should be considered part of the treatment and not optional, would clarify treatment procedures. Even if treatments varied from study to study, it would be clear just how they varied. Since random assignment to unvarying treatment groups is a rare occurrence in clinical practice, more ecological validity might result if practitioners simply described their treatments as specifically as possible. Assessment of relaxation, both in session and in vivo would be an integral part of a program evaluation approach to research.

Summary and Hypotheses

This chapter first presented a definition and theoretical conception of stress. Approaches to stress control were classified according to their focus. Stressor management procedures aim to reduce demand in a situation to a manageable level. Stressor management strategies moderate one's experience of stress. Stress management procedures were classified as behavioral, cognitive, and physiological, and the latter were

described. The research on relaxation procedures with children was summarized, and methodological problems were discussed. A program evaluation model for counselling research was described and applied to the methodological problems found in the extant child relaxation literature.

As stated in the previous chapter, the school is a strategic location in which to teach skills, including self-regulation skills, which would enhance and optimize mental health. As has been seen above, much of the existing research on relaxation with children utilizes procedures which require the services of highly trained psychologists or counsellors, large amounts of individual attention, and possibly biofeedback apparatus, conditions which are incompatible with everyday classroom conditions. In contrast to many of the procedures discussed above, the Kiddie QR program can be used quite easily in a large group setting such as an entire primary class, and requires no specialized personnel to perform the instruction. This study, then, explores both the effectiveness and the practical utility of training children in relaxation procedures.

In view of the findings of previous research into relaxation with children, the following hypotheses guided the investigation:

1. There will be significant reductions in measures of state anxiety, trait anxiety, and self-report of physiological symptoms of stress as evidenced by comparisons of pre-and posttest scores between children receiving Kiddie QR training and children not receiving Kiddie QR training.
2. There will be a significant increase in physical, social, academic, and general self-concept among children receiving Kiddie QR training.

3. There will be a significant increase in performance in a nonverbal performance task among children receiving Kiddie QR training beyond the practice effect obtained in children not receiving Kiddie QR training.
4. In children identified as having behavioral problems, there will be a significant improvement following Kiddie QR training.

The next chapter will describe the methods used to test these hypotheses.

CHAPTER 3

METHOD

This chapter describes the method used in this study. The subjects are described, followed by a description of the treatment and of the steps taken to ensure treatment fidelity. The dependent measures, including paper and pencil measures, assessments of skill acquisition, and behavioral observation data, are then discussed. A description of the procedure for performing the assessments (pre and post), and the treatment concludes the chapter.

Subjects

The treatment group was a self-contained Grade 2 class composed of 27 students (10 boys, 17 girls) at the beginning of the study. Mean age was 7 years, 3 months. The treatment group was relatively free of children with academic and behavior problems, since all such Grade 2 children in this school were grouped into another single class. During the course of the study one girl moved away from the school, and all data pertaining to her were deleted, leaving an experimental group composed of 10 boys and 16 girls. Due to the inherent differences in size and composition between the Grade 2 classes, a Grade 1 class from the same school, containing 14 boys and 12 girls was used as a control group (mean age 6 years, 3 months). One of the boys in the control group was on a combined Kindergarten-Grade 1 program and was omitted from the study, leaving a control group of 13 boys and 12 girls. The two classes were located in a large, predominantly middle class elementary school in Maple Ridge, B.C.

Treatment

The treatment program used in this study was a professionally prepared, commercially marketed audiotope program entitled Kiddie OR: A

choice for children (Stroebe, Stroebe, & Holland, 1980). According to the instructor's manual which accompanies the program, two purposes of the program are to teach children to recognize rising tension levels, and to develop a response that can arrest rising tension levels, and restore homeostasis. In sixteen, 10 to 15 minute segments, the program aims at teaching the Quieting Response, an abbreviated relaxation procedure, to primary aged children. Throughout the program, two important concepts are interwoven: First, fear, worry, anger, and other stressful emotions are a normal part of life. Second, the child can be an active agent in coping with these experiences, rather than a passive receptor of them.

In the first half of the program (see Table 1 for a description of program elements and corresponding objectives), components of the Quieting Response are shaped through a series of "body friends": "Finger Houses" introduces breathing as a self-regulation procedure, and uses the warmth of breath as a parallel to the warmth in relaxation, which the child will later experience. "Finger Trip," "Little Fish," "Wiggles," and "Magic Jaw String" promote awareness of the facial musculature, especially the jaw and forehead. Some body friends can be used as indices of overall tension, while others serve as a means of reducing facial tension. "Magic Breathing Holes" introduces the sensation of deep abdominal breathing which is part of many relaxation procedures. Together with "Magic Jaw String," "Magic Breathing Holes" forms the Quieting Response proper. "Bubble Pipe" is an additional generalization exercise which suggests children visualize their stressful emotions being blown out.

The second half of the program promotes transfer of training by addressing specific situations in which QR can be used. "Fifty Fist and Finger Balloon," "Octopus," and "Magic Breathing Fingers" address faulty

muscle bracing in the hands and arms, and "QR The Muscle Man" draws attention to other major muscle groups. Unhappy emotional states are connected to faulty muscle bracing in "Rigid Robot" and "Grouchy Face". "Body Bike Cycle" addresses inappropriate hyperaroused states. "My Very Own Good Feeling Self" explains homeostasis, reviews previous elements, and summarizes the goal of the program.

Instructional sessions were usually held twice a week, with some exceptions (see Procedure section, below). Normally, the teacher would begin playing the tape, pausing occasionally to initiate discussion, address questions or prompts made on the taped presentation, or give time allow the children to experience a particular sensation or image presented on the tape. Often, further discussion or other instructional activities (drawing, printing, recitation) augmented the taped presentation.

Program Fidelity

Teacher recruitment and training. Implementation of the Kiddie QR program in this school was initiated one year prior to the beginning of this study. On the request of the principal of the school in which the study took place, the registered psychologist supervising the study held an initial information meeting with interested teachers. Portions of the Kiddie QR program were played, and parts of the instructor's manual were distributed in preparation for a 3 hour workshop to follow. This workshop included: a theoretical conception of stress, and explanation of the role of relaxation in reducing stress, a description of cue controlled and differential relaxation, an outline of the adult QR program, and a detailed description of Kiddie QR. The program was then taught by six classroom teachers to their own classes. Three teachers, including the one who instructed the program in this study, completed the

Table 1

Description of the Kiddie QR Program

Element	Body Friend(s)	Objective(s)
1	QR	<ul style="list-style-type: none"> -to convey that stressful emotions are common -to suggest that children can take responsibility for dealing with stress, using built-in "body friends"
2	Angry Puppy Happy Puppy	-to demonstrate control of breathing as a self-regulation procedure
3	TMJ (temporo-mandibular joint)	-to teach differentiation of tense and relaxed states through facial musculature
4	Little Fish	-to introduce the first component of the Quieting Response -- jaw slackening
5	Magic Breathing Holes	<ul style="list-style-type: none"> -to review the use of breathing as a self-regulation strategy -to demonstrate how the entire body is affected by breathing patterns -to introduce the feelings of warmth and heaviness which are part of many relaxation procedures
6	Magic Jaw String	-to review the jaw-slackening procedure
7	Magic Jaw String Magic Breathing Holes	<ul style="list-style-type: none"> -to combine the jaw drop and deep abdominal breathing into the Quiet-in Response -to reinforce sensations of warmth and heaviness
8	Bubble Pipe	-to have the child introduce his/her own imagery and problems into the Quieting Response

Table 1 (cont'd)

Element	Body Friend(s)	Objective(s)
9	Fighty Fists Finger Balloon	-to have the child recognize excessive muscle tension in the hands and arms -to teach a differential relaxation procedure to alleviate this
10,11	Octopus	-to integrate suggestions of warmth and heaviness into the differential relaxation procedure taught above
12,13	QR, the Muscle Man	-to have the child recognize excessive tension throughout the body
14	Grouchy Face	-to reiterate that the child has his/her own "body friends", and can be responsible for calling on them as necessary
15	Body Bike Cycle	-to help the child to be aware of appropriate and inappropriate states of high arousal
16	My Very Own Good Feeling Self	-to provide an overall review of the program -to present the concept of homeostasis as an appropriate balance between tension/arousal and relaxation/inertia -to once again reiterate the child's responsibility for his/her own stress reactions

the entire program. Concurrent to this instruction, the psychologist held two meetings to provide consultation for the teachers. A final meeting was held at the end of the school year in which the psychologist, teachers, and interested parents discussed the impact of the program. The psychologist's impression at this time was that two teachers, including the teacher who subsequently instructed the experimental group in this study, had applied the program creatively and enthusiastically.

The next school year, the psychologist and the primary teachers met with me, at which time I presented a proposal for research on the Kiddie QR program. At this time the teachers of the experimental group and the control group volunteered to participate in a research project. Both teachers held Bachelor of Education degrees, and had over twenty years of experience teaching, mostly in the primary grades. The teacher of the experimental group had planned to implement the Kiddie QR program in her class that year, and the teacher of the control group had not, allowing me to assign them to the two conditions in accordance with their wishes.

Experimenter observations. Continuous observation protocols were kept on seven of the segments, to evaluate the extent to which the teacher adhered to the instructional package. Where applicable, additional instructional activities used by this teacher to supplement the tapes (art, printing exercises, recitation) were observed as well. A graduate student in instructional psychology acted as co-observer with me. Both of us were present for all seven of the observed sessions. An emphasis was placed on recording specific instructional skills used, and the students' responses to these skills.

Teacher self-observations. In addition to experimenter observations, the teacher was asked to observe her own behavior while encouraging children to use QR outside of the teaching sessions, and

record her behavior on a form supplied by me (see Appendix 1). In fact, the teacher actually recorded instances of children using QR which she either saw, or heard about second hand, not her own behavior in cueing the children to use self-regulation skills. These anecdotal reports will be described in the next chapter.

Summary

Kiddie QR is an audiotape program which aims at teaching self-regulation skills to children, while encouraging children to take responsibility for coping with their own stress reactions. The first half of the program shapes the Quieting Response, while the second half trains for transfer of learning. To ensure that she had sufficient background knowledge to use the program, the teacher instructing the experimental group participated in a workshop and received consultation while instructing the program. Continuous observation protocols and a teacher self-observation form were also used to assess treatment fidelity.

Dependent Measures

In this section, the pencil and paper measures used are described. Also, the procedure used to assess skill acquisition is reported, and the behavioral observation system used is described.

Pencil and Paper Measures

State-Trait Anxiety Inventory for Children. The State-Trait Anxiety Inventory for Children (STAIC) was initially developed as a research tool for the study of anxiety in children (Spielberger, 1973). Two scales make up the STAIC. The A-State scale is designed to measure transitory anxiety states. It is composed of 20 statements that ask children how they feel at a particular moment in time. The stem "I feel" is followed by adjectives describing feeling states and their degree.

Ten of the items reflect a state of relaxation (e.g. "I feel: very calm; calm; not calm."), while the other ten reflect a state of distress (e.g., "I feel: very scared; scared, not scared."). In items where relaxation is described, a score of 1 is assigned to "very," 2 to the adjective alone, and 3 to "not." In items where distress is described, a score of 1 is assigned to "not," 2 to the adjective alone; and 3 to "very." Thus, the higher the score, the greater the distress.

The A-Trait scale is designed to measure stable individual differences in anxiety proneness (Spielberger, 1973). Here, the child is asked to report on the frequency of a specific affective, behavioral, or cognitive correlate of anxiety (e.g., "I have trouble making up my mind: hardly ever; sometimes; often."). A value of 1 is assigned to "hardly ever," 2 to "sometimes," and 3 to "often."

Test-retest reliability for the A-Trait scale is reported at .65 for boys and .71 for girls. It was lower for the A-State scale (.31 for boys and .47 for girls), but this was not unexpected since the A-State scale is intended to measure a transitory anxiety state. Internal consistency as measured by the Cronbach alpha ranged from .78 to .87 (Spielberger, 1973).

Nelson and colleagues studied the concurrent validity of the STAIC (Nelson, Kendall, Finch, Kendall, & Nelson, 1974). The correlation between the A-Trait scale and the Children's Manifest Anxiety Scale (Castenada, McCandless, & Palermo, 1956) was .75. The A-State scale correlated with the Children's Manifest Anxiety Scale at .25, while the two STAIC scales correlated at .35. On this basis, Nelson, et al. (1974) conclude that the two STAIC scales measure two distinct types of anxiety and possess construct validity. Further evidence of the construct validity of the A-State scale is provided by Papay, Costello, Heidl, &

Spielberger (1975). They had children answer the scale truthfully, and then as if they were about to take a test. Significant overall differences were found, and each item discriminated between the two conditions.

Bodily Cues for Tension and Anxiety. Bodily Cues for Tension and Anxiety (Cautela, Cautela, & Esonis, 1983) is a checklist composed of 32 items which describe in simple language specific physiological manifestations of stress, e.g., "I feel like throwing up," or "My palms get sweaty." Following this descriptor, the child is asked to comment on the frequency of each symptom: "not at all," "a little," or "very much." The frequency estimates were assigned the scoring values of 0, 1, and 2, respectively. Therefore, a higher score would represent more physiological symptoms of stress or anxiety. No data on norms, reliability, or validity were available.

The Self-Description Questionnaire. The Self-Description Questionnaire (SDQ) (Marsh & Smith, 1981) has 8 scales designed to measure academic (Math, Reading, School Subjects), physical (Physical Appearance, Physical Ability), interpersonal (Relations with Parents, Relations with Peers), and General self-concept. The SDQ's 76 items each have a 5-point Likert scale (False; Mostly False; Sometimes False; Sometimes True; Mostly True; True), preceded by a stem which is phrased either positively ("I am good at all school subjects."), scored 1 to 5 respectively, or negatively ("Overall, I am no good."), scored 5 to 1 respectively.

A number of recent sources report efforts to validate the SDQ (Marsh, Barnes, Cairns, & Tidman, 1984; Marsh, Parker, & Smith, 1983; Marsh, Smith, & Barnes, 1983; Marsh, Smith, Butler, & Barnes, 1983). It should be noted that only one of these studies (Marsh, et al., 1984) used

a form identical to the one used in this study. The earlier studies used a form which did not contain the questions composing the General scale. Also, three other items were reworded to make them more understandable to children. Thus, the differences between forms were not substantive.

Marsh, Smith, and Barnes (1983) administered the SDQ to 655 Grade 5 and 6 students and found substantial agreement between student self-reports and teacher estimates of self-concept. The distinctiveness of the seven subscales was determined through factor analysis and the relative lack of correlation among scales, both in self-reports and teacher estimates. Marsh, Parker, and Smith (1983) studied three diverse samples totalling 958 Grade 5 and 6 students, including the Marsh, Smith, and Barnes (1983) sample, and replicated the findings of the earlier study. Actual academic achievement tended to be uncorrelated with nonacademic self-concept, moderately correlated with academic self-concept, and highly correlated when subject areas were matched (i.e., Math self-concept and Math achievement) (Marsh, Smith, & Barnes, 1983; Marsh, Smith, Barnes, & Butler, 1983). Marsh, et al. (1984) included Grade 2, 3, and 4 children in their sample ($n=658$). Factor analysis revealed that negatively worded items formed a distinct factor among these younger children. In the Grade 2 sample ($n=170$), the correlation between total score on positively worded items and total score on negatively worded items was $-.02$. The authors suggest that reading level or cognitive development might relate to ability to respond accurately to negatively worded items. As the authors suggest, negatively worded items were omitted from the scoring in this study.

Skill Acquisition Measures

To assess improvement in performance as a result of skill acquisition, the Block Design subtest of the WISC (Wechsler, 1949) was

administered once during the pretest period and twice during the posttest period. Raw scores were used. Following the first posttest administration, children in the experimental group were interviewed in a structured format (see Appendix 2) to assess their ability to identify and demonstrate the skills taught in Kiddie QR. The first three items presented situations in which Kiddie QR could be applied. Children were asked what they could do in such situations, and responses were scored as follows: 0 for responses that reflected the child didn't know; 1 for responses which indicate the child knew that QR could be used; 2 for identifying a body friend or strategy which could be applied; 3 for being able to demonstrate the strategy. Three other items were used to gather anecdotal data. A final item cued the children to use QR skills before the second WISC Block Design administration, and was scored on the same basis as the first three items. They were then prompted to use Kiddie QR to enhance their performance on the second posttest administration which followed immediately.

Behavioral Observation Data

The behavioral observation procedure used followed that of Becker, Madsen, Arnold, and Thomas (1967). Their coding system lists nine mutually exclusive, observable behaviors which interfere with classroom learning. An interval recording procedure was used, with a 20-second observation interval followed by a 10-second recording interval. This 30-second cycle was repeated ten times to make up one 5-minute observation session. After this 5-minute observation session, the observer restarted the stopwatch. When two observers were present, stopwatches were resynchronized at the end of a 5-minute session. The scheduling of the observation sessions is described below in the Procedure section.

The principal observer held an undergraduate degree in the social sciences, with several courses in social and behavioral research. After familiarizing herself with the Becker, et al. (1967) schedule, she participated in two sessions in which she and I simultaneously coded the behaviors of the three children selected. Observations were compared at the end of each interval, and questionable instances were clarified and discussed. Following these sessions, I acted as a second observer approximately 30% of the time to provide intermittent reliability checks, the results of which are reported in the next chapter.

Three children from the experimental group, Sheila, Graham, and Kyle (pseudonyms) were selected on the basis of information provided by their teacher. Sheila's parents were undergoing marital difficulties and Sheila displayed frequent fighting, distractibility, and withdrawal. Graham was frequently noncompliant in class, withdrawn, and displayed poor social skills, despite being highly intelligent. Kyle behaved impulsively and was seen by the teacher as highly distractable. The teacher believed that the classroom behavior, or academic achievement, or both, of all three children was impaired by their stressful responses to their particular situations.

Summary

The STAIC, Bodily Cues for Tension and Anxiety, and the SDQ measured changes in state and trait anxiety, self-report of physiological symptoms of stress, and self-concept, respectively. Skill acquisition was assessed through repeated administrations of a performance task, the WISC Block Design, and through an interview and demonstration procedure. Behavioral observation was used with three selected children to evaluate overt behavioral outcomes of the Kiddie QR program.

5

Procedure

Pretest Phase

Pretesting took place in the last two weeks of October. As suggested in the STAIC manual (Spielberger, 1973), the STAIC can be administered in groups of up to 35. Finding nothing to contraindicate this procedure, all pencil and paper measures were group administered. The STAIC was administered at the beginning of the pretest period, followed by Bodily Cues for Tension and Anxiety two days later, and the SDQ during two separate days the following week. Pencil and paper measures were given in the period before recess. At least two, and usually three adults were present to ensure the children understood the items. The control group did not receive the SDQ due to their limited vocabulary, reading level, and ability to discriminate the 5-point Likert scale used in the SDQ. The WISC Block Design was administered over a 2-day period in the pretest phase. Subjects were taken individually to the school medical room which was private, soundproof, well-lit, and of normal room temperature. Baseline behavioral observations were taken during the 2-week pretest phase. They were scheduled for the period following morning recess (Math) on Mondays and Wednesdays. This schedule for observation sessions was held constant for the treatment and posttest phases, and was varied only because of a professional development day falling on a Monday, a statutory holiday falling on a Monday, and a special event at school on a Wednesday.

Treatment Phase

Kiddie QR sessions were held on Mondays and Wednesdays in the period before recess, beginning in the first week of November. The same events which disrupted the schedule of observation sessions also interrupted training sessions. In total, the program spanned 11 school weeks,

interrupted by the Christmas holiday. The first segment following the Christmas holiday contained a review of previous sessions jointly developed by the teacher and me.

Posttest Phase

The posttest phase was identical to the pretest phase except for the WISC Block Design administration. The WISC Block Design was given twice during posttesting, with the interview/demonstration procedure in between in the case of the experimental group. With the control group, an oral reading task of comparable length separated the two administrations.

Summary

Characteristics of the subjects were listed, followed by a description of the Kiddie QR program, and of the steps taken to ensure proper execution of the treatment. The dependent measures, the STAIC, Bodily Cues for Tension and Anxiety, the SDQ, the WISC Block Design and interview procedure, and the Becker, et al. (1967) behavioral observational schedule, were then described. Finally, the overall procedure was given.

The next chapter presents the results of the study.

CHAPTER 4

RESULTS

This chapter discusses the results of this study in terms of the hypotheses stated at the end of Chapter 2. The first section reports on measures administered to both groups, the STAIC, Bodily Cues for Tension and Anxiety, and the WISC Block Design subtest. The second section describes data collected from the experimental group only, the SDQ and the behavioral observation data. Relationships among various dependent measures are discussed, program fidelity data are reported, and anecdotal reports of treatment effects are given.

Between Groups ComparisonsPencil and Paper Measures

Statement of the hypothesis. There will be significant reductions in measures of state anxiety, trait anxiety, and self-report of physiological symptoms of stress as evidenced by comparisons of pre- and posttest scores between children receiving Kiddie QR training, and children not receiving Kiddie QR training.

Data analysis. In the experimental group, two cases were deleted from the data pool for the STAIC A-State scale as outliers. In the case of these two children, their scores on the other two instruments discussed in this section were not as widely aberrant as their STAIC A-State scores. Also, it appeared that the forms had been filled out indiscriminantly with responses at the maximum value for each item. Therefore, it was concluded that these two children's STAIC A-State scores were not reliable. In another case, both the Bodily Cues for Tension and Anxiety and the STAIC A-Trait scales were deleted because the child spoiled his forms. In the control group, four cases were deleted because of absence at some point in the testing. The analyses were performed

with 23 subjects in the experimental group, and 20 children in the control group.

The data were analyzed using a 2×2 (group \times time) multivariate analysis of variance. Means and standard deviations for each cell in the design are found in Table 2. A significant group effect was found for Bodily Cues for Tension and Anxiety and the STAIC A-State scale, and a significant time effect was found for Bodily Cues for Tension and Anxiety and the STAIC A-Trait scale, but no group \times time interaction effects were found for any of three variables (See Tables 3 and 4.). No evidence was found to support this hypothesis.

WISC Block Design Subtest

Statement of the hypothesis. There will be a significant increase in performance in a nonverbal performance task in children receiving Kiddie QR training beyond the practice effect obtained in children not receiving Kiddie QR training.

Data analysis. The data pertaining to this hypothesis were raw scores on the WISC Block Design, which was administered once in the pretest phase, and twice in the posttest phase. One case was deleted from the control group because of absence at the time of post-testing. These data were analyzed using a 2×3 (group \times time) analysis of variance. Cell means and standard deviations appear in Table 5. A significant omnibus F was obtained for a time effect: $F(2,47) = 15.78$, $p < 0.001$, and a significant group effect was also found. Sheffe's post hoc analysis was used to make pairwise comparisons on the time effect, the results of which can be found in Table 6. The experimental group did significantly better than the control group on all three administrations. Neither group improved from Time 1 to Time 2, suggesting that practice effect over this time period was minimal. But, the experimental group

Pretest and Posttest Scores for Bodily Cues for Tension and Anxiety, and the STAIC A-State and A-Trait Scales

Instrument	Time		Marginal
	Pretest	Posttest	
Experimental group (<u>n</u> = 23)			
Bodily Cues for Tension & Anxiety*			
<u>M</u>	23.04	18.04	20.54
<u>SD</u>	10.99	12.37	11.84
STAIC A-STATE**			
<u>M</u>	29.26	27.26	28.26
<u>SD</u>	4.91	4.58	4.80
STAIC A-Trait**			
<u>M</u>	34.70	31.52	33.11
<u>SD</u>	7.53	6.36	7.10
Control group (<u>n</u> = 20)			
Bodily Cues for Tension & Anxiety			
<u>M</u>	12.45	8.70	10.56
<u>SD</u>	3.82	6.91	5.83
STAIC A-State			
<u>M</u>	22.60	23.10	22.85
<u>SD</u>	2.30	3.55	2.97
STAIC A-Trait			
<u>M</u>	36.10	29.35	32.73
<u>SD</u>	6.81	4.85	7.05
Column marginal (<u>n</u> = 43)			
Bodily Cues for Tension & Anxiety			
<u>M</u>	18.17	13.70	
<u>SD</u>	9.92	11.14	
STAIC A-State			
<u>M</u>	26.16	25.33	
<u>SD</u>	5.13	4.60	
STAIC A-Trait			
<u>M</u>	35.35	30.51	
<u>SD</u>	7.15	5.75	

* range: 0 - 64

** range: 20 - 60

Multivariate Tests of Significance for Bodily Cues for Tension
and Anxiety, STAIC-S, and STAIC-T

Effect	F	p <
	df=3, 39	
Group	15.12	.001
Time	12.91	.001
Group x Time	2.44	.079

Table 4

Univariate Tests of Significance

Effect, Variable	MS	F	p <
df = 1,41			
Group			
BCTA	2126.07	14.70	.001
STAIC-S	626.40	25.33	.001
STAIC-T	3.15	0.05	.828
Time			
BCTA	419.77	13.45	.001
STAIC-S	15.07	1.93	.172
STAIC-T	503.07	27.26	.000
Group X Time			
BCTA	8.36	.27	.608
STAIC-S	33.43	4.29	.045
STAIC-T	68.40	3.71	.061

scored significantly better at Time 3, after being cued to use their relaxation skills, than at Time 1, yielding the only significant difference for any two administrations within one group. Differential improvement between the experimental and the control groups suggests the presence of treatment effects. This hypothesis is supported (See Figure 1.).

Within Group Comparisons

Self Description Questionnaire

Statement of the hypothesis. There will be significant increases in social, academic, physical, and general self-concept among children receiving Kiddie QR training.

Data analysis. Two cases were deleted because the respondents had indiscriminately filled in "True" box for each item on the instrument, making suspect the reliability of their responses. The data were analyzed using a one-tailed t -test for related measures. Table 7 contains the pre- and posttest means and standard deviations, and t -values for each of the eight SDQ scales. No significant results were obtained and the hypothesis was not supported.

Case Studies Incorporating Behavioral Observations

Statement of the hypothesis. In children identified as having behavioral problems, there will be a significant improvement following Kiddie QR training.

Units of analysis. Although data were collected for nine discrete behaviors, data were collapsed for ease of analysis and reporting. Frequency counts of a single category, off-task behavior, are reported in this study. Normally, three 5-minute observation sessions were done on each child on each observation day. However, on some days it was possible only to observe the child for two 5-minute sessions. So that

Cell Means and Standard Deviation for the WISC Block Design Subtest

Group	<u>n</u>	Time			Marginal
		1	2	3	
Experimental	26				
<u>M</u>		14.73	17.62	21.27	17.87
<u>SD</u>		9.63	13.29	12.81	12.69
Control	24				
<u>M</u>		9.88	11.79	13.13	11.60
<u>SD</u>		6.71	6.68	8.27	7.28
Column Marginal	50				
<u>M</u>		12.40	14.82	17.36	
<u>SD</u>		8.63	10.94	11.52	

Sheffe Post Hoc Comparisons for the WISC Block, Design SubtestComparison

Group, time	with	Group, Time	Value of <u>S</u> obtained
E,1		E,2	2.27
E,1		E,3	5.16 **
E,2		E,3	2.88
C,1		C,2	1.45
C,1		C,3	2.46
C,2		C,3	1.01
E,1		C,1	3.75 *
E,2		C,2	4.50 **
E,3		C,3	6.29 **
*p < .05		**p < .01	

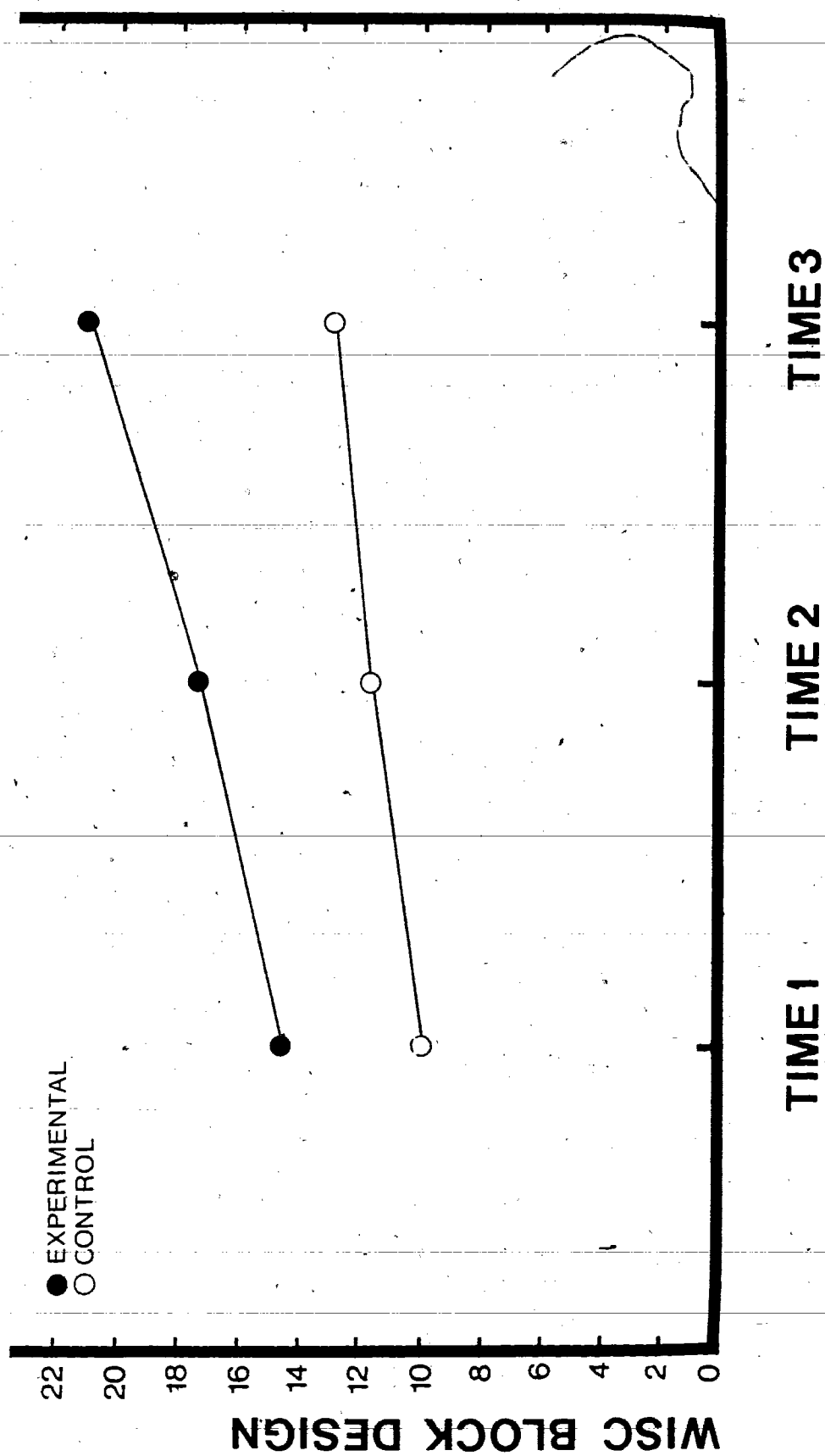


Figure 1. WISC Block Design Scores

Pretest and Posttest Scores for SDQ Scales

Scale	<u>M</u>	<u>SD</u>	<u>t</u>
Physical Appearance			
Pretest	26.58	7.03	
Posttest	25.50	7.33	-0.90
Phys. Abilities			
Pretest	34.43	6.21	
Posttest	29.83	7.64	1.23
Reading			
Pretest	35.54	5.17	
Posttest	34.17	5.75	0.36
Rel. with Parents			
Pretest	34.63	5.96	
Posttest	34.50	6.41	0.36
Rel. with Peers			
Pretest	30.46	8.19	
Posttest	31.83	6.54	-1.33
General			
Pretest	32.83	5.91	
Posttest	32.33	6.14	0.44

Critical value of t for df = 23 for a one-tailed test = -1.74;
no significant results

the frequency of off-task behavior reported here could reflect the child's behavior that day, but not reflect the occasional disparity in observation time, the figures reported are averaged to represent the frequency of off-task behavior for one 5-minute observation session.

Reliability. Using the frequency data which was obtained after the original observations were collapsed into one category, reliability coefficients were calculated for each observation session in which two observers participated. The correlations between one observer's observed frequency of off-task behavior in a series of 20-second observation intervals, and the other observer's observations for the same series of 20-second time periods, were calculated (Gelfand & Hartmann, 1975). The values which were correlated were the observed frequencies of off-task behavior in each 20-second observation interval. Correlations were found to be fairly high, ranging from 0.77 to 1.00. These reliability coefficients are found in Table 8.

Sheila. The general trend of Sheila's graph (Figure 2) indicates no apparent change in the frequency of off-task behavior during the course of treatment. Other dependent measures would seem to bear this conclusion out. Although Sheila's STAIC scores were high at pretest (A-State scale, 34, 75th percentile; A-Trait scale, 42, 88th percentile), downward movement was slight (A-State scale, 31, A-Trait scale, 41), and could well have been due to regression to the mean. Decrease on the Bodily Cues for Tension and Anxiety (44 to 12) did not fit this pattern, but since this instrument is not standardized, the STAIC scores should be given more weight. Moreover, Sheila received a skill acquisition score of zero, indicating little or no skill acquisition. It must be concluded that Kiddie QR training had no effect on Sheila since she did not acquire the skill.

Reliability Coefficients (\underline{r})
for Joint Observation Sessions

Time	\underline{r}		
	Sheila	Graham	Kyle
1	.88	.77	.83
4	.91	.83	.92
6	.78	.85	.90
9	1.00	.92	.89
13	.93	.86	.81
16	.90	.92	.84
19	.89	.91	.96

Graham. Graham's frequency of off-task behavior decreased toward the end of the treatment phase. However, the decreased level of off-task behavior appears not to have stabilized (Note Times 17, 18 and 19).

Graham spoiled his Bodily Cues for Tension and Anxiety and STAIC A-Trait forms, but showed a minimal, probably regression related decrease in the A-State scale (42 to 38), which is the least face-valid instrument for assessing stable treatment gains. Graham's skill acquisition score was zero, not surprising since he seldom paid attention or complied with directions during QR instruction. Although some behavioral improvement was seen, it appears not to be stable. It should be concluded that Graham did not experience any treatment effects.

Kyle. Kyle improved behaviorally toward the end of the treatment phase and those improved levels of behavior appeared to be stable (Note Times 15 to 21). Kyle showed modest improvement on both STAIC scale (32 at pretest, 27 at posttest on the A-Trait, 42 at pretest, 38 at posttest on the A-State), although the latter appears regression-related. Again Bodily Cues for Tension and Anxiety scores are not consistent with the other instruments (17 at pretest, 30 at posttest). Kyle obtained a zero for skill acquisition. Therefore, his stabilized level of improved behavior and lower anxiety levels should be attributed to factors other than treatment. A history effect stemming from the alleviation of a stressor apart from treatment could explain the behavioral improvement. It may be significant that Kyle's improvement took place after the Christmas break, which may have been stressful for him. In any event, it should be concluded that Kyle did not improve as the result of Kiddie QR training.

Chi-Square Analyses

Finding significant treatment effects only with the WISC Block

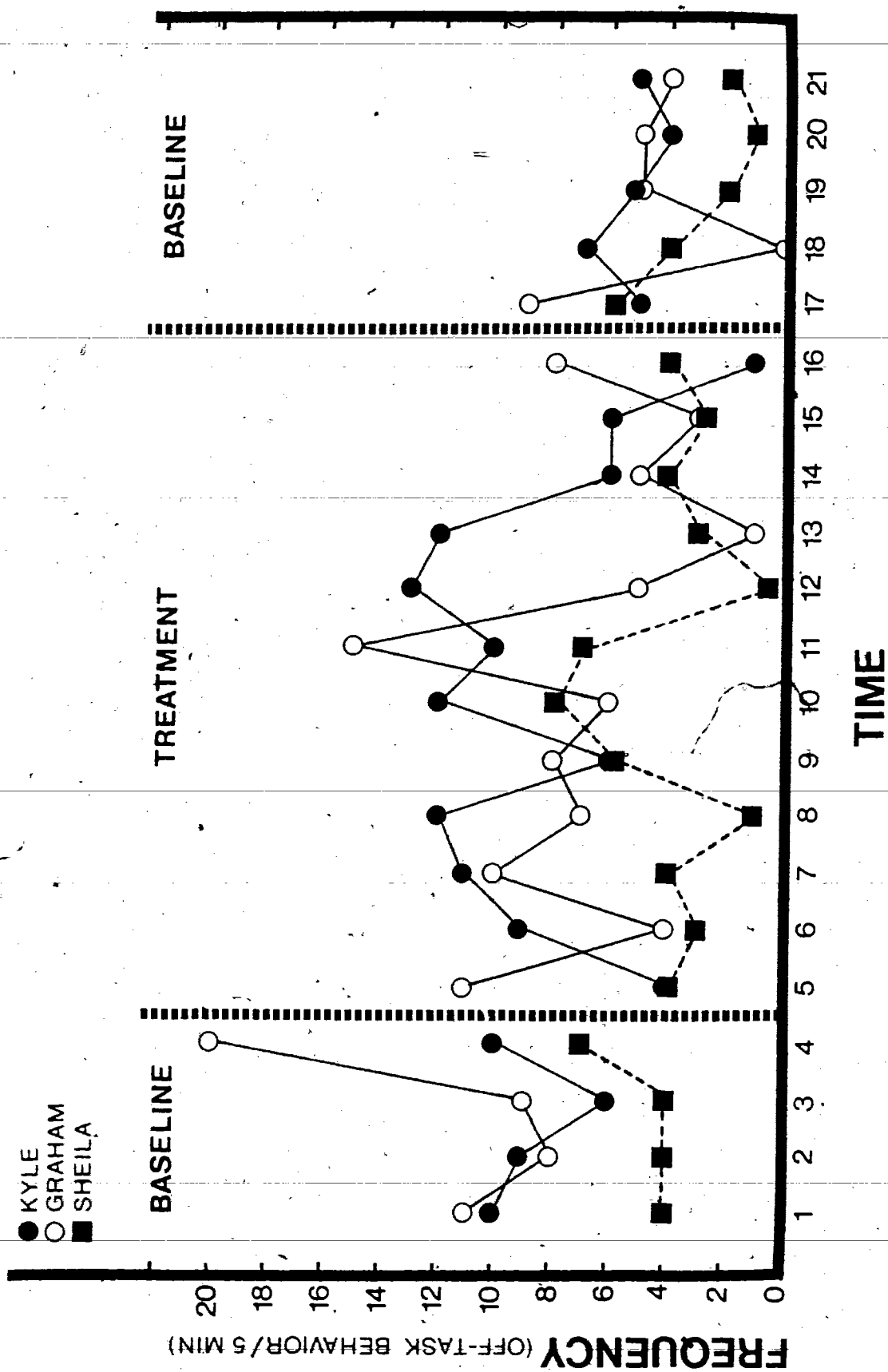


Figure 2. Behavioral Observations

Design, subsequent hypotheses were developed. It was hypothesized that there would be a relationship between the estimate of skill acquisition (see Table 9) and improvement on the WISC Block Design beyond the expected practice effect. Following Spillios and Janzen (1983), it was also hypothesized that a relationship would be found between pretest anxiety measures (STAIC scales and Bodily Cues for Tension and Anxiety) and improvement on the WISC Block Design beyond the expected practice effect. That is, highly anxious children would improve more, as a result of the treatment they had received. WISC Block Design scores from the control group were used to obtain an estimate of practice effect unaffected by exposure to the treatment. The mean increase in WISC Block Design scores for the control group from Time 1 to Time 3 was 3.25. Using this increase as an estimate of the practice effect, the experimental group was divided into two groups: those children who had improved 4 raw score points or more on the WISC Block Design from Time 1 to Time 3, and those who had not. These two groups were cross-tabulated with skill acquisition (high or low, split at the median), and anxiety, as measured by the pretest administrations of the STAIC and Bodily Cues for Tension and Anxiety (high or low, split at the median). These cross-tabulations were analyzed using a chi-square analysis, the results of which can be found in Table 10. No significant results were found, leading to the conclusion that children who appeared to acquire the self-regulation skills would not improve on the WISC Block Design, beyond the expected practice effect, in greater numbers than in an untreated population. Nor was it found that children who were highly anxious at the outset of the study, improved on the WISC Block Design beyond the expected practice effect, in greater numbers than in an untreated population.

Table 9

Skill Acquisition Estimates for Experimental Group following
Kiddie QR Training

ID	Sex	Score	ID	Sex	Score
01	F	3	14	F	4
02	F	3	15	M	6
03	M	3	16	F	3
04	F	0	17	M	0
05	F	6	18	M	12
06	F	6	19	M	2
07	F	4	20	F	3
08	M	0	21	F	0
09	F	0	22	F	3
10	M	0	23	M	9
11	F	6	24	F	9
12	F	3	25	F	4
13	M	0	26	M	5

Table 10

Chi-Square Analyses

		Skill Acquisition	
		High	Low
WISC Block Design Improvement	4	7	9
	4	3	7

$$\chi^2 = 0.08 \text{ (nonsignificant)}$$

Bodily Cues for Tension and Anxiety

		High	Low
WISC Block Design Improvement	4	6	9
	4	6	4

$$\chi^2 = 0.33 \text{ (nonsignificant)}$$

Table 10. (cont'd)

Chi-Square Analyses

		STAIC A-State Scale	
		High	Low
WISC Block Design Improvement	4	9	7
	4	4	6

$$\chi^2 = 0.22 \text{ (nonsignificant)}$$

		STAIC A-Trait Scale	
		High	Low
WISC Block Design Improvement	4	7	9
	4	5	5

$$\chi^2 = 0.33 \text{ (nonsignificant)}$$

Program Fidelity Data

Experimenter Observations

The observations taken while the teacher was instructing Kiddie QR in class indicated that, for each of the seven sessions observed, she followed the objectives and format set out in the instructor's manual. During four of the observed sessions, the teacher implemented additional instructional activities. Following Element 4, "QR & Little Fish," the class printed "temporomandibular joint," the Latin name for the jaw joint, which was introduced in the audiotape presentation. For Element 5, "Magic Breathing Holes," the class drew outlines of their feet, including magic breathing holes, through which deep warm breaths are taken. After Element 8, "Bubble Pipe," the class drew bubble pipes with their problems floating away in the bubbles. Following Element 13, "Rigid Robot," the class printed "dysponesis," which was defined in the audiotape presentation as faulty muscle bracing.

Teacher Self-Observations

As stated in a previous chapter, although it was originally intended that the teacher would make self-observations of her attempts to prompt the children to use their self-regulation skills, she actually recorded anecdotal reports of the children's QR use, not her own behavior. In general, the teacher had the impression that she did not exercise enough effort to get the children to practice their skills.

Anecdotal Reports

A number of children reported using their Kiddie QR body friends outside the instruction sessions. Five children stated that their body friends were used to help them get to sleep at bedtime. Others reported using the skills to calm down when being silly or hyperactive in class, in controlling anger, to settle down following a minor injury, and to

alleviate anxiety associated with a hockey tournament, school work, and being teased on the playground. Most children stated they enjoyed learning about the body friends in class.

Summary

Although significant time effects (Bodily Cues for Tension and Anxiety and STAIC A-Trait) and group effects (Bodily Cues for Tension and Anxiety and STAIC A-Trait) were found for some of the dependent measures, no significant interaction effects were found. There was significant improvement among the experimental group on the WISC Block Design, while there was none for the control group. No pre- to posttest changes were found for any SDQ scales. Behavioral observation with selected children identified no improvement which could be attributed to treatment. Chi-square analyses did not find that those children who appeared to acquire self-regulation skills improved on the WISC Block Design, beyond the expected practice effect, in greater numbers than in an untreated population. Nor was it found that those children who were highly anxious at the outset of the study improved on the WISC Block Design, beyond the expected practice effect, in greater numbers than in an untreated population.

The next chapter discusses the findings, and makes recommendations about the use of the Kiddie QR program.

CHAPTER 5

DISCUSSION

This chapter interprets the results obtained in this study. First, the results are summarized and explained in light of methodological issues and current literature. Factors affecting the instruction of self-regulation skills in this study are discussed, as are assessment procedures. Suggestions for further research are made, and finally, a conclusion regarding the future use of the Kiddie QR program is presented.

Summary of Results

Measures related to stress and anxiety (STAIC A-State and A-Trait scales, and Bodily Cues for Tension and Anxiety) yielded significant group (Bodily Cues for Tension and Anxiety, and STAIC A-State) and time (Bodily Cues for Tension and Anxiety, and STAIC A-Trait) effects, but no group x time interactions were found. On the WISC Block Design subtest no significant increase was found in control group scores, but the experimental group improved significantly. No within group differences were found for the SDQ in the experimental group, and no behavioral changes that could be interpreted as treatment effects took place in the three children selected for observation. No relationships between improvement on the WISC Block Design and skill acquisition, and improvement on the WISC Block Design and pretest anxiety, were found when chi-square analyses were performed.

Interpretation of Results

The overall finding of no significant group x time interaction effect on anxiety and stress measures could, in part, be attributed to floor effects. It should be noted that the STAIC pretest scores were substantially lower than the norms found in the STAIC manual.

(Spielberger, 1973), thus rendering it less likely that improvement could occur. This would be consistent with conclusions by Borkovec and Sides (1979), Richter (1984), and Spillios and Janzen (1983), suggesting that significant improvement in a population of normals is rare.

The significant time effect (Bodily Cues for Tension and Anxiety, and STAIC A-Trait scale) should be attributed to a history effect which applied to both groups. Since the study began early in the school year, one possibility is that distress associated with the start of school and unfamiliarity with new classroom routines could have dissipated as the school year progressed.

On the WISC Block Design, the experimental group scored significantly higher than the control group on all three administrations. Neither group improved significantly from Time 1 to Time 2, suggesting that practice effect over this time period was minimal. The experimental group was cued to practice their QR skills prior to the third administration of the WISC Block Design, and a significant improvement was found for their WISC Block Design scores from Time 1 to Time 3. No corresponding improvement was found for the control group. This differential improvement suggests the presence of treatment effects.

The finding that no relationship exists between skill acquisition and WISC Block Design improvement beyond practice effect, or between pretest anxiety and WISC Block Design improvement beyond practice effect, could be attributed to the low level of skill acquisition (See Table 9). Although a small number of children clearly did acquire the skills taught in the Kiddie QR program, most children scored poorly.

Inherent differences between the treatment and control groups in age, grade level, "school-wiseness," academic and cognitive skills, gender distribution, and other factors threatened this study's internal

validity. These differences resulted in a large group effect in STAIC and Bodily Cues for Tension and Anxiety scores, and could have accounted in part for the differential improvement on the WISC Block Design. Careful selection of research sites which would provide two or more classes matched for age, grade level, and gender distribution might strengthen future research. Random assignment of classes to conditions might then be possible.

Delivery of Instruction

Floor effects have been discussed above as a possible explanation for the lack of group x time interaction. The generally low level of skill acquisition has also been hypothesized as being responsible for the lack of positive results in this study. Since it is clear that children can learn self-regulation skills (see Chapter 2), I now turn to factors affecting the delivery of instruction.

This study incorporated suggestions made in a previous field test (Ragan & Hiebert, in press), that instructional sessions be held on a regularly scheduled basis, and that a teacher who was committed to the validity of teaching stress management skills in the regular classroom be involved in the study. Also, seven continuous observation protocols were taken of the teacher while she was instructing Kiddie QR. These revealed that the stated objectives of each session were reflected in the sessions and accompanying instructional activities.

An attempt was made to promote the teacher's cueing and reinforcement of the children's in vivo use of QR skills by having her self-monitor and record her efforts in this area. She had difficulty carrying out this task, and actually recorded children's anecdotes about their own use of skills. It may be that this task was overly demanding for a classroom teacher with a large class and competing curricular

demands. This lack of data on the teacher's attempts to cue and reinforce skill use, and the children's practice of the skills is unfortunate, given the importance of adult encouragement in children's acquisition of self-regulation skills (Day & Sadek, 1982; Loffredo, et al., 1984; Lupin, et al., 1976; Porter & Omizo, 1984). In view of the large group setting and short time frame of the Kiddie QR program, substantial cueing and reinforcement is probably needed to bring about skill acquisition and generalization of learning. On the other hand, the constant cueing and reinforcement which is probably needed may be an overly burdensome task, which even the most skilled and committed teacher could not execute. The teacher in this study was committed to the validity of teaching stress management skills in the classroom, but felt herself that she did not do enough to promote the children's skill use. Further research should address the extent to which teachers can prompt children to generalize their self-regulation skills, the extent to which teachers actually do so, and the effect on skill acquisition and outcome.

A number of strategies could be utilized to encourage transfer and maintenance. Instruction in natural settings (e.g., playground, school bus, hallway) can promote generalization (Walker, 1979), as can teaching in a setting that is similar to that in which the skill is to be used (Goldstein, 1981). The use of props is useful to enhance the similarity of the teaching setting to the natural setting (Buckley & Walker, 1978).

Increasing instruction time has been found to facilitate learning in a number of subject areas (Wang, 1979), including relaxation skills (Borkovec & Sides, 1979). It is well to keep in mind that the training in this study constituted, at most, 45 minutes to one hour out of the 25 hours of instruction in any given school week. Overlearning the skills to be used, through repeated practice in a variety of settings

(Goldstein, 1981), and systematic withdrawal and review of the skills (Buckley & Walker, 1978) would be productive uses of the limited available time. Repeating the program would no doubt improve learning and performance, although the extensive competition of other curricular demands may not allow for this.

Assessment Procedures

Ragan and Hiebert (in press) have suggested that the use of self-report measures of anxiety may not be appropriate for field tests of preventive stress management interventions, since these instruments may not be sensitive to the anxiety or stress levels found in normal populations. In future studies, longitudinal follow-up could be used to determine preventive effects, possibly combined with repeated administrations of the training procedure (e.g., Cowen, et al., 1973). In the case of this study, it is unlikely that follow-up assessment would yield measureable effect since relaxation skills were not acquired by the majority of children.

Continued use of performance tasks in studies of this nature is useful, especially in school settings, since programs such as Kiddie QR have to be justified on the basis of potential improvement in academic performance. Future research might attempt to explain the mechanism(s) through which this improvement in task performance occurs.

Observation of analogue demonstrations has been found to be a valid indicator of skill acquisition following skill training interventions, especially in the area of social competence (Arkowitz, 1981; Eisler, 1976). A structured interview and demonstration task similar to the one used in this study should be used to assess the "when-to" component of the skills taught in the Kiddie QR program, although efforts to validate empirically such an assessment procedure are needed. Physiological

measures have been used successfully with young children in at least one instance (Zaichovsky & Zaichovsky, 1984), and should be used in further studies to assess the "how-to" component of relaxation skills.

Behavioral observation, to ascertain whether any overt behavioral outcomes occur as a result of training, ought to be continued. Pretest anxiety measures ought to be used to prescreen children who are presumed to be in need of such training.

The extent to which children practice the techniques taught could be observed simultaneous to teachers' attempts to cue and reinforce children's skill use. Teacher self-observation, which was attempted in this study, could be augmented by independent observation. Observation of randomly selected children during instruction could be used to determine the extent of the children's participation in the program.

Summary and Conclusion

The results of this study were reviewed, and then explained in light of methodological features. Factors affecting instruction were also used to explain some of the results, and it was recommended that future studies address the extent to which teachers can and do prompt children to make use of their self-regulation skills, and the effect of increasing instructional time. The assessment procedures used in this study were examined. Longitudinal research to determine preventive effects, continued use of performance tasks, supplementing analogue observation of skill acquisition with physiological measures, and increased use of observation to assess children's participation in the program, were suggested.

The results of this study do not strongly suggest that Kiddie QR and similar programs ought to be adopted immediately and universally. Although such programs may seem logically appropriate, the empirical

evidence of their effectiveness is still not conclusive. Approaches which utilize intensive instruction on a small group basis have been empirically validated, but it may be that the intensive effort required to impart self-regulation skills to a large group may be too onerous for a regular classroom teacher, with all the regular curricular demands, to undertake. Given unlimited time and resources, Kiddie QR can certainly be effective. However, before the use of Kiddie QR can be recommended on a wholesale basis, further research is required, not to evaluate its effectiveness, but the practicality of having a regular classroom teacher implement it.

APPENDIX 1

Teacher's Log Sheet

Child's name _____ date _____ time _____

What indications were there that the child was upset? (verbal, behavioral, physical) _____

What happened earlier (either immediately preceding or earlier in the day) to trigger the child's upset or anxiety? Did you see the event that triggered the upset, or was it related to you by the child, or someone else?

What direction did you give the child re: QR use? _____

What did the child do in response to your direction? _____

APPENDIX 2

Interview for QR Use

I am going to tell you about three situations. I'd like you to listen to what I'm going to say, and tell me what you would do if these things happened to you.

1. You are talking to a friend. An argument starts, and you are getting angry. You feel like hitting your friend. You don't hit him or her, but you really want to. Your friend goes away, but you are still angry. You notice that you have made two tight fists, and you still feel like fighting someone. What could you do?
2. You've been outside at recess playing. When you come back you're still excited and you're out of breath. But (teacher's name) wants the class to calm down and get ready to work. What could you do?
3. At bedtime you are trying to sleep. But you can't because you have had a busy day playing, and you're still excited. You keep thinking about all the fun you had, and it feels like your body is still running and jumping around. Your neck and shoulder muscles are tight, too. What could you do?
4. I know that you are not learning about QR in your class any more. I wonder if you have had any of the body friends help you in the last week? (If yes...) Tell me what happened, which body friend you used, and how you felt after.
5. Do you have a special practice time when you do QR? (If yes...) When?
6. Is there anything else that you'd like to tell me about QR?
7. Sometimes doing a test or a puzzle like this (The WISC Block Design subtest was administered previous to the interview, and is being administered again immediately following the interview.) makes people nervous or scared. Were you nervous today when you were doing this test

for me? (If yes...) Before I ask you to work with the blocks again, maybe you'd like to ask one of the body friends to help you to not be nervous. Take as much time as you want, and let me know when you are ready to work with the blocks again. (After demonstrating the skill...) Which body friend did you use?

(If the child claimed not to have been nervous...) Before I ask you to work with the blocks again, maybe you'd like to ask one of your body friends to help you to get ready to do a good job. Take as much time....(as above)

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