

THE FAILURE-DISABLED STUDENT
THREE STUDIES OF THE STUDENT AT-RISK FOR
SCHOOL FAILURE AND A SUGGESTED REMEDIAL MODEL

by



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Abstract

The effect of prolonged school failure on young adolescents was assessed by examining the intellectual, cognitive and affective competence of three samples of sixth and seventh graders.

In the first study, 263 students selected by their teachers as being At-Risk for future failure were found to be of normal intelligence, but significantly less academically able, more anxious and less confident than 54 of their most able classmates. In the second study, another sample of 51 such At-Risk students were also demonstrably less able, more anxious, and less confident than 51 of their normal classmates, and, used fewer adaptive coping strategies. Approximately thirty percent of the seventh graders in this study also showed debilitated performance under test-like conditions.

The efficacy of training stress-vulnerable students to use more adaptive stress-reduction strategies was also assessed in this investigation. In Study I, a Coping Skill training program was designed and taught to sixteen of the At-Risk students who subsequently showed an increase in social problem solving ability and a trend towards heightened self-concept when compared with two control groups. In the third study, two such skill-building programs, one using a structured format and the other encouraging the development of idiosyncrastic coping strategies, were taught to twenty-four test-vulnerable students. Subsequent to training, the students showed a significant increase in the number and quality of their coping sets and strategies, heightened cognitive vigilance, and a trend towards improved grades and a heightened resistance to test-stress.

The results of this investigation are considered to substantiate both the debilitating effects of prolonged failure in school and the efficacy of Coping Skill training to ameliorate these effects.

L'ETUDIANT HANDICAPE PAR LES ECHECS:
TROIS ETUDES DE L'ETUDIANT AYANT UN RISQUE D'ECHEC
SCOLAIRE EVENTUEL, ET UN MODELE DE CORRECTIF SUGGERE

Renée Stevens

Résumé

L'échec scolaire prolongé chez un groupe de jeunes adolescents fut évalué en examinant le potentiel intellectuel, cognitif et affectif chez trois échantillons d'étudiants de sixième et septième année.

Dans la première étude, 263 étudiants détectés par leurs professeurs comme pouvant avoir éventuellement des échecs furent estimés d'intelligence normale mais académiquement nettement inférieurs, plus anxieux et moins confiants que 54 de leurs plus habiles confrères de classe.

Dans la deuxième étude, un autre échantillon de 51 étudiants ayant ce même risque d'échec, étaient aussi moins capables, plus anxieux et moins confiants que 51 de leurs confrères de classe normaux et, qui plus est, utilisaient moins de mécanismes d'intégration.

Environ 30% des enfants de septième année du groupe étudié ne pouvaient résoudre un nombre égal de problèmes mathématiques lorsqu'ils croyaient passer un test que lorsqu'ils étaient dans des conditions plus détendues.

La tentative d'habituer les étudiants sujets au Stress d'utiliser des mécanismes plus efficaces de réduction du stress a aussi été étudiée dans ce travail.

Dans la première étude, un programme d'aptitude à l'intégration a été formulé et enseigné à seize des étudiants ayant un risque d'échec, qui, par après, ont fait preuve d'une capacité supérieure de résolution de problèmes et une tendance vers une plus grande estimation de soi, lorsqu'ils furent comparés avec deux groupes témoin. Dans la troisième étude, deux programmes pour le développement d'habilités, l'un, présentant un format structuré, et l'autre encourageant le développement idiosyncratique de mécanismes d'intégration furent enseignés à 24 étudiants

susceptibles au stress en condition de test. A la suite de la formation, les étudiants, ont démontré une augmentation significative dans le nombre et la qualité de leurs mécanismes et techniques d'intégration et une plus grande surveillance cognitive. Ils ont aussi fait preuve d'une tendance vers de meilleurs notes et une meilleure résistance aux conditions de stress d'un test.

Les résultats de cette recherche viennent confirmer d'une part les effets négatifs d'échecs scolaires prolongés et d'autre part l'efficacité d'un programme de techniques d'intégration afin d'améliorer ces effets.

PREFACE

Both the background and the format of this study require some explanation.

At the McGill-Montreal Children's Hospital Learning Centre, where I am a psychologist, we have often been puzzled by the pervasiveness of school failure. We have watched severely learning-disabled students develop new and better strategies for learning and begin to learn successfully. But not infrequently these now successful learners continued to fail in school. Even when careful diagnosis and intensive remediation has been articulated in cooperation with effective teachers in good schools, it has sometimes been extremely difficult to transfer skills learned in a clinical setting from that setting to the school. And it has been even more difficult, in these instances, to transfer the attending success. This investigation has been a search for ways to solve that puzzle and to facilitate that transfer.

This investigation has been conducted, and is herein presented, as three separate but connected studies. This has necessitated some repetition of introductory and procedural material and references. References for each of the studies appear at the end of that study; references for the general Introduction and the summary Discussion sections appear at the end of the dissertation.

Several of the findings in these studies are submitted as contributions to original knowledge. First, the predictive validity of teachers' judgements, made by a simple rating, are confirmed not only by standard measures of academic competence, but, for

the first time for this population, by measures of intellectual, affective and cognitive competence and by subsequent school performance.

As well, this study establishes the parameters of functioning that differentiate the young adolescent who is At-Risk for school failure from his normal classmates. One important way in which these populations differ, which has not previously been demonstrated, is in their ability to deal with normal school stress.

Finally, the use of Coping Skill training as a therapeutic adjunct to a remedial academic program for young adolescent students has not previously been reported. Nor has the comparative use of two types of coping skill training for this population, one highly structured, and one designed to stimulate idiosyncratic coping strategies.

Because of the manuscript format of this presentation, the Faculty of Graduate Studies and Research of McGill University requires that the full text of Section #7, of Guidelines Concerning Thesis Preparation be included in this preface, and this, accordingly, follows:

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This study has been completed only with the competent and diligent assistance of many, and this brief acknowledgement cannot adequately reflect my profound appreciation.

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THE FAILURE-DISABLED STUDENT:
THREE STUDIES OF THE STUDENT AT-RISK FOR SCHOOL FAILURE
AND A SUGGESTED REMEDIAL MODEL

INTRODUCTION

The problem of the intelligent child who fails to learn in school is a modern one. Although there have always been individuals whose academic ability did not match familial norms and expectations, it was not until universal education became the goal of contemporary egalitarian western politics - before 1800 in Scotland and the United States, since 1850 in Germany and Britain, and much more recently in France and Canada - that this perplexing student became a school problem.

Before universal public education, able students remained in school and poor scholars left to follow other pursuits, often with successful and satisfying results. When this simple equation was made simplistic by changing societal aspirations and needs, it was supplanted by the doctrine of public responsibility for the education of all children.

Although cautionary queries may have been raised about this doctrine of universal public education on political, economic and even pedagogical grounds, until recently, its humanitarian basis has been considered unassailable. But if everyone is permitted to go to school, then everyone is expected to attend, profit and succeed. Against a background of such opportunity and expectations, what happens to the child who fails to learn in school?

The notion that when everyone goes to school, some will find the experience unrewarding, and others even destructive, (Illich, 1970; Postman and Weingartner, 1969) has espoused some

intriguing educational counter-philosophies, but as yet little data. What is accumulating, however, is increasing evidence of the debilitating effect of prolonged failure. The effects of failure on future learning (Seligman, 1975; Hiroto, 1974; Dweck, 1975) self concept (Ames, Metraux and Walker, 1971; Black, 1975) and affective integrity (Wolff, 1969; Kliman, 1968) have all been demonstrated. It seems unnecessarily utopian and inhumane to await the millenium of school reform before addressing the current problem of school failure. Whether or not the unsuccessful student fails to pass into the next grade, or is "socially" promoted merely to continue to face a new set of school tasks at which he will fail, the same potential problem remains: he begins each school day without the probability or anticipation of much success.

Why any given child becomes a school failure is by no means well understood. Although intelligence (Vernon, 1969; U.S. Dept. H.E.W., 1970; Jensen, 1973) and socio-economic level (Ausubel, 1966; Montague, 1964; Webster, 1966) are reasonably good predictors of school success and failure in the general school population, they are much less reliable as clinical predictors (Sattler, 1974). There have always been children with below normal scores on standard intellectual measures, from below level homes, who nevertheless learn well in school (Farrell, Derevensky, Coates, Hymovitch, Stoloff and Zlotowski, 1977; Farrell and Derevensky, 1978) and there are still intelligent children without debilitating personal or social problems who fail

to learn, or who, as they progress through school find their daily failures outweighing any success that even enlightened and effective pedagogy can provide. As these students grow older and enter puberty, they have this stress to add to the other developmental stresses normally encountered by adolescents in our society.

It seems appropriate to examine this population of failing students and the effects of that failure on their developing intellect and personality. Can any generalization be drawn about which children fail to learn in school? What happens to the student whose early school years have been largely unsuccessful? How can this at-risk population be identified? Can children who begin school as disabled learners ever become successful school learners? These are the questions to which this study is addressed.

ETIOLOGY AND DEFINITION

Background

The study of school-related failure to learn has centered largely, in the past thirty years, in the field of learning disabilities. The otherwise healthy child who fails to learn in school has captured the attention of investigators from increasingly disparate disciplines including ophthalmology (Rosner, 1970, 1975; Getman, 1961), audiology (Johnson and Myklebust, 1967), biochemistry, genetics and pharmacology (Steg and Rapoport, 1975; Finegold, 1975), clinical and experimental psychology (Hunt, 1961; Pihl and Parks, 1977), and neurology and neuropsychology (Strauss and Lehtinen, 1947; DeHirsch, 1960; Doehring, 1968; Rourke and Orr, 1977). These investigators have studied the effects of visual and auditory disfunction, cultural and experiential deprivation, genetic and neurological markers and predispositions, food and drug reactions, and even the presence of trace elements in the hair in an effort to define and understand this problem. Some of these investigations have contributed detailed suggestions about how such a child should be taught and cared for. The earliest of their formulations led Samuel Kirk to label him "The Disabled Learner" (Kirk and Bateman, 1962), the first of many attempts to define what has previously often been misdiagnosed, and therefore mistreated, as an intellectual deficit, an emotional disturbance or a motivational problem.

The impact of these multi-disciplinary views is now felt throughout the public schools of this continent and beyond. But

even in the most enlightened and effective school systems, although modifying traditional teaching methods and programs often impressively increases his school learning in the early grades (Karnes, 1970; Gray & Klaus, 1965; De Lacey, Nurcombe, Taylor and Moffatt, 1973), these academic gains fail to be maintained as he proceeds through the upper elementary grades and enters high school.

In fact, follow-up studies of remedial programs in schools have always shown disappointing results. James B. Conant, in his 1958 survey of American high schools found that for "...the ten or fifteen percent of the students reading at the fourth, fifth or sixth grade level, in the opinion of the teacher involved, it is very difficult even with the best of instruction to raise the reading level of these students more than two grades" (Conant, 1959). Curr and Gurlay (1953) studied 128 Birmingham reading-retarded eight year olds and found no significant gains on follow-up for the experimental group who received a six month intensive program of reading-coaching and motivational support. Collins (1961) found significant increase in reading performance immediately after treatment for an experimental group of twenty-four students with an equal number of carefully matched controls, but two years later, no significant difference remained in reading ability between the groups. He concludes "the effects of remedial education were not permanent". Similar findings were obtained by Lovell (1962) who actually found a slight decline in 'mean reading quotient' in his two year follow-up of 258 children

who had shown impressive reading gains immediately after treatment.

It might be argued that the remedial programs described in these earlier studies were too general and non-specific. Little or no mention is made of the child as a learner. Would better results have been obtained if more had been known about the disabled learner? Would more precise definitions of learning disabilities have increased the effectiveness of remedial programs for these children?

Towards an Operational Definition of the Disabled Learner

Recently renewed interest in the problem of defining learning disabilities has come from two sources. First, as the domain of the special educator, the educational psychologist, the remedial reading specialist, the behavioral therapist, and the language consultant began to overlap, it became necessary to look for equivalence of meanings between concepts and labels like, "off-track behavior", "skill deficit", "visual memory deficit", "word analysis ability" and "specific language disability" so that all the experts at work in the school could converse in some, common language about the children upon whom they were plying their crafts. Lerner (1975) discusses some of the diversities and commonalities of definition as conceptualized by the remedial reading consultant who focuses on the reading lack, and the special educator whose focus is the learner. Although some of her assumptions are so overgeneral as to be inaccurate (Senf, 1975;

Kirk, 1975) the point she makes is a good one: the definition of the problem often depends on who's doing the defining.

The second source of renewed interest is political. Governmental interest in the education of the handicapped, encouraged by recent court decisions requiring access to the "least restrictive" education for all children, has sent both legislators and special educators back to their drawing boards for more precise definitions.

Theories of Perceptual and Linguistic Disfunction

Before 1960, investigations into the problems of these children centered upon their inability to learn to read. As early as 1896, Morgan spoke of "word blindness" (Morgan, 1896). Hinshelwood (1911, 1917) described two cases of "word blindness" in school children and suggested a congenital deficit in visual processing, originating in the angular gyrus, as the probable cause. Hinshelwood emphasized the need for accurate diagnosis and treatment to distinguish this condition from mental retardation "to ensure the patience and perseverance ... important to success." Orton (1928) coined the term "dyslexia" and later (Orton, 1937, 1943) summarized his theories of reading disability as the result of a developmental lag in the establishment of cortical hemispheric dominance which interfered with visual processing.

Studies based on this model have shown contradictory results. Eames (1932) studied 114 dyslexics and 143 normals and reported more problems in ocular coordination within the dyslexic group.

However, Fendrick (1935) found no difference between sixty-four "good" and sixty-four "poor" readers. Witty and Kopel (1936) reported that eighteen percent of the "poor" readers in a large school population lacked visual fusion, but twenty percent of the "good" readers also demonstrated this lack. Nichols (1960) found no relationship between refractive errors or ocular coordination and dyslexia, and concluded that ocular defects might contribute to but could not initiate dyslexia. Brod and Hamilton (1973) assessed the disruptive effect of lack of binocular vision on reading in 162 good and poor reading fifth grade students. Each child was asked to read a passage three times: once with a distorting lens in the left eye, once with right eye functioning distorted, and once undistorted. Both good and poor readers did less well without binocular vision.

About 1960, observers on this field began to consider other behavioral deficits in the learning disabled child. They noted that children who have trouble learning to read often cannot catch a ball, tie their shoes, distinguish left from right or skip in sequence (Kephardt, 1960; Barsch, 1967, Frostig, 1963).

The child's ability to use visual information and to visually direct his own movements came under study. DeHirsch (1954) noted the depressed performance of reading disabled children on the Bender Gestalt test, a measure of ability to recognize, remember, and reproduce patterns, as evidence of visual-motor dysfunction in this population. Frostig, Lefever and Whittsley (1962) found disabilities in visual perception were associated

with school learning problems.

Proponents of this model often pointed to the significant discrepancy between scores on the verbal and performance subtests of the Weschler Intelligence Scale for Children protocols of these children, in favor of the verbal scores (Coleman and Rosoff, 1963) as further evidence that the learning disabled child was perceptually impaired and had defective knowledge of space.

However, many learning disabled students are superb athletes and skilled artists. Some of these, in fact, show the reverse discrepancy in Weschler Intelligence Scale for Children performance - significantly depressed verbal scores (Rourke, 1975). Other investigators noted this "high performance-low verbal" subgroup displayed imprecision in discriminating and difficulty in remembering auditory input. Myklebust (1964), citing the impact of auditory defects on visual development, suggested that faulty integration of sensory processes prevented school learning. Belmont and Birch (1964) found depressed intersensory integration associated with reading problems. Satz, Rardin and Ross (1971) found that older learning disabled children showed significantly lower performance on dichotic listening tests than did normal controls. The descriptive diagnosis of "specific language disability" was suggested by Gillingham (1965). The atypical language development of this population of learning disabled children has been described by Golick (1977) who found that despite normal intelligence they lack vocabulary, syntactical structures,

flexibility and fluency and that all their language-associated learning is impaired.

Other correlates of learning problems came under scrutiny. Differences between younger and older disabled learners were examined in the Satz, Rardin and Ross (1977) study. They found that younger (aged 7-8) learning disabled children performed less well than normal controls on measures of visual-motor processing. Older (aged 11-12) learning disabled children did not show this difference, but did less well on measures of language skills. They concluded that "developmental dyslexia" reflects a maturational lag in central nervous system functioning which delays the acquisition of skills at each developmental level.

Theories of Neurological Disfunction

Interest in the relationship between learning problems and brain function was renewed by Straus' formulation of impaired cerebral functioning in children (Straus and Lehtinen, 1947). This work was based on the similarity of symptoms observed in learning disabled children to those of brain injured victims in World War I (Goldstein, 1942). Definitions of learning disability began increasingly to include references to abnormal brain and central nervous system functioning. Cruickshank (1961) used Straus and Lehtinen's work as a basis for his investigations of optimal learning settings and teaching methods. He defined these children as "hyperactive underachievers .. (with a) ... lack of that cortical control which permits prolonged attention to the

task and negative adaptation to the unessential". Boshes and Myklebust (1964) spoke of "psychoneurological" learning disorders, emphasizing that these were psychological concomitants of presumed neurological deficits.

Myklebust and his colleagues (Myklebust, 1965; 1967; Johnson and Myklebust, 1967), cited some evidence from individual case studies of faulty alpha wave blocking in learning disabled children to account for deficits in selective attention and problem-solving ability. But except for this scanty evidence, the data offered to substantiate the postulated link between centrally mediated intersensory deficits and learning problems was largely behavioral evidence.

Nevertheless, the neurological disfunction model has been a powerful one, and it began to appear with increasing frequency in the formulations of the pedagogical theorists concerned with providing an appropriate education for these children (Bateman, 1964; 1965a, 1965b; Kirk and Bateman, 1962; Ashlock and Stevens, 1966). This view is summarized in Bateman's (1965a) definition of the child with a specific learning disability as: a) having a significant discrepancy between intellectual potential and actual level of performance; and b) showing a disorder in learning processes which may or may not be accompanied by demonstrable central nervous system disfunction, but which are not secondary to mental retardation, educational or cultural deprivation or sensory loss.

Clements (1966), author of an authoritative study by a

panel convened by the National Institute of Neurological Diseases and Blindness, suggested the term "Minimal Brain Dysfunction" which he defined as "learning or behavioral disabilities, ranging from mild to severe, which are associated with deviations of functioning of the central nervous system".

But while direct evidence for a neurological basis of learning disability is lacking, some studies have begun to supply indirect evidence for this model.

E. Ray John and his associates, working in the Brain Research Laboratories at the New York University Medical Center, have developed techniques for computerized summation of electroencephalogram responses and sensory-evoked potential responses which permit them to explore cognitive processes hitherto accessible only on a behavioral level (John, Karmel, Corning, Easton, Brown, Ahn, John, Harmony, Prichep, Toro, Gerson, Bartlett, Thatcher, Kaye, Valdes and Schwartz, 1977). This study of fifty-seven learning disabled and 118 normal children, aged 7.8 to 10.4, who were tested on a forty-seven item battery of sensory and perceptual tasks, showed significant differences in brain wave patterns between the groups. Their data suggests that these differences are related to the sensory, novelty and memory requirements of the tasks used. An elegant design and intriguing data lead these authors to hypothesize that memory, expectancy, cognitive matching, and even hypothesis-testing produce differences in brain wave shape that correspond to the region of the brain being engaged. The data in this study suggests that these processes

function differently in young learning disabled and normal children.

Although still highly experimental and inferential, this work suggests several potentially powerful statistical, mathematical and technological avenues for addressing the complex problems of brain function in the disabled learner. For example, micro-electrode studies of brain functioning in cats trained to respond to different frequencies of light flicker (Ramos, Schwartz and Johns, 1976) showed the presence of two different levels of cells in the cortex and thalamus: "stable" firing cells, which appeared to respond to the physical stimulus, and "plastic" firing cells, which show varying response patterns depending upon what had been learned, or the "meaning" attributed to the input. Such precise data on the relationship between learning and brain function suggests a possible mechanism for linking central disfunction and learning deficit.

And further evidence of the similarity between the performance of some learning-disabled children and brain-damaged adults comes from a study by Doebling (1968). As part of a larger neuropsychological investigation of retarded readers, two experts -- neuro-psychologists experienced in the differential diagnosis of adult cerebral disfunction on the basis of test performance -- made blind evaluations of the test protocols of thirty-nine retarded readers and thirty-nine normal children, aged 10-14. These judges rated a significantly larger proportion of the disabled readers as having 'minimal' or 'definite' central

disfunctioning on the basis of their test performance.

Owen, Adams, Forrest, Stalz and Fisher (1971) found that a group of seventy-six educationally handicapped children given a comprehensive classical neurological battery of tests, performed less well than matched controls on tasks requiring rapid sequential movements. But only three of the seventy-six showed definite signs of damage to the central nervous system; and electroencephalogram studies on a sub-sample of these children "did not prove to be significantly associated with the degree of learning problem". These authors did find increased incidence of performance deficit amongst normal siblings of the sample, and increased history of family learning problems, as compared to controls.

Rourke and his colleagues, working at the University of Windsor (Rourke, 1975, 1976a, 1976b; Rourke and Finlayson, 1975, 1978; Rourke and Orr, 1977), have been interested in the ways cerebral disfunction may be related to hemispheric impairment, and the subsequent effect of such presumed impairment on learning. Results they report from a recent investigation of forty-five elementary school children show reading and spelling problems in the children who are at grade level in arithmetic are associated with depressed scores on the Weschler Intelligence Scale for Children verbal sub-tests and other measures of verbal ability, "as would be expected if they had relatively disfunctional left hemispheres". Children with arithmetic-learning problems but without problems in reading showed the opposite profile: depressed Weschler Intelligence Scale for Children

performance scores and lower scores on tests of spatial knowledge, "as if they had relatively dysfunctional right hemispheres" (Rourke and Finlayson, 1978).

Learning Disabilities as Hyperactivity

In the late 1960's the "hyperkinetic" syndrome also attracted interest, spurred by the rise in interest in pharmacological treatment of behavioral and learning problems. This term, defining the population of children with problems of control of their own behavior and attention without frank neurological abnormalities, has often been used interchangeably in the literature with "learning disability" (Finegold, 1975; Meichenbaum, 1975). Estimates of the number of hyperactive children who are also learning disabled have run as high "almost 100%" (Ambrosini and DelFonte, 1973). However, Douglas (1972, 1979) warns of the need to distinguish these two groups of children, and Safer and Allen (1976), in their review of studies of hyperactive children, estimate that only about one third of these children also have a learning impairment.

Kinsbourne (1975) makes the distinction between learning problems due to distractability, and those which reflect defective cognitive functioning, notably problems in sequencing, which he relates to inadequate hemispheric integration. Douglas and Peters (1979) suggest that learning disability and hyperactivity in children are both constitutional vulnerabilities, but that they differ in the primary deficits they predispose. In their

model, a learning disability sets the stage for increased vulnerability to intrusion during task performance and, thus, to increased experience of failure and subsequent failure-avoidance. Secondary to this cycle are the problems of concentration and attention and depressed development of higher cognitive processes. Conversely, they view hyperactive children as having a primary difficulty in maintaining attention and control which leads to secondary deficits in higher level cognition and to increased failure-avoidance experience.

Predicting School Learning Disabilities

Attempts to refine the definitions of learning disabilities have centered, since the late 1960's, on a search for measures by which these children may be selected from the greater school population. DeHirsch, Jansky and Langford (1966) found that the way a kindergarten child holds his pencil, and the number of words he uses in retelling a story were the best predictors of whether or not he would have a reading problem three years later. Doebling (1968) explored the ways reading and non-reading variables are related in retarded readers and in normals. A large battery of neuropsychological tests was administered to thirty-nine disabled readers and thirty-nine controls matched for Performance I.Q. and educational background. Separate factorial analysis of each group's test results showed that, although a reading-spelling factor and visual-perceptual factor emerged for each group, the reading and spelling achievement of poor readers is highly

constrained by their visual-perceptual speed, while in good readers reading ability is associated with vocabulary and other verbal abilities. Four measures, two of oral ability and two of visual competence, emerged from a multiple regression analysis as the best composite discriminator between the groups.

In a later study (Doehring and Hosko, 1977), two additional groups of problem learners were assessed using a battery of thirty-one reading tests. Factorial analysis of these test results by the Q-technique, which groups children by their test score patterns, defined several sub-types of reading problems: a slow oral word reading group, a slow auditory-visual letter association group, a group who were slow in auditory-visual association of word and syllables, and some children who were slow at visual matching.

Similar findings are reported by Rourke and Orr (1977) who found reading and spelling achievement for twenty-three normal and nineteen retarded readers, aged eleven and twelve, was most accurately predicted by the visual discrimination "Underlining Test", adapted from the Doehring study (1968), given to the children four years before.

Learning Disability as Attentional Deficit

Other investigations have examined the role of attention in learning, and some even suggest that a learning disabled child can be defined as a child who "manifests a disorder of selective attention" (Ross, 1976). Some evidence for this view came from

a study of the performance of two groups of learning disabled children, each with matched controls, on a battery of performance and physiological measures (Dykman, Ackerman, Clements and Peters, 1971). Factorial analysis of the results yielded a primary "focus of attention" factor which differentiated between the disabled children and their controls. Developmental differences between younger and older learning disabled children were also found which these investigators related to "neurological immaturity", due to faulty reticular functioning. They proposed that learning disabled children be considered to be children with an "attentional deficit syndrome". Rourke and Czudner (1972) produced similar results, using a reaction time task. Pelham and Ross (1977) in a study of central and incidental attention in seventy-four learning disabled boys in Grades One, Three and Five, found that selective attention is established two to four years later in poor readers than in good readers. Ross (1976) goes even farther in his review of studies of the performance of learning disabled children to conclude that all of these findings might be more parsimoniously accounted for as deficits or lags in selective attention, with or without an accompanying lag in perceptual functioning.

Definitions of Learning Disabilities: A Summary

Several considerations arise from a review of these attempts to define learning disabilities, and the often contradictory studies which test the discriminative power of these

definitions.

The question of commonality or homogeneity is a basic one. Myklebust (1967) has suggested that any definition of learning disability should use criteria that "makes for the greatest homogeneity", since "it is the major handicap that has the greatest impact on the child." His aim was to provide an unequivocal basis for selecting such children for special class placement where their special learning needs might be met. But the sorry history of such segregated instruction attests, at least, to the difficulty, and the confounding variables, in such an endeavor. Certainly an operational definition must clearly specify the criteria by which class inclusion can be determined. However, at this stage of our knowledge, using only criteria which are common to all learning disabled children would exclude some definitions which appear to distinguish some significant portion of that population. In the studies reviewed, all that was commonly established for the children investigated was their intellectual capacity to learn in school and their lag in academic learning.

Secondly, the presumption of brain dysfunction in the definition of learning disability, except for the early inconclusive correlational data, and the intriguing but as yet unreplicated speculations of Johns and his co-workers (Johns, et al, op cit), has not been established by independent neurological evidence. Dependent measures such as Weschler Intelligence Scale for Children verbal I.Q. scores, which are known to be affected by school learning, the variable being measured, cannot be considered a

a strong basis from which to infer underlying neurological mechanisms. The symptom-matching studies are also highly suggestive but still only speculative.

Finally, as Ross (1976) and Dykman, Ackerman, Clements and Peters (1971) have pointed out, the discrimination tasks widely used in these studies all rely on vigilance and short-term memory and a good case can be made for these attentional variables accounting for many of the results reported.

Until more refined measures and further research provide more evidence, we can only conclude:

- 1) that children who fail to learn in school sometimes show concomitant deficits or lags in visual and auditory discrimination, memory, and sequencing, and in the integration of information from these modalities.

- 2) that younger children with learning problems often show deficits or lags in visual processing and spatial knowledge, while older disabled children tend to show language processing deficits.

- 3) that children who do more poorly at reading and spelling do less well on measures of verbal ability; those who are poor in arithmetic do less well on measures of spatial knowledge.

- 4) that some of the above might be accounted for as a deficit or developmental lag in language and cognition associated with early academic lags.

- 5) that some or all of the above might be accounted for as differences in selective attention.

- 6) that some or all of the above might be explainable in

terms of presumed underlying cerebral dysfunction.

The Learning Disability Model and Remedial Programs:
Outcome Studies

Although still inconclusive, these definitions of the disabled learner add much to our appreciation of the school learning problems facing him. It would not be unreasonable to expect that by using these definitions, and their underlying models, as a basis for planning remedial interventions in schools, the poor track record of remedial programs demonstrated in the early studies cited might be improved.

A few studies do show improvement in school learning due to programs of visual-motor training. Painter (1966) found improvement after a sensory-motor training program with kindergarten children. Meikle and Kilpatrick (1971) demonstrated improvement on reading measures, as well as in motor and tactual performance, for nine ten year old retarded readers after a remedial reading program. An untreated matched control group showed no such improvement.

However, others fail to show improvement with training. Robbins (1966), O'Donnell (1969) and Anderson (1972) all failed to find significant reading improvement over untrained controls for learning disabled children after intensive treatment with highly structured programs designed to improve motor and visual functioning.

Silverberg (1973) taught four groups of grade three children by four reading methods - a visual, a kinesthetic, an

auditory, and a multi sensorial method; all remedial methods improved the children's reading level significantly by the end of the teaching year, but by the middle of the next school year "much (sic) of these gains had washed out". He concludes that "research had indicated that remedial reading fails to raise the average reading level of its recipients over the long term". A 1974 review of thirty-eight studies designed to improve children's ability to understand and use language to help themselves think and learn, i.e. their psycholinguistic ability, showed no significant results due to training in discrete linguistic-skill acquisition (Hamill and Larsen, 1974). Fifty-eight disabled readers, age ten to eighteen, assessed three to five years after clinical remedial help were found still to be considerably retarded in their reading: (Gottzman, Belmont and Komener, 1975). These authors suggest that "... our goals for these children are often unrealistically high"... Meuhl and Forell (1973) found similar results with forty-three high school students re-examined five years after being treated at the University of Iowa reading clinic. This sample was still averaging three years below grade level in reading. Pihl (1975) concludes from his review of these follow-up studies that "children diagnosed as poor readers, in spite of special remediation, remain poor readers."

Generally speaking, one must conclude that the myriad investigations into the causes of school learning problems, and the definitions of these problems they have spawned, have not yet contributed in any significant way toward increasing the success

of school-based remedial intervention programs.

We might be forced to agree with Gottsman's gloomy prediction and conclude that it is hopeless to aim for a successful school experience for the learning disabled student, were it not for clinical evidence that has accumulated over the past few years of severely disabled students who have become successful learners.

A three year follow-up study of thirty-six graduates of the McGill-Montreal Children's Hospital Adolescent Learning Clinic (1973), showed twenty of the thirty-six formerly failing students to be successful in high school three to thirty-six months later. Similar findings are reported by Maston (1974) as a result of a team intervention program. Maslow's (1979) follow-up study of over one hundred young adults who had been diagnosed as learning disabled and treated at the Marianne Frosteg Centre as children showed that sixty-six percent had completed high school and over twenty percent of these had continued on into post-secondary institutions. Similar success is reported in a retrospective ten year study of disabled learners treated in a Houston remedial centre (Johnson, 1979). While treatment effects cannot be said to be substantiated by these uncontrolled studies, the subsequent academic success of these disabled learners certainly is established.

What then accounts for the generally poor findings in the earlier reports cited? More importantly, how can the gains demonstrated in case by case clinical interventions be translated into

school based strategies to increase and prolong the effectiveness of remedial programs in school?

THE EFFECTS OF FAILURE

To understand how an unsuccessful student learns in school, and to develop a remedial program to help him learn better, it is necessary to consider not only his cognitive and academic deficits, but also how his history of school failure may have affected him.

The definitions of learning disability reviewed herein presume a deviance from the normal developmental model. They note, and purport to explain, how some children fail to acquire the visual, auditory, linguistic and cognitive precursors of successful school learning. Whether caused by insult or defect, and considered a deficit, or caused by maturational interference and considered a lag, anything that interferes with normal development can serve to restrict the quantity and complexity of a child's early experiences and set the stage for a later lag or disability. Whether neurological, genetic, or environmental in origin, the resultant problem, for each child, lies in his inability to deal with the learning task at hand.

As this child progresses through school, even if he is lucky enough to receive special instruction planned with his level of readiness and special needs in mind, he will find difficult and time-consuming what his classmates find easy to learn and remember. And if his school provides less than this optimal learning setting, he may fail to learn to read or spell or write at all. He will come to question his own ability. Even if his parents and school are enlightened enough to reassure him of

his worth and competence despite his learning problems, as he progresses through school he is continually under the threat of having to deal with a task at which he will probably fail. This history of failure then becomes a potential source of additional deficit.

No one who has dealt with learning disabled adolescents can fail to see some of the effects of this failure history. When we treat the school learning problems of a seven or eight year old we are often tackling most of the things that are distressing him and his parents. But it is rare to find an adolescent who has lived with school failure for five or six years who is neither sad nor angry, and who still feels competent and confident.

The link between failure and depressed affect has been demonstrated in analog studies of depression. Depressive mood can be induced in normal college students by a brief experience of task failure (Wener & Rehm, 1975; Wright, 1977). Other major theories of depression emphasize the role of a low rate of reinforcement, or success, in initiating and maintaining depressed affect (Lewinsohn, Weinstein and Shaw, 1969). Ferster (1973) noted that the combination of a lack of skill in 'reading' environmental cues, and low frequency of success lead to the extinction of previously observed behaviors, and if these behaviors were essential to adequate functioning, to depression. This model is one plausible explanation for the disabled learner who stops asking questions, and even stops completing assignments in

class, and about whom the teacher complains: "he doesn't even try!".

Several investigations have demonstrated a link between behavior, affect and learning disabilities. Coleman and Sandhu (1967) found 96% of a group of 364 children referred to a university clinic for learning problems were "moderately to severely maladjusted". Barr and McDowell (1972) found learning disabled students showed more behavior problems than matched controls. Studies using projective techniques of personality assessment in this population report depressed self-image and problems in interpersonal relationships (Sarvis, 1965; Gerber, 1973; Stavrianos and Landsman, 1969). A recent study comparing the self-concept of retarded readers with that of their successful classmates showed the unsuccessful learners had significantly depressed self-images (Black, 1975). Failing high school students, their parents and their teachers often report that they have deep feelings of inadequacy and anxiety which keep them from normal contact with their peers (Spivak, Platt and Shure, 1975). And the less practice these adolescents get in spontaneous daily social exchange, the less able they become as compared to their classmates. Too often they end up as the class clown, or socially isolated, or clinging to a group of other unsuccessful adolescents. Current investigations into the links between learning disabilities and juvenile delinquency tend to confirm this (Berman & Seegal, 1976). Thirty of forty-four learning disabled adolescents referred to the 1978 Adolescent Summer Program at the McGill-Montreal

Children's Hospital Learning Centre were described as having social or behavioral problems (unpublished case records McGill-Montreal Children's Hospital Learning Centre, 1978). What begins as a school learning problem becomes a 'social' learning problem.

These affective and behavioral correlates of school failure are serious problems for the disabled learner, but even more potentially debilitating are the effects of failure on his subsequent thinking and learning.

Failure and Subsequent Learning

As we watch these disabled learners begin to achieve with one-to-one clinical teaching we see that it is not only in their ability to read and spell and do arithmetic that they differ from their successful classmates. They also differ in the way they approach new learning and the way they approach a problem-solving situation. One is reminded of Harlow's (1949) notion of "learning to learn", generated from watching the adolescent monkeys he trained on a series of discrimination tasks gain in specific problem-solving ability as their training progressed. The adolescents observed at the Learning Centre seem to lack not only basic school learning skills, but also the skills of learning. They have not yet learned to look for generalizations, to search for the information they need to fill in gaps, or even to expect things to make sense. They often stop looking for the answer at the first sign of difficulty, dropping out of the search before they could be expected to succeed.

Some of these poor learning strategies may be explained by examining the studies on the effect of failure over subsequent performance. Although there is an extensive literature from many sources on the performance-related effects of previous success and failure, the results reported are often contradictory.

For example, the effects of using praise and blame on children in school are reviewed in a study of fifty years of research by Kennedy and Willcott (1964). They found that while praise was generally facilitating and blame generally debilitating there were notable exceptions. Praised underachievers did more poorly. Bright adolescents did better after blame. These investigators concluded that both praise and blame facilitated and debilitated performance, and the major source of these "confused" results was differences in "individual reinforcement history."

Even exhortations to do better or "try harder" affects children differently (Miller, Brickman & Balen, 1975). A group of fifth grade students encouraged to "try harder" did less well on keeping their classroom tidy than a matched class who were merely labelled as "neat". Similar results were obtained in comparing second grade maths classes. The authors conclude that in a group setting, persuasion implies a negative self-concept and, thus, is interpreted by some of the children as failure feedback.

A recent study by Brickman, Linsinmeier and McCareins (1976) illustrates some of the problems involved in predicting the effects of failure on subsequent learning. These investigators

found that whether or not failing on a task debilitated subsequent performance depended both on how much the student expected to fail and how relevant to the subsequent learning task he judged his own failure to be. After an initial training period, forty-eight high school students were given success feedback and forty-eight others were given failure feedback on a practice series of symbol discrimination tasks. The training period had been used to set half of the students in each group to view the practice items as "relevant", or predictive of subsequent test items, and the other half to view them as unlike or "irrelevant" to the subsequent test items. An additional manipulation was also performed. Within the "relevant" group, half the students were trained to expect success, and half trained to expect failure. The same manipulation was performed within the irrelevant group. Thus, one group of students expected success and thought their training relevant; a second group expected success, although their training was irrelevant; a third expected failure and thought their training relevant, and a fourth group expected failure and thought their training irrelevant. All ninety-six students were then given twenty additional symbol discrimination tasks. Both success and failure facilitated performance on the subsequent tasks, but under very different conditions. Those trained to expect success and task relevance and then given success feedback did best of all; those trained to expect success and task relevance and then given failure feedback did significantly poorer. However, those trained to expect success, but set

to consider their training "irrelevant", did better after failure. The investigators concluded that this group, discounting this irrelevant training, took their failure as a signal to try harder. Thus for success-expectant children, both success and failure can facilitate subsequent performance, depending upon how predictive they consider that success or failure to be.

The scores of the failure-expectant children were very different. For them, success actually debilitated performance particularly after a 'relevant' set. And this effect was more pronounced in the later trials, so it actually increased over time. The investigators suggest that the students trained to expect to do poorly found success 'dissonant' and, thus, debilitating. They suggest that children high in ability, analagous to their success-expectant group, have an advantage over those with low ability, because they "treat failure as irrelevant and success as relevant to their future performances".

The child whose school experience has left him with a low expectancy of success actually learns less from both his successes and his failures. He cannot rely on either to be predictive of, or to guide, his future learning.

These findings on the interactional effect of high expectancy, predictive value of feedback, and the experience of success and failure offer some explanation for previous contradictory findings on the effects of success and failure over performance. They suggest that expectancy of success or failure, or the individual learning history, plays a crucial role in the effect of failure on any given child.

Some clues to the precise mechanism of this interaction come from another group of studies which suggest that the relationship between failure and performance is a function of how much control one feels over one's own performance.

Failure and the Perception of Control

The relationship between failure to control one's own reinforcers, and persistence in the wake of failure was investigated by Martin Seligman and his students (Seligman, 1975; Seligman and Maier, 1967; Seligman, Maier and Geer, 1968). Working initially with animals, these investigators found that dogs previously exposed to a series of inescapable electric shocks, failed to try to avoid further instances of shock, even when it became escapable. They appeared to "give up", become passive and "accepting" of punishment. These investigators labelled this condition "learned helplessness" and described it as a learned independence of response and reinforcement. They postulated that the learner comes to feel powerless to control either his rewards or his punishments.

Learned helplessness in humans has been examined in a study of undergraduates subjected to unavoidable and excessive or "white" noise (Hiroto and Seligman, 1975). Trained to feel "helpless" on an instrumental task, these students failed to escape escapable aversive noise on a subsequent cognitive task, demonstrating the generalization of helplessness training. A subsequent study by Benson and Kennedy (1976) replicated this effect

of uncontrollable failure in producing learned helplessness in man.

The disabled learner, whose efforts to learn have gone largely unrewarded by increased skill, good grades or even right answers seems a good candidate for this 'helpless' state. He would not expect to increase his success rate by trying harder. Often he fails all year but is 'promoted' anyway by sympathetic teachers who don't want him to "feel out of place". So he comes to feel that neither his successes nor his failures are the result of his own efforts, but due to factors beyond his control. Learning disabled adolescents do appear to feel themselves as externally controlled. Hallohan, Gojar, Cohen and Tarver (1978) found twenty-eight learning disabled high school students were significantly lower on the internal scale of both school-specific and general locus of control measures than a matched group of normals. Of course the direction of this link remains to be established but the commonality of failure experiences amongst learning disabled students -- the only common factor to the heterogeneous group, except, perhaps, for Ross' suggested selective attention (Ross, 1976) -- suggests that it is this failure history that leaves the student feeling out of control.

Another group of studies have examined more precisely this effect of perceived control on success or failure in school. Crandall (1965) investigated how responsible children feel for their own success and failure in school with her Intellectual Achievement Responsibility scale. Extending the work of early

investigations of locus of control (Rotter, 1966; Rotter, Liverant and Crowne, 1961), she designed her scale to measure how much children feel their own school success and failure to be determined by what their teachers do, or the difficulty of their work -- i.e., beyond their control -- and how much they feel their performance to be the result of their own efforts.

Dweck and Reppucci(1973) used Crandall's Intellectual Achievement Responsibility scale in a study of the efforts of failure on subsequent performance of forty fifth graders. They found that following failure, many children failed to solve previously solvable block design problems, and that this failure-depressed effect was significantly greater for the children with low Intellectual Achievement Responsibility scores, or those who felt least responsible for their own performance. Their findings suggest that persistence after failure (even after a few minutes of failure with an unknown teacher) is quickly attenuated, in children who have learned to attribute their performance to factors beyond their own control. These authors consider that these failure-impaired children remain less persistent and more "helpless" after failure because they attribute their own failures to luck or ability rather than to their own efforts.

Dweck (1975) taught a group of these "helpless" students to change this attribution, i.e. to consider their own failure as a signal that they needed to "try harder!" She demonstrated that after such re-attribution training, failure actually facilitated subsequent performance for a group of "helpless" children,

while continuing to depress performance on matched controls. Andrews and Debus (1978) confirmed the effectiveness of such attribution retraining on a sample of forty-two sixth grade boys and found persistence of these re-training effects in a four month follow-up.

Additional data on the interrelationship between the experience of failure, perceived control of reinforcement, responsibility for success and failure, and subsequent learning comes from two recent studies of problem-solving in children (Diener and Dweck, 1978). One hundred fifth grade students were assigned to either a "mastery-oriented" or a "helpless" group, depending upon whether or not they had scores above or below the median on the Intellectual Achievement Responsibility scale. In the first study, seventy of these children, thirty-five in each group, were trained in a discrimination task and the strategies they employed to perform the task immediately after a failure trial were noted. Then the remaining thirty were trained and tested the same way, and asked to verbalize "what they were thinking" as they performed the task subsequent to failure. Although the persistent and helpless children learned the tasks with equal ease during the training period, in the subsequent post-'failure' testing, helpless children used inefficient hypotheses significantly more often than mastery-oriented children. Furthermore, while the hypothesis testing strategies of the mastery-oriented children improved after failure, the hypotheses testing strategies of the helpless students deteriorated, and this difference between the groups was

highly significant.

The two groups also differ in the context of their verbalizations following failure. Helpless children made significantly more attribution-related statements, while mastery-oriented children verbalized more task-relevant statements and more self-monitoring. Persistent children verbalized more positive statements after failure ("I love a challenge") while two-thirds of the helpless children verbalized negative feelings ("This is no fun anymore!"). The authors conclude that helpless children, unlike persistent children, "ruminate about the causes of their failure and, given their attribution to uncontrollable factors, spend little time searching for ways to overcome failure (p.460)"

Effective thinking requires the ability to generate and use problem-solving strategies, a willingness to risk and try, the ability to scan and monitor with persistence and precision, and the confidence to persevere in the search for information. The studies cited suggest that this is precisely the combination of set and skill that a failure-expectant, "helpless" child does not have.

In summary, these findings about the effect of failure over subsequent performance suggest:

1. Whether failure improves or debilitates performance depends upon one's previous learning history. When a student has learned to expect success and has come to feel that his success is linked to his own efforts, and thus, under his control, failure appears to act as a signal to exert more effort. His failure

facilitates subsequent performance. However, when a student has learned that failure is more likely for him, and that increased effort does not increase his success, he comes to feel less responsible for his own performance and "helpless" to control whether or not he fails. For him, failure becomes debilitating to subsequent performance.

2. A student with a prolonged history of failure becomes expectant of further failure, and perceives his failure as both relevant and beyond his control. After failing, he cannot duplicate even a previously successful performance. For him, success also may debilitate subsequent performance, probably because it is dissonant with his own predicted failure.

3. Older disabled learned who have prolonged histories of school failure can be expected to suffer from these failure-related performance effects and to be further disabled for subsequent learning. When the pervasive concomitants of failing are considered, the overwhelming lack of success of remedial programs for disabled school learners, as reviewed in the studies cited, becomes more plausible. In even the most carefully monitored programs, although academic and cognitive skills increased, school performance did not. If, as this data on failure-expectant learners suggests, the disabled student's performance deteriorates after each failure, his on-task attention and persistence decrease, and his problem-solving strategies do not develop appropriately, then despite academic remediation, he will remain At-Risk for further school failure.

The Role of Anxiety in Failure-Debilitated Performance

One obvious criticism of this behavioral model of failure over performance is that no adequate mechanism is suggested. Every individual's learning history includes much failure and, also, much success. How does a given amount of failure come to signal a need for increased effort in some and resigned acceptance of subsequent failure in others?

To answer this question, we must consider the way failure expectant children learn to deal with the anxiety which their failure induces. Anxiety, the hypothetical construct which describes the affective responses to stress, has been conceptualized in several, often conflicting models. Four of these models of anxiety suggest potential explanations for the effect of stress on school performance and, therefore, invite a brief review. They are: Freud's view of anxiety as debilitating loss, the drive and arousal theories of anxiety, the trait-state model, and the model of anxiety as organismic vulnerability, or neurosis.

Anxiety as Debilitating Loss

Freud saw anxiety as arising from the unexpressed hostility of the child faced with real or imagined loss of parental love and approval (Freud, 1936). Sarason (Sarason, Davidson, Knight-hill, Waite and Ruebush, 1960) based his exhaustive exploration of the causes of anxiety in elementary school children on this model. He saw the anxious child as unduly threatened by failure or any potentially evaluating situation, and dealing defensively

with his own unexpressable anger against evaluating parents and parent-surrogates, or teachers. Many studies confirm this debilitating effect of anxiety on school performance from elementary school through university. I. Sarason (1963) found a significant negative correlation between test anxiety and academic achievement for 738 college freshmen, as measured by high school grade point averages, college entrance scores, and measures of general anxiety. Lunneborg (1964) found similar negative correlations between anxiety and reading and arithmetic achievement for 213 upper elementary school students, and this effect increased with each grade level. Gaudry and Bradshaw (1970) studied seventh and eighth-grade children in Australia and replicated these results, finding higher negative correlations between anxiety and performance with more test-like situations. McCandless and Castenada (1956) found measures of anxiety increased the validity of I.Q. scores for predicting school achievement in sixth graders. Lipman (1960) found a high negative correlation between scores on the Children's Manifest Anxiety Scale (Castenada, McCandless and Palermo, 1956) and concept formation. Callaghan (1957) found highly anxious children did less well on the Weschler Intelligence Scale for Children digit span sub-test. Cowen, Zax, Klein, Izzo and Trast (1965), Bluhm (1965) and Prem (1978) all confirmed this relationship between anxiety and depressed performance.

But, other studies failed to find this effect. Keller (1964) found no significant relationship between achievement and anxiety in a junior high school sample, Sarnoff, Sarason, Lighthall and

Davidson (1959) found none in eleven year olds in Britain, and Knight (1964) found "low, insignificant correlations" between achievement and anxiety in a sample of seventh graders.

Some studies found this effect in girls only. Walter (1964) found anxiety and grades were significantly correlated for girls only, although both boys and girls in his sample showed a significant relationship between I.Q. and anxiety. Gjesme (1972) also found a sex related difference in anxiety and performance. Girls are generally found to be more anxious than boys in these studies, (Phillips, 1966; Dunn, 1968) which this model of anxiety would suggest implies that performing in school seems more threatening to them.

Anxiety and Drive

By contrast to the analytical view, is the suggestion that anxiety is a hypothetical construct which "adds nothing to our understanding of behavior" (Duffy, 1941). Here anxiety is viewed as the affective concomitant of 'drive' or need, dispelled, in classical Hullian terms, when drive-induced behavior returns the organism to homeostasis. Spence (1956) developed a theory of anxiety as drive. He postulated that anxiety would facilitate performance for simpler tasks and debilitate performance on more complex tasks.

The Manifest Anxiety Scale (Taylor, 1953) and the subsequent children's form, Children's Manifest Anxiety Scale, 1956) were based on Spence's drive-reduction model of anxiety. Studies by

these investigators and their colleagues, using these measures, demonstrated the interactive effort of task complexity and high levels of anxiety. Montague (1953) and Farber and Spence (1953) found highly anxious (HA) subjects performed better than those with low anxiety (LA) on simple tasks, but worse than LA subjects on more complex tasks.

Alpert and Haber (1960) constructed the Anxiety Achievement Scale with two scales: one to measure facilitating anxiety and the other to measure debilitating anxiety. Validating their work in a study of anxiety in college freshmen (Alpert & Haber, 1960), they found specific anxiety scales (i.e. those that made this facilitative-debilitative distinction), were better predictors of school achievement than were general scales such as the Manifest Anxiety Scale (Taylor, 1953). Lunneborg (1964, op cit) found both specific and general scales were negatively correlated with reading and arithmetic performance for upper level elementary school children, but correlations obtained using specific measures were higher. Alpert and Haber conclude that anxiety is a general personality correlate, acting to improve performance in some students and reduce it in others.

Intelligence and the Drive Theory of Anxiety

Spielberger (1966) elaborated this theory to suggest that since task-difficulty would depend, in part, on the intelligence of the learner, anxiety would become facilitative for the more intelligent learners. Several studies of the anxiety by

intelligence interaction confirm this. Gaudry and Fitzgerald (1971) found that in a sample of Grade Seven Australian boys, high anxiety was associated with high exam marks for the twenty percent most intelligent children only. For the rest of the class low anxiety was associated with high marks. Feldhuesen and Klausmeier (1962) found that anxiety differentially affected students with high, average or low I.Q.'s. I. Sarason (1963) confirmed this effect on eleventh and twelfth grade high school students and found the correlations higher in girls. Messer (1970) found that the relationship differed in impulsive and reflective children and concluded that "the effect of anxiety over intelligence was one antecedent of the reflective cognitive disposition."

However, other studies of this relationship between intelligence and facilitating anxiety give less clear results. Kerrick (1956) found the opposite effect in a study of I.Q. and discrimination in 400 high school students. She found anxiety debilitated performance for the more intelligent and facilitated it for the less intelligent children and concluded that anxiety makes intelligent children less discriminating and helps less intelligent children make finer, less polar discriminations. In another study, mean grade point averages for a group of college freshmen were examined considering students with low ability, average and high ability separately. In each group, high anxiety was correlated with lower grade point averages. However, in a second study by these investigators of upperclassmen, anxiety and higher grades were associated for the most intelligent group (Spielberger and

Weitz, 1964). Ruebush (1960) found that anxiety debilitated performance in the most intelligent group of 208 sixth grade boys, but facilitated the performance of all the others on a task where the children were permitted to 'recheck' the questions as often as they wanted to. He concluded that anxious children were more 'cautious'.

Other studies suggest other considerations that might influence this relationship. Odier (1956) found more use of 'magical' rather than logical thinking in highly anxious children and suggested that cognition was 'affectively' debilitated. And a study of Weschler Intelligence Scale for Children performance in fifty-seven elementary school children showed that low in anxiety children tested by a highly anxious examiner performed better than low in anxiety children tested by a non-anxious examiner (Eglund, 1967).

Other investigators have noted the effect of socio-economic level on the anxiety-intelligence relationship. Walter, Denzler and Sarason (1964, op cit) found the significant negative correlation between intelligence and anxiety he had reported for tenth grade middle class boys did not appear in a second study of boys' from lower socio-economic backgrounds. Hallworth (1961) and Veroff (1969) both found children from lower socio-economic backgrounds, who are known to score lower on I.Q. measures, were more anxious about school.

Anxiety and Arousal

The variously facilitating and debilitating effects of anxiety are, perhaps, better explained by re-examining the concept of anxiety. Like Duffy (1941, 1962), Lindsley (1951) was suspicious of the usefulness of the construct, anxiety, and suggested that the concept of arousal or activation had "more explanatory power and was less confusing." Hebb's work (1955, 1958), sustained by physiological investigations into the functioning of the Reticular Activation System (Malmo, 1950, 1959), recast the earlier drive reduction theories. He described the optimal level of arousal or readiness to learn and perform as the intermediate state between the unawakened or unaware state on the one hand, and the hyperactive or anxious state on the other. The relation between performance and arousal-anxiety so described came to be known as the Yerkes-Dobson Law.

By placing attention and anxiety on the same continuum, this model postulates a mechanism by which Sarason's 'threat' and Spence's 'drive' can be understood to interact, with the resultant differential effect on attention and performance. The stress of failure would, then, be expected to debilitate performance only when it was perceived as a "threat", i.e. when a lack of available adaptive responses allowed arousal to proceed to the level of anxiety.

The arousal theory implies that those children with 'medium' levels of anxiety in any group would be the top performers. Some studies bear this out. When ninety-six school boys were

categorized by anxiety scale scores into low, medium and high anxiety groups, and their grades inspected. Three quarters of the medium anxiety group were found to have grades in the top half of the class, compared to only one-half of those in the low anxiety group, and one-third of the highly anxious (Cox, 1960). However, other findings did not confirm this. Gaudry (1967) found that students in both low anxiety and high anxiety groups learned a simple paired associate task faster than those with medium anxiety. On a more difficult verbal learning task, Trapp and Kausler (1960) found that highly anxious students performed best and those in the medium anxiety group the worst.

The Trait-State Distinction

Spielberger and his associates (Spielberger and Gorsuch, 1966; Gaudry and Spielberger, 1971) have suggested an elaboration of the earlier definitions of anxiety. As well as individual differences in anxiety-proneness, which can be considered to be more or less stable 'traits', these investigators point out that at any given moment an individual may react with a fluctuating 'state' of anxiety. A-trait is compared to potential energy, and A-state to the specific reaction evoked by a particular stress at a particular time. Of course, an individual high in A-trait would be expected to exhibit more frequent A-state elevations. But the stress level of any situation only affects the individual insofar as it is perceived as a threat. This model suggests that by cognitive reappraisal, over-learning or any "defense mechanism",

the threat perceived by individual differences in A-trait may be modified, and A-state reduced. So, the way in which any individual reacts to any stress including the experience of failure, will be the result of the interaction between the level of that stress, his own proneness to anxiety or A-trait, and the adaptive processes he has learned to minimize threat and deal with stress. In effect, the State-Trait model interjects an organismic modifier to Sarason's notion of anxiety as threat. This theory is something akin to Freud's "signal anxiety" (Freud, 1959). The State-Trait Anxiety Inventory (Spielberger and Gorsuch, 1966) was developed to measure this distinction.

In confirmation of this formulation, Hodges and Spielberger (1969) report a study of 72 undergraduates, who had been selected because they scored in the upper and lower quartiles on the Manifest Anxiety Scale (a measurement of A-trait). Half of the students in each group were assigned to a stress condition and given failure feedback; the other half were given success feedback. Stress debilitated performance for all students, and this was equally true for highly anxious and those low anxiety students, as measured by the trait measure. However when A-state levels were measured and compared, low A-state was significantly linked to higher test performance for students in both stressed and non-stressed conditions. More than half of the students with high Manifest Anxiety Scale scores responded with elevated A-state in unstressed condition, and almost half of the low Manifest Anxiety Scale scoring students showed elevated A-state subsequent to failure. This suggests that threat increases anxiety for everyone,

but anxious people perceive threat more readily.

Other studies have also demonstrated the way in which differences in the perception of threat operate to evoke anxiety. Spielberger and Smith (1966) found that under conditions of low stress, the performance of highly anxious and non-anxious undergraduates was indistinguishable on a simple verbal learning task. But on a re-test in which the students were led to believe their intelligence was being evaluated, high anxiety debilitated performance in early trials but facilitated it in later trials. The authors suggest that the stress produced ego threat evoked higher levels of A-state in the more anxious students and presumable, high levels of drive.

A well designed study by Verma (1976) demonstrated the interactive effects of threat, anxiety and intelligence on performance. The performance of 252 ninth grade Indian students on a paired associate learning task was studied under both low and high reinforcement conditions. Praise reduced the debilitating effect of high anxiety, especially for the more intelligent children. And for all the children, a combination of intelligence and praise (or loss of threat) reduced the effect of high anxiety. Sinclair (1969) studied 173 twelfth grade boys and found those with low A-trait scores performed significantly better on a test under stressed conditions, but on a re-test where students were permitted to use memory supports, anxiety level was not associated with performance. Sieber and Kameya (1967) also found memory supports reduced the debilitating effect of anxiety in highly anxious

children. Young and Brown (1973) found differences in performance on I.Q. tests given under stressed and relaxed conditions among 264 elementary school children. Highly anxious children, particularly boys, appear to respond as if threatened under both stressed and relaxed conditions.

Unlike other theories of anxiety which focus on situation-engendered stress, the state-trait distinction implies that it is the subjective perception of threat that determines A-state level, intensity and duration. This element of cognitive appraisal links this theory to those of the cognitive behavioral therapists (Ellis, 1971; Mahoney, 1974; Kazden, 1973) who suggest that one's reactions are not in response to an event, but to one's perception and beliefs about that event. One of the main assumptions of the state-trait formulation is: "stressful situations that are encountered frequently may cause an individual to develop coping responses, or psychological defence mechanisms which reduce A-state by minimizing the threat." (Gaudry & Spielberger, 1971, p. 69). Any means by which an individual learns to reduce this threat can be considered 'adaptive'. But resourceful children who adapt to their own school-related anxiety by trying harder and learning more will perform very differently in school than children with less intellectual ability, or with learning problems, or poorly integrated egos who have fewer behavioral options available to reduce their anxiety. Monday morning sickness, clowning, disruptive behavior and 'maintaining a low profile' have all been used successfully by perceptive students to reduce the

threat of potentially stressful school situations.

The cognitive appraisal component of the state-trait formulation has important implications for modifying the maladaptive effects of failure on failure-expectant or anxious children. Follow-up studies of anxiety-reduction treatments based on cognitive restructuring, a treatment which teaches people how to make adaptive re-appraisals of stressful situations, show favorable results. Sarason (1973), Meichenbaum (1971, 1972, 1974), Goldfried, Linehan and Smith (1978) all report reduction of anxiety by cognitive restructuring. Linden (1973) reports reduction of scores on the Test Anxiety Scale for Children and increases in selective attention for thirty Grade Three children, as compared with control groups, after an eighteen week program of training in meditation. One recent treatment outcome study looked specifically at trait-state levels. Forty-eight test anxious college students were treated in groups by three different 'stress-innocation' treatments. One group was taught specific strategies for coping with test anxiety; a second group was taught general coping strategies; a third group met for 'discussion' of their problems, and a fourth group served as a no-treatment control. After treatment, both coping skills training groups improved on measures of anxiety. Both groups showed equal and significant reduction of trait anxiety as compared to the no-treatment controls, but the test-specific group showed a greater reduction in state anxiety (Hussian and Lawrence, 1978). These findings suggest that the state-trait distinction is a pragmatic one with importance for any

discussion of the debilitating effects of school-related stress.

Anxiety and Vulnerability

These models of anxiety: as threat, as arousal, and as a varying state, help explain why some students respond to the stress of school failure with heightened effort and subsequent success, while others use less adaptive means to reduce the threat of failure. These models emphasize the role of the child's previous learning history in determining how he will come to deal with his own stress-induced anxiety. Another determinant, the child's own tolerance for stress, must also be considered.

Individual differences in vulnerability to stress are the focus of the formulations of H.J. Eysenck (1956, 1965). Eysenck, expanding on earlier attempts to recast psychoanalytic theories of anxiety into a stimulus-response model (Spence, 1958; Dollard and Miller, 1950), suggested that individuals differ in their innate capacity to tolerate stress without becoming anxious or "neurotic". He cites data on monozygotic twins reared apart to show that, like intelligence, "neuroticism", or the predisposition to react to stress is more highly concordant in monozygotes reared apart than in dizygotic twins reared together.

Current studies of high risk populations - those most likely to be affected by stress - usually involve this notion of organismic vulnerability. Murphy and Moriarty's (1976) longitudinal study of normal development in the child and adolescent, Thomas and Chess' (1977) study of differences in temperament, and

Hamburg's (1974) study of adolescence, are all based on physiological differences in stress-tolerance between individuals.

Other Anxiety-Related Variables

Before discussing the implications of these models of anxiety for understanding the effects of failure, some additional data should be considered. The studies cited demonstrate that how a child reacts to stress, while principally dependent upon his previous learning history and his organismic vulnerability, is also affected by his socioeconomic status, his sex and his age. Several other anxiety related variables also seem relevant to this investigation of school failure: the relationship between anxiety and self-concept, and between anxiety and attention, the differential effect of anxiety on learning of specific academic subjects, and the relationship between anxiety and motivation.

Anxiety, Self Concept and Self Evaluation

Self-esteem or self concept has been shown to be negatively correlated with anxiety in children and adolescents (Ross, 1976). Millen (1966) found correlations of $-.54$ to $-.69$ between anxiety and self concept in 643 high school students. Moss (1969), however, points out that this relationship is a complex one: the more evaluation-sensitive child would be expected to have both a high anxiety level and a more negative self image. Nichols (1976) suggests that the Test Anxiety Scale for Children really measures 'self-evaluation' rather than anxiety, and that "many results with

the Test Anxiety Scale for Children may better be interpreted in terms of self-evaluation than anxiety." Using a revised version of the Test Anxiety Scale for Children with two sub-scales: a 'self concept of attainment' (SCA) scale and an 'anxiety' scale, he evaluated 264 Grade Six students. He found that 'self concept of attainment' - a measure of the child's perception of his own attainment, was a better predictor of achievement than the 'anxiety' scale; grade averages correlated .0 with anxiety, $-.52$ with S.C.A. He suggests that accurate self-evaluators are good predictors of their own grades, and that the Test Anxiety Scale for Children really measured this perception. In another study, Nichols (1975) found that older children were more realistic in their self-evaluations than younger children. The reported increase of Test Anxiety Scale for Children scores with age, and the increased correlations between Test Anxiety Scale for Children scores and reading with age (Hill & Sarason, 1966) could be considered evidence of Nichol's hypothesis. Until further studies and more valid measures separate semantical confounding from correlations, it seems reasonable to consider self-concept and anxiety as separate constructs, operating sometimes to complement and sometimes to supplement each other. Both seem related to competence (Spivack, Platt and Shure, 1976) and both can affect school performance.

Stress, Attention and Anxiety

The link between attention and stress-induced anxiety

suggested by arousal theory has important implications for school performance. If anxiety is conceptualized as the result of 'over-arousal', then it could be expected to have direct and debilitating effect on one's ability to direct and control attention. This effect of stress on selective attention has been demonstrated in a number of studies (McNamara, 1961; Matyniak, 1963; Solley, 1969) which show that stress narrows the size of the attentional field and restricts the amount of information perceived. Wine (1971) suggests that the way anxiety operates to depress performance is through its effect on attention. Anxiety can direct attention away from the task toward "self oriented" responses. A study by Deffenbacher (1978) confirms this hypothesis. He found highly anxious students spent less time on-task, and attended more to their own distracting thoughts while under stress than they did under unstressed conditions. The previously discussed study of self-verbalization during problem-solving after failure (Diener and Dweck, 1978) also substantiates this debilitating effect of failure on task-related attention.

Anxiety, Reading and Arithmetic

While some of the studies cited note higher negative correlations between reading and anxiety (Sarason et al, 1960, op cit; Hill and Sarason, 1966) others found arithmetic performance more related to anxiety (Cox, 1964). In the Feldhuesen and Klausmeier (1962) and Lunneborg (1964) studies, no anxiety by school subject interaction was found. Hill and Sarason found the difference

between the effect of anxiety on reading and on arithmetic grew less as the students got older, and tended to disappear as they entered junior high. These conflicting findings are probably due to differences in the emphasis, and hence the potential threat associated with these subjects in different cultures and different grades. Of course, individual difference in specific learning ability would also affect the relationship.

Achievement, Motivation and Failure

The role of anxiety in determining how hard a child tries in school has also been investigated at some length. Motivation to achieve in school has been examined from both its situational (Atkinson and Feather, 1966; Smith, 1969) and social (Crandall, 1969; Veroff, 1969) dimensions, and achievement-related motivation is a complex concept. But simply stated, motivation theory suggests that for any task, whether a child chooses to try for success or to avoid the risk of failure, depends on how much he has learned success is worth and failure costs, and how likely he feels he will be able to succeed.

Klinger (1975) (Klinger, Barta & Kemble, 1974) sees motivation, or incentive to attain a goal, as a useful construct in explaining many aspects of both healthy and non-adaptive behavior. From his observations of the depressed performance of rats in an open field running subsequent to failure, he concludes that failure to attain a goal or "incentive loss", initially debilitates activity level until the unattained goal is "disengaged". He

suggests that recovery, or return to normal performance is associated with beginning to strive for a new goal or incentive.

Several longitudinal studies of child-rearing practices and social determinants of behavior have investigated the origins of school-related achievement motivation (McClelland, Atkinson, Clark and Lowell (1953; Moss and Kagan, 1961). Conclusions from these studies all include the same basic components: external evaluation, self evaluation, and cost or threat. These are all, also, elements in Sarason's theory of anxiety (1960) which also stressed the role of child-rearing practices in the development of independence and resistance to stress-evaluation in the child. In this view, facilitative anxiety is linked to aspiring for success, and debilitating anxiety with the avoidance of failure.

Some studies substantiate the additionally modifying effect of parental attitude. Rosen and D'Andrade (1959) found parents of highly-motivated boys held higher aspirations for their sons. Feld et al (1963), Smith (1966), Feld (1967), and Robbins (1963) all report the effect of parental value on subsequent achievement orientation.

Other studies demonstrate societal influence. Crandall (1969) suggests that social norms make girls more expectant of success than boys in our culture. In her study, girls rated their own ability lower than did boys of equal ability, and generally underestimated their own potential for success. Veroff (1969) demonstrated that social comparison as a basis for motivation develops in the child early in school, increases with age, and is

higher in boys. Another study (Veroff, Goldsmith and Taylor, 1966) showed that whether a child responds with renewed or depressed effort after failure is determined by how autonomously or socially determined his achievement motivation is.

Anxiety, Performance and School Failure

The models of anxiety described and the studies which support them, suggest that the effect on anxiety on school performance at any given moment is dependent on: the intensity of the stress involved, the individual's general level of anxiety, his organismic sensitivity to stress, the perceived threat evoked by the stress and the coping strategies he has developed to reduce this threat, and his skill, intelligence, age, sex and previous learning history. His parents' values and expectations, and how able he perceives himself to be, relative to his peers, will influence the integration of these variables.

These findings have several major implications for understanding the student with a history of school failure. With approaching adolescence, this student, like all adolescents in our culture, faces an increased demand upon his capacity to cope with pressure. G. Stanley Hall summarized the historical recognition of this period of "strain and stress" in his two volume study, *Adolescence* (1904), and Erik Erikson (1950) made the adolescent search for unity or "identity" a cornerstone of his theory of personality development. Virtually all investigation of human psychological development describes adolescence as a period of

great stress and high vulnerability. Adolescents with school learning problems have these to add to their already problem-filled lives as they face a new stressful experience - high school.

In order to assess the effects of school failure, it will be important to determine how each failing student has learned to deal with the various stresses he encounters. School failure, then, becomes a special case of stress, to be dealt with as the child has learned to deal with any of his stresses.

These studies of the effect of stress-related anxiety offer some explanation for the learning disabled student's continued failure despite academic remediation. First, he can expect to be more vulnerable to stress than his 'normal' classmate. Several of the studies of learning disabled children reviewed noted increased neurological or behavioral vulnerability. It is reasonable to expect that this population contains more stress-vulnerable children.

Secondly, as he becomes further disabled by his history of learning failure, especially if he retains a high level of motivation to maintain his anxiety, he can be expected to be more anxious than his classmates. This increased anxiety will be apparent both as a general elevation of debilitating affect, or increased trait anxiety, and as more frequent elevations from situation to situation, or increased state anxiety.

Thirdly, he will have fewer options with which to reduce and control his own failure-induced anxiety. Whereas able students who learn easily can reduce the threat of failure with more

studying and increased effort, these adaptive coping responses are often not available to the disabled learner. He must use less adaptive responses, like reduced responding (maintaining a low profile), or disengagement of incentive (decreased interest in school), to reduce his own stress-related affect.

Finally, and most debilitating to his subsequent performance, because he lacks both adaptive stress reducers and the expectation of successfully coping with stress, his attention is so captured by his own need to find a way to reduce his anxiety that he will spend even less time on the task at hand than his successful classmates. Whatever the task difficulty, even when he has previously been able to perform successfully, following yet another failure, he can be expected to use poorer problem-solving strategies than his successful classmates.

And these debilitating effects can be expected to increase as he grows older and enters high school. The studies cited have demonstrated the discrepancy between performance under 'test' and 'non-test' situations for the anxious student. As he progresses through school, academic content increases, classes are shorter, larger and more impersonal, and achievement is increasingly evaluated by examination. All but the very brightest anxious students will be penalized in such a setting. Examinations will be measures of their stress reactions, rather than measures of their achievements. The studies of attention under stress suggest that the anxious child will spend more time daydreaming and in task-irrelevant behavior, and less time learning. Failure, particularly

for the highly achievement-oriented anxious child, will by the Dollard-Miller paradigm, increase his anxiety which will further capture his attention and reduce the time he spends in on-task problem solving.

For the successful, able student who has learned that failure usually signals a need for heightened attention, and that increased effort can terminate failure, failure comes to be associated with subsequent success. But for the stress vulnerable, less skilled child, who has learned that failure is usually predictive of even more task difficulty, failure signals yet another stress over which he has no effective control. It increases his negative self-appraisal and decreases the effective hypothesis testing. He becomes a poor risk for future success.

The studies cited note the facilitative effects of intelligence, increased skill and good coping strategies on the performance of anxious children. As this anxious but able student progresses through school, it is reasonable to expect these facilitative effects to be cumulative as skill, expectancy and adaptive responses increase. Conversely, it is reasonable to expect a cumulative debilitating effect for the anxious child who lacks both skill and coping strategies. This would account for the fact that both anxiety and its correlation with performance increase with age (Lunneborg, 1964, op.cit; Hill and Sarason, 1966, op cit).

Of course, the direction of the causal link, if any, is not established in the correlational studies. But taken together,

these studies imply, overwhelmingly, that high anxiety lowers performance for most students (Gaudry and Spielberger, 1971) and it is the least able and most vulnerable who are most affected. The most parsimonious assumption is that failure both follows from and increases anxiety for the child with a paucity of response alternatives. As they progress through high school, the gap in achievement between able students and vulnerable, anxious students can be expected to widen.

The anxious child has been described as dependent, fearful, and hostile, motivated by external rather than internal standards and lacking in self-esteem (Jackson, 1960; Gaudry & Spielberger, 1971, Chap. III). These descriptions match closely those of the learning disabled child in the studies cited. Whatever the direction of the causal link, this child, as he approaches adolescence with a lower self concept, heightened anxiety and the model of himself as a potential failure, will be ill prepared to face what Erikson (1950) has described as his central developmental task -- the establishment of an independent identity. And he will remain highly At-Risk for future school failure.

To be successful, any remedial program must address itself to the entire spectrum of academic, affective and cognitive competencies that the At-Risk student will require to become successful. As the reviewed studies noted, remedial programs for older disabled learners have hitherto been directed largely at academic skill building. When these fail, these students are either maintained in special education classes to learn "at their own speed",

or redirected to other less academic programs because of their 'inability' to learn high school subjects, often in the face of demonstrable intellectual ability and interest. The failing student is assumed to be unable to succeed. If, as suggested, it is this failure, itself, which further debilitates school learning, then it is reasonable to suppose that if the effects of failure can be mitigated, future school learning might be enhanced.

Before deciding that disabled learners cannot become skilled enough to learn successfully in high school, it is necessary to see if the skills they lack can be taught to them. Just as successful techniques have been devised to teach dislexics to read, perhaps the failure-disabled child can be helped to learn how to deal more adaptively with stress, monitor and direct his own attention and use more effective cognitive strategies. The complex situations and learning tasks he must deal with in high school will require both the ability to learn from books and the ability to cope. Can he be taught to cope, as earlier he was taught to read? And can this coping skill training be part of a school remedial program?

LEARNING TO COPE IN SCHOOL

Background

Classical psychotherapy has long addressed the problems associated with low self-esteem and heightened anxiety, but schools are not equipped to offer intensive therapy. Schools are however, equipped for skill-building. If failure-induced skill deficits could be attacked as an adjunct to ongoing remedial programs, then these deficits would become appropriate targets for school-based interventions.

As noted in the preceding section, if the failure-disabled student is to be helped to become successful in school, he will need to learn: -

1. how to take control of, and responsibility for, his own performance -- to learn from his own failures.
2. how to generate and use better problem-solving strategies.
3. how to monitor and control his own anxiety so that his attention is available for on-task learning.

Recently, clinicians using behavioural techniques have reported a wide range of successful interventions aimed at helping people learn to control their own maladaptive behaviors (Thoresen & Mahoney, 1976; Mahoney, 1974; Meichenbaum, 1977). Reports are now in the literature (Meichenbaum, 1969; 1971; Spivak and Shure, 1974; Mahoney, 1971; Camp, 1975) of successfully teaching adults and recently, children, to speak more sensibly, to stop and think before attacking a task, to generate appropriate alternatives, to control their own aggressive behavior and even to expect success.

More recently these procedures have been used to help people learn to control the effects of their own anxiety by substituting better, i.e. more task-related, responses for the maladaptive stress-reducers in their repertoires.

It is not the purpose of this present study to consider the effectiveness and suitability of these interventions for a variety of behaviors, but rather their suitability for use in school to help failure-disabled students learn to cope better. In several respects these behavioral interventions merit consideration for such use.

First, they emphasize skill-building. Previous behavioral treatments of stress-depressed performance focused on reducing accompanying inhibitory anxiety. In the past decade, interest has grown in teaching and expanding the repertoires of alternative behaviors to increase the likelihood of an adaptive response even under stress. This view represents a shift from classical therapeutic interventions that focused on disturbed and debilitating affect. It emphasizes, instead, the need to focus on the maladaptive behaviors or skill deficits which often maintain this affect. What had previously been considered to be unremediable deficits, or even 'traits', have come to be viewed as missing skills which can be taught and learned.

An example is a study by Wright (1976). He used peer modeling, rehearsal, and coaching to teach sixteen speech-anxious college students how to ask questions, respond more assertively and effectively in class and how to begin a speech. After treatment,

he compared their performance on behavioral and self-rating measures of anxiety to the performance of another group of thirteen students who had been given a systematic desensitization program of equal duration, and a third waiting list control group. Both treatment groups improved relative to the controls on self-report measures. Only the skill-trained group also showed significant increase in frequency of verbalization during a mock quiz section, although no transfer effect could be demonstrated. Such a behavioral skill building program is often called Social Skill training.

Other investigations report more appropriate social assertiveness (McFall, Marston, 1970; McFall, Littleland, 1971; McFall and Twentyman, 1973; Kazden, 1974D, 1976) improved conversational skills (Minkin et al, 1977) heightened interpersonal skill in psychiatric patients (Goldsmith and McFall, 1975) and even increased job-finding skills (Azrin et al, 1975) as evidence of the wide range of performance deficits that have been successfully treated with systematic skill building programs.

A second emphasis in these behavior therapies that makes them relevant in the present study, is their use of cognitive restructuring or cognitive modification. The role of negative expectations (Rotter, 1966; Beck, 1970; Meichenbaum, 1977) and irrational beliefs (Ellis, 1962; Trexler and Karst, 1972; Meichenbaum, 1971) in maintaining maladaptive behavior and affect has been demonstrated. And it is suggested that it is not simply the consequences of behavior that maintain that behavior in most complex human reactions, but rather how one interprets, evaluates and

thinks about those consequences. The Dweck study (1975) of attribution retraining to alleviate learned helplessness, cited earlier, is an example of successful cognitive restructuring. Other outcome studies using treatment techniques aimed at changing maladaptive cognitions report a wide range of improved functioning, including decreased anxiety (DiLareto, 1971; Goldfried et al, 1978; Meichenbaum, 1972), increased tolerance of pain (Gottlieb et al, 1975; Meichenbaum, Turk, Burstein, 1975), and improved control of anger (Noveco, 1975; Camp, 1975).

The search for effective ways to control these debilitating cognitions has led to a third emphasis in the newer therapies: behavioral self-control. The only really effective way to monitor and control distracting thoughts, irrational beliefs, and inhibitory sets is to do it for oneself. Behavioral self-control procedures are aimed at helping people learn to recognize the effect of cognitions in their own learning and behavior, and to monitor and 're-appraise' or 're-structure' their own stress - maintaining cognitions and self-statements. In effect, they are taught how to develop and use cognitive strategies, defined by Gagné (Gagné and Briggs, 1969) as "internally organized skill(s) that select and guide the internal processes involved in defining and solving novel problems." Reports of the successful use of self-control training in programs to reduce excess weight (Hall, 1972; Penick, Fillion, Fox and Stunkard, 1971; Mahoney, Moura and Wade, 1973) control smoking (Axelrod, Hall, Weis and Rohrer, 1974; Greene, 1964), eliminate obsessive and compulsive thoughts (Mahoney, 1971)

and control aggressive behavior in children (Camp, 1975) appear in increasing numbers annually. Self-control therapy, as an adjunct to, or supplement for, conventional therapy, is becoming the treatment of choice for many common social and personal problems.

In summary, these three aspects of these successful behavioral interventions -- the notion of skill deficit as a source of debilitating affect, the contribution of cognitions to the maintenance and modification of behavior, and behavioral self-control therapy -- have particular relevance for designing a coping skill training program for failure-disabled students.

Coping Skill Training

These newer behavioral therapies, and the studies which demonstrate their effectiveness, reflect a change in the underlying rationale by which problem behavior is viewed. Previously, problem behavior was considered to be abnormal behavior, requiring external intervention, surveillance or manipulation. In the newer rationale, problem behavior, although maladaptive and distressing, is seen as inescapable in everyone's life, and thus, normal. What distinguishes 'normal' from 'patient' populations is less often their problems, or even the magnitude of those problems, but the availability of effective coping strategies with which to solve the problem, reduce one's own stress-induced distress, and regain control over one's own behavior.

This formulation is reminiscent of Spielberger's trait-state model of anxiety (Spielberger, 1966). This model postulates a

coping mechanism by which even an anxious individual -- i.e. one high in A-trait -- can reappraise and reduce the 'threat' in any situation and, therefore, deal more adaptively with the stress involved.

As Wine (1971) has noted, previous treatment of anxiety relied heavily on reducing the arousal or emotional component of anxiety, without dealing with the 'worry' or cognitive component. By contrast, Marmor (1958) demonstrated the 'work of worrying' in the adaptive management of post-operative anxiety in surgery patients, and Goldfried (1971) suggests that the standard systematic desensitization treatment for debilitating fear would be enhanced if cognition were given a more active role. Wolpe's (1958) earlier formulations had described counter-conditioning as the mechanism by which passive relaxation could be paired with increasingly stress-involving situations until arousal was reduced. Goldfried proposed, instead, teaching relaxation as an active coping skill that could be employed in a variety of anxiety-producing situations. He suggested teaching clients to attend to their own physiological responses to stress and using these as 'signals to begin coping'. Re-directing attention from situational cues to proprioceptive cues might increase the expectation of control.

Outcome Studies Reviewed

Treatment programs which include this cognitive reappraisal of stress, sometimes called Coping Skill training, report some success. Tori and Worrell (1973), studies forty-seven snake-phobic

undergraduates to compare three different treatments. One group was treated with a standard desensitization hierarchy and relaxation. A second group was taught specific coping strategies for approaching snakes, and a third group was given training in using general coping strategies. On post-treatment measures of snake-approach behavior and self-rating fear scales, the two coping-skills groups showed significantly more improvement than both the systematic desensitization group and a placebo control group.

Goldfried and Trier (1974) studied the contribution of Coping Skill training to relaxation therapy. They taught twenty-seven speech anxious college students by two different methods. One group was given standard relaxation training. The second group was taught relaxation as an active coping strategy which they could use whenever they wanted to control their own stress. This self-control group was taught to monitor their own physiological stress reactions to recognise when to begin to cope. A third, attention-placebo group, met for discussion. The coping skill group improved on behavioral measures and self-report measures of both speech-specific and general anxiety. The discussion group improved on self-report measures only. No significant improvement was demonstrated for the relaxation only group. But despite significant intra-group improvement, there was no significant difference between treatments.

Spiegler, Cooley, Marshall, Prince, Puckett and Slenazy (1976) compared the self-control and counter-conditioning models by teaching one group of test-anxious college students to practice

active coping while imagining anxiety-producing scenes and another group to relax passively while under the imagined stress. The 'coping' group showed significant improvement on self-report measures, as compared to waiting list controls; the 'counter-conditioned' group's improvement approached significance. But the two treatments did not differ significantly.

Test-anxious college students were also the subjects of the coping skills training program in Meichenbaum's (1977) study. Here, too, systematic desensitization was compared with coping skills training for two groups, each with eight students. The coping skills group was taught to imagine themselves coping with test-related scenes, and to self-instruct or cognitively self-direct themselves through a coping sequence. This group showed significant improvement on self-report measures of anxiety both immediately after treatment, and one month later as compared with the systematic desensitization group and a waiting-list control group. The coping skills group also showed an increase in facilitating anxiety on the Alpert-Haber (1960) Scale. The Meichenbaum study incorporated both relaxation training and the modification of cognitions.

Goldfried also (1978) investigated the possibility that "cognitive reappraisal" would reduce test anxiety. He assigned thirty-six test anxious adults, aged 18-49, to one of three groups. One was a rational restructuring group which was taught to note and record both self-defeating and reappraised coping cognitions while imagining a fifteen item graded hierarchy. A second

"prolonged-exposure" group was exposed to the same hierarchy for the same period, but directed to focus on, and record, their own affective responses. The group taught to systematically reappraise and cope with stressful scenes showed significant improvement on self-rating measures of anxiety and a decrease in anxiety in an analogue test-taking situation, as compared to the other two groups. The 'coping group' also showed greater generalization of anxiety reduction on measures of anxiety in other social situations.

Treatment Components

Meichenbaum (1977) has suggested the components common to these coping skills treatment programs include:

1. Teaching the role of cognition in contributing to the problem.
2. Training in noticing, discriminating and monitoring self-statements, images and maladaptive behaviors.
3. Training in the fundamentals of problem-solving.
4. Modelling of adaptive cognitions and images and positive self-evaluations.
5. The use of rehearsal and encouragement.
6. The use of relaxation training, training in coping imagery and behavioral rehearsal.
7. Graded in vivo homework assignments.

These components are, essentially, a combination of earlier counter-conditioning techniques and the three salient aspects of

behavior therapy suggested as relevant for the failure-disabled student: self-control techniques, cognitive restructuring, and instruction and practice in solving problems.

But although theoretically potent, the actual contribution of each, or any, of these treatment components to improved functioning under stress remains to be confirmed. Some preliminary investigations of comparative component effectiveness has been undertaken. Horan, Hackett, Buchanan, Stone and Stone (1977) examined the active components of stress inoculation training by comparing five different single-session treatments of pain management. They trained one group of twelve college students in coping skills using deep muscle relaxation, imagery rehearsal, and self-instruction, and compared their subsequent performance on a cold pressor test with a second group trained by a non-specific educational method, a third group given six practice exposures to the cold pressor task, a fourth group who received both exposure practice and Coping Skill training, and a fifth no treatment control group. Compared to all other methods, Coping Skill training significantly increased pain tolerance and threshold, and reduced reported discomfort. Neither the non-specific education program nor exposure alone had any effect. However, the coping skills plus exposure group showed the greatest improvement.

Although suspect for its brief treatment period, this study suggests several things. It demonstrates that active coping practice is superior to other common techniques for pain management, and that Coping Skill training can even increase the effect of,

or be enhanced by, an otherwise powerless treatment. It also compares the effectiveness of some of the components suggested in the Meichenbaum (1977) checklist (p. 70): It substantiates the efficacy of self instruction, relaxation, and imagery training and fails to find evidence for the value of an educational component or for rehearsal.

Other studies also demonstrate the usefulness of one or another of these treatment components. Kendall (1977) discusses the use of verbal self-instruction procedures with children, citing a number of well-designed studies to confirm the value of this method, particularly for children lacking in self-control. He suggests that the emphasis on increased verbal mediation and self control, and the generalizing potential of the mazes and puzzles commonly used as practice materials, make this a promising method for school-related problems. Denny (1975) found that modeling self instructions about good strategies, i.e. "cognitive modeling", prior to modeling an answer-seeking questioning sequence, "exemplar modeling", increased the effectiveness of the exemplar modeling as an instrumental technique for six year olds. But adding self-instruction rehearsal, both aloud and covertly, did not enhance the cognitive modeling in this study. A study of training impulsive children by Ridberg et al (1971) suggests that the addition of verbal cues appears to aid low I.Q. subjects, but not those with high I.Q.'s who, presumably, have better developed verbal mediation processes of their own.

These examples of initial excursions into investigating the

relative contributions of Coping Skill training components points up the complexities of the questions being addressed. The most parsimonious conclusion that can be drawn at this point is that some of these techniques seem admirably designed for specific problems on specific populations. Much more investigation is needed to establish the optimal conditions under which each component operates, the populations to which each is potentially suited, the spectrum of problems that each best matches, the differential effects of setting and materials on generalization, and the possible contributions of other variables such as age, intelligence and verbal ability.

Coping Skill Training and the Failure-Disabled Adolescent

In the over view, Coping Skill training seems admirably designed for the needs of the failure-disabled student. Unlike the traditional pharmacological, behavioral, or analytic interventions for dealing with debilitating anxiety, it does not rely on external control nor professional surveillance. Instead, it encourages self-control and self-monitoring, it teaches problem-solving skills and it promotes independence. These are precisely the cognitive and affective competencies that the disabled school learner with a history of school failure lacks and must develop.

Other implications of this treatment recommend it for this population. As noted, the failure-expectant learner drastically curtails his own chances for finding an answer or solution because he drops out of the search at the first sign of failure. Using

the cognitive sequence immediately increases the likelihood of task-success simply because it increases on-task attention.

And these procedures could lend themselves well to being used in schools as part of an on-going remedial program. Teachers are not therapists and cannot be expected to practice psychotherapy, but they do understand skill-building. The sequential programmatic nature of a coping skills training program (Meichenbaum, 1972) makes it worthy of investigation as a school-based intervention.

Initial pilot studies using these techniques with learning disabled students have shown promise. One ten year old boy with a long standing disability whose teachers reported worked only when the teacher was beside him, was taught to work independently using a self-directed, cued sequence ("think", "try", "check", "great"). He subsequently wrote his first composition (working alone) and has continued to progress (case file, McGill-Montreal Children's Hospital Learning Centre, 1975). Another eleven year old girl showed similar gains (Wright, Millelire and Stevens, 1977) which have been maintained on a three year follow-up.

One problem frequently noted with therapeutic skill-building programs is lack of transfer or generalization (Wright, 1976; Kendall, 1977). Generalization should be facilitated if the setting where the child learns coping skills, practices them, and comes to use them is his school.

Finally, Coping Skill training encourages the student to participate in solving his own problems. Meichenbaum (1977)

reiterates the role of the child as collaborator in his own treatment ... "he helps to define and diagnose the problem ... and in the development and implementation of the treatment". The learning disabled adolescent will need to take active responsibility for his own learning needs if he is to succeed in a large modern high school. Even if he is fortunate enough to have flexible and knowledgeable teachers and the optimal support of his parents, he will need to know when to seek help with his assignments, how to arrange for the courses he needs sometimes in the face of regulations to the contrary, how to use and profit from the system. These have been called school survival skills (Hops, 1974; Stevens, 1975). Coping Skills training should increase the likelihood that he will learn and succeed in school despite his learning problems, and that he will survive school with an intact personality. Hopefully, too, he will come to expect that problems can be solved, and that he can cope.

SUMMARY: PRESENT STUDY

This, then, is the frame of reference of the present study of the effect of school failure on subsequent learning and school performance, and the efficacy of teaching more effective cognitive strategies to failing students.

It is suggested that hitherto, the results of remedial programs for disabled learners have yielded few worthwhile results because they were based upon definitions of the disabled learner, that, while useful for experimental investigations and clinical assessment and treatment, did not directly address some of the basic problems of the failing school learner. These problems: low expectation of success, poor strategies for successful problem-solving, low self-esteem, and high levels of debilitating anxiety particularly in test-like situations, are concomitants of the student's history of failure, and are deterrents to his future learning. When added to his prevailing academic and cognitive deficits, they keep him failure-expectant and at risk for additional school failure, even when those academic and cognitive deficits are treated. The failure-expectant student, lacking adaptive stress-reducers, deals with his stress-induced anxiety by less adaptive means. And some of these maladaptive stress reducers, such as his reduced on-task attention, and his attributing of success or failures to his teacher or to luck, actually further reduces the likelihood that he will start to succeed in school.

To stop the cycle of deficit --> failure --> depressed learning ability --> depressed cognitive attack skill -->

further failure, and to permit this student to begin to learn appropriately and to succeed in school, it is suggested that he will need, as well as academic and cognitive remediation, systematic training in how to deal more effectively with his own failures and the anxiety they produce.

Coping Skill training, a cognitive-behavior therapy which incorporates behavioral self-control techniques, cognitive restructuring, and training in problem solving, is suggested as an appropriate way to teach these failing learners these missing skills.

The main assumptions to be tested in this study are:

- that students with a history of school failure show concomitant deficits in cognitive functioning, an increase of debilitating anxiety, decreased self-esteem, and other affective deficits -- and less ability to cope with stress than their more successful classmates.
- that these student can be taught some of the coping skills, they lack, and that training in monitoring and controlling their own on-task attention under stress and in generating and using effective problem-solving strategies will enhance their school performance, increase their ability to learn, and mitigate some of the destructive correlates of their histories of failure.

STUDY I: THE AT-RISK STUDENT:

IDENTIFICATION AND REMEDIATION

Identifying The Young Adolescent With A History Of
School Learning Problems, And A Suggested Remedial
Model.

STUDY I: THE AT-RISK STUDENT: IDENTIFICATION AND REMEDIATION

Abstract

This study was designed to investigate three aspects of the problem of prolonged school failure: the classroom teacher's ability to identify which students are At-Risk for future school failure, how students so identified differ from their most able classmates, and the efficacy of teaching such At-Risk students to deal more adaptively with school-related stress.

The intelligence, academic ability and cognitive and affective competence of 337 Grade Six students, aged 11 to 13, was assessed using standard group measures. 284 of these students had previously been identified by their teachers as being At-Risk for failure to cope with Grade Seven because of a history of problems in school. The remaining 53 had been selected by these teachers as the most able students in their classes.

Correlations between the teachers' ratings and standard measures of intelligence, cognitive ability, anxiety, self-concept and academic achievement were all highly significant, as were correlations between these ratings and grades earned the following year in high school. Discriminant Analysis generated a function which separated the groups with 95.6% accuracy.

The At-Risk students, although of normal intelligence, were significantly less intellectually, cognitively and academically able and more anxious and had lower self-concepts. After a nine-week Coping Skills training program, sixteen of these At-Risk students showed significantly improved social problem-solving ability and a trend towards heightened self concept, when compared with a group of sixteen others who had been given nine weeks of standard school counselling and a second control group who were untreated.

The validity of teachers judgements, the debilitating sequelae of school failure and the remedial potential of Coping Skills training, as demonstrated by this data, are discussed.

INTRODUCTION

In every school system, even the most effective, there are some students who fail to learn in the early years and who continue to fail as they progress through school. In some schools these students actually fail to be promoted to the next grade; in others they are "socially" promoted. But in one sense all can be considered school failures: they, and their teachers, can document countless daily instances when they are faced with learning tasks with which they cannot successfully cope.

General intellectual retardation will account for some of this failure. Since intelligence is presumed to be normally distributed, with a mean of 100 and a S.D. of 15 or 16 in the most widely used I.Q. tests (Weschler Intelligence Test for Children - Revised, Weschler, 1974; Stanford-Binet Intelligence Scale, Thorndyke, 1973; Quick Test, Ammons & Ammons, 1962), 16% of the population can be expected to have I.Q.'s below 84 or 85. However, the profoundly retarded, I.Q. 50 and below, and the moderately to mildly retarded, I.Q. 50 - 79, are usually identified in the early school years and provided with modified pedagogical programs and goals. This leaves about 6% of the school population, those children with I.Q.'s between 80 - 85*, who can be expected to have difficulty keeping up with their classmates as they progress through school.

*6.44% of the normal population.

Another group of children appear to do poorly in school because of non-school problems. Cultural and experiential deprivation (Siller, 1957; Hunt, 1960, 1961; Zigler and Ranger, 1962; Schalnick, Asler, Katzenellenbogen, 1968,69) social and personal conflicts (Kauffman, 1974; Kalvin, Arensted, Richardson and Garside, 1971) and behavioral deficits (Minde, Levin, Weiss, Lavigne, Douglas and Sykes, 1971; Douglas 1972) have all been demonstrated to be correlates of lowered school functioning. These children are often described in the literature and in legislation related to education as 'emotionally disturbed' (Haring, 1963) or 'socially and emotionally maladjusted' (Ministère de l'éducation, Province de Québec, 1975). They seem to lack the ability or motivation to direct and maintain their own attention on the learning task at hand. This group is estimated to comprise 5 - 15% of the school population (Schultz, Hirshen, Marston, Henderson, 1971).

In the past decade, the group of failing children who have attracted the widest attention are the children with specific learning disabilities. Estimates of their incidence in the normal school population differ greatly: from 2% to 7% (Kirk, 1972; Dunn, 1973) to 10 - 15% (Celdric Report, 1970). These are the students who are intelligent enough to learn in school, and who are without debilitating social and emotional problems, but who have specific perceptual or psycholinguistic lags that hinder their learning. Currently both the etiology and the treatment of the school failure of these children are subjects of hot debate.

Traditionally, academic remediation has been developed for each of these At-Risk groups directed towards their deficits (Cruickshank, 1961; Fernald, 1943; Frostig, 1964), and special education programs based on these remedial techniques have proliferated in the past twenty years. More recently, a skills-referenced approach to teaching these children, emphasizing skill acquisition regardless of the origin of the disability, has gained in popularity (Bateman, 1977). But there has been one serious problem in assessing the validity of reported observations and treatment of these remedial programs effects. Intellectual problems, behavioral problems and learning disabilities have often been inadequately discriminated, and the primary source of difficulty not reliably established (Ross, 1976; Douglas and Peters, 1979; Kinsborne, 1975). In fact, except for the data obtained through intensive individual assessment and skilled diagnosis, this confounding can be considered to be virtually unavoidable. For any of these populations, both their reported percentage of incidence in the general school population, and their susceptibility to any reported intervention, needs to be considered in the light of this potential confounding.

And whether or not their academic problems and needs differ, and whatever the etiology of those problems, all of these students share the common experience of prolonged school failure. The commonality of their failure experience makes these diverse groups of children similar in two important respects. First, although their school learning problems arise from different sources, these problems, because they have resulted in failure-

ridden learning histories, can be expected to have left all of these children with additional, failure-related, cognitive deficits. Studies of the way in which children perform after failure have shown that while successful learners perform better after failure, because they marshal more effort (Brickman, Linsenmeier and McCareins, 1976; Dweck, 1975) and use more effective problem-solving strategies (Diener and Dweck, 1978), this is not true for children whose previous learning experience has set them to fail. Failure-expectant children perform more poorly after each failure, sometimes failing to solve problems they had previously found solvable (Brickman, Linsenmeier and McCareins, 1976; Dweck and Reppucci, 1973). These failure-expectant children feel little control over their own performance (Crandall, Katkovsky & Crandall, 1965), attributing their successes and failures to luck or factors beyond their control, rather than to their own efforts (Dweck, 1975; Andrews and Debus, 1978). Their failure histories have left them with defective problem-solving strategies, and more vulnerable to the stress of failure. They remain At-Risk for future failure.

Secondly, since these At-Risk children have experienced much stress, they can be expected to have heightened levels of the affective correlate of stress -- anxiety. Highly anxious children perceive all stress as threatening (Sarason, Davidson, Lighthall, Waite & Ruebush, 1960) and their performance on tests or in test-like situations deteriorates, (Sarason, 1963; Lunenborg, 1964; Callaghan, 1957; Lipman, 1960; Cowen, Zax, Klein, Izzo and Trast, 1965; Verma, 1976). Spielberger (1966) suggests that the fewer options for successful effort that any child

possesses, such as high ability and good problem-solving strategies, the less he is able to control his own stress-induced anxiety in any situation, and the more debilitating that anxiety becomes. Students at-risk for failure because of learning-related problems and prolonged histories of school failure can be expected not only to have higher levels of anxiety than their well-put-together classmates, but also fewer options by which to reduce that anxiety.

But these At-Risk students, regardless of the origin of their cognitive or affective deficits, also share the same needs as all growing children --- the development of a healthy personality and personal competence. As an educational goal, this means the acquisition of sufficient skill and knowledge to live a potentially independent and satisfying life.

Helping these students to achieve this goal becomes doubly difficult as they progress towards the upper grades. First, even with careful and effective teaching, they usually lag behind their classmates in academic skill. As the quantity and complexity of the work increases their chances for failure also increase. Secondly, since they have had little experience with school success, they cannot be expected to have developed the skills of the successful and competent learner: good study habits, well organized patterns of learning, organizing, and presenting their work. Their failure histories can be expected to have left them anticipating further school failure and with a view of school as a place where they can expect to find neither profit nor reward.

Poor strategies for achieving success, low expectancy of success and heightened anxiety are, then, some of the deterrents that need to be investigated and dealt with if these children are to become successful school learners. Low self-esteem has also been demonstrably associated with depressed school performance (Gaudry & Spielberger, 1971; Black, 1975) and is an additional potential roadblock to success for these children. Any successful remedial program must attack not only their academic skill deficits, but these affective and cognitive deficits as well.

Since the only alternative to successful remediation -- permitting these students to continue to fail and leave school as unskilled and uninstructed adults who know themselves to be less than competent -- is to continue to swell the ranks of dependent, troubled, and disruptive adults, it seems appropriate to explore the possibility of developing an intervention program which addresses some of these debilitating correlates of school failure.

To do this, these students must be identified from amongst the total school population, their major areas of academic, cognitive and affective deficit assessed, and appropriate remedial programs devised and provided. The first part of this study addresses the question of identification and the second part presents the results of a remedial program.

PART I - IDENTIFYING THE AT-RISK STUDENT

The most immediate source of information about which students are At-Risk for failing to cope with school is the teacher. Standardized objective measures can give reading, spelling and mathematics levels, but any test is only a single sample of behavior, and behavior under stress at that. Classroom teachers have observed countless samples of their students' behavior under test and non-test conditions. They are in a position to know which students compensate for lower ability with heightened effort and careful organization, and which fail to mobilize adequate skills and resources when distracted or stressed. Mass screening methods are costly and the results of remedial programs based on such screenings are unpromising (Curr & Gurlay, 1953; Collins, 1961). By contrast, teachers' evaluations have been well established as a source of reliable information. Binet used teachers' evaluations as criteria in his initial work in the measurement of intelligence (Binet, 1903) and Cattell used teachers' ratings in developing his High School Personality Questionnaire (Cattell and Butcher, 1968). Some studies demonstrating high correlations between teachers' predictions and performance suggest that teacher expectancy contributed to differences (Rosenthal and Jacobson, 1968; Crono and Mellon, 1978). Other studies deny the effect of expectancy, lending confirmation that these judgements are veridical and predictive (Dusek and O'Connell, 1973; Fleming and Anttonen, 1971a, 1971b).

The current study was designed to see:

- 1) If the classroom teacher can identify which of her students are At-Risk for school failure.
- 2) How students so identified differ from their classmates on academic and non-academic variables.

METHOD

About six weeks before the end of the school year, all Grade Six teachers in the Baldwin Cartier School Commission were asked to select the ten children in each of their classes who were most at-risk for failure to cope with Grade Seven. They were also asked to select the 'top three' students in each class.

Grade Six is the final year of elementary school in this Commission. In Grade Seven students from the twelve elementary schools feed into two of the Commission's three secondary schools; one of these high schools has approximately the population of an elementary school, about 500 pupils. The second is much larger, with about 2,000 students. The third and largest high school serves only upper level secondary students.

At the time of this study, this Commission had nearly 10,000 English speaking students, about half of whom were in elementary school. A little over 1,000 of these were enrolled in Grade Six *. Average class size was 30. There were 34 Grade Six classes; twenty-six or more than three quarters of these, had female teachers.

The families served by these schools are largely middle to upper-middle class. A 1966 survey (Stevens, 1966) found most parents were in the upper three categories of the seven point Blishen scale of occupational ratings.

* Since even special class students in this Commission spend part of their day in regular classrooms, these students were also included in the survey.

Although the largest of the three high schools offers a vocational degree program, students in the other high schools follow a largely academic program. Each school maintains a comprehensive special education service for academically retarded and learning disabled students which includes smaller catch-up classes in language arts and mathematics for mildly unskilled students, and individual help for the more disabled learners. With the exception of one small class for mildly retarded students, all other students are maintained in the main stream. Prior to this study, students needing academic remediation in high school were selected by specific referral from their elementary schools, or on the basis of their performance on Commission-wide mathematics and language arts examinations which are given in December and May in all elementary schools to identify below level students.

The survey described in this study was, in effect, an extension and refinement of this on-going referral system. The high schools had been dissatisfied that each year a few students were 'missed', only to surface some time later as problems. They wanted to ensure that all students needing academic remediation were referred.

As well, the survey was aimed at locating students with other than purely academic deficits - those at-risk for failure to cope with high school for any reason.

The previously used system of separate surveys by the Commission's language arts consultant, the mathematics consultant, and the special education consultant, was replaced by this single Grade Six Screening.

It was decided to make this study of the effects of school failure as an adjunct to this on-going Grade Six survey for three reasons:

1. A more natural, and presumably, reliable measure of teacher evaluation could be expected.
2. This population had been in school long enough to have been affected by their own school failure.
3. These students were at the point of facing two potential sources of increased stress: approaching puberty, and a new and complex school situation.

Procedure

Each Grade Six teacher was contacted by letter early in May and asked to select the ten students in each class who he or she considered least likely to be able to cope with high school "for academic, intellectual or emotional reasons" and the two or three he or she thought would do best. It was explained that these recommendations would be followed in arranging for appropriate remedial help in Grade Seven. The teachers were asked for "ten" At-Risk students to ensure that they considered all the students in the bottom third of their classes as they made evaluations. The top two or three were requested for two reasons: first, the teacher's choice of the upper five to ten percent of each class was needed to validate their ability to discriminate between At-Risk and not At-Risk students. Secondly, this 'top' group was needed to ensure that when the subsequent group measures were administered, the students being tested would not find themselves in an easily recognizable roomful of problem students. The Grade Six teacher was asked to fill out the Grade Six Screening Form (see appendix) for each student so referred. In the last week of May, the three Commission consultants visited each school and met with each teacher to answer any queries. As predicted, no teacher wished to refer as many as ten students as potential non-copers. Referrals in this category ranged from five to nine. Total number referred as At-Risk was 284.

In each case the decision whether or not to refer a child was made by the classroom teacher. Some of the teachers questioned the disposition of their recommendations, and many were concerned about the "self-fulfilling prophecy" effect of such labelling. All were reassured by the steps outlined to guard against this possibility. The information in the form was to be made known to the High School special education teachers and the guidance personnel only. The rest of the school's staff and teachers were to be advised that additional information was available on some students from the guidance department if any difficulty or query should arise. This was to ensure that no one was aware of which students were considered At-Risk, while still making the Grade Six teachers' observations and suggestions available when required to help the student. The information in the form was subsequently used, for example, by the Special Education Departments of the High Schools to arrange for remedial academic intervention for all students with below level reading and mathematics. It was also used for follow up by the High School guidance department where appropriate.*

All Grade Six teachers agreed to participate in the survey.

* The Grade Six screening has been continued each year since this study at the request of the School Commission.

Measures

Major Variables

1. The Grade Six Screening Form (see appendix) was designed for this study. It asks the teacher to answer "yes" or "no" to whether or not she judged her student likely to do well in High School the following year. The teacher is also asked to select the description that most aptly fits her students from a scale of 1 ("with ease") to 7 ("not at all") in answer to a rephrasing of the same question: "this student will probably cope with High School-----". A few teachers demurred at answering "no" to the first question and a few others preferred not to make a judgement on the 1 - 7 scale. However, at least one of the two judgements was obtained for each student. In the majority of cases, both questions were answered.

Space was also provided on the Grade Six Screening Form for the teachers to describe any methods that had been found particularly useful for teaching each student. Typical responses included: "needs much encouragement"; "responds well to firm but fair structure". The teacher was also asked to note each student's particular strength and weakness in both academic and non-academic areas; e.g. "weak in rote memory", "low in reading", "has no friends". For the outstanding students referred, these comments were typically, "a joy to teach", "needs to be constantly challenged". Many of the teachers spontaneously expressed their satisfaction at this opportunity to communicate their observations of their pupils to the High School teachers who would be teaching them the next year.

The Grade Six Screening Form also included a list of one or two word behavioral descriptions, taken verbatim from anecdotal reports made by Grade Six teachers in previous years. Teachers were asked to check any that were descriptive of their student. Space was also provided in the form to record the marks from the two Commission-wide mathematics examinations, Canadian Test of Basic Skills scores, and, when available, last report card marks in English, French and Math.

Two measures were derived from responses to the Grade Six Screening Form and served as independent variables in this study:

Teacher Rating I (TRI) was derived from the yes/no responses to the question "Is this student likely to do well in high school...?" It yielded two groups, those judged the most able students (TRI=yes) and those judged most At-Risk for failure to cope (TRI=no).

Teacher Rating II (TR2) was derived from responses on the 1 - 7 scale. It also yielded a "most able" group (TR2=rated as 1 on the scale) and an "At-Risk" group (TR2=rated at 5,6 or 7).

These two measures were used to assess the teachers' ability to discriminate which students were At-Risk for subsequent school failure because of deficits in the affective, cognitive and intellectual variables being measured.

2. Pupil Rating Scale (Myklebust, 1971). Each teacher was also asked to complete the Pupil Rating Scale for each student she referred. This is a twenty-four item scale designed to distinguish

learning disabled students from other low achievers. Items are grouped into five learning-related areas: auditory comprehension, Pupil Rating Scale I, spoken language, Pupil Rating Scale II, orientation, Pupil Rating Scale III, motor coordination, Pupil Rating Scale IV, and personal-social behavior, Pupil Rating Scale V. A factor analysis of the scale used in a study of 359 elementary school boys (Bryan & McGrady, 1972) yielded four rather than five groupings -- although both methods of grouping yielded highly significant results in differentiating learning disabled children from normal controls. The Pupil Rating Scale also yields a verbal, Pupil Rating Scale VI and a non-verbal, Pupil Rating Scale VII, score. Additional studies have found that this instrument reliably discriminates between failing and passing students (Myklebust, 1971), and that scores are significantly correlated with reading, spelling and arithmetic performance (Myklebust, 1971). The Pupil Rating Scale was standardized on a population of 2,176 elementary school children. Although the standardization group was composed of students through Grade Four only, the subsequent study of 359 boys (Bryan and McGrady, 1972) contained students through Grade Six.

Since the Grade Six Screening Form used in this study had been designed to identify all At-Risk students, of which the learning disabled group is a sub-set, the Pupil Rating Scale was judged to be the most appropriate measure to validate the Grade Six Rating Scale. The Pupil Rating Scale had been designed to identify learning disabled children, but had been shown to be a

valid discriminator of other At-Risk populations. The Pupil Rating Scale was also very close in format and construction to the Grade Six Screening Form.

Scores obtained on the Pupil Rating Scale were used in this study in two ways. First, the total score, Pupil Rating Scale - Total was used to validate the teachers' judgments made on the Grade Six Screening Form. Secondly, the verbal score, Pupil Rating Scale VI, and non-verbal score, Pupil Rating Scale VII, and all the subtest scores, Pupil Rating Scale I, Pupil Rating Scale II, Pupil Rating Scale III, Pupil Rating Scale IV, Pupil Rating Scale V, served as dependent measures to test for differences between the most able and the At-Risk students.

Other Dependent Variables

In the first week of June, a few weeks after the Grade Six Screening was completed, both 'At-Risk' and 'top three' students selected by their teachers were assessed as a group in each school by a visiting High School guidance counsellor, using:

3. Otis' Quick Scoring Mental Abilities Test (IQ) (Otis, 1954)

This is a group measure of intelligence, composed of eighty multiple choice questions, frequently used in schools. It gives a single score, I.Q., and was included to confirm that the At-Risk population was essentially of average intelligence and not having difficulty in school simply because of intellectual retardation. It also served as an added check on the teacher's ability to discriminate between the groups.

4. The Piers-Harris Self Concept Scale (Piers, 1969)

This measure of self-esteem is an eighty item yes/no questionnaire with good reliability (Kuder-Richardson, .77 to .9). Previous investigations demonstrate the relationship of self-concept to school learning (Cox, 1960; Black, 1975; Pihl and Parks, 1977). For this study, the global score on this measure Piers-Harris Total, and two of the four factors produced by factor analysis: Appearance (AP), negative (Pop-) and positive (Pop +) popularity loadings, were used as measures of self-concept.

5. Children's Manifest Anxiety Scale (Castenada, McCandless and Palermo, 1956)

This is the children's form of the Taylor Manifest Anxiety Scale, a measure of trait anxiety. It is a fifty-three item yes/no questionnaire, and was included to assess hypothesized differences in anxiety level between the groups, and to assess the teachers' ability to select students At-Risk for affective as well as academic variables.

6. Mathematics Tests

Scores on the Commission-wide mathematics tests, given the preceeding January (Math 1), and just Prior to the Grade Six Screening in May (Math 2) -- were also obtained for all pupils referred, and served as measures of academic ability.

7. Christmas Marks

The following year, four months after these students entered Grade Seven, marks on their report cards for Language Arts

(Chris 1) and mathematics (Chris 2) and their total grade average (Chris 3) were obtained. (Students attending Grade Seven in the smaller high school (N=1 'top', and N=15 At-Risk students) were not included in this assessment as noted in text (see "Results").)

8. June Marks

One year later, at the end of Grade Seven, language arts (June 1), and mathematics (June 2) and the year's total (June 3) marks were also obtained. These measures were included to assess both differences in long range school performance between the groups, and the teachers' ability to discriminate those differences.

To recapitulate, the measures used were:

INDEPENDENT VARIABLES

1. Teacher Rating I (TRI) (based on yes/no responses)

"most able"	"At-Risk"
(TRI=yes)	(TRI=no)
2. Teacher Rating II (TR2) (based on 1 - 7 scale rating)

"most able"	"At-Risk"
(TR2=#1)	(TR2=#5,6 or 7)

DEPENDENT VARIABLES

	<u>Variable</u>
1. Pupil Rating Scale - Total	overall cognitive competence
2. Pupil Rating Scale 1 - auditory comprehension	language functioning
3. Pupil Rating Scale 2 - spoken language	}
4. Pupil Rating Scale 3 - orientation in space	} spatial - motor ability
5. Pupil Rating Scale 4 - motor co-ordination	}

Variable

6.	Pupil Rating Scale 5 - personal-social behavior	social competence
7.	Pupil Rating Scale 6 - verbal ability	verbal competence
8.	Pupil Rating Scale 7 - non-verbal ability	non-verbal competence
9.	Otis Intelligence (I.Q.)	intelligence
10.	Piers-Harris self-concept (Piers-Harris) TOT	self-concept
11.	Piers-Harris (AP) appearance	self-concept of appearance
12.	Piers-Harris (Pop minus) negative popularity	self-concept of lack of popularity
13.	Piers-Harris (Pop +) positive popularity	self-concept of popularity
14.	Children's Manifest Anxiety Scale	anxiety
15.	Commission-wide mathematics test Jan. (MATH I)	math ability
16.	Commission-wide mathematics test May (MATH II)	
17.	Grade Seven Marks - December: Language Arts (CHRIS I)	grades in succeeding year
18.	Grade Seven Marks -Seven Months Later Math (CHRIS II)	
19.	Grade Seven Marks -Seven Months Later Total (CHRIS III)	
20.	Grade Seven Marks - June: Language Arts (June I)	
21.	Grade Seven Marks - One Year Later Math (June II)	
22.	Grade Seven Marks - One Year Later Total (June III)	

Subjects

From the total Grade Six population of approximately 1,075 (enrollment fluctuated monthly by approximately one per cent) 337 students were referred by their teachers and assessed by these measures. Fifty-three of these, or 5% of the school population, were referred as 'top' students; two hundred and eighty-four, or 26% of the total population, were considered by their teachers to be in need of support or monitoring because they were at-risk for failure to cope with High School.

The proportion of boys and girls within each group differed markedly between the 'top' and At-Risk groups. In the 'top' group, more girls than boys were referred: thirty of the fifty-three top students, or 57%, were girls. In the At-Risk group, only 23%, or sixty-five of the two hundred and eighty-four students referred were girls. This high incidence of boys within the At-Risk group is in line with previous data on high-risk populations which typically show three to four times as many males as females (Anthony, 1975; Ross, 1976). Ages ranged from 11-8 to 12-11.

The following September, this group of students proceeded to Grade Seven in two of the Commission's High Schools, the majority, approximately 950 going to one school. Except for one 'top' student and fifteen "At-Risk" students who attended the smaller High School, all others in the survey, N=321, enrolled in the larger High School. Subsequent data collection including all High School grades (Chris 1, Chris 2, Chris 3, June 1, June 2, June 3), and the second part of this study were conducted in this

larger school only. In both High Schools, information collected was made available to the appropriate staff for use in planning for required remediation.

RESULTS

The first part of this study addressed the questions:

Can teachers reliably identify their At-Risk students?

How do these At-Risk students differ from other students on academic and other performance-related variables?

Group Differences: Analyses of Variance

Data was first analyzed by means of analyses of variance using the two teachers' ratings derived from the Grade Six Screening, Teacher Rating I, based on the yes/no judgement, and Teacher Rating II, based on the 1 - 7 scale rating, as independent variables. Scores on the measures of intelligence, verbal and non-verbal ability, cognitive competence, self-concept, anxiety, academic ability and school performance served as dependent variables. Results of these analyses appear in Tables I & II.

As noted, some teachers preferred not to respond "no", even for some children they considered to be At-Risk. There were 204 responses to be grouped by Teacher Rating I: 86 "most able" and 118 "At-Risk". The 117 unrated At-Risk cases would only have served, presumably, to increase the likelihood of significant differences between the two groups (Table I).

Likewise, a few teachers preferred not to make an estimate on the 1 - 7 scale. And since the measure derived from ratings on that scale, Teacher Rating II, was based on a comparison of only those students rated most highly (#1 = "most able") with those students rated in the three lowest categories (#5, 6, 7 = "At-Risk"), any student rated as #2, 3, or 4 was not included.

TABLE I

Analysis of Variance: TEACHER RATING I: Reported As Means:

('yes'/'no' to "Likely to be successful?"; n = 204)

	"yes" (Most Able)	"no" (At-Risk)	s
1. I.Q.	108.77	97.13	.001
2. Pupil Rating Scale-(Total)	84.19	62.34	.001
3. Pupil Rating Scale - (Auditory)	13.98	9.22	.001
4. Pupil Rating Scale - (Language)	17.36	11.9	.001
5. Pupil Rating Scale -(Space)	14.95	11.4	.001
6. Pupil Rating Scale -(Motor)	9.64	9.33	n.s.
7. Pupil Rating Scale-(Social)	28.87	20.55	.001
8. Pupil Rating Scale-(Verbal)	31.75	21.29	.001
9. Pupil Rating Scale-(Non-Verbal)	52.83	41.25	.001
10. Piers-Harris Total - (self concept)	62.01	53.31	.001
11. Appearance	8.40	7.73	.06
12. Pop +)	3.75	3.25	.009
13. Pop -)	2.24	2.74	.06
14. Childrens Manifest Anxiety Scale	20.12	22.93	.01
15. Math 1) (Math Ability)	64.50	59.50	.16 n.s.
16. Math 2)	64.55	55.22	.05
17. Chris I)	74.06	54.98	.001
18. Chris 2) Mid Term Marks	78.96	62.67	.001
19. Chris 3)	73.32	57.18	.001
20. June 1)	74.72	52.48	.001
21. June 2) Final Marks	78.53	52.64	.001
22. June 3)	74.55	50.33	.001

Note: n varies slightly with each measure - all scores available reported.

TABLE II

Analysis of Variance: TEACHER RATING II: Reported as Means;(answers on # 1 - #7 scale to "Is this student likely to cope?")
(n = 216)

	Scale=#1 (<u>Most Able</u>)	Scale=#5,6 or 7 (<u>At-Risk</u>)	<u>s</u>
1. I.Q.	117.91	113.73	.09
2. Pupil Rating Scale-(Total)	92.23	64.2	.001
3. Pupil Rating Scale-(Auditory)	15.89	9.62	.001
4. Pupil Rating Scale - (Language)	19.18	12.48	.001
5. Pupil Rating Scale-(Space)	16.42	11.60	.001
6. Pupil Rating Scale-(Motor)	9.49	9.23	ns
7. Pupil Rating Scale-(Social)	32.52	20.95	.001
8. Pupil Rating Scale-(Verbal)	34.81	22.32	.001
9. Pupil Rating Scale - (Non- Verbal)	57.75	41.71	.001
10. Piers-Harris Total - (self concept)	65.86	63.64	NS**
11. Appearance	8.66	7.43	.03
12. Pop +)	3.66	3.37	ns
13. Pop -) (Popularity)	2.56	2.72	ns
14. Childrens Manifest Anxiety	18.83	22.68	.007
15. Math 1) (Math Ability)	74.00	59.42	ns
16. Math 2)	98.00	55.92	.03**
17. Chris 1)	83.27	56.81	.001
18. Chris 2) Mid-Term Marks	87.31	64.09	.001
19. Chris 3)	81.88	61.22	.001
20. June 1)	83.09	55.34	.001
21. June 2) Final Marks	87.79	55.79	.001
22. June 3)	83.39	53.33	.001

** probably not representative due to low number of cases
(n = 43)

Two hundred and sixteen students were grouped by Teacher Rating II: 40 "most able" and 176 "At-Risk". (Table II)

Teacher Rating I, based on the yes/no response, distinguished between the "most able" and the "At-Risk" groups at a highly significant level on 16 of the 22 variables, $F(1,203) = 6.88$ to 142.56 , ($s = .009$ to $.001$). On two additional variables these groups also differed significantly, $F(1,203) = 3.95$ and 6.06 , ($s = .05$ and $.01$). The second measure, Teacher Rating II, also distinguished between the groups on 16 of the 22 variables measured. Fourteen of these differences were highly significant, $F(1,215) = 7.58$ to 185.2 ($s = .007$ to $.001$), and two were significant at the .03 level: $F(1,215) = 4.54$ and 4.66 .

For the "most able" group, means on each variable obtained using the 1 - 7 scale, Teacher Rating II, were generally higher than those on the yes/no rating, Teacher Rating I, because some teachers chose to answer 'yes' for some of the children they considered "At-Risk". (They explained, when queried, that they thought the despite his problems, this child would be successful.) So this "most able" group, in Teacher Rating I contained some of the known problem children, who had been judged "At-Risk" when selected by the Teacher Rating II.

The analyses of variance also shows that teachers' ratings distinguished between the able and At-Risk student as reliably as the Pupil Rating Scale. Not only on the overall rating, Pupil Rating Scale Total, but in each of the Pupil Rating Scale subtests except motor coordination, the judgments of Teacher Rating I and the Pupil Rating Scale, and Teacher Rating II and the

Pupil Rating Scale coincided. All three teachers' ratings distinguished between the groups at highly significant levels (Tables I & II): For Teacher Rating I, the F values of differences on the scores on the Pupil Rating Scale ranged from: $F(1,203) = 79.3$ to 142.56 ($s = .001$). For Teacher Rating II F values on the Pupil Rating Scale were: $F(1,215) = 97.96$ to 185.17 ($s = .001$).

Significant group differences between the "most able" and "At-Risk" students appear in ability, cognitive competence, school performance and affective competence. Differences in I.Q., verbal and non-verbal ability, auditory comprehension, spoken language, orientation in time and space, personal and social behavior, self-concept and mid-term and final grades are all highly significant, $F(1,203)$ ($1,215$) 22.65 to 185.17 ($s = .001$). The groups also differ significantly in anxiety level, $F(1,203)$ 6.06 ($s=.01$); $F(1,215)$ 7.58 ($s = .007$), and ability in math, $F(1,215)$ 4.54 ($s = .03$); $F(1,203)$ 3.95 ($s = .05$).

It should be noted that although the At-Risk students had significantly lower I.Q.'s than their more able classmates, I.Q.'s for both groups are in the normal range. Results of I.Q. comparison using Teacher Rating II show both "able" and "At-Risk" groups to have much higher mean scores than those in Teacher Rating I. Presumably, the unrated students, as well as those rated in the middle range (#2,3,4) and, thus, eliminated from this comparison in Teacher Rating II, had lower I.Q.'s.

Group Differences: Discriminant Analyses

To ensure that the significant differences between the two groups on this wide range of variables actually reflected a significant range of dimensions, and that these dimensions accounted for most of the variance between the able and At-Risk students, a Discriminant Analysis was performed on each of the independent variables. The SPSS program for Discriminant Analysis, minimizing Wilks' Lambda was used.

For Teacher Rating I, the following function was obtained:
 (.298) Pupil Rating Scale I + (-.77) Pupil Rating Scale II + (-.52)
Pupil Rating Scale IV + (-.24) Pupil Rating Scale V + (.89)
Pupil Rating Scale VI + (.56) Pupil Rating Scale VII + (-.10)
 Pop minus + (-.85) Math I + (.35) Math 2 + (.33) Chris 1 + (-.28)
 Chris II + (-.28) Chris III + (.64) June 2.

Using this function, the cases were grouped:

<u>Actual Grouping:</u>		<u>Predicted Grouping</u>	
	<u>N</u>	<u>most able</u>	<u>At-Risk</u>
<u>most able</u>	86	72 (83.7%)	14 (16.3%)
<u>At-Risk</u>	118	8 (6.8%)	110 (93.2%)

correctly classified = 89.22%

For Teacher Rating II, the following function was obtained:
 (-.37) Pupil Rating Scale III + (.34) Pupil Rating Scale IV
 + (-.30) I.Q. + (.097) Piers-Harris Total + (.15) Children's
 Manifest Anxiety Scale + (.62) Math 1 + (-.25) Chris 1 + (.25)
 Chris III + (-.36) June 2 + (-.19) June 3.

Using this function, the cases were grouped:

Actual Grouping:		Predicted Grouping:	
	<u>N</u>	<u>most able</u>	<u>At-Risk</u>
<u>most able</u>	40	37 (92.5%)	3 (7.5%)
<u>At-Risk</u>	176	6 (3.6%)	170 (96.4%)
correctly classified = 95.63%			

The first function used auditory comprehension, spoken language, motor coordination, personal and social behavior, verbal ability, unpopular self-concept, mathematics ability and grades to discriminate between the groups. The second function used spoken language, motor coordination, I.Q., self-concept, anxiety, mathematics ability and grades. This confirms that the able and At-Risk groups do not merely differ by one strongly discriminating variable, such as I.Q., but that they are differentiated by a range of cognitive, academic and affective variables.

Correlations:

Teachers' Ratings

Correlations between each of the two independent variables, Teacher Rating I and Teacher Rating II, and all of the dependent variable were also obtained, using Pearson Product moment correlations. These appear in Tables III & IV. The validity of these two teachers' ratings is further confirmed by the highly significant correlations between each of them and all but one of the measures derived from the Pupil Rating Scale (Table IV).

TABLE III

Correlations of Three Teachers' Evaluations with Grades
7 months (Chris 1,2,3,) later and 13 months (June 1,2,3,) later.

	Teacher Rating I	Teacher Rating 2	Pupil Rating Scale
Chris 1)	- .55	- .68*	.56
Chris 2) Mid Term Grade	- .50	- .59	.49
Chris 3)	- .56	- .66	.60
June 1)	- .62	- .72	.65
June 2) Final Grades	- .65	- .72	.63
June 3)	- .61	- .66	.64

Note: all correlations, $s = .001$

Correlations of Three Teachers' Evaluations with other variables
in Grade Six Screening

	Teacher Rating 1	s	Teacher Rating 2	s	Pupil Rating Scale	s
I.Q.	-.47	.001	-.68	.001	.40	.001
Math 1) Math Ability	-.13	.08	-.26	.001	.15	.07
Math 2)	-.18	.025	-.27	.001	.16	.06
Childrens Manifest Anxiety Scale	.18	.007	.18	.003	-.23	.003
Piers-Harris Self-Concept	-.34	.001	-.28	.001	.26	.001
Pop Minus (Popularity)	-.14	.032	-.14	.001	.12	.09

* correlations negative because TR_1 : 'yes' = 1, 'no' = 2
 TR_2 : 1 - 7 = hi - low.

TABLE IV

Correlations of Two Teachers' Evaluations from Grade Six Screening with Pupil Rating Scale (Myklebust): Total Score, Verbal, Non-Verbal, and Sub-Scales

	Teacher Rating <u>1</u> <u>s</u>		Teacher Rating <u>2</u> <u>s</u>	
Pupil Rating Scale-Total	-.73	.001	- .76	.001
Pupil Rating Scale-(Verbal)	-.71	.001	- .71	.001
Pupil Rating Scale - (Non-Verbal)	-.63	.001	- .65	.001
Pupil Rating Scale Subscales:				
Pupil Rating Scale (Auditory)	-.72	.001	-.77	.001
Pupil Rating Scale (Spoken) (Language)	-.72	.001	-.70	.001
Pupil Rating Scale(Orientation)	-.63	.001	-.65	.001
Pupil Rating Scale - (motor co-ordination)	-.08	ns	-.09	ns
Pupil Rating Scale - (Personal Social Behaviour)	-.64	.001	-.65	.001

TABLE V

Other Relevant Correlations

		<u>Piers-Harris</u> <u>(Self-Concept)</u>	<u>s</u>	<u>Childrens Manifest</u> <u>Anxiety Scale</u>	<u>s</u>	<u>I.Q.</u>	<u>s</u>
Piers-Harris Self-Concept							
Childrens Manifest Anxiety		-.26	.001				
Scale							
I.Q.		.26	.001	-.26	.001		
Math 1)	Math Ability	.14	.03	-.12	.06	.34	.001
Math 2)		.14	.04	-.18	.009	.33	.001
Chris 1)	Mid Term Marks	.28	.001	-.09	ns	.63	.001
Chris 2)		.21	.004	-.16	.02	.48	.001
Chris 3)		.30	.001	-.18	.003	.55	.001
June 1)	Final Marks	.27	.001	-.13	.05	.67	.001
June 2)		.34	.001	-.27	.001	.58	.001
June 3)		.35	.001	-.19	.002	.54	.001

Teacher Rating I correlated .73 ($s = .001$) with the total score on the Pupil Rating Scale, and from .63 to .72 ($s = .001$) with all the Pupil Rating Scale subtests, except motor coordination. Teacher Rating II correlated .76 ($s = .001$) with the overall Pupil Rating Scale score and from .65 to .77 ($s = .001$) with scores on the subtests (except motor coordination).

All three teachers' ratings, Teacher Rating I, Teacher Rating II and Pupil Rating Scale, were highly correlated with grades obtained the following year in Grade Seven. All correlations between each of these teachers' ratings and each of the mid-term and final grades were highly significant ($r = .49$ to $.72$, $s = .001$). Moreover, for each of the three mid-term marks (Chris 1, Chris 2, Chris 3) and the three final marks (June 1, June 2, June 3) correlations with one or both of the ratings taken from the Grade Six Screening Form; Teacher Rating I and Teacher Rating II were higher than correlations with the standardized measure the Pupil Rating Scale (Table III).

Table III also shows correlations between the three teachers' evaluations: Teacher Rating I, Teacher Rating II and Pupil Rating Scale, and other significant variables. The two teachers' ratings taken from the Grade Six Screening -- Teacher Rating I and Teacher Rating II -- were better predictors of intelligence ($r = .47$ and $.68$, $s = .001$) than was the standardized measure, Pupil Rating Scale ($r = .40$, $s = .001$). Teacher Rating II was also a better predictor of math ability, Math 1 and Math 2 ($r = .26$ and $.27$, $s = .001$) than the Pupil Rating Scale ($r = .15$, $s = .07$; $r = .16$, $s = .06$). All the teachers' ratings were

significantly correlated with anxiety ($r = .18$, $s = .007$; $r = .18$, $s = .003$; $r = .23$, $s = .003$), self-concept ($r = .34$, $s = .001$; $r = .28$, $s = .001$; $r = .26$, $s = .001$), and self-perception of appearance ($r = .14$, $s = .03$; $r = .14$, $s = .001$; $r = .12$, $s = .09$).

Correlations Dependent Variables

Other significant correlations appear in Table V. As might be expected, the affective variables, self esteem and anxiety, are negatively and significantly related ($r = .26$, $s = .001$). This coincides with previous findings (Ross, 1976; Millen, 1966), although in the present study the correlation coefficient is lower than those previously reported, $-.54$ to $-.67$. Perhaps the "top"/"At-Risk" only nature of this sample contributes to this decrease.

Of more interest are the significant correlations between self-concept and grades ($r = .21$ to $.35$, $s = .001$ to $.004$), and self-concept and intelligence ($r = .26$, $s = .001$). Intelligence as expected, is a better predictor of grades than the affective measures ($r = .48$ to $.67$, $s = .001$) (Table V).

The validity of using teachers' ratings to select students At-Risk for failure to cope with school seems well confirmed by these correlations. The two teachers' ratings used in this study correlated more highly with subsequent grades than did intelligence. For Teacher Rating I, these correlations ranged from $.50$ to $.65$ ($s = .001$); for Teacher Rating II, they were even higher: $r = .54$ to $.72$ ($s = .001$) (Table III). In fact, no other

correlations were as high as those between these two teachers' ratings and grades, except for one: the correlation between I.Q. and final grades ($r = .54$ to $.67$; $s = .001$) (Table V).

It is also interesting to note that the two groups differ more in grades than they do in ability. Scores on the Commission-wide mathematics test, Math II, which measured math ability, differed at the .03 and .05 level $F(1,215) = 4.54$; $F(1,203) = 3.95$ while grades in mathematics, Chris II and June II, differed at the .001 level $F(1,203) = 87.93$; 40.53) $F(1,215) = 125.75$; 74.32) (Table III). This can be considered additional evidence that grades are dependent on factors other than ability, a suggestion that is further confirmed by the significant correlation between final grades and self-concept ($r = .35$; $s = .001$) and final grades and anxiety ($r = -.19$; $s = .002$) (Table V). The hypothesized debilitating effects of prolonged school failure and heightened anxiety on school performance would also predict such results.

PART II - LEARNING TO COPE WITH HIGH SCHOOL

The second part of this study addresses the question:

Can At-Risk students be trained to deal more effectively with school? Will they feel less anxious and more confident, and become more competent and successful in school, if their remedial program includes training in developing and using successful strategies and reducing their own expectancy of failure?

As the previous studies on the effect of failure demonstrated, whether or not a stressful situation becomes a facilitative challenge, or an anxiety-provoking problem, depends upon one's previous learning history and whether or not one can respond with sufficient skill and adequate problem-solving strategies. The At-Risk students identified in this study, having been found to be less able, more anxious, less confident and deficient in cognitive skills, could be expected to be facing their first year in a new and bigger school, with less probability and less expectation of success than their more able classmates, and with increased opportunities for failure.

As described, this School Commission provides a spectrum of services to deal with academic lags, and all students more than one year below grade level in language arts and mathematics were given a remedial program in Grade Seven. The more severe problems were monitored and taught by the special education teachers for these subjects. Guidance counsellor service was available to deal with the more severe personal and social problems.

But none of these services addressed the demonstrated stress-related correlates of lowered school performance of these students. Could a direct attack be made on these as part of the school's remedial program, and would such an intervention increase the school performance of these At-Risk students, and reduce their school failure?

Several behavioural techniques, in current therapeutic use, have demonstrated their usefulness in reducing stress-debilitated performance by teaching stress-vulnerable individuals to generate and use more effective problem-solving strategies. Studies report reduction of debilitating anxiety and increased appropriate and task-related behaviour using these techniques on a diversity of school-related problems, from impulsivity in children to test anxiety in university students (Goldfried and Trier, 1974; Meichenbaum and Goodman, 1971; Langer, Janis & Walper, 1975; Gottman, Gonso & Rasmussen, 1974; Dweck, 1975; Andrews & Debus, 1978). It was decided to implement such a coping skills training program with a selected sample of this At-Risk population, as an adjunct to their on-going remedial programs, to see if such training would increase their success in school.

METHOD

Of the two high schools serving Grade Seven students, the larger, (total school population approximately 2,000) was selected for this study. (The smaller school was a much less stressful setting. It was about the size of an average elementary school, classes were small and the staff turnover extremely low. Teachers got to know all of the pupils in the school, often their siblings and families as well. The staff was willing and able to make the adjustments needed to reduce the stress of going to school for the more vulnerable, and to increase the appropriateness of instruction, both for them and for the more able students.) Approximately 950 students were enrolled in Grade Seven in the high school being studied. 269 of the 284 At-Risk students selected by the Grade Six Screening attended this school.

Subjects

From amongst the 269 At-Risk students described in Part I of this study, a sample was selected of those "Most At-Risk", i.e. those most likely to be affected adversely by the stress of high school. The sample was composed of all students who were:

- (1) Rated on the Grade Six Screening Form as "At-Risk" on both teachers' ratings: "No" on Teacher Rating I and 5,6 or 7 on Teacher Rating II.
- and (2) Below the median, < 72 , on the Pupil Rating Scale.
- and (3) Above the median, > 17 , on the Childrens Manifest Anxiety Scale.

and (4) Below the median, < 54 , on the Piers-Harris Self Concept Scale.

Two children with neurological problems were excluded from the sample. Three more with below normal I.Q. scores were also excluded to control for the known pervasive effect of low intelligence. (This low incidence of I.Q. 80 and below was surprising -- doubtless a product of the relative socio-economic homogeneity of this school population). This left a sample of forty-eight "most At-Risk" students - seventeen girls and thirty-one boys, ranging in age from 12 years, 1 month to 13 years, 6 months.

Procedure

These 48 students were randomly assigned -- first girls, then boys -- to one of three groups. Group one, composed of 6 girls and 10 boys, received a twice weekly Coping Skills Training program for nine weeks; Group two, also composed of 6 girls and 10 boys, served as an attention placebo Control group and met for equal time with one of the school's three guidance counsellors; Group three, composed of 5 girls and 11 boys, served as a no treatment Control. Since the investigator was one of the Coping Skills Trainers, it was not possible to conceal the design. However, all trainers, for both experimental and placebo-control groups, were told we were investigating the best way to help stress-vulnerable students to succeed more in school. All were aware of the criteria by which "most At-Risk" students had been selected. Difference in

expectancy by the trainers was controlled for by ensuring uniformity of presentation by the two Coping Skills program trainers (as detailed in the following section) and by asking the three participating guidance counsellors to follow their best judgements in designing a therapeutic program for such highly At-Risk students.

Parents were informed by letter that the program was being carried out as part of the follow-up of the Grade Six Screening, and queries were invited. (Only two calls were received and these ended with requests to include their own children!) Meetings were held with the Grade Seven teachers to discuss the aims of the study and enlist their co-operation. It was explained that exact details of each program, and which group leader was employing which method, could not be discussed until the study was completed. (Full explanation of the rationale of all programs has been given subsequently; all findings are available to the staff.)

Coping Skills Training

Coping Skills Training was given in two ways. Four of the sixteen students assigned to this group were chosen at random to be seen individually for one 45 minute period twice a week for nine weeks from the middle of October until the last week of December. The remaining twelve were divided into two groups of six each; each group also met twice a week for that period. Both individual and group instruction was included because pilot studies of the programs had been conducted with individuals only.

Two teachers, the author, and a speech therapist trained by the author for this investigation, each taught one group of six and two of the individual students. Sessions were conducted in two small classrooms in the high school, students being excused from their regular classes for one period twice a week to attend sessions. All sessions were taped, and these tapes used by the two teachers to ensure as much uniformity as possible in the programs presented. An on-going journal was also kept by each teacher, filled in in the period following each session. Contact after each day's sessions and weekly planning meetings were also maintained between the teachers.

Both individual and group coping skill programs included instruction and guided practice in noticing and monitoring one's own reactions to stress, particularly distracting self-statements and off-task behavior (detailed outline of daily program, Appendix I). Students were taught to notice their own "behavior,

thoughts, and feelings" before, during, and just after a stress or "hassle". They practiced labelling their own self-statements as facilitating or debilitating, i.e. "uppers" or "downers", depending on whether or not they increased or decreased on-target behavior, and led to an adaptive solution. Students were taught to notice their own heightened somatic reactions as a signal to start this coping procedure. Role-playing and rehearsal were used to help the students generate and practice adaptive responses. Homework was assigned and reported on in each session .

Beginning with the fourth week, relaxation techniques, following a modified Jacobsonian (Jacobson, 1938) model, were introduced, and practiced for the final five minutes of each session. The role of relaxation in reducing the debilitating somatic sequelae of stress was discussed. Systematic instruction in flexing and relaxing groups of muscles, beginning with the hands and arms, and proceeding through the upper body, legs, face and trunk, was accompanied by modelling and rehearsal. One boy labelled this relaxation practice, learning to "cool it".

Finally a seven step problem-solving sequence "Problem Solving Steps" (after D'Zurilla and Goldfried, 1971) was introduced to teach and practice problem-solving skills. This sequence, taught as a series of mnemonic logos, included noticing and defining the problem, generating alternative solutions, selecting and checking the fit of the best solution, and, finally giving oneself an 'upper' or self-compliment for

remembering to complete the sequence (See Figure I). Practice using this series to solve imaginary and real life problems was given in the final sessions.

Homework assignments included practice in each new skill as it was taught, record keeping in a daily diary, and filling in "How Did I Cope?" sheets (see Appendix) in which students recorded instances of noticing, confronting, and reducing their own stress induced anxiety as they had been taught to do.

Students reported they were using their newly-learned skills and noticing an increase in adaptive behavior in stressful situations, such as reciting in front of the class and taking exams. One boy proudly reported teaching his tense, harassed father how to pack for an emergency trip more efficiently using Coping Skills!

The four students on individual programs were given the same program and, in addition, practice in using a task-relevant checklist of sequential-solution finding steps, "Steps to the Right Answer", (see Appendix) on 'school-type material'. Reading-Thinking-Skills worksheets (Continental Press Ltd., Menlo Park) were used to give them practice in scanning for, selecting and checking the fit of the appropriate answer by using this checklist to cue a series of self directions. They were also taught how to write a short essay by generating ideas, grouping these ideas into categories, then labelling and sequencing these categories. All other procedures included in the group program were taught to the individual students as well.

Counsellor-Trained Groups

The sixteen At-Risk students in the second group were seen by one of the school's three guidance counsellors for the same nine week period in bi-weekly sessions. These counsellors were asked to proceed in their sessions as they "would normally deal with such students". This counsellor-trained group served to compare the effectiveness of conventional school intervention with Coping Skills Training in helping At-Risk Seventh Graders, and as an attention placebo control.

As in the Coping Skills Training program, twelve of these students were seen in two groups of six, and four were seen individually. One of the counsellors saw the four individual students. She described the aim of her program: "to try to develop a relationship that would allow them to express themselves on a one-to-one basis - to feel comfortable about seeking help if they should ever need help again". The other two guidance counsellors each met with one of the groups of six for the same period. One reported: "we discussed the problems of being a first year student in a new high school". The other group studied and practiced Transactional Analysis. Average absence rate was reported as 5 sessions.

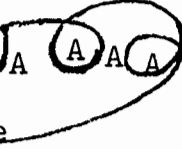
Control Group

The third group of sixteen At-Risk students served as a control over time and received no treatment beyond normal school procedures. They were included in the pre and post testing given the experimental groups.

Both Coping Skill and Counsellor trained groups met between October 28, 1975 and December 17, 1975. Unfortunately a major storm and teachers' labor problems closed the school several days in this period, requiring rescheduling of two sessions (one day later) and reduction of the originally planned ten week program by one week to terminate by Christmas holiday time. To recapitulate, the forty-eight "most" At Risk subjects were randomly assigned, and treated, as follows:

<u>Coping Skills Training</u> (N=16)		<u>Counsellor Trained</u> (N=16)		<u>Controls</u> (N=16)
1 } 2 } 3 } 4 } 5 } 6 }	Trained by Author	1 } 2 } 3 } 4 } 5 } 6 }	Trained by Counsellor A	1 } 2 } 3 } 4 } 5 } 6 }
	Matched Programs			7 } 8 } 9 } 10 } 11 } 12 }
7 } 8 } 9 } 10 } 11 } 12 }		7 } 8 } 9 } 10 } 11 } 12 }	Trained by Counsellor B	7 } 8 } 9 } 10 } 11 } 12 }
13 } 14 } 15 } 16 }	Trained by Author Trained by Teacher	13 } 14 } 15 } 16 }	Seen by Counsellor C	13 } 14 } 15 } 16 }
				Pre/ Post Testing Only

FIGURE I
Problem Solving Steps

1. 
2. 
3. A A A A A A A 
4. Choose 
5. TRY
6. 
7. 

Notes:

1. noticing the problem
2. defining the problem
3. generating alternatives or answers
4. selecting the best answer(s)
5. trying out the fit of #4
6. checking #5
7. self compliment

MEASURES

All forty-eight students were evaluated individually both prior and subsequent to training using the following measures:

(1) Means-End Problem Solving Test (Platt & Spivack, 1975)

This is a measure of the ability to generate relevant solutions to personal and social problems. It is presented as a series of stories which have only a beginning conflict and a 'happy ending'; the subject is asked to supply the 'middle' of the story, or the means to the end. Previous studies have found the Means-End Problem Solving Test distinguished between delinquent and normal adolescents (Spivack & Levine, 1963) normal and schizophrenic adolescents (Platt, Spivack, Altman & Peizer, 1974) and young heroin addicts and normals (Platt, Scura & Hannon, 1973). Four of the ten Means-End Problem Solving Test stories accounted for the variance in two of these studies, and these four stories were used in the present study. It was hypothesized that Coping Skills Training would result in an increase in the number of relevant means generated.

(2) Alternatives (Platt, Spivack, Altman & Peizer, 1974)

This is a similar measure to the Means-End Problem Solving Test. Four problem situations are presented and the subject asked to generate as many alternatives as he can to each. Platt, Spivack, Altman & Peizer (1974) found that institutionalized adolescents generated significantly fewer alternatives than normals. Alternatives was included in this study as a further check on the hypothesized increase in problem solving strategies with training.

(3) Piers-Harris Self-Concept Scale

Scores obtained on this measure in the Grade Six Screening battery the previous June (Piers-Harris Tot) served as the pre-test score. A second assessment using this measure (Piers-Harris post) was included in the post-testing.

It was hypothesized the Coping Skill Training would increase self concept.

An additional measure was used in the post-testing:

(4) Problem-Solving Test

This is an adaptation, developed for this study, of an adult problem solving test taken from Westcott, 1968. The student is asked to guess the solution to a problem presented clue by clue, and to report how 'confident' he is of each answer on a scale of 1 - 5. Fourteen problems are presented, five clues are available for each. The test yields several scores: the average number of clues used, the average number of seconds taken, an efficiency score, and the average level of "confidence". The time score (Problem Solving Time) and the confidence score (Problem Solving - Confidence) are reported in this study. This measure was developed for use in post-testing with all forty-eight students, but unforeseen time constraints, (as described below) made possible its use with only the four individually trained students in each group and their controls (N = 12). It was hypothesized that Coping Skills Training would increase confidence, and decrease time required to solve problems.

Pre-testing using these measures as described, took place in the two week period preceding the first treatment session. The forty-eight students were seen individually by one of two research assistants and given the pre-test battery. A problem arose in the post-testing. It was scheduled to be completed immediately following the Christmas holiday, but this turned out to be a month even more disrupted by a prolonged teachers' strike. The planned post-testing period of two weeks was extended, through necessity, to approximately six weeks. It was also necessary to abandon the use of two proposed measures: a socio-metric ranking "Choosing Partners", and a teacher's evaluation.

RESULTS

Data was analyzed by means of Analysis of Variance, using the Balanova 5.01 program of Analysis of Variance for Repeated Measures for analysing the pre- and post-treatment scores of social problem solving and self concept, and the SPSS G031 Analysis of Variance program to compare post-treatment grades and problem-solving ability. Results of these analyses appear in Table VI.

Only on the Means-Ends Problem Solving Test, the measure of ability to generate relevant means to solve personal and social problems, did coping skill training result in a significant increase, as compared with the two control groups $F(2,46) = 4.69, (s = .015)$. Students in all three groups showed increased scores over time, $F(1,47) = 18.85, (s = .001)$, and this was significantly larger for the two trained groups $F(2,46) = 4.33, (s = .02)$.

Coping Skills Training also increased scores on the self-concept measure, Piers Harris-post, as compared to the other two groups. The Coping Skills group gained 7 points in their measure, as compared with gains of 1.6 points for the counsellor-trained group, and 4.6 points for control group. However, this increase was not significant. In fact all three groups gained in self-concept significantly, over the first testing at the end of Grade Six $F(1,47) = 5.26, (s = .03)$. This suggests that going to high school did not diminish, but rather enhanced the way these At-Risk students felt about themselves. However, the mean scores of all three groups of these At-Risk students on

TABLE VI

Analysis of Variance: EFFECT OF TREATMENT

(All dependent measures, reported as means, by group; N = 48)

		<u>Coping Skills</u> N=16	<u>Counsellor</u> N = 16	<u>Control</u> N=16	<u>Group</u> <u>S</u> <u>Time</u> <u>gxt</u>		
Social Problem Solving)	Means-Ends Problem Solving - pre	8.07	6.5	10.2			
	Means-Ends Problem Solving - post	12.6	8.6	10.7	.02	.0001	.02
	Alternatives-pre	12.6	10.7	10.8			
	Alternatives-post	12.0	12.2	10.6	ns	ns	ns
Self Concept)	Piers-Harris - pre	52.7	51.5	50.9			
	Piers-Harris - post	59.7	53.1	55.7	ns	.03	ns
Problem Solving)	*Problem Solving: Confidence	43.3	40.8	40.8	ns		
	*Problem Solving-Time	415.8	539.3	334.8	ns		
GRADS	Chris 1	68.0	52.2	65.3	ns		
	Chris 2	66.5	56.6	70.2	ns		
	Chris 3	60.8	56.6	62.4	ns		
	June 1	57.2	50.3	59.2	ns		
	June 2	52.2	47.5	50.0	ns		
	June 3	53.4	46.4	55.3	ns		

*N = 12

the self-concept measure (Table VI) remained below that of the able students, as measured the previous June ($\bar{x}$, "most able" = 62.01).

Contrary to the hypothesized results, this Coping Skills Training program did not improve subsequent grades. Only on the mid-term language arts and final mathematics marks does the Coping Skills group do better than the other two, and the difference is not significant. There were no significant group differences on the scores for the other social problem-solving measure Alternatives nor for the problem-solving measures Problem Solving - Time and Problem-Solving - Confidence, although the Coping Skills Trained group did have higher confidence scores: 43.3, as compared to 40.8 for the other two groups.

DISCUSSION: PART I - IDENTIFYING THE AT-RISK STUDENT

The first part of this study was designed to see if teachers could reliably identify which of their students were At-Risk for failure to cope with school, and how such At-Risk students differed from their more able classmates.

These questions are clearly answered for the sample in this study. Students considered by their teachers to be amongst the least successful quarter of the class were very significantly less skilled, less intelligent, less confident and more anxious than those selected as being amongst the top ten percent. The At-Risk students differ from the most outstanding students on all the cognitive, affective, academic variables measured except motor coordination, "popularity" and one math examination; and the discriminant function generated from these variables distinguished the two groups very accurately. The most able students have better auditory comprehension, spoken language, make better judgements of time and space, and display more competent personal and social behavior than do the At-Risk group. They also have higher verbal and non-verbal competence. They are less anxious, have higher self-concepts and feel more attractive and popular. The groups also differ significantly in intelligence, although the absolute difference is small and both scores are within the average range. All of the grades of the able students are very significantly higher.

However, it must be remembered that this comparison is being made between the most able and the least able students only. A valid answer to whether or not these At-Risk students differ significantly from the normal school population on these variables requires a comparison with the total school population. This study suggest that this is a promising hypothesis and a promising area for further study. The next step would be to compare the At-Risk population with randomly selected normal classmates on these variables.

Some of the data suggests that the teachers' judgements would continue to be reliable even between less polar groups. Mean scores of the At-Risk group on the standardized measures of anxiety, cognitive competence and self concept show that vis-a-vis a normal sample these students would also be considered At-Risk. As a group, they scored above the median on the anxiety scale and below the median on the measures of self concept and cognitive competence.

It is also impressive that these teachers were able to predict which students would earn the lowest and the highest grades in a new school seven months and one year later. Despite academic remediation, Coping Skills Training, counselling programs, school strikes and the passage of time, these correlations remained high. It is almost axiomatic that the best predictor of behavior is previous behavior, and these findings suggest that the teacher is a reliable observer of performance-related behavior. Results of the discriminant analysis show that in making their judgements, teachers not only

consider ability and performance, as measured by intelligence and grades, but they are sensitive to a range of affective and cognitive dimensions as well. These include the child's auditory and linguistic competence, his self-concept, his personal and social behavior, and his level of anxiety. Although all three teachers' evaluations distinguished able from At-Risk students very reliably, answers to the two questions on the Grade Six Screening did it better than the standard measure, the Pupil Rating Scale. Furthermore, the three judgements coincided at a very high level. Therefore, the substitution of this simple procedure, The Grade Six Screening Form, for the standard measure seems warranted.

The effect of the year's school disruptions on these predictions is difficult to assess. It is reasonable to assume that since learning in school became difficult for all students, the effects of any learning-related deficits would be exacerbated by this situation. If this acted to increase the difference between good and poor students, the predictive validity of the teachers' evaluations would be enhanced. On the other hand, if all students were seriously affected, the range might be narrowed. But whatever the mitigating/exacerbating effects of these disruptions in school, these results remain a confirmation of the teachers' ability to judge between their least able and most able students.

There are several other unanswered questions. Although a difference in ability to cope with stress might be inferred from the difference in anxiety levels, and in self-concept, this

is a tenuous link. Any subsequent study should include measures of how these students deal with stress, particularly how their school performance is affected by stress, to see if the hypothesized debilitating effect of failure over performance does distinguish the At-Risk students from their classmates.

In the same manner, the hypothesized difference in problem-solving ability between the groups needs to be established. Although the At-Risk students in Part II of this study gained significantly in social problem-solving ability, it remains to be seen if they differ in this ability relative to their more able classmates.

Any future study should also examine closely the contribution of intelligence to differences in over all competence between the groups. Although intelligence did not account for a major portion of the variance in the first discriminant analysis and did not even appear in the second, if measures of coping ability and problem solving ability are added in subsequent studies, care must be taken to control for the effect of intelligence on these additional measures of ability.

Still some of this data is informative and several of the differences between these polar groups particularly interesting. For instance, differences between the groups in mathematic ability is less than differences between them in grades, particularly in their mathematics grades: Chris 2 and June 2. This suggests that the academic performance of the At-Risk students is being debilitated by the several affective and cognitive dimensions on which they are also less competent.

Also, the high negative correlations between grades and self-concept, and grades and anxiety, lend further confirmation to the debilitating effect of low self-esteem and high anxiety and the hypothesized disabling effect of prolonged failure on the At-Risk students.

So the question of how At-Risk students differ from their classmates, although answered clearly for the groups in this study, needs further investigation. It remains for further study to determine whether the differences demonstrated between these groups also obtain when the At-Risk students are compared to an unselected normal population of classmates.

However, there are some implications to be drawn from this study. This data suggests that a simple, efficient and effective way to identify those students who are At-Risk for failing to cope with school because of depressed cognitive and academic skills, lowered self-concept and heightened anxiety is to ask their teacher. It further suggests that by the end of elementary school, the most able students differ from the least able students, not only by how well they achieve in school, but also by how anxious, attractive and competent they feel themselves to be.

DISCUSSION: PART II COPING SKILLS TRAINING

The second part of this study was designed to see if students identified as being At-Risk for failing to cope with school could be taught to deal more effectively with their own debilitating stress and, therefore, succeed more in school.

It is difficult to evaluate the results of the nine weeks of Coping Skills Training program. The only significant treatment effect was an increase in social and personal problem-solving ability. Although these results must be viewed with caution because of the still experimental nature of the instrument used, they do suggest that problem-solving ability can be enhanced with training. Self-concept also appeared to increase, although not to a significant level. Perhaps an increase of self-esteem and heightened problem-solving skills are valid goals for such a program. It would require a more detailed investigation of how At-Risk students differ from their classmates on performance-related variables, and more precise knowledge of the effects of stress on these students, to clarify these goals.

The disruption and the general air of dis-ease within the school during the treatment programs and post-testing -- e.g. loudspeaker announcements at any time during the period that school was closing immediately -- probably confounded any potential treatment effects and the validity of post-testing. So sophisticated perusal of this data is unwarranted. On the basis of this, the most parsimonious observation that can be made is that the effects of Coping Skills Training on improved

school functioning needs to be re-evaluated by further study under more reasonable conditions. The third question in this study was, in effect, not answered.

However, some observations can be made to increase the rigor of any subsequent study. As noted, more precise knowledge of the effects of stress would lead to a more precisely designed Coping Skills program. The aim of this program was general: to teach students to generate, and use more effective problem-solving strategies in the face of any stress in school. It is reasonable to expect that a program aimed at a more specific problem such as stress-debilitated performance on tests, would permit a better evaluation of the effectiveness of such training.

A second source of confounding might be eliminated by increasing the frequency of the sessions and fitting the training program into two or three weeks. Although the reported disruptions during this program were highly unusual, any school-based study is vulnerable to interruptions by absences, field trips, and examination periods. The shorter the time period covered by such a study, the less disrupted it is likely to be, because it can be scheduled around other planned school activities. It is also less likely to disturb the normal school schedule -- an important concern for any study directed towards improving school performance.

Finally, the dependent measures used to assess the effectiveness of the Coping Skills Training program might be more closely related to coping ability. Appropriate measures might be:

self-report measures of coping ability, self-report measures of problem-solving strategies, teachers' evaluations of coping ability, observations of on-task behavior, and performance under stress.

In summary, this study of the identification, description and treatment of students at-risk for school failure, demonstrates a simple and effective way that these At-Risk students can be identified so that they may be helped. Screening all classes at the end of elementary school to glean the teachers' evaluations about the student as a learner could easily be implemented by any school board using available personnel. With necessary precautionary measures to ensure that no self-fulfilling prophecy is set up, this procedure should enhance performance and increase success. Since this study shows that At-Risk students leave elementary school significantly deficit in competence and in confidence, it seems worthwhile to continue to look for effective ways to make their school experience more profitable and more successful. The effectiveness of training such students to cope better with school-related stress and, thus, enhance their own performance in school was suggested but not established by this study, and awaits further investigation.

REFERENCES

- Ammons R. & Ammons C. The Quick Test (Q.T.) provisional manual, Psychol. Reports, 1962, 11; 111-161
- Andrews G. & Debus R. Persistence and the causal perception of failure, J. of Educ. Psychol., 1978, 70:2; 154-166.
- Anthony J. (ed.) Explorations in Child Psychiatry, N.Y., Plenum Press, 1975.
- Bateman B. in Learning and Behavior Characteristics; A Humanistic Approach, in W. Gardner, Boston, Allyn Baron, 1977, 550-551
- Black F.W. Self concept as related to achievement and age in learning disabled children, Child Develop., 1975, 45; 1137-1140.
- Binêt A. L'Etude Experimentale de l'Intelligence, Paris, Schleicher, 1903.
- Brickman P., Linsenmeier J., McCareins A. Performance enhancement by relevent success and irrelevant failure, J. Person. and Soc. Psychol., 1976; 33:2; 149-160.
- Bryan T. and McGrady H. Use of a teachers' rating scale, J. of Learn. Disab., 1972, 5:4; 199-206.
- Callaghan R. Digit span and anxiety, Amer. J. Ment. Def., 1957,, 61; 581-582.
- Castenada B., McCandless R. and Palermo D. The children's form of the manifest anxiety scale, Child Develop., 1956, 27; 317-326.
- Cattel R. & Cattell M. Junior Senior High School Personality Questionnaire (H.S.P.Q.) I.P.A.T. Editions, Ill, Champaign, 1968.

- Celdric Report One Million children, report by the Commission on emotional and learning disorders in children, Canada, 1970.
- Collins J.E. The Effects of Remedial Education, Edinburgh, Oliver & Boyd, 1961.
- Cowen E., Zax M., Klein R., Izzo L. & Trast M. The relation of anxiety in school children to school record, achievement and behavioral measures, Child Develop., 1965, 36; 685-695.
- Cox P. Correlates of general and test anxiety in children, Austr. J. of Psychol., 1960, 12; 169-177, as cited in Gaudry E. & Spielberger G., Anxiety and Educational Achievement, Australia, Wiley, 1971.
- Crandall V.C., Katkovsky W. & Crandall V.J. Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations, Child Develop., 1965, 36;
- Crano W. and Mellon P. Causal influence of teachers' expectations on children's academic performance - a cross-lagged panel analysis. J. of Educ. Psychol., 1978, 70:1; 39-49.
- Cruickshank W. A Teaching Method for Brain-Injured and Hyperactive Children, Syracuse, Syracuse Univ. Press, 1961.
- Curr W. and Gurlay N. An experimental evaluation of remedial education, Brit. J. of Educ Psychol., 1953, 23; 45-55.
- Diener C. & Dweck C. An analysis of learned helplessness: continuous changes in performance, strategy and achievement cognitions following failure, J. of Person. & Soc. Psychol., 1978, 36:5; 451-461.

- Douglas V. Stop, look and listen: the problem of sustained attention and impulse control in hyperactive and normal children., Can. J. of Behav. Science, 1972, 4; 259-282.
- Douglas V. and Peters K. Towards a clearer definition of the attentional deficit in hyperactive children in G. Hall and M. Lewis (eds.) Attention and the Development of Cognitive Skills, N.Y. (in press), Plenum, 1979.
- Dunn L.M. (ed.) Exceptional Children in the Schools: Special Education in Transition, 2nd ed., N.Y., Holt, Rinehart, Winston, 1973, 245-295.
- Dusek J. and O'Connell E. Teacher expectancy effects on the achievement test performance of elementary school children, J. Educ. Psychol., 1973, 65; 371-377.
- Dweck C. The role of expectations and attributions in the alleviation of learned helplessness, J. Person. and Soc. Psychol., 1975, 31:4; 674-685.
- Dweck C. & Reppucci N. Learned helplessness and reinforcement responsibility in children, J. Person. and Soc. Psychol., 1973, 25; 109-116.
- Dzurilla T. & Goldfried M. Problem solving and behavior modification, J. of Abnorm. Psychol., 1971, 78; 107-126.
- Fernald G.M. Remedial techniques in Basic School Subjects, N.Y., McGraw-Hill, 1943.
- Fleming E. & Anttonen R. Teacher expectancy as related to the academic and personal growth of primary age children in J. Money, monog: Soc. Res. in Child Develop., #145, 1971a, 36:5.

- Fleming E. & Anttonen R. Teacher expectancy or my fair lady, Amer. Ed. Res. J., 1971b, 8:2; 241-252.
- Frostig M. and Horan D. The Frostig Program for the Development of Visual Perception, Chicago, Follett, 1964.
- Gaudry E. & Spielberger C. Anxiety and Educational Achievement, Australia, Wiley, 1971.
- Goldfried M. & Trier C. Effectiveness of relaxation as an active coping skill, J. of Abnorm. Psychol., 1974, 83:4; 348-355.
- Gottman J., Gonso J. and Rasmussen B. Social interaction, social competence and friendship in children, unpub. mans. Indiana U., 1974, as cited in D. Meichenbaum, Cognitive Behavior Modification, N.Y., Plenum, 1977.
- Haring N. as quoted in S. Kirk & Weiner B. (eds.) Behavioral Research on Exceptional Children, N.Y., Coun. Ex. Child, 1963.
- Hunt J. McV. Experience and the development of motivation, Child Develop., 1960, 31; 489-504.
- Hunt J. McV. Intelligence and Experience, N.Y., Ronald, 1961.
- Jacobson E. Progressive Relaxation, Chicago, U. of Chicago Press, 1938.
- Kauffman J. Severely emotionally disturbed, in N. Haring (ed.), Behavior of Exceptional Children, N.Y., Bell & Howell, 1974, 377-409.
- Kinsbourne M. Cerebral dominance, learning and cognition in H. Myklebust (ed.), Progress in Learning Disabilities, Vol III, N.Y., Grune & Stratton, 1975, 201-218.

- Kirk S. Educating Exceptional Children, Boston, Houghton & Mifflin, 1972.
- Kalvin I., Arensted C., Richardson L. and Garside R. The family and social background in childhood psychosis, Brit. J. of Psychiatry, 1971, 118; 396-402.
- Langer E., Janis I. & Wolper J. Reduction of psychological stress in surgical patients, J. of Exper. Soc. Psychol., 1975, 11; 155-165.
- Lipman R. Effect of anxiety level on concept formation, Amer. J. of Ment. Def., 1960, 65; 342-348.
- Lunneborg P. Relations among social desirability, achievement and anxiety measures in children, Child Develop., 1964, 35; 169-182.
- Meichenbaum D. and Goodman J. Training impulsive children to talk to themselves: A means of developing self-control, J. of Abnorm Psychol., 1971, 77; 115-126.
- Millen L. The relationship between self-concept, social desirability and anxiety in children. Unpub. M.A. Thesis, Penn State University, 1966, as cited in Piers E. Manual for The Piers-Harris Children's Self-Concept Scale, Nashville, Counsellor Recordings and Tests, 1969.
- Minde K., Lewin, Weiss G., Lavigne H., Douglas V., and Sykes E. The hyperactive child in the elementary school: A five year controlled follow-up, Except. Children, 1971, 38; 215-221.
- Ministère de l'Éducation, Province de Québec, Direction générale de l'enseignement élémentaire et secondaire, Bull. # 08-02-01, July, 1975.

- Myklebust H. The Pupil Rating Scale, Screening for Learning Disabilities, N.Y., Grune & Stratton, 1971.
- Otis A. Otis Quick Scoring Mental Abilities Test: New Edition, Beta Test, form EM, N.Y., Harcourt, Brace & World, 1954.
- Piers E. The Piers-Harris Children's Self Concept Scale, Nashville, Counsellor Recordings and Tests, 1969.
- Pihl R.O. and Parkes M. Hair element content in learning disabled children, Science, 1977, 198; 204-206.
- Platt J.J., Scura W.C. & Hannon J.R. Problem-solving thinking of youthful incarcerated heroin addicts. Journal of Community Psychology, 1973, 1; 278-281.
- Platt J., Spivack G., Altman D and Peizer S. Adolescent problem-solving thinking, J. Consult. & Clinic. Psychol., 1974, 42; 787-793.
- Platt J. & Spivack G. Manual for the Means-Ends Problem-Solving Procedure (MEPS); A measure of interpersonal cognitive problem-solving skill, Hannemann Community Mental Health/Mental Retardation Center, Phila., 1975a.
- Rosenthal R. & Jacobson L. Pygmalion in the Classroom, N.Y., Holt, Rinehart and Winston, 1968.
- Ross A.O. Psychological Aspects of Learning Disabilities and Reading Disorders, N.Y., McGraw-Hill, 1976.
- Sarason I. Test anxiety and intellectual performance, J. Ab. and Soc. Psychol., 1963, 66:1; 73-75.
- Sarason S., Davidson K., Lighthall F., Waite R. and Ruebush B. Anxiety in Elementary School Children, N.Y., Wiley, 1960.

- Schalnick E., Asler S. and Katzenellenbogen R. Discrimination learning and concept identification in disadvantaged and middle-class children, Child. Develop., 1968, 69; 15-25.
- Schultz E., Hirsharen A., Marston A. and Henderson R. Special education for the emotionally disturbed, Except. Children, 1971, 38; 313-320.
- Siller J. Socio-economic status and conceptual thinking, J. of Abnorm. and Soc. Psychol., 1957, 55; 356-371.
- Spielberger C. Anxiety and Behaviour, N.Y., Academic Press, 1966.
- Spivack G. and Levine M. Self-Regulation in Acting-out and normal adolescents, Report #M4531, Washington, National Institute of Health, 1963.
- Stevens R. Bilingual experience and psycholinguistic ability, McGill J. of Educ., 1:2, 1966.
- Thorndyke R.L. Stanford-Binét Intelligence Scale, Form L-M, 1972 norms tables, Boston, Houghton Mifflin, 1973.
- Verma P. Effect of anxiety reinforcement, and intelligence in learning a difficult task, J. of Exper. Child Psychol., 1976, 22; 302-308.
- Wechsler P. Manual for the Wechsler Intelligence Scale for Children (Revised), N.Y., Psych. Corp., 1974.
- Westcott M. Towards a contemporary Psychology of Instruction, N.Y., Holt, Rinehart & Winston, 1968.
- Zigler E. and Kanzer P. The effectiveness of two classes of reinforcers on the performance of middle and lower class children, J. of Person., 1962, 30; 157-163.

Linking Statement

This is a report of the second study in the investigation of the effects of school failure on subsequent learning in young adolescents. In the first study, The At-Risk Student: Identification and Remediation -- three questions were considered: how can students At-Risk for coping successfully with school be identified, how do these At-Risk students differ from their classmates, can they be taught the coping skills they lack?

The first study investigated 263 eleven and twelve year old Grade Six students who had been judged by their teachers to be at-risk for failure to cope with Grade Seven. These students were found to differ significantly from a group of their classmates judged by the teachers to be the "most able" in each class. As well as being less academically able, the "At-Risk" students were less competent in spatial and linguistic ability, had lower self-concepts, were more anxious, and earned lower grades the following year in Grade Seven. Although of normal intelligence, the At-Risk group also had significantly lower I.Q.'s. These results demonstrated that the classroom teacher could reliably distinguish the most able from the At-Risk students from amongst a population of Grade Six students about to enter high school, and that these At-Risk students were beginning a new and stressful school experience with depressed academic, cognitive, intellectual, and affective competence.

The efficacy of teaching a group of these At-Risk students to monitor their own behavior, deal more effectively with their own

anxiety, and to use better problem-solving was also explored in that study. This coping skill training appeared to increase the ability to generate appropriate social problem-solving strategies, and there was a trend towards increased self-concept with training. However, a prolonged teachers' strike and the attendant disruption contaminated the effect of training and interrupted the post-treatment testing, so the results of this investigation do not necessarily reflect the potential effect of such a training program. The value of this intervention remains to be investigated.

Several other questions were raised in the first study that also remain to be answered:

(1) Would the At-Risk student also differ significantly on these academic, cognitive, and affective variables if compared not to the most able students, as in the first study, but to an unselected group of normal classmates?

Although the first study demonstrated that these eleven and twelve year olds were facing a new and stressful school setting at one of the most stressful periods of their lives with depressed confidence and heightened anxiety, when compared to their most competent classmates, until their competency vis-a-vis their "normal" classmates is established, these deficits can only be considered comparative, and like all polar comparisons, not unexpected. Likewise their cognitive and academic deficits need to be considered in the light of "normal" performance.

(2) Are the At-Risk students really more debilitated by failure and less able to perform under stressful school conditions?

Prolonged experience of failure has been shown to debilitate subsequent problem-solving ability by increasing failure-expectancy (Brickman, Linsenmeier, & McCareins, 1976; Diener & Dweck, 1978; Andrew & Debus, 1978; Hiroto and Seligman, 1978). Previous studies have also shown that a history of failure in school leads to decreased perception of control over one's own performance (Crandall, 1965; Hallohan, Gojar, Cohen & Tarver, 1978), an increase in debilitating anxiety (Lipman, 1960; Gaudry and Fitzgerald, 1971; Young, 1973) and a lowered self-concept (Black, 1975; Sarvis, 1965).

But although the At-Risk students in the first study were significantly more anxious and less self-confident than their classmates, this can only be considered indirect evidence of their failure expectancy and vulnerability to stress. It remains to be demonstrated that these At-Risk students also feel less control over their own school success and failure, and that their learning, problem-solving ability and school performance is debilitated by normal school stress.

This second investigation was designed to answer these two questions.

STUDY II: THE EFFECTS OF SCHOOL FAILURE

A comparison of the competencies and the performance under stress of At-Risk and normal Seventh Graders.

PART I

A Comparison of Academic, Cognitive and Affective Competence

PART II

Performance Under Stress

ABSTRACT

This study was designed to assess the effects of school failure or the subsequent performance in school of young adolescents. Fifty-one Grade Seven students, identified as At-Risk for future school failure, were compared to fifty-one of their randomly selected classmates on individually administered measures of intelligence, self-concept, problem-solving ability, coping ability, and attribution and locus of control. Teachers' ratings, mathematics ability, and grades of the two groups were also compared. The students with a history of school failure, although of normal intelligence, were found to be significantly less intellectually, academically and affectively competent than their more successful peers and were rated by their teachers as significantly less able to deal adaptively with normal school stress. Discriminant Analysis generated a function which separated the groups with 93% accuracy.

On the two equivalent mathematics tests, one given under relaxed conditions, and the other under normal school test-like conditions, approximately thirty percent of both the At-Risk and the otherwise normal students did more poorly when they thought they were taking a test.

Implications of these results for the understanding and remediation of stress-depressed school performance are discussed.

INTRODUCTION

Previous attempts to distinguish the potentially At-Risk members in a population of children, even those studies based on measures of presumed deviance or potential pathology (Poser, 1975; 1976; Hartman, 1977) have highlighted the role of organismic vulnerability to stress (Chess, Thomas & Birch, 1960; Thomas & Chess, 1977; Murphy & Moriarity, 1976).

Adolescence, particularly early adolescence, or the period from age twelve to fifteen, has been described as a focus of vulnerability (Hull, 1904; Hamburg, 1974; Kestenberg, 1967) and, in our culture, a time of particular stress. The rapid increase in gonadal development and physical growth, and the rapid changes in physical appearance and affective mood that these mediate, come at precisely the same time in Western society that the nature of cultural demands change markedly, both in and out of school. Hamburg (1974) has emphasized the compound stresses of this early adolescent period when the child precipitously enters 'junior high' or high school and assumes the mantle of the "teen-ager", with all the attending folklore surrounding that role for both himself and his family. Hamburg makes the important point that many societal expectations associated with the construct "teen-ager", for example, the desire for independence, heightened sexual interest and activity, are more descriptive of the older adolescent, age fifteen to twenty-one, and may be inappropriate and bewildering when applied to the twelve to fifteen year-old.

The most common cultural experience for the younger teenager is school. Junior high schools, conceived and developed in an attempt to ease the transfer from elementary school to high school have not succeeded in most cases (Hamburg, op. cit.) and, in fact, the result has been an acceleration of the entry into a high school-like milieu. The vulnerable, immature or unsuccessful student will have fewer resources to deal with this additional stress of going to high school, and, therefore, presumably be less able to deal appropriately with that stress.

This investigation, then, is concerned first with the profile of the young adolescent who is At-Risk for school failure because of a history of depressed academic, cognitive or affective functioning. Secondly, it will attempt to examine more precisely the effect of school-related stress on this At-Risk student. The hypotheses to be tested are:

- Students with a history of school failure will be more anxious, less academically able, will feel less in control of their own performance in school, respond with fewer coping strategies, and have lower self-concepts and fewer behavioral options than their normal classmates.

- These At-Risk students will be more vulnerable to school-related stress than their normal classmates, and respond to a stressful situation with depressed performance.

PART I

A Comparison of the Academic, Cognitive and Affective Competence of At-Risk and Normal Students

METHOD

All Grade Six teachers in the Baldwin Cartier School commission, which serves just under 10,000 elementary and high school students living in the western end of Montreal Island, were surveyed toward the end of the school year in May, 1976 and asked to select any students in their classes whom they considered to be At-Risk for failure to cope with Grade Seven the following year. Grade Six is the final year of elementary school in this commission, which serves a relatively homogeneous middle-class population (Stevens, 1966). For Grade Seven the students move on to two of the commissions three high schools.

The thirty four grade six teachers had participated in a similar survey the previous year when they had been asked to select the most At-Risk and the most able students in their classes: A study based on that survey (Stevens and Pihl, note 1) showed that the teachers could distinguish their most and least intelligent, confident, anxious and cognitively skilled pupils with a high level of confidence.

In this second survey, the teachers were again asked to identify the students who they considered at-risk for failure to cope with Grade Seven, for academic, intellectual, social or behavioral reasons. As in the previous study, each teacher

completed a Grade Six Screening Form for each child referred. This is a survey sheet, developed for these investigations, which, in addition to including relevant and useful details about the student's previous learning in school, asks the teacher to answer 'yes' or 'no' to the question: "Is this student likely to cope well with high school next year?". A second question on the Grade Six Screening Form asks the teacher to rate each student on a scale from '1' ("with ease") to '7' ("not at all"), according to judged ability to cope well in Grade Seven.

The validity of the Grade Six Screening Form for distinguishing the At-Risk from the most able students was established in the first study. Two discriminant analyses based on data from this measure yielded functions that discriminated the groups with 89.2% and 95.6% accuracy. The Grade Six Screening Form was used again in the present study to test its validity in making the finer discrimination between At-Risk and unselected normal students.

Each student referred in this Grade Six Screening as At-Risk was referred to the guidance or special education staff of the high school he or she would be attending the following September, so that progress in high school could be monitored and the appropriate back-up services supplied. The experimental sample for the present study was drawn from a pool composed of all students so referred in the Commission's largest high school.

One hundred and twenty-six At-Risk students were referred in this high school. This is less than half the previous year's total (Stevens, 1979). This may in part be explained by the drop in elementary school enrollment: 1975 = average enrollment, 5174; 1976 = average enrollment, 4902. No other systematic explanation has been found for this large discrepancy.

Individual Grade Six teachers, when queried, expressed the opinion that the students in the first study had comprised a particularly difficult group, ("a terrible year") but no really adequate explanation was offered or found. Perhaps the knowledge that they would be surveyed at the end of the year encouraged the Grade Six teachers to notice and deal with their students' problems from the beginning of the school year. Perhaps they were more selective in their referrals. Subsequent surveys in 1977 and 1978 have produced numbers similar to those in the present study, approximately twelve percent of the total Grade Six population.

SUBJECTS

At-Risk Group

From the pool of 126 At-Risk students, the experimental sample of most At-Risk students was selected using the following criteria for inclusion:

- 1) rated on the Grade Six Screening Form as At-Risk by both criteria: "no" in answer to the question: "Is this student likely to cope well with high school?", and #5,6, or 7 on the 1 - 7 scale.
- 2) having no major diagnosed physical or organic deficits.
- 3) not diagnosed as intellectually retarded (I.Q. below 75)*.
- 4) not judged At-Risk only because of an inability to speak English.
- 5) not older than the normal age for Grade Seven (born between 10-63 and 9-64; or aged twelve years, one month to thirteen years seven) because of missing or repeating a year. In order to keep the comparison of scores on measures of the dependent variables as reliable as possible between the At-Risk and normal groups, it was necessary to eliminate large discrepancies in age. Removing the older students, i.e. "repeaters", from the At-Risk sample could only serve to decrease the hypothesized difference between the groups.

* No such students were found in this sample, due probably to:

- 1) the relatively high and homogeneous S.E.S. (See Study I, Stevens, 1979).
- 2) early screening in this commission to identify and plan special programs for educably mentally retarded students. (at time of this study, there were four educably mentally retarded students in this commission in this age bracket - they were not included in this study).

This produced a sample of fifty-eight At-Risk students ($N = 40♂$, $N = 18♀$). Four of these were found to have moved after Grade Six, leaving fifty-four At-Risk students ($N = 37♂$, $N = 17♀$) in the experimental sample.

Normal Group

A normal control group of fifty-four students was selected from amongst the remaining Grade Seven students using class lists and a table of random numbers. First seventeen girls and then thirty four boys were selected. Excluded from the control sample were:

(1) any student referred as potentially At-Risk in the Grade Six Screening for any reason (i.e. marginal, but not serious cases).

(2) any student who had not attended a Baldwin Cartier School Commission school in Grade Six, and who had, therefore, not been rated by his teacher.

Of the 108 students selected, only 102 were included in the final sample because, three of the At-Risk students moved before assessments could be completed. Three of the Control Students, matched for sex, were randomly selected to be removed from the sample. The final sample was composed of fifty-one students in, each of the two groups, thirty five boys and sixteen girls:

	<u>Total Sample</u>		<u>Totals</u>
	<u>At-Risk</u>	<u>Normal Control</u>	
Girls	16	16	32
Boys	35	35	70
Totals	51	51	102

All data for Part I of this study, was collected from this full sample. However, because of absences of sixteen of the students from one or more of the math examinations during Part II of the study, Performance Under Stress, the sample was reduced to eighty-six. The composition of the reduced sample used in the later analyses was:

	<u>Sample: Part II</u>		
	<u>At-Risk</u>	<u>Normal Control</u>	<u>Totals</u>
Girls	14	13	27
Boys	30	29	59
Totals	44	42	86

PROCEDURE

Each of the 102 students in the sample was tested individually by one of three undergraduate research assistants trained by the investigator in the use of the measures being used, but unaware of the hypothesis being tested. Each assessment took approximately forty minutes and students were excused from class and interviewed in a room provided in the high school. All test items were read to the student by the testor to eliminate any differences in reading ability.

Parents were informed by letter that this Grade Seven Survey was underway. It was explained to them, as well as to the Grade Seven teachers in a briefing session, that this survey was part of an on-going investigation into ways to help students cope better with the stress of high school. Teachers were, of course, aware of which students were in the total sample, but At-Risk students were not identified. It was explained to each student, prior to testing, that he had been selected as part of a group of about 100 Grade Seven students to represent all seventh graders in a study of "how kids learn in school" (see protocol, appendix). Confidentiality was promised, and no names were used in reporting this data. All agreed to participate. At the end of each testing session, the student was given a roll of Life Savers as a token of appreciation of his or her participation.

MEASURES

Dependent measures in this study include age, grades, measures of intellectual, academic and affective competence, and measures of attribution of success and of control. Each of the 102 students was assessed using the following measures:

1) The Quick Test (Ammons R. and Ammons C, 1962). This is a test of intelligence based on vocabulary definitions and is a shortened version of the Full Range Picture Vocabulary Test (Ammons, R. and Ammons, H, 1948). There are three forms of the Quick Test, each consisting of fifty words to be defined by pointing to one of four pictures in the presented plate. All three forms may be used together, making a 150 item test that can be administered in less than ten minutes. This was the version used in this study. Test-retest reliability is high, ranging from .80 to .89 (Sattler, 1974) Mean is 100, S.D. is 15. The Quick Test has been used to assess a wide range of children and youths, including poor readers (Otto and McMenemy, 1965) children referred to a school psychologist (Joesting and Joesting, 1971), the tenth grade population of three midwestern high schools (Mednick, 1967) pediatric out-patients (Pless, Snider, Eaton, and Kearsley, 1965) and Grade Seven Students (Burgess & Wright, 1962). Most relevant for the present study are the findings of an investigation made in this same School Commission. (Wright and Gallagher, 1977). They compared the Wechsler Intelligence Test for Children - Revised, (Wechsler, 1974) to the Quick Test scores of forty-five students aged five to sixteen referred to the school psychologist. For the five to

eleven group, Quick Test scores correlated .57 with the Wechsler Intelligence Test For Children - Revised verbal, .73 with Wechsler Intelligence Test For Children - Revised performance, and .69 with Wechsler Intelligence Test For Children - Revised Full Scale scores. In the eleven to sixteen year olds, these correlations were: Wechsler Intelligence Test For Children - Revised - verbal, .93; Wechsler Intelligence Test For Children - Revised - performance, .64; and Wechsler Intelligence Test For Children - Revised Full Scale, .87.

This measure was selected for use in this study because it has good reliability even when used by non-psychologists (Pless, Snider, Eaton, Kearsly, 1965; op cit.), takes little time to give, and seemed the most valid and reliable estimate of intelligence available in such a format.

2) Test Anxiety Scale For Children (Sarason, Davidson, Lighthall, Waite and Ruebush, 1960). This is a thirty item yes-no questionnaire designed to measure trait anxiety. The questions are all related to test-like situations in school, following the Sarason paradigm that suggests that school tests represent the pivotal experience of anxiety for children. Test-re-test reliability, from a sample of 320 students, is reported as .55 to .78 (Sarason, Davidson, Lighthall, Waite and Ruebush, 1960). The Test Anxiety Scale For Children has been used as a measure of anxiety in studies of academic achievement (Phillips, Martin & Meyers, 1972), (Reubush, 1963), peer friendships (Phillips, Martin & Meyers, 1972), motivation to avoid failure (Atkinson & Feather, 1966) and "learned helplessness" in children (Dweck, 1975).

In this study, it was substituted for the Children's Manifest Anxiety Scale (Castenada, McCandless and Palermo, 1956), the measure of anxiety used in the previous study, for two reasons. Informal feedback from listening to the Grade Seven students after the previous year's testing revealed that some of them had been dismayed by the intrusive nature of some of the questions asked on the Children's Manifest Anxiety Scale ("sounds like they think we're crazy!"). Questions in the Test Anxiety Scale for Children, since they are all related to school, would presumably sound more plausible in a school setting to the pupils. Also, since stress-related performance under test-like conditions was to be investigated (see Part II, this study), the school-test model of anxiety upon which this measure is based seemed more relevant and precise. Two other measures were derived from scores on this test. High and low anxiety was measured by ANX. Scores below the median on the Test Anxiety Scale (TASC = 12) were ranked as low anxiety, (Anx = 1), scores above the median on the Test Anxiety Scale, were ranked as high anxiety (Anx = 2). Scores on the Test Anxiety Scale for Children were also rated as "low", "medium" and "high" anxiety, or UPT. This was done by considering the lowest quartile (TASC = ≤ 9) as UPT = 1, the middle range (TASC = $> 9 \leq 13$) as UPT = 2, and the highest quartile (TASC = > 13) as UPT = 3.

3) Poor Self-Evaluation Scale (Feld and Lewis, 1969)

This is one of four sub-scales identified in a factorial analysis of the Test Anxiety Scale for Children. It consists of six items related to self-rated comparison to peers. It was used in this

study as a measure of negative self-concept instead of the Piers-Harris Self Concept Scale (Piers, 1969), used in Study I, simply because of the time constraint involved. (It was necessary to keep the time for the entire battery to forty minutes, or one school period, to minimize class disruption). The Poor Self-Evaluation Scale is the only Test Anxiety Scale sub-test that does not have a main effect for sex (all others show higher anxiety-related scores for girls) and can thus be considered to be the most orthogonal (Feld, and Lewis, op. cit.). Since anxiety and self-concept are known to be correlated, and indeed such a correlation is demonstrated in Study I, ($r=.26.s=.001$), its cautionary use as a measure of negative self-concept in this study seemed valid.

4) Intellectual Achievement Responsibility Scale (Crandall, Katkovsky and Crandall, 1965). This is a measure of attribution of control. It is designed to see how responsible a child feels for his own academic successes and failures, or, conversely, how much he feels what happens to him in school depends on chance or on what his teacher does. It is a thirty-four item forced choice questionnaire, each item describing a positive or negative school achievement situation, and offering a self-controlled or 'other'-controlled outcome. The Intellectual Achievement Responsibility Scale plus scores show how responsible the student feels for his academic successes, the Intellectual Achievement Responsibility Scale minus score indicates how responsible he feels for his failure. Intellectual Achievement Responsibility Total is the

combined score. The Intellectual Achievement Responsibility Scale can also be scored for use as a measure of the relative attribution of effort and ability on one's own part, attribution to effort being acknowledgement of the potential for more control. Norms were standardized on a population of 923 students in Grades three to twelve. Test-re-test reliability is .69 to .74.

5) Effort vs. Ability Attribution Scale*(Dweck, 1975)

This is a refinement of the effort vs. ability attribution measure of the Intellectual Achievement Responsibility Scale, consisting of five forced choice questions, all related to mathematics. It was designed for and used in the author's study of the effect of re-attribution training on "helpless" children. Two scores, the number of attributions to effort (Effort Attribution 1) and the number of attributions to ability (Effort Attribution 2) were used in this study.

6) Internal-External Control Test (Rotter, 1966)

This is another, more general, measure of locus of control. It consists of twenty nine forced choice items (including six filler items for ambiguity) each requiring a choice between two statements about every day events and conditions. Score is the number of choices related to internal locus of control. This measure was standardized in a sample of 400, and reliability coefficients are reported ranging from .49 to .83 (Rotter, op.cit.). Mean scores for a sample of eighty Grade Eight students was 7.72, S.D. was 3.65 (Ladwig, 1963). It has been used extensively on a wide range of populations, including learning disabled high school students who showed depressed Internal-External Control Test scores on one study (Hallohan, Gojar, Cohen & Tarver, 1978).

7) Means Ends Problem Solving Test (Spivack, 1975)

This was included in this study because of the increased performance associated with coping skills training in the previous study in this series of investigations (Stevens, 1979). This is a measure of the ability to generate relevant solutions to personal and social problems. It is presented as a series of stories which have only a beginning conflict and a 'happy ending'; the subject is asked to supply the 'middle' of the story, or the means to the end. Previous studies have found the Means Ends Problem Solving Test distinguished between delinquent and normal adolescents (Spivack & Levine, 1963) normal and schizophrenic adolescents (Platt, Spivack, Altman & Peizer, 1974) and young heroin addicts and normals (Platt, Scura & Hannon, 1973). Four of the ten Means Ends Problem Solving Test stories accounted for the variance in two of these studies, and these four stories were used in the present study. It was hypothesized that coping skills training would result in an increase in the number of relevant means generated.

8) What Would You Probably Do

This is a measure of coping ability designed for this study. In it, the student is asked to judge his own ability to cope with stressful school situations. It consists of five described 'scenes', each with a choice of four or five behavioral responses. The student is asked to rate each described behavioral response as "like me" or "not like me". The first response to each scene is an adaptive coping response (i.e. task-related) and the last is a non-adaptive (i.e. off-task) response. All other described

responses are filler items to reduce the likelihood of polar choices and are not scored. This measure yields two scores: What Would You Probably Do - Cope, the number of coping responses; and What Would You Probably Do - Non-Cope, the number of non-coping responses. A third composite coping score, SCOP, was also computed for each student, by subtracting his non-coping from his coping responses (What Would You Probably Do - Cope Minus What Would You Probably Do - Non-cope).

9) Teacher Check List

This is a teachers' version of What Would You Probably Do also developed for this study. It assesses the teacher's estimate of each student's coping and non-coping responses. It follows the same format as What Would You Probably Do, except that there are one coping and two non-coping responses for each scene, as well as several filler items. Teachers are asked to respond to each behavioral response as "likely" or "unlikely" for that student. It yields a score for the number of coping responses (Teachers' Check List - Cope), a score for the number of non-coping responses divided by two (to make scores comparable to scores on What Would You Probably Do) (Teachers' Check List - non-cope) and a composite coping minus non-coping score (TCOP).

10) Final Grades

Marks on the June report card in language arts (June English), mathematics (June Math), and for the year's average (June-Total) were obtained for each student and included in the comparisons.

In summary, twenty-one measures of competence and other performance-related variables were selected to test for hypothesized group differences and used to assess the fifty-one At-Risk and fifty-one normal students in this study. They were:

<u>Measure</u>	<u>Variable</u>
Quick Test	intelligence
Test Anxiety Scale for Children	anxiety
ANX	
UPT	
Poor Self Evaluation	negative self-concept
Intellectual Achievement	perceived locus of control
Responsibility Scale - Total	
IARS +	
IARS minus	
Internal-External Control Test	attribution to effort/ability
Effort vs. Ability Attribution Scale	
Effort Attribution	
Ability Attribution	
Means Ends Problem Solving Test	social problem solving
What Would You Probably Do - Cope	coping ability
What Would You Probably Do - Non-Cope	
SCOP	
Teachers Check List - High	
Teachers Check List - Low	
TCOP	grades
June English	
June Math	
June Total	

TABLE I

Part I Comparison of Competence: At-Risk and Controls

ANOVA: ALL DEPENDENT MEASURES

Main Effect for GROUP only

(reported as means)

n = 102

<u>Variable</u>	<u>Measure of:</u>	<u>At-Risk</u> n = 51	<u>Control</u> n = 51	<u>s</u>
Age	age in months	159.04	154.14	.001
I.Q.	intelligence	102.48	116.55	.001
Test Anxiety Scale For Children	anxiety	15.30	10.77	.0001
ANX	upper,middle,lower levels anxiety	1.66	1.35	.004
UPT	below,above,median anxiety	2.28	1.72	.002
What Would You) Probably Do - High)	coping ability - (self evaluation)	4.05	4.26	NS
What Would You) Probably Do - Low)	non-coping ability (self-evaluation)	1.68	.89	.001
SCOP	self-evaluation,coping ability (What Would You Probably Do -Cope minus Non-Cope)	2.4	3.34	.002
Effort vs. Ability) Attribution Scale)				
Effort Attribution	attribution of success: -effort	4.27	4.37	NS
Ability Attribution	attribution of success: ability	.75	.63	NS
IARS +	responsibility for school success	12.32	12.58	NS
IARS -	responsibility for school failure	12.14	12.61	NS
IARS Tot.	responsibility for school success/failure	24.46	25.19	NS
Internal-External Control Test	locus of control	10.21	9.61	NS
Teachers Check List - High	coping ability (teachers' evaluation)	2.70	4.09	.001
Teachers Check List - low	non-coping ability (teachers' evaluation)	3.50	1.21	.001
TCOP	teachers' evaluation, coping ability (TCL h - 1)	-.86	3.06	.001

TABLE I
(continued)

<u>Variable</u>	<u>Measure of:</u>	<u>At-Risk</u> n = 51	<u>Control</u> n=51	<u>s</u>
Means Ends Problem Solving Test	social problem solving	9.05	8.76	NS
June English	final English grade	57.66	69.81	.001
June Math	final Math grade	49.57	68.45	.001
June Total	final grade average	54.84	73.88	.001
Poor Self Evaluation	negative self-concept	2.68	1.76	.003

RESULTS - PART I:

Main Effect For Group Only

Since this is a two part study, in the interest of clarity, only differences related to the main effect for group will be reported after each part is described. Other main effects, and interactive effects, since they refer to both parts of the study, will be reported jointly after both parts of the study are described.

Data was first analyzed by means of analyses of variance using the SPSS program G031. Simple rather than multiple analyses of variance were performed because the contribution of each individual measure to group difference was under study. To ensure that the accumulated variance did, in fact, account for a significant portion of the actual variance between the groups, a discriminant analysis was also performed, and the result of this is reported later in this section.

The performance of the At-Risk and the normal control groups was compared on each of the twenty one dependent measures described. The results of these analyses appear in Table I.

Confirming the findings in the first study, and replicating, the group difference suggested in that study (Stevens, 1979) these results show that At-Risk students differ very significantly from their normal classmates in age, $F(1,101) = 16.03$; ($s = .001$), intelligence $F(1,101) = 32.97$, ($s = (.001)$), anxiety $F(1,101) = 20.33$, ($s = .001$), self concept $F(1,101) = 9.78$, ($s = .003$) and grades $F(1,101) = 56.56$ to 84.86 , ($s = .001$).

In addition, the At-Risk students differ in coping ability from the normal controls. On the teachers' evaluation, these groups differed in both coping, Teachers Check List - cope $F(1,85) = 25.7, (s = .001)$ and non-coping, Teachers Check List Non-Cope $F(1,85) = 20.78, (s = .001)$ responses. In the composite teachers' evaluation, TCOP, based on the number of coping minus non-coping responses, this difference is still at the .001 level $F(1,101 = 27.59)$. On the self-evaluation measure of coping ability, What Would You Probably Do, the groups do not differ significantly for coping responses, What Would You Probably Do-Cope, but they do differ in non-coping responses, What Would You Probably Do - Non-Cope, $F(1,101) = 11.47; (s = .001)$. On the composite measure of coping minus non-coping responses based on this self-measure, SCOP, the groups differ at the .002 level $F(1,101) = 10.33$.

The hypothesized differences between the groups in responsibility for, or attribution of, control over their own performance do not appear. However these variables do appear to distinguish between sub-groups of these populations as described later in this section.

PART II - PERFORMANCE UNDER STRESS

METHOD

The second hypothesis to be tested in this study concerned the performance-related stress-vulnerability of the At-Risk students. It was hypothesized that relative to their classmates, the At-Risk students would be more vulnerable to the normal stresses of high school, such as school exams, and their school performance more debilitated by exam related stress.

To test this, two mathematics exams of equivalent difficulty were given to all the students. The first was given under unstressed conditions, and the second, three days later, was given under conditions as closely as possible duplicating those of a normal school examination. It was hypothesized that if exam-like conditions did not debilitate performance, scores on the second exam would be equal to or, because of practice effect, better than scores on the first. Those students whose score on the second exam was more than ten percent lower than their score on the first exam were considered to be students whose performance was debilitated by test-related stress.

Producing Equivalent Tests

The arithmetic section of the Wide-Range Achievement Test (Jastak and Jastak, 1965) was used to produce a 102* item arithmetic test, containing items of progressive difficulty from Grade 2 through Grade "16". This test was piloted on all Grade Seven students (N = 123) in John XXIII High School, the

*some original problems added to increase numbers in the most difficult section.

smallest of this commission's high schools. This high school was chosen for the development of this instrument because, although it probably provides a different school environment to its students than the experimental school, since it is smaller and has relatively little staff turnover, it serves a very similar population of Grade Seven students, and both schools follow the same basic mathematics program.

Items on the resultant tests were then scored and an error score for each item obtained. Two tests, WRAT I, and WRAT II were then produced, using this item error analysis. Each of these forms of the test contained forty-two items of increasing difficulty. Both forms were equivalent in difficulty, as rated by the number of errors made on each item during the developmental testing.

The two equivalent tests were prepared to resemble as closely as possible the format of commission math tests, in consultation with the commission's math consultant. WRAT I was labelled "Mathematics Review" and WRAT II was labelled "Mathematics Test".

Perception of Goal Attainment

To heighten the test-like dimension of WRAT II, each row of problems in this test, from the simplest to the most difficult had a number, in the right hand margin under the meaningless heading "percentile average grade level". These numbers ran from 2.5 to 10.3 and were suggestive of grade equivalent criteria.

They were devised so that Grade Seven level problems were marked "6.0" and "6.3". Sarason's model of anxiety (Sarason, 1966) suggests that test-anxious children are constantly feeling themselves to be compared and found "wanting", by significant others in their environment. Since one of the objectives of this study was to determine whether or not anxiety was debilitating or facilitative to At-Risk students, that is -- whether their scores on the Test Anxiety Scale For Children correlated negatively or positively with their performance under stress, the manipulation of the self-perception of goal attainment was included.

PROCEDURE

After all 102 students in the experimental sample had been individually assessed on the twenty-one measures described in Part I, their stress-related performance was assessed using WRAT I and WRAT II.

WRAT I was administered in all the Grade Seven geography classes in the experimental high school by the classroom teacher to all pupils. The geography rather than mathematics class was selected since some students took mathematics in French. Since reaction to test-induced stress under classroom conditions was under study, it was necessary to use this rather cumbersome procedure, involving all the Grade Seven students (nearly 1,000 students) and their teachers, to ensure that the 102 students in the experimental sample would in no way associate this procedure with the Grade Seven survey in which they had taken part. Instructions for conducting this "Mathematics Review" (WRAT I) as well as the subsequent "Mathematics Test" (WRAT II), given in all the same classrooms three days later, were given to the Grade Seven teachers in a briefing workshop conducted by the investigator. Written protocols (see Appendix) for both presentations were given to each teacher. All agreed to participate.

The first presentation was untimed and low key: "We've been asked to take part in this math review ... some problems are very easy, some are too hard for you..I don't know much about this". The second test was geared to elicit maximal test-

like vigilance and test-associated affect. It was timed, and instructions were precise: "Some of you didn't do very well last time.. I want you to pay attention...".

After the two testing periods were completed, students were debriefed by their teachers with an explanation of why the study was being made, and assured that the results would not "count" in their grades. Many spontaneously contributed anecdotes about their own stress-debilitated performance on tests.

MEASURES

The two math tests each yielded a score for each student: WRAT I - math performance on the unstressed test, and WRAT II - math performance under test-like conditions.

Two composite measures were also obtained from these scores. The sum of the two mathematics tests divided by two, (WRAT I + WRAT II + 2) RATA, served as a measure of average mathematics ability for each student. And the difference between the scores, (WRAT I minus WRAT II) STRES-P, served as a measure of the effect of stress over performance for each student.

Self-Prediction of Performance

Prior to the administration of both WRAT I and WRAT II, pupils were asked to estimate "how many right" answers they expected to have on the forty two problems. This prediction was made on a sheet attached to the test and collected by the teacher before the test began. Immediately after finishing each test, the students were again asked to predict "how many right" answers they thought they had. These predictions yielded four scores: Pre-prediction, WRAT I (Pre-pred I), Pre-prediction, (Pre-pred II), Post-prediction WRAT I (Post-pred I) and Post-prediction WRAT II (Post-pred II) for subsequent comparison with ability and anxiety levels.

An additional composite measure was obtained from these predictions. The difference between the two post-predictions (STRES-X) (Post-pred I minus Post-pred II) served as a measure of the stress perceived by each student during WRAT II.

Additional Measures

Six additional scores were also obtained from this manipulation. Immediately after finishing WRAT II, each student was asked to complete a questionnaire which contained five questions (see Appendix). These questions were devised for this study to measure students' perception of task difficulty and value of achievement under stress, and the relations between these variables and their perception of control over their own academic success and failure. The first question asked was whether or not performance on the second test, WRAT II, seemed better or worse; it was scored for 'Worse' (W) answers only. The second question asked whether or not the second test seemed easier or harder and was scored for "Harder" (H) answers only. Questions three and four were measures of attribution to effort or ability and yielded an Effort-Attribution (E1) and an Ability-Attribution (E2) score, and a composite Effort Minus Ability Attribution (TEA) score. High scores on Effort-Attribution (E1) and Effort Minus Ability Attribution (TEA) suggested more perception of control over one's own performance; high scores on Ability-Attribution (E2) suggested less perceived control. Question five is a measure of the importance or value of attainment for each student, or how much he "Cares" (C).

To sum up, to assess the effect of stress over performance, the two math exams, and their accompanying questionnaire, yielded the following additional measures:

WRAT I (Mathematics Test) - unstressed performance

WRAT II (Mathematics Review) - performance under test-like conditions

RATA ($\frac{\text{WRAT I} + \text{WRAT II}}{2}$) - average math ability

Pre-prediction WRAT I) - pre-exam predictions

Pre-prediction WRAT II)

Post-prediction WRAT I) - post-exam predictions

Post - prediction WRATII)

STRES X - difference between post-exam predictions I & II

STRES P - difference between scores, WRAT I and WRAT II

"WORSE" - (W) - second exam judged "worse"

"HARDER" - (H) - second exam judged "harder"

Effort Attribution (EI) - attribution to effort

Ability Attribution (E2) - attribution to luck or ability

Effort minus Ability Attribution (TEA) - perception of relative control

"CARE" (C) - self report of value of attainment

RESULTS - PART II:
Main Effect For Group Only

Before analyzing the results of the stress manipulation, the effectiveness of the manipulation was tested: A t-test was performed between the mean of the two self predictions made about the unstressed math exam, Pre-pred I and Post-pred I, and the mean of the two self predictions associated with the second, stressed, math test, Pre-pred II and Post-pred II. The results were as follows:

	<u>X̄</u>	<u>diff.</u>	<u>S.E.</u>	<u>t</u>	<u>d.f.</u>	<u>s</u>
Self Predictions, WRAT I	58.42	2.42	.449	5.39	85	.005
Self Predictions, WRAT II	56.0					

The total sample of students was significantly less expectant of performing well on the second test than on the first. Results of the analysis of the performance of both the At-Risk and the Control groups on the math tests, WRAT I and WRAT II appear in Table II. Contrary to the hypothesized difference in vulnerability between the groups, almost equal numbers of the At-Risk and control students -- approximately thirty percent in each group -- showed impaired performance under test-stress. These were the children whose score on the second math test, WRAT II, was ten percent or more below their score on the first test, WRAT I. The numbers and percentages of stress-vulnerable and normal students for each group are shown in Table II.

TABLE IIStress-Depressed Performance On Tests

Total Sample (N = 86)

	<u>Performance Stable:</u>	<u>Decreased Performance (Stress-Vulnerable)</u>	<u>Totals</u>
<u>AT-RISK</u>			
Total N =	30	14	44
(♂)	(21)	(9)	(30)
(♀)	(9)	(5)	(14)
Percent	68%	32%	51%
<u>NORMALS</u>			
Total N =	30	12	42
(♂)	(21)	(8)	(29)
(♀)	(9)	(4)	(13)
Percent:	71%	29%	49%
<u>TOTALS</u>			
N =	60	26	86
(♂)	(42)	(17)	(59)
(♀)	(18)	(9)	(27)
Percent:	70%	30%	100%

Results of performance on the fifteen measures associated with the two mathematical exams were then analyzed by means of additional analyses of variance. The results for main effect for group appear in Table III.

Further confirming the hypothesized differences between the At-Risk and control groups is the highly significant difference in mathematical ability $F(1,85) = 85.83$ and $84.29, (s = .001)$. The students predictions of their own performance also reflected this difference: $F(1,85) = 12.85$ to $38.86, (s = .001)$.

The equivalence of the two forms of the mathematics exams used, WRAT I and WRAT II, is confirmed by the equivalence of the means for each group on both exams: 17.7 and 17.82 for the At-Risk group and 25.67 and 25.12 for the controls (Table III). For the total sample, the results on these two mathematics exams were:

	$\bar{X}$	S.D.
WRAT I	21.62	4.11
WRAT II	21.38	3.63

It can, therefore, be assumed that individual differences between scores on the two tests are unrelated to task difficulty.

TABLE III

Part II Performance Under Stress: At-Risk and Control

ANOVA: ALL DEPENDENT MEASURES

Main Effect for GROUP only

(reported as means)

n = 86

<u>V</u>	<u>MEASURE OF:</u>	<u>At-Risk</u> n = 44	<u>Control</u> n = 42	<u>s</u>
WRAT I	math ability (unstressed exam)	17.70	25.67	.001
WRAT II	math ability (under stress)	17.82	25.12	.001
PRE-PRED I)	pre-prediction of own number correct, WRAT I, II	28.16	32.72	.001
PRE-PRED II)		26.82	32.49	.001
POST-PRED I)	post-prediction I, II	25.07	31.43	.001
POST-PRED II)		23.65	30.59	.001
'WORSE'	evaluations of WRAT II from questionnaire after test: yes = 1; no = 2.	1.72	1.81	NS
'HARDER'		1.65	1.65	NS
'CARE'		1.25	1.33	NS
EFFORT ATTRIBUTION (E ₁)	attribution to effort (post-test questionnaire)	1.11	.88	NS
ABILITY ATTRIBUTION (E ₂)	attribution to ability (post-test questionnaire)	1.37	1.46	NS
EFFORT minus ABILITY ATTRIBUTION (TEA)	"Effort-Ability"; composite attribution	-.25	-.57	.09
STRES P	depressed performance under stress (WRAT I - WRAT II)	-.12	.59	.06
STRES X	depressed prediction under stress (Post-pred I - II)	1.42	.84	NS
RATA	average math ability <u>WRAT I + II</u> 2	17.52	25.14	.0001

Additional Results

As reported in Part I, the At-Risk group differed very significantly from the normal controls in anxiety, intelligence, coping ability, self concept and grades. Results of the stress manipulation in Part II showed additional significant group differences in mathematics ability and self-perception of that ability.

However, since this study is primarily concerned with exploring hypothesized differences in the correlates of school failure: anxiety and coping ability, before analyzing the data further it seemed necessary to ensure that the heightened anxiety and depressed coping ability of the At-Risk students were not merely reflections of their lower general competence. To test for this additional analysis of variance were made on these measures co-varying out intelligence, age and mathematics ability. Since intelligence is the best predictor of school competence, age the best marker of grade repetition, and mathematics ability was being tested, it was hypothesized that any effect not accounted for by these three variables could more confidently be associated with the experience of school failure. Results of these additional Analyses of Variances show that even with I.Q., math ability and age covaried out, the At-Risk group is still significantly higher in anxiety, TASC $F(1,101) = 9.12; (s = .004)$ and lower in coping ability, TCOP $F(1,101) = 5.72; (s = .02)$ and SCOP $F(1,101) = 6.39; (s = .01)*$

*(These results have not been adjusted for shrinkage which would have presumably, increased the confidence levels).

TABLE IV

ANALYSIS OF VARIANCE: SELECTED DEPENDENT MEASURES
WITH INTELLIGENCE (I.Q.), AGE, AND MATH ABILITY (RATA)
COVARIED OUT

(reported as means)

N = 86

<u>V</u>	<u>MEASURE OF:</u>	<u>At-Risk</u>	<u>Control</u>	<u>s</u>
Test Anxiety Scale	anxiety	15.30	10.77	.004
Teachers Check -List-Cope	coping ability (teachers' evaluation)	2.70	4.07	.02
Teachers Check List-Non-Cope	non-coping ability (teachers' evaluation)	3.5	1.21	.04
Effort minus Ability (TEA)	composite measure of attribution	-.25	-.57	.09
SCOP	self-evaluation, coping ability ("What Would You Probably Do" Cope minus Non Cope)	2.4	3.34	.01
TCOP	teachers' evaluation, coping ability (Teachers' Check List - Cope minus Non-Cope)	-.86	3.06	.02

OTHER MAIN EFFECTS:
Sex and Vulnerability

The data was then analyzed for two other main effects: sex and vulnerability. These independent variables were selected because school performance and affective functioning are known to differ in boys and girls, and the relationship between such academic and affective functioning and vulnerability was the prime focus of this study.

When the performance of all the boys in the sample was compared to that of the girls, several significant differences emerged. Other differences appeared when the twenty-six stress-vulnerable students were compared to the students whose performance was unaffected by test stress. (Table II). Results of these additional analyses appear in Tables V & VI.

Differences Related To Sex:

Boys score higher than the girls on the Intelligence Test, I.Q., $F(1,85) = 7.43; (s = .008)$. They are also more confident of their own mathematics ability, as demonstrated by their higher pre- and post exam predictions:

	<u>df</u>	<u>F</u>	<u>s</u>
<u>Pre-Prediction I</u>	(1,85)	4.09	.04
<u>Pre Prediction II</u>	"	4.81	.03
<u>Post-Prediction I</u>	"	6.23	.01
<u>Post-Prediction II</u>	"	8.5	.005

However, they are not actually more able in math, WRAT I, WRAT II, and, in fact, the girls surpass them in overall final

TABLE V

Analysis of Variance: Selected Dependent Measures

All Other Significant Main and Interactive Effects for Group
(At-Risk, Normal), Vulnerability (Test performance stable/
depressed) Sex (♂ or ♀).

Source	Sex			Vulnerability			Group x Sex			Group x Vulnerability			Sex x Vulnerability			Group x Sex x Vulnerability		
	MS	F	S	MS	F	S	MS	F	S	MS	F	S	MS	F	S	MS	F	S
I.Q.	1030.5	7.43	.008			NS			NS			NS			NS			NS
UPT			NS			NS	3.63	8.47	.005			NS			NS			NS
Test Anxiety Scale	99.64	4.24	.04			NS	295.07	12.78	.001			NS	109.54	4.5	.04			NS
What Would You Probably Do-High			NS			NS	4.54	5.65	.02			NS			NS			NS
What Would You Probably Do-Low			NS			NS			NS			NS			NS	2.35	3.26	.07
Effort Attribution	8.58	8.4	.005			NS	3.69	3.76	.05			NS			NS			NS
Ability Attribution	8.11	7.23	.009			NS	4.43	4.2	.04			NS			NS			NS
Intellectual Achievement Responsibility Scale			NS			NS	40.89	6.88	.01			NS			NS	22.52	3.86	.05
Internal-External Control Test			NS			NS			NS	40.9	3.97	.05			NS	29.35	7.71	.007
WRAT I			NS	155.06	9.18	.004			NS			NS			NS			NS
WRAT II				136.53	10.25	.002			NS			NS			NS			NS
PREDICTIONS																		
-Pre I	147.09	4.09	.04			NS			NS			NS			NS			NS
-Pre II	172.78	4.81	.03			NS			NS			NS			NS	120.85	3.37	.07
-Post I	196.13	6.23	.01			NS			NS			NS			NS			NS
-Post II	208.29	8.5	.005			NS			NS			NS			NS			NS
Effort Attribution - (Post Test)			NS			NS						NS			NS			NS
Ability Attribution - (Post Test)							3.22	3.95	.05	3.27	3.98	.05			NS	3.04	3.74	.05
Care			NS			NS	1.53	7.42	.008			NS			NS			NS
Means Ends Problem Solving			NS			NS	16.68	3.29	.07			NS			NS			NS
June English			NS	336.37	5.85	.02			NS			NS			NS			NS
June Math			NS			NS			NS	586.49	5.81	.02	577.38	5.72	.02			NS
June Total	256.57	2.66	.10			NS			NS			NS			NS			NS

TABLE V (continued)

Source	Sex			Vulnerability			Group x Sex			Group x Vulnerability			Sex x Vulnerability			Group x Sex x Vulnerability		
	MS	F	S	MS	F	S	MS	F	S	MS	F	S	MS	F	S	MS	F	S
Effort minus Ability Attribution			NS			NS	13.47	8.58	.005	5.46	3.29	.07			NS	24.23	3.76	.06
STRES X			NS	74.35	4.62	.03			NS			NS			NS			NS
RATA			NS			NS			NS	52.61	3.64	.06			NS			NS
ANX.	.76	3.35	.07			NS			NS			NS			NS			NS

TABLE VI

Analysis of Variance: Selected Variables

Main Effect: Vulnerability to Stress

(Comparison of Means)

	TOTAL SAMPLE			AT-RISK ONLY			NORMAL ONLY		
	<u>Vulnerable</u>	<u>Stable</u>	<u>S</u>	<u>Vulnerable</u>	<u>Stable</u>	<u>S</u>	<u>Vulnerable</u>	<u>Stable</u>	<u>S</u>
Age	154.8	157.4	NS	157.1	160.0	NS	152.0	154.8	NS
I.Q.	111.04	108.66	NS	103.22	102.14	NS	120.16	115.0	NS
TCOP	2.41	2.2	NS	- .56	- 1.0	NS	2.91	3.11	NS
SCOP (Self Evaluation)	2.50	2.98	NS	2.0	2.57	NS	3.09	3.43	NS
WRAT I	23.42	20.88	.004	20.9	16.1	.003	26.9	25.5	NS
WRAT II	19.27	22.35	.002	16.79	18.3	NS	23.17	26.26	.001
STRES X	2.58	.47	.03	3.62	1.47	.02	1.37	.48	NS
JUNE ENGLISH	66.34	62.4	.02	59.64	56.73	NS	74.11	68.07	.05
JUNE MATH	59.62	57.7	NS	54.14	46.54	.007	66.0	68.43	NS
JUNE TOTAL	65.23	63.67	NS	58.55	53.13	.09	73.08	73.96	NS
Intellectual Achievement Responsibility Scale	11.92	12.77	NS	11.64	12.64	NS	12.12	12.72	NS
Test Anxiety Scale For Children	13.96	12.67	NS	16.86	14.67	NS	10.59	10.86	NS
Effort minus Ability Attribution (TEA)	- .23	- .49	NS	.29	- .50	.06	- .83	- .47	NS
(Hi/Lo)Anxiety	1.61	1.46	NS	1.86	1.57	.07	1.33	1.36	NS

grades, $F(1,85) = 2.66; (s = .10)$. Boys also attribute more of their own performance to effort, $F(1,85) = 8.4; (s = .005)$ while girls consider they are less in control of what happens to them; they attribute their own performance significantly more to ability or to luck or forces beyond their control (EA₂) $F(1,85) = 7.23; (s = .009)$.

Girls are also more anxious. They score significantly higher on the anxiety measure, Test Anxiety Scale For Children, $F(1,85) = 4.24; (s = .04)$ and, as well, more girls than boys score above the median in anxiety, ANX $F(1,85) = 3.35; (s = .07)$.

Differences Related To Vulnerability

Several interesting differences emerge when the twenty-six stress-vulnerable students from both the At-Risk and control groups are considered together, and compared to the stress resilient children in both groups. These results also appear in Tables V & VI. First of all, the vulnerable children are more competent in several ways. The score significantly higher on the first math exam, WRAT I, $F(1,85) = 9.18; (s = .004)$. They also get better grades (June Math, June English, June Total), although this difference is significant only on the final English grade, $F(1,85) = 5.85; (s = .02)$.

The vulnerable students also accurately perceive their own stress-vulnerability. They predict their own stress-depressed performance with significantly depressed post exam predictions, Stres X, $F(1,85) = 4.62; (s = .03)*$. Although not significant, the trend of other differences is also in the direction of heightened

* This is also additional confirmation that this stress-vulnerable group is not merely a statistical entity.

self-perception of stress (Table VI); they feel more anxious (Test Anxiety Scale For Children), less responsible for their own school success (Intellectual Achievement Responsibility Scale), and less able to cope (SCOP) than their more resilient classmates. By contrast, their teachers judge them as better copers (TCOP), and within both the At-Risk and control groups, the stress-vulnerable students have higher I.Q.'s, but are younger.

When the fourteen stress vulnerable At-Risk students are compared to the rest of the At-Risk group, Table VI, further trends towards heightened competence emerge. The vulnerable At-Risk children earn higher grades, even higher math grades $F(1,43) = 5.81; (s = .007)$, higher final grades $F(1,43) = 3.0; (s = .09)$, have more mathematics ability (WRAT I) $F(1,43) = 9.18; (s = .003)$ and feel more control over their own performance (Effort minus Ability Attribution) $F(1,43) = 3.81; (s = .06)$.

INTERACTIVE EFFECTS: Vulnerability and Group

The analyses of variance also revealed some significant interactions amongst the three independent variables and these also appear in Table V.

Of particular interest to this study of the school performance of vulnerable children are the ways in which test-vulnerability affects the At-Risk students differently from its effect on the normal controls, or the group by vulnerability interactions.

Unlike their test-vulnerable controls, the vulnerable At-Risk students attribute less of their own performance on exams to luck than to effort. This is shown by their performance on two measures of attribution of control, Attribution to Effort (E_2) $F(1,85) = 3.98$; ($s = .05$) and Effort minus Ability Attribution (TEA) $F(1,85) = 3.29$; ($s = .07$). However they feel less in control of their own lives, as demonstrated by their scores on the locus of control measure, the Internal External Test, $F(1,85) = 3.97$; ($s = .05$). The vulnerable At-Risk students are also the best in their group in mathematics. They earn higher marks, June-Math, while the vulnerable controls earn slightly lower marks within their own group $F(1,85) = 5.81$ ($s = .02$) and their scores on the combined mathematics exams, RATA, are the highest within their group $F(1,85) = 3.64$; ($s = .06$). These interactive effects of group and vulnerability are reported in Table V and depicted in Figures 1 - 8.

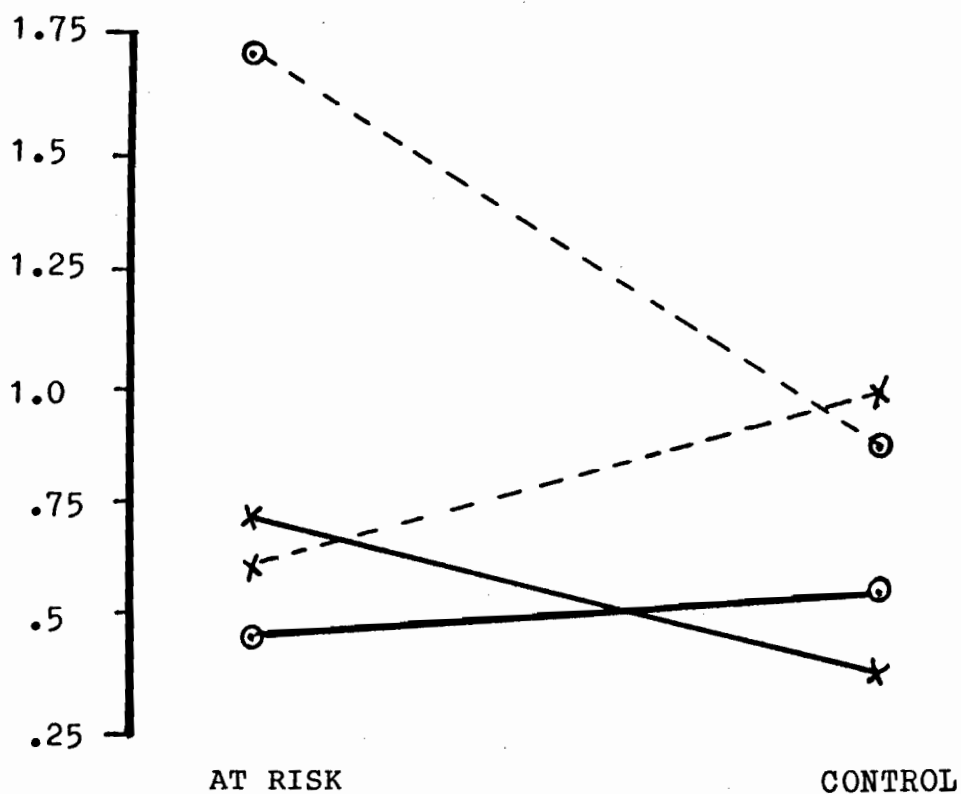
INTERACTIVE EFFECTS:

Sex and Group

Girls and boys also perform differently depending upon whether or not they are members of the At-Risk or the normal control groups. For instance, the previously noted heightened anxiety level for girls reflect significantly higher scores for the girls in the At-Risk group (see Figure 6). Only the At-Risk girls score significantly higher than the boys in their group on the anxiety measure, Test Anxiety Scale For Children, $F(1,85) = 12.78$; ($s = .001$). Normal girls appear to be no more

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

ATTRIBUTION TO UNCONTROLLABLE EFFECTS I (EA_2)



ATTRIBUTION TO UNCONTROLLABLE EFFECTS II (E_2)

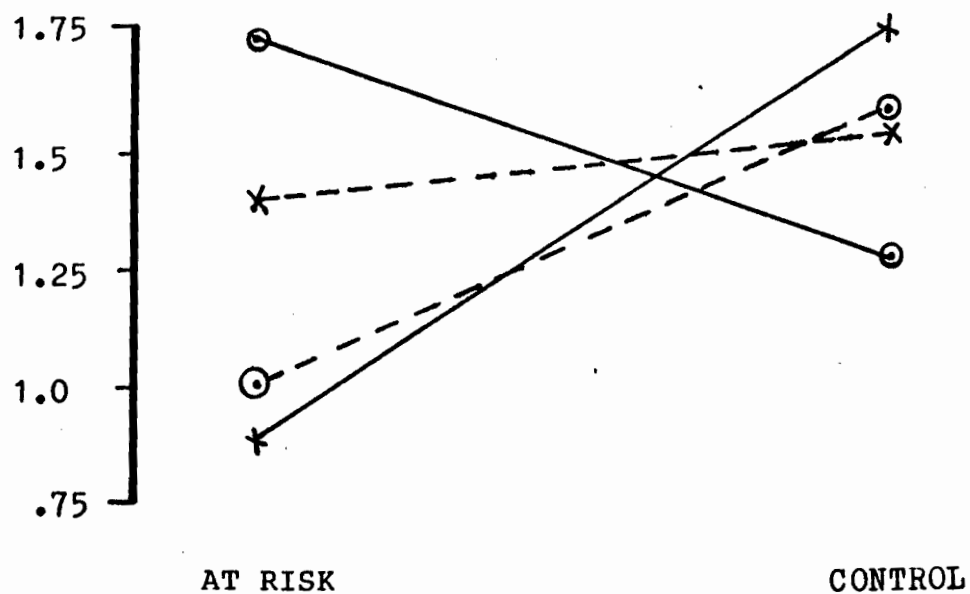
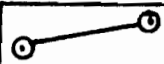
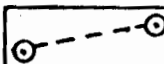
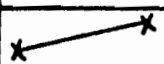
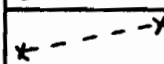


FIGURE 1

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

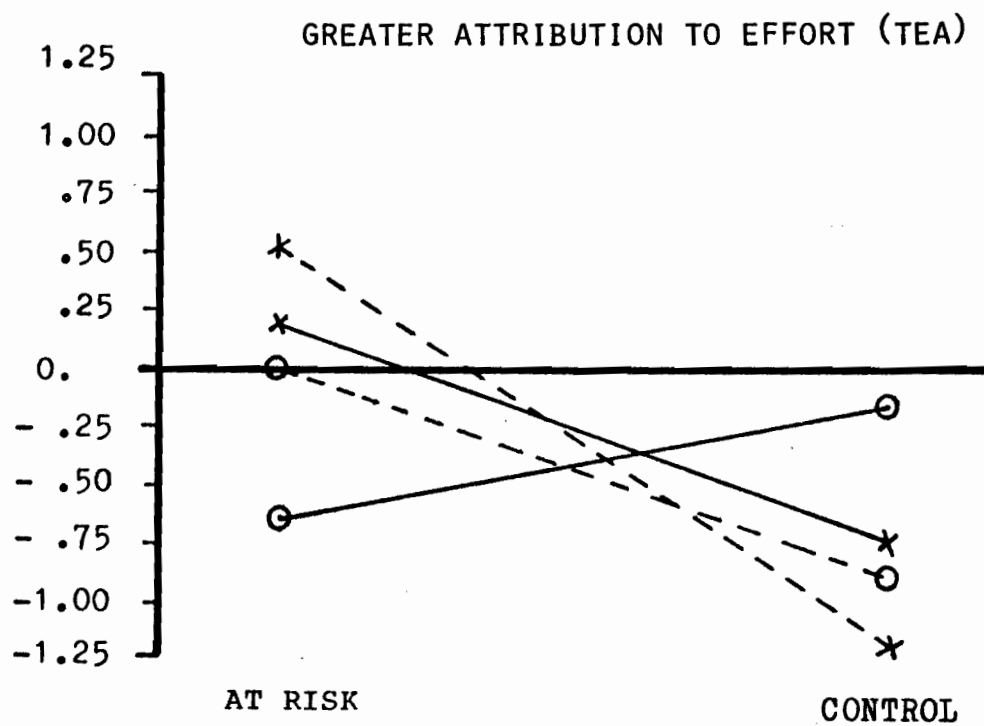
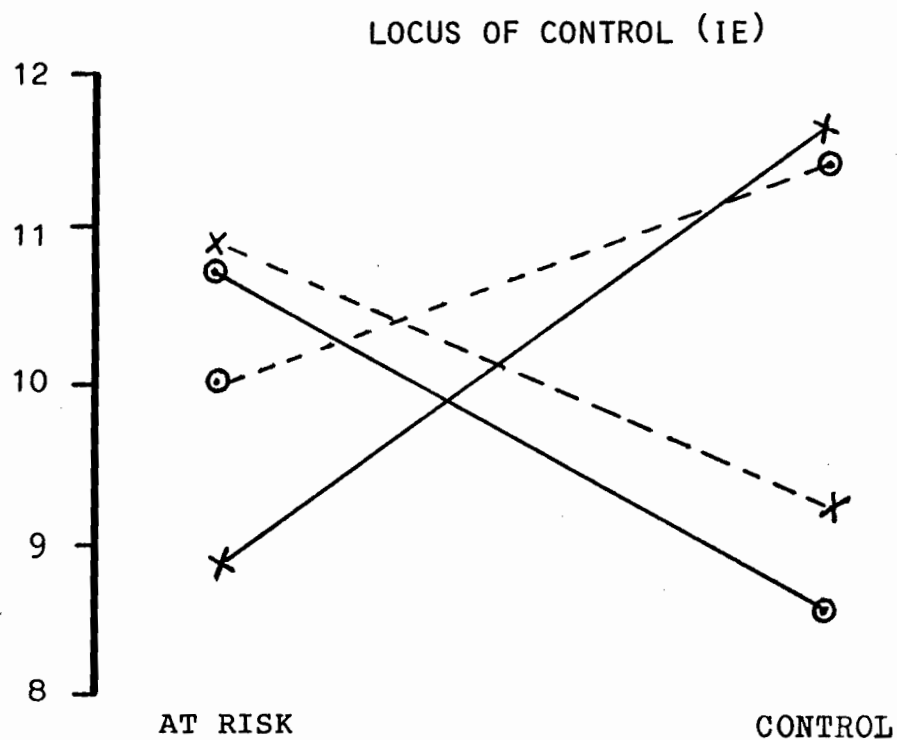
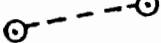
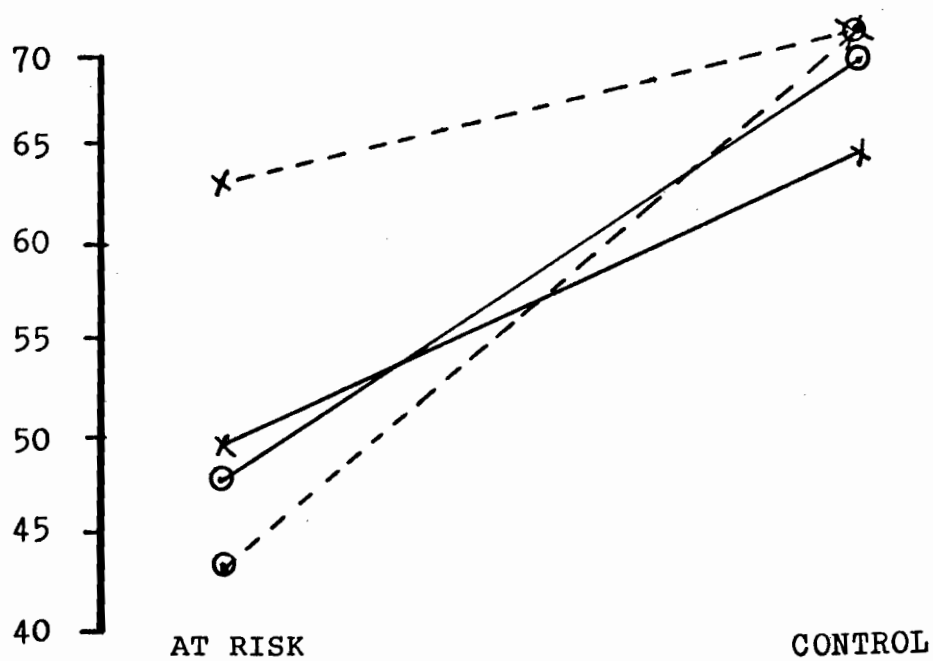


FIGURE 2

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

MATHEMATICS ABILITY: JUNE MARKS (J.M.)



MATHEMATICS ABILITY: MATH EXAMS (RATA)

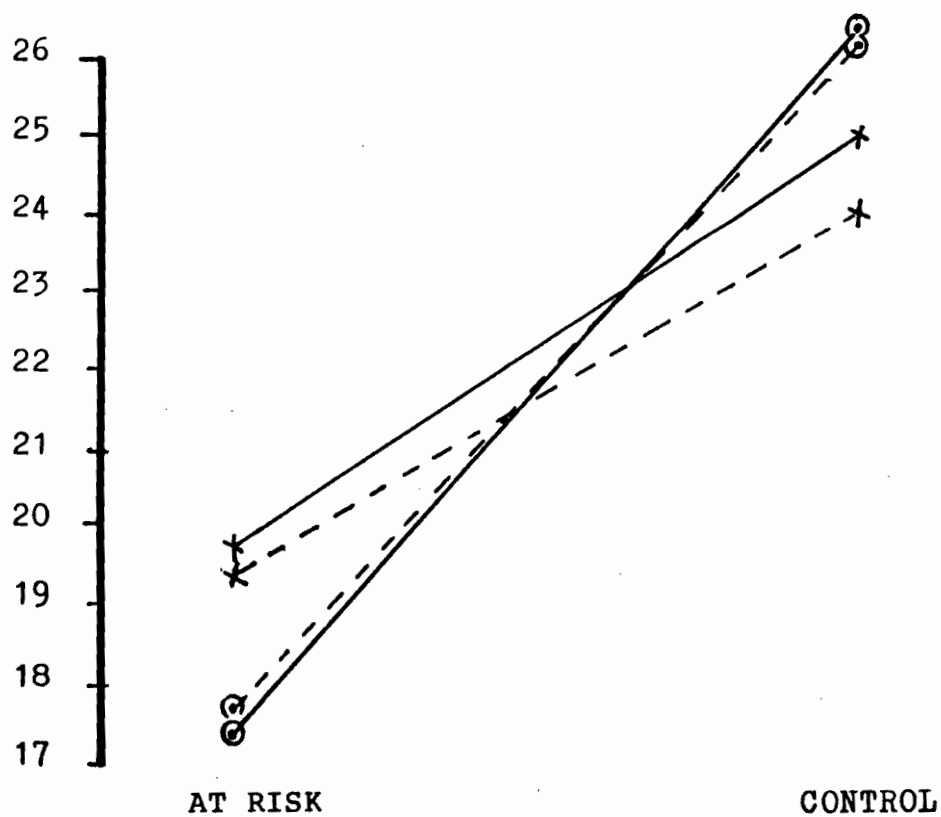
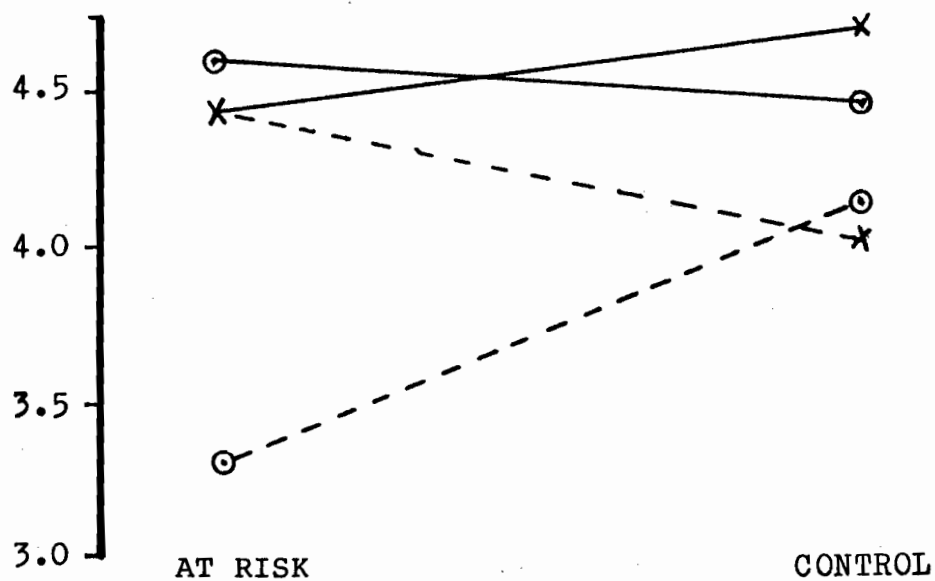


FIGURE 3

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

ATTRIBUTION TO EFFORT I (EA_1)



ATTRIBUTION TO EFFORT II (E_2)

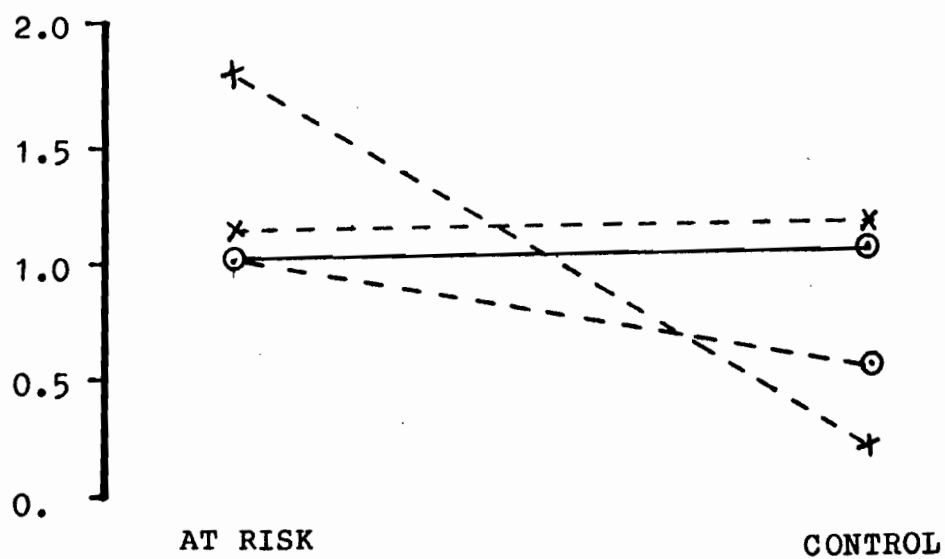
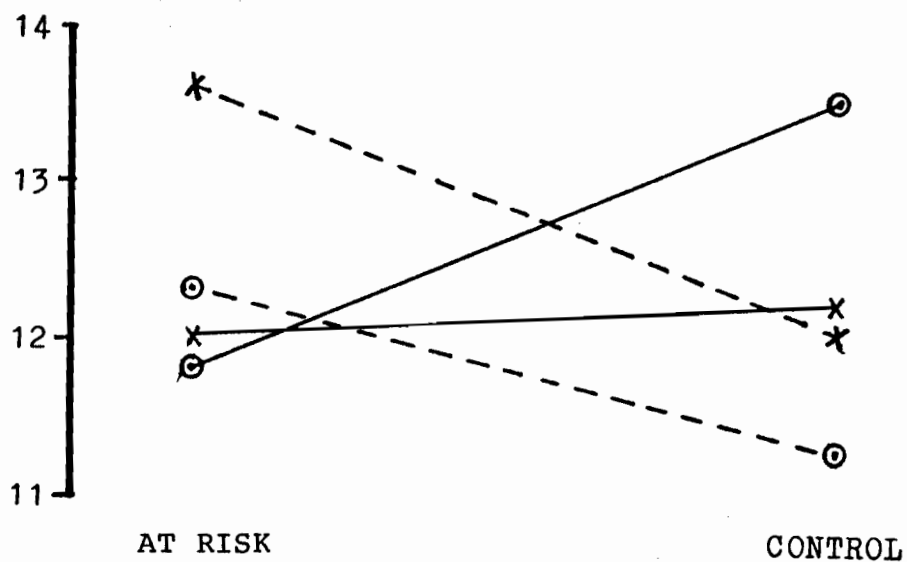


FIGURE 4

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

RESPONSIBILITY FOR FAILURE (IARS₂)

VALUE OF ATTAINMENT ("CARE")

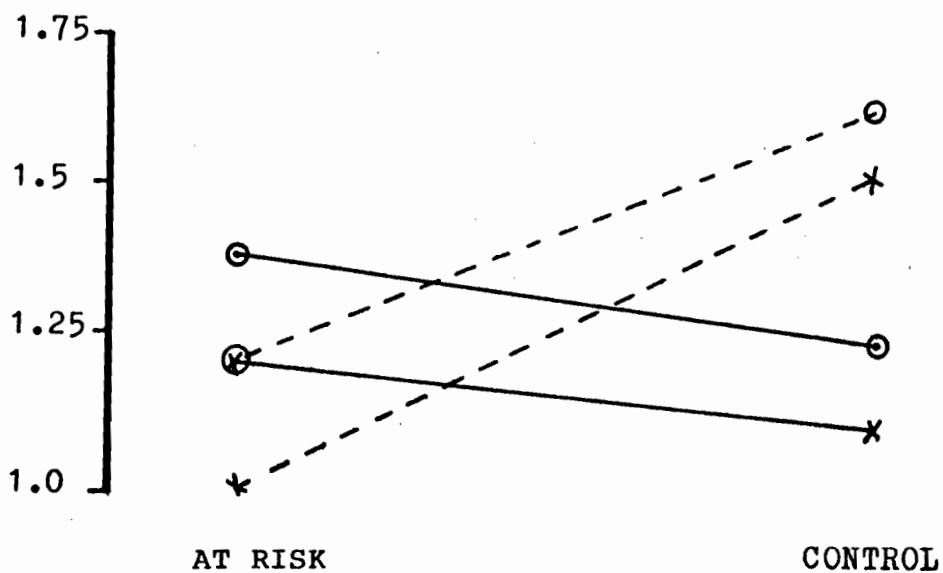
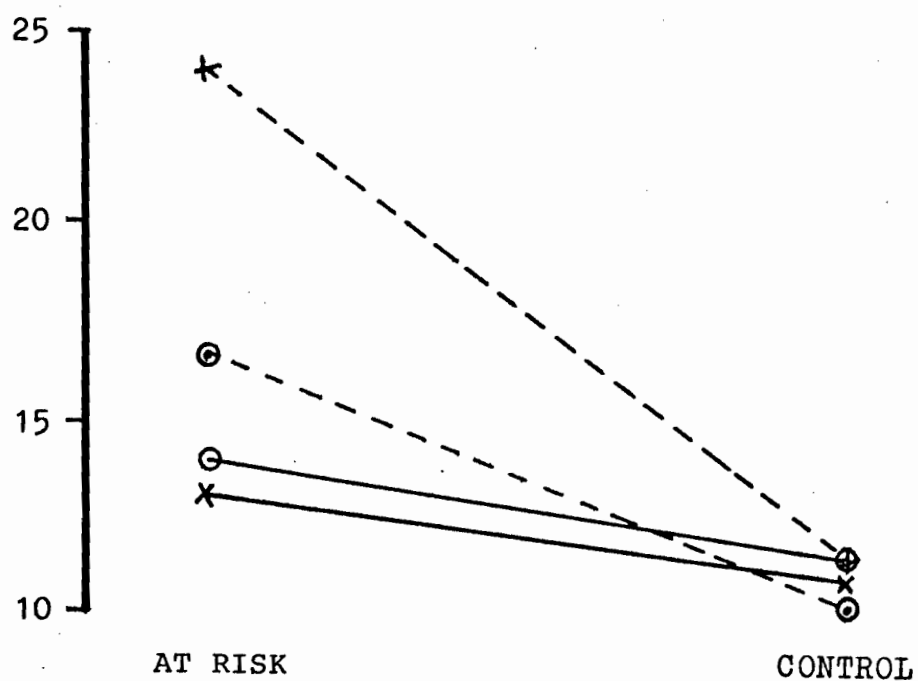


FIGURE 5

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

ANXIETY (TASC)



ANXIETY LEVEL (UPPER, MIDDLE, LOWER TRUNK)

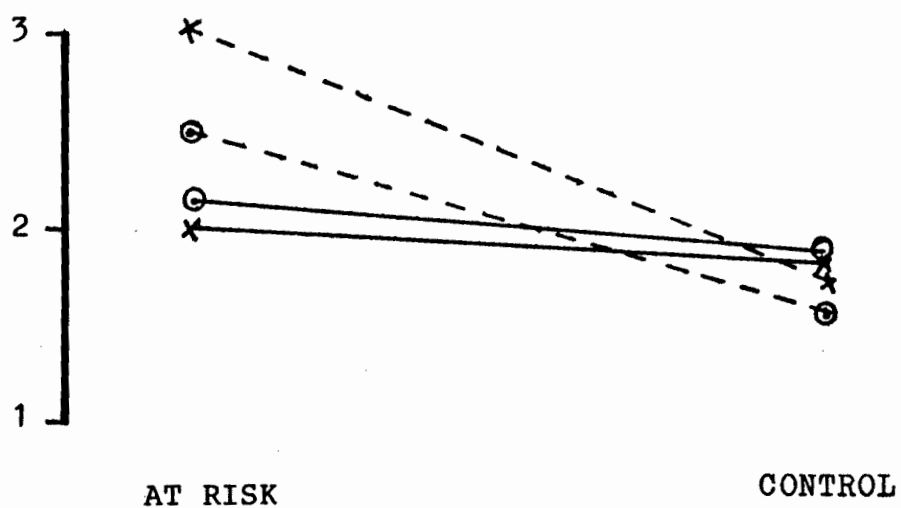
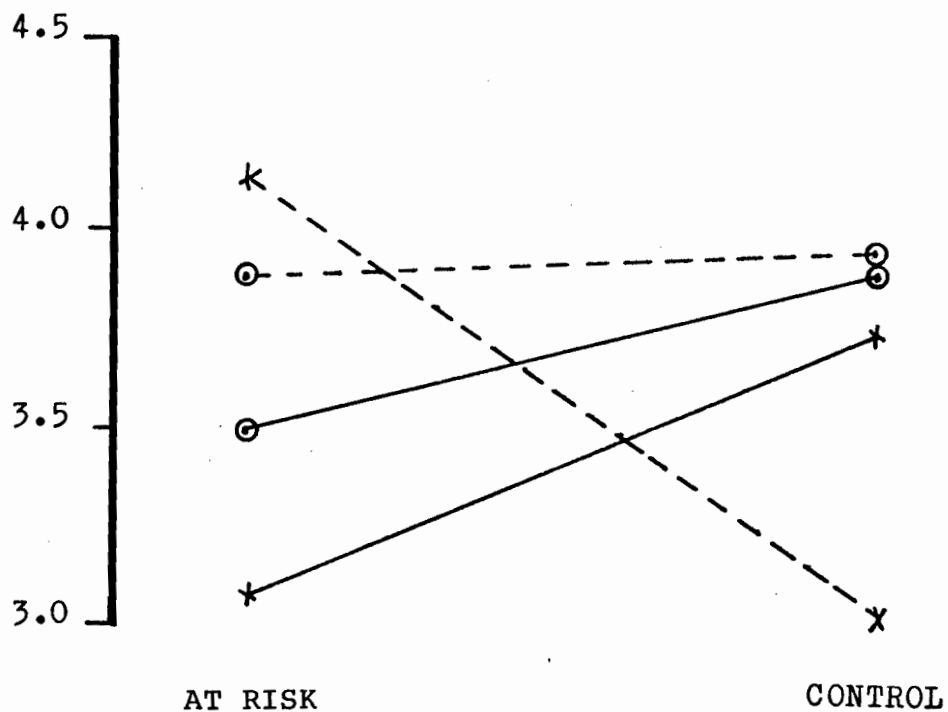


FIGURE 6

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

COPING ABILITY - SELF REPORT (WWYD-H)



NON-COPING ABILITY - SELF REPORT (WWYD-L)

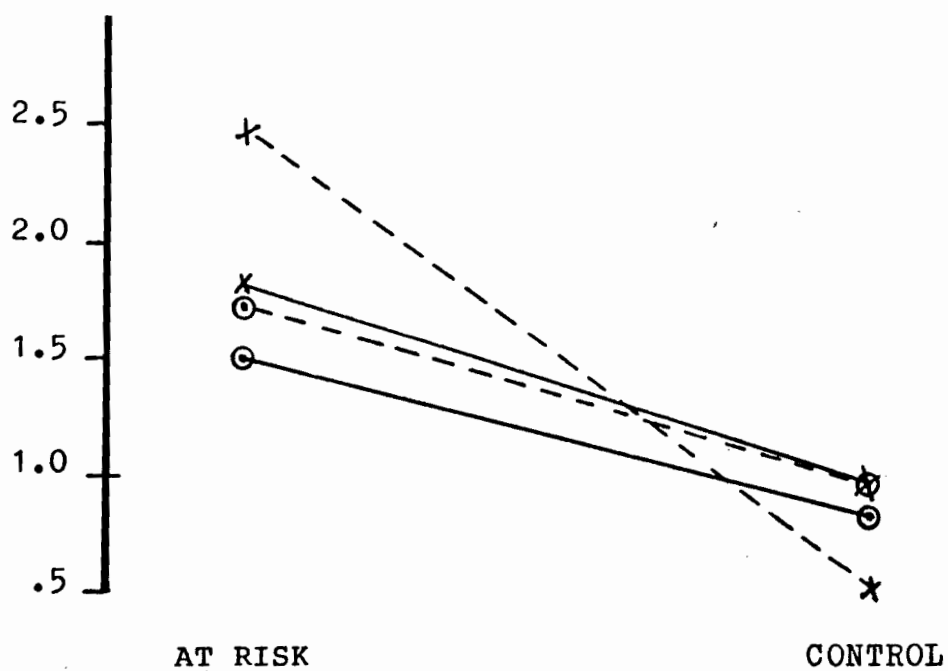
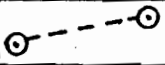
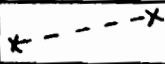


FIGURE 7

		RESILIENT			RESILIENT
		TEST-VULNERABLE			TEST-VULNERABLE

SOCIAL PROBLEM-SOLVING ABILITY (MEPS)

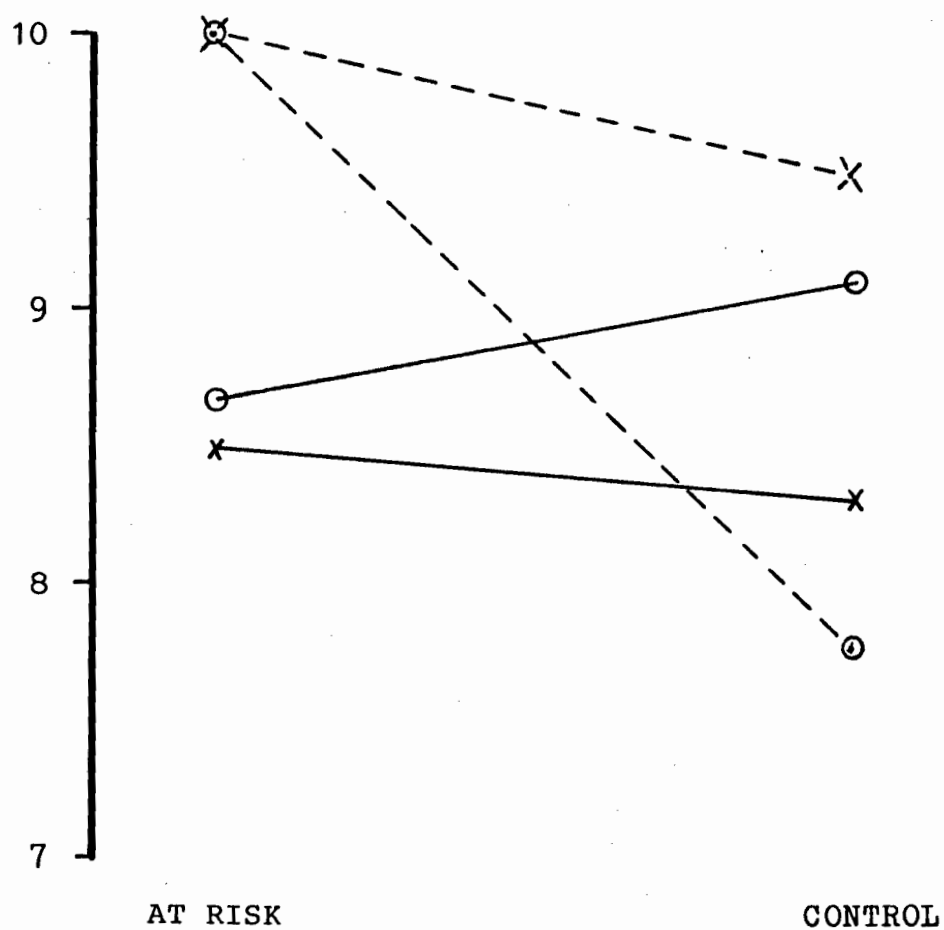


FIGURE 8

anxious than normal boys (Figure 6). And when the total sample is rated as high, medium or low in anxiety on this measure, (UPT) the same group by sex difference appears: At-Risk girls remain higher than At-Risk boys, but normal girls are seen to be even less anxious than normal boys $F(1,85) = 8.47; (s = .005)$ (Figure 6).

The increased attribution to effort rather than to ability, previously reported for boys also differs within the At-Risk and control groups. At-Risk girls generally feel much less in control of their performance than do the normal girls. They attribute significantly more of their own performance to non-specific luck, or ability (EA_2) $F(1,85) = 4.2; (s = .04)$, and significantly less to general effort (EA_1) $F(1,85) = 3.76; (s = .05)$. However, when they are asked immediately after the math exam, on the post-exam questionnaire, they feel more responsible for their own performance than do the normal girls: Effort Attribution (E_1) $F(1,85) = 9.98; (s = .002)$; Ability Attribution (E_2) $F(1,85) = 3.98; (s = .05)$; and Effort minus Ability Attribution (TEA) $F(1,85) = 3.29; (s = .07)$. At-Risk girls also feel more responsible for their own school failure, Intellectual Achievement Responsibility minus, while in the normal group, boys feel more responsible $F(1,85) = 6.88; (s = .01)$.

Although the At-Risk group did not differ significantly from the controls on the self-report measure of coping ability, What Would You Probably Do - Cope, as reported in Table I, the At-Risk girls score higher on this measure than do the normal girls while the reverse trend is seen in the boys; the difference

is significant $F(1,85) = 5.65; (s = .02)$ (see Figure 7). The At-Risk girls also scored significantly higher than all the others on the social problem solving measure, Means-Ends Problem Solving, $F(1,85) = 3.29; (s = .07)$ (see Figure 8). Normal girls appear to value attainment (as measured by "Care") more highly than boys, while, as seen in Figure 5, the reverse trend appears in the At-Risk group, $F(1,85) = 7.42; (s = .008)$.

OTHER INTERACTIVE EFFECTS

Other interactive effects amongst the three independent variables, Group membership, Sex and Vulnerability also appear in Table V and are depicted in Figure 1 - 8. A comparison of the means for each sub-group on each of the variables involved in all significant interactions appears in Table VII.

Test-vulnerable At-Risk Girls:

Of particular interest is the performance of the five girls in the test-vulnerable At-Risk sub group (see Table VII). Compared to all other sub-groups, this group is:

1. the most anxious. They score higher than any other group on the anxiety measure, Test Anxiety Scale For Children, $F(1,25) = 5.96; (s = .03)$ as well as on ANX, the grouping of these anxiety scores above and below the median, and UPT, the grouping of the anxiety scores as low, medium and high. In fact, all of these girls score in the high UPT group.
2. the lowest in intelligence as measured by I.Q. score.

TABLE VII

Summary: Interactive Effects

For each sub-group (At-Risk/Normal; Boys/Girls; Test-Stable/Vulnerable) on all Variables Involved in Significant Interactions.

(reported as means)

Total N = 86

	AT-RISK (N = 44)				NORMAL (N = 42)			
	GIRLS (N = 14)		BOYS (N = 30)		GIRLS (N = 13)		BOYS (N = 29)	
	Stable (N=9)	Vulnerable (N=5)	Stable (N=21)	Vulnerable (N=9)	Stable (N=9)	Vulnerable (N=4)	Stable (N=21)	Vulnerable (N=8)
I.Q.	99.67	93.2	103.2	108.8	110	116	117.4	122.3**
Test Anxiety Scale	16.6	23.2**	13.7	13.3	10.	11	11.2	10.4
What Would You Probably Do - High	4.3	4.6**	4.0	3.56	4.4	3.5	4.3	4.3
What Would You Probably Do - Low	1.7	2.4**	1.5	1.8	1.0	.5	.86	1.0
Pre-Pred I	23.8	27.0	29.3	30.6	33.7	28.5	32.3	34.6*
Pre-Pred II	23.2	26.4	28.3	26.9	31.8	28.8	32.4	35.0*
Post-Pred I	20.3	26.0	25.7	28.1	30.0	30.1	31.6	31.6
Post-Pred II	21.0	21.0	24.8	24.9	29.2	26.7	32.0	30.5*
Effort-Attribution	3.3	4.4	4.57	4.44	4.1	4.0	4.48	4.60*
Ability Attribution	1.67**	.6	.43	.67	.9	1.0	.52	.38
Effort Attribution (Post-Test)	1.0	1.8**	1.0	1.1	.56	.25	1.10	1.1
Ability Attribution (Post Test)	1.0	1.4	1.7	.89	1.56	1.5	1.29	1.75**
Cares	1.2	1.0	1.3	1.2	1.67	1.5	1.2	1.1
Means Ends Problem Solving	10.0	10.0	8.6	8.6	7.7	9.5	9.1	8.4
June English	57.9	62.2:	56.2	58.2	71.6	74.3**	67.1	74.1
June Math	43.0	63.0:	47.2	49.2	70.0**	70.0**	69.2	64.0
June Total	55.2	60.2:	52.2	57.6	77.8**	76.0	72.8	71.6
Effort minus Ability Attribution (TEA)	.0	+ .4**	- .91	+ .22	-1.0	-1.25	- .24	- .63
ANX	1.78	2.0**	1.48	1.78	1.4	1.5	1.33	1.25
UPT	2.56	3.0**	2.1	2.0	1.6	1.75	1.9	1.88
RATA	17.2	18.4	16.8	18.7	25.6	23.5	25.6	24.1
WRAT I	15.9	21.4:	16.3	20.67	25.4	25.5	25.4	26.8
Intellectual Achieve- ment-Resp. for Failure	12.3	13.6**	11.8	12.0	11.3	12.0	13.5	12.1
Internal-External Control Test	10.0	10.8	10.7	8.9	10.8	9.3	8.4	11.4
STRES X	- .67	4.5**	.95	3.2	.89	2.0	.28	1.1
STRES P	- 3.2	5.4**	-1.6	3.4	-.6	3.8	- .95	4.5

* lowest sub-group score (at-risk and control)

** highest sub-group score (at-risk and control)

: highest score (at-risk sub-groups only)

3. the highest in both coping responses, What Would You Probably Do - Cope, $F(1,25) = 5.76$; ($s = .02$) and non-coping responses What Would You Probably Do - Non-Cope, $F(1,25) = 2.04$; ($s = NS$), of any of the groups.

4. the group which feels most responsible for their own performance on the math exam, E₁, $F(1,25) = 6.93$; ($s = .02$) and TEA.

5. the group that feels most responsible of any for their own school failures, Intellectual Achievement Responsibility Scale Minus.

6. the group whose performance was most debilitated by the test-like presentation. They had the biggest drop in math scores between WRAT I and WRAT II (STRES-P), of any of the groups, and the largest difference between post-predictions after the unstressed and after the test-like math exams, (STRES-X).

When these test-vulnerable At-Risk girls are compared only to the other students within the At-Risk group, they:

1. have the highest scores on the unstressed math exam, WRAT I.

2. earn the highest grades in all subjects: June English, June Math, and June Total.

This suggests that a significant portion of the interactive effects herein reported can be explained by the performance of this group of test-vulnerable At-Risk girls. The combination of increased competence, heightened responsibility for one's own performance, and high anxiety previously noted for all the

twenty-six stress-vulnerable students in this sample is even more evident in the performance of this smaller group of stress-vulnerable At-Risk girls. Although only some of these differences are significant, taken together they suggest a trend and a model for further analysis and study.

Correlations

Correlations amongst all the dependent variables were also obtained using Pearson Product Moment correlations, SPSS program. This analysis showed some additional significant relationships. Significant intercorrelations amongst the major variables: academic ability, affective-behavioral variables, I.Q. and age appear in Table VIII.

As might be expected, the highest correlations are between the academic variables: math ability and grades. All of these correlations are highly significant ($r = .59$ to $.82$) ($s = .001$). Less predictable are the high correlations emerging between coping ability (both self-evaluated, SCOP, and teacher evaluated, TCOP) and the academic variables. These correlations range from $.26$ to $.47$ and all but one are highly significant ($s = .001$).

Anxiety, and negative self-concept are also significantly and negatively correlated with the academic variables ($r = .28$ to $-.43$; $s = .003$ to $.001$). Although the high correlation between anxiety and negative self-concept ($r = -.71$) must be suspect because of the derivative nature of the self-concept measure (despite the orthogonal claim of the validity studies as noted in the 'measures' section) the correlations amongst anxiety, coping ability, I.Q. and self-concept bear out the findings in Study I (Stevens, 1979). These range, for the unrelated variables, from $.24$ to $.53$ ($s = .008$ to $.001$).

TABLE VIII

CORRELATIONS: MAJOR VARIABLES
Total Sample: N=86

Grades, Academic Ability, Affective-Behavioural Variables, I.Q. & Age

	<u>grades</u>			<u>math ability</u>		<u>affective-behavioural</u>				I.Q.	Age
	<u>June Tot.</u>	<u>June Eng.</u>	<u>June Math</u>	<u>Wrat I</u>	<u>Wrat II</u>	<u>Test Anx. Scale</u>	<u>-Self Eval.</u>	<u>SCOP</u>	<u>TCOP</u>		
June English	.73										
June Math	.75	.60									
WRAT I	.70	.59	.68								
WRAT II	.71	.50	.65	.82							
Test Anxiety Scale For Children	-.36	-.38	-.29*	-.28 ^a	-.43						
Poor Self Evaluation	-.35	-.34	-.30	-.30	-.34	-.71 ²					
SCOP	.35	.34	.26 ^c	.31	.43	-.41	-.41				
TCOP	.46	.47	.41	.41	.39	-.28*	-.25 ^c	.25 ^c			
I.Q.	.52	.37	.39	.43	.44	-.35	-.25 ^c	NS	NS		
Age	-.40	-.30	-.28*	-.45	-.36	NS	NS	-.25 ^c	-.24 ^d	-.33	
What Would You Probably Do - High	NS	NS	NS	NS	NS	NS	NS	.64 ²	NS	NS	NS
What Would You Probably Do - Low	-.31	-.34	NS	-.28*	-.40	.53	.45	-.80 ²	-.26 ^b	-.27*	NS
Teachers Check List-High	.40	.38	.34	.39	.40	NS	NS	NS	.85 ²	.32	-.24 ^d
Teachers Check List - Low	-.44	-.50	-.39	-.38	-.33	.28*	NS	-.23 ^e	-.95 ²	NS	NS
Pre-Prediction I	.29*	.33	.36	.44	.47	-.36	-.34	.25*	NS	NS	-.32
Pre-Prediction II	.38	.34	.43	.52	.56	-.39	-.29*	NS	.34	.33	-.36
Post-Prediction I	.46	.37	.52	.56	.57	-.30	-.27*	.24 ^a	.30	.43	-.30*
Post-Prediction II	.56	.45	.56	.60	.68	-.42	-.42	NS	.47	.47	-.32*

All correlations, $s = .001$, except as noted:

* = .002
a = .003
b = .004
c = .006
d = .008
3 = .009

2 = related variables as described in "Measures"

Anxiety and Performance

The relatively high correlations between the self-predictions, Pre-Pred I, Pre-pred II, Post-pred I, Post-pred II, and math performance, WRAT I, WRAT II, ($r = .44$ to $.57$; $s = .001$) is further evidence of the reliable self-evaluations these students make. The students were better predictors of their own math ability than was I.Q. ($r = .43$ to $.44$; $s = .001$). It was also interesting to note that the correlation between anxiety, and the self-predictions is also significant ($r = -.30$ to $-.42$; $s = .001$) but of a lower order than the correlations between the predictions and math ability. This suggests that the hypothesized link between self-evaluation and anxiety postulated by the Sarason (1960) studies is suspect. In this population at least, self-prediction of performance reflected math ability more than it reflected anxiety.

The reliability of self-report measures of debilitating anxiety (see INTRODUCTION) is also called into question by the low order correlations between stress-debilitated performance (STRES-P) and the self-report measure of test anxiety, Test Anxiety Scale, (and its derivative groupings: ANX and UPT).

	STRES-P (<u>depressed performance</u>)	STRES-X (<u>depressed self-predictions</u>)
Test Anxiety Scale	$r = .11$	.14
ANX.(Hi/Lo) <u>Test Anxiety Scale scores</u>	.06	.29*
UPT.(Hi/Med/Lo) <u>Test Anxiety Scale Scores</u>	.06	.13

* $s = .01$

TABLE IX
MEASURES OF: PERCEPTION OF CONTROL
Correlations N = 86

	SCOP (Self Concept)	IARS+	IARS-	IARST	EA ₁	EA ₂	E ₁	E ₂	TEA	1E	"W"	"H"	"C"
Intellectual)													
Achievement) +	.27												
Responsibility)													
Scale) -	.35	.39											
Total	.37	.84	.83										
Effort Attribution		NS	NS	NS									
Ability Attribution		NS	NS	NS	-.98								
Effort Attribution (Post test)		NS	NS	NS	NS	NS							
Ability Attribution (Post-test)		-.25	NS	-.23	-.21	.20	-.22						
Attribution to Effort (TEA)		.22	NS	.21	.19	.18	.74	-.82					
Internal-External Control Test	-.27	-.22	-.28	-.30	-.18	NS	NS	NS	NS				
"Worse"		NS	NS	NS	NS	NS	.21	-.22	.28	NS			
"Harder"		NS	NS	NS	NS	NS	.19	-.21	.26	NS	.61		
"Cares"		NS	-.28	NS	NS	NS	-.47	NS	-.35	NS		NS	
Pre-Pred I		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre-Pred II		NS	NS	.20	-.21	NS	NS	NS	NS	NS	NS	NS	NS
Post-Pred I		.18	NS	.19	.18	.17	NS	NS	NS	NS	NS	NS	NS
Post-Pred II		.21	NS	.18	.20	.20	NS	NS	NS	NS	.26	NS	NS
"What Would You Probably Do-High"		.16	NS	.19	NS	NS	NS	-.28	.25	NS	NS	NS	NS
"What Would You Probably Do - Low"		-.33	-.23	-.34	NS	NS	NS	NS	NS	.25	-.18	-.19	NS
Test Anxiety Scale		-.34	NS	-.27	NS	NS	NS	NS	NS	NS	-.23	-.18	NS

N = 102

<u>r</u>	<u>S</u>
= .28	= .005
= .26	= .009
= .22	= .01
= .18	= .05

Previous outcome studies report the reduction of self-reported test anxiety without accompanying improvement in test performance (Goldfried, Linehan and Smith, 1978; Hussian and Lawrence, 1978; Finger and Galassi, 1977). The lack of correlation between self-report measures of debilitating anxiety and performance-related measures is substantiated by the present data.

Stress-debilitated performance (STRES-P) as measured by a lower score on the second math test, is not significantly correlated with any of the anxiety measures. Depressed self-prediction under stress (STRES-X) correlated significantly only with ANX, the Hi/lo anxiety measure, showing that only those in the most highly anxious group also predicted lower scores for themselves, when under stress.

Perception of Control and Related Variables

Tables IX shows significant relationships amongst the measures of perception and locus of control. These are the measures that reflect how responsible the student feels for his own performance and how much value he places on success and failure. Significant but low correlations amongst these measures can be noted. Almost all of these correlations are of a lower order than those amongst grades, intelligence, coping ability, anxiety, self-concept and self-predictions (Table VIII).

As previously noted, the At-Risk and normal groups did not differ significantly on these variables, as hypothesized, although some significant interactive differences did appear (Tables V & VI, Fig. 1 - 8). (Also, one of these measures, TEA, the composite measure of attribution to Effort minus attribution to Ability, appears in the Discriminant Analysis. as noted in the following section.)

Discriminant Analysis

As described, it was necessary to use a variety of measures in this study to sample a wide range of academic, cognitive, affective and behavioral variables. However, using this number of variables increases the risk that, although significant, differences between groups are not reflective of a significant "real" difference. They might conceivably be measures of a few obvious but insignificant factor, and taken together, not account for a major portion of the variance between the groups.

To ensure this was not the case, a Discriminant Analysis was made using all the dependent variables. (Program used was SPSS, Discriminant Analysis Option minimizing Wilk's Lambda). The analysis was made using only students having scores on all measures, as required by this program (N=86). The resultant rank ordering used twelve variables in the following order:

<u>Step</u>	<u>Rank</u>	<u>F(to enter or remove)</u>
1	- June total (overall marks)	83.49
2	1 June Math (math grades)	14.60
3	2 Test Anxiety Scale For Children (anxiety)	8.20
4.	3 Teacher's Check List(coping ability)	6.37
5	4 June English (English grade)	4.40
6	5 RATA (<u>WRAT I & WRAT II</u>) 2	2.66
7	6 TEA (attribution to effort)	3.09
8	(June Total Removed)	.87
9	7 I.Q. (intelligence)	2.47
10	8 What Would You Do (coping ability)	2.69
11	9 Means-Ends Problem Solving (social problem solving)	3.55
12	10 SEX	2.05
13	11 SCOP (coping ability)	1.68
14	12 ANX (anxiety)	1.25

As can be noted, the top-ranking predictors are grades. The single best predictor, overall grades (June Total) was removed in the eighth step, presumably because of the inclusion of June English, the final English mark, and June Math, the final math mark, with which this predictor was highly correlated. When these predictors are removed, anxiety becomes the next best predictor, then coping ability. TEA, a measure of attribution of control, ranks seventh. Unexpectedly, all of these academic, affective and behavioral variables rank before I.Q., presumably because of the high correlations between these variables and I.Q. The ranking of I.Q. in this function reflects its discriminating effect beyond these covariances.

The resultant standardized function: $(E = -.25 \text{ I.Q.}) + (.34 \text{ Test Anxiety Scale For Children}) + (-.27 \text{ What Would You Do - high}) + (-.17 \text{ Teacher's Check List - high}) + (-.11 \text{ Sex}) + (.16 \text{ Means Ends Problem Solving}) + (-.27 \text{ June English}) + (-.26 \text{ June Math}) + (.20 \text{ TEA}) + (.13 \text{ SCOP}) + (-.25 \text{ RATA}) + (-.15 \text{ ANX.})$.

This function includes grades (June Total, June Math, June English), anxiety (Test Anxiety Scale For Children), (ANX), coping ability (Teacher's Check List - high, What Would You Do, SCOP), math ability (RATA), intelligence (I.Q.), perception of control (TEA) and problem-solving ability (Means Ends Problem Solving). Sex is also included in step ten presumably because of the interactive effect of sex with some of the other variables (as described in previous section "Interactive Effects") which differs within the At-Risk and the control groups.

Using this discriminant function obtained on the reduced sample of eighty-six, the entire sample of 102 students was then "grouped". The analysis predicted the groups as follows:

	<u>N</u>	<u>Predicted Normal</u>	<u>Predicted At-Risk</u>
<u>Actual Normal</u>	51	47 92.2%	4 7.8%
<u>Actual At-Risk</u>	51	3 5.9%	48 94.1%

percent of "grouped" cases correctly classified: 93.14%

As can be noted, there are three false negatives and four false positives amongst the 102 students. The remaining ninety-five students were correctly classified as At-Risk or control by this discriminant function.

This confirms that the At-Risk students not only differ significantly on a wide range of variables from their 'normal' classmates, but that this wide range of variables must be included to make the most accurate discrimination between the groups. It also confirms that the variables measured in this study account for most of the variance between the groups.

This finding also replicates the high level discrimination made between the At-Risk and able groups in the previous study (Stevens, 1979) unfortunately since some of the measures used in that study were not used in this one, and other measures were added (see measures) it was not possible to use the functions generated in that study to discriminate the sample in the present study.

DISCUSSION

The results of this study show striking differences between a group of seventh grade students who had been normally successful in school and a group of their classmates whose previous six years in school had included much less success and much more failure.

The successful students not only have higher academic ability and intellectual competence, but they are also more confident and less anxious, and they cope better with routine school stress than their less successful classmates.

However, both groups of students contained some members whose performance on a mathematics test was unaffected or even enhanced under test-like conditions, and both the successful and unsuccessful groups also contained students who could not solve mathematics problems as well when they thought they were taking a test.

These findings will be considered in two ways. First, in terms of the hypothesis upon which this study was postulated, and secondly in terms of their implications for understanding the prolonged effects of school failure.

Confirmation of Hypothesis

The hypothesis to be tested were:

At-Risk students would be more anxious, less academically able, feel less in control of their own school performance, respond with fewer coping strategies and have lower self-concepts and fewer behavioural options than their normal classmates.

At-Risk students would be more vulnerable to school-related stress, and respond to stressful situations with depressed performance.

The first hypothesis was confirmed for all the cognitive and affective dimensions except the locus and attribution of control variables. The differences between the groups in all the variables except those related to locus and attribution of control, were highly significant and, as demonstrated by their inclusion in the discriminant function, it was these differences that "made the difference" between the groups.

As a group, the At-Risk students did not appear "helpless", as had been hypothesized. In fact, in their responses to the questionnaire immediately following the test-like math exam, WRAT II, they held themselves more responsible for the results of their own performance than the control children did, at a marginally significant level. Previous findings which have shown disabled learners to feel more externally controlled (Hallohan, Gojar, Cohen and Tarver, 1978) were not confirmed by this study. The At-Risk group did, however, appear to contain a "helpless" sub-group: those who did as well or better under test-like conditions also attributed their own performance significantly less to effort. This sub-group also showed a trend towards being less anxious (although still more anxious than the normal controls) and less competent academically and intellectually, when compared to the other At-Risk students.

Boys in both the successful and the At-Risk groups feel significantly more in control of their own performance than do the girls. This suggests that perception of control over one's own performance is much more a function of whether or not one is an adolescent boy or an adolescent girl than whether or not one has previously done well or poorly in school. These results also suggest that perception of control is a complex interrelationship of previous learning history, sex, vulnerability, and how one learns to deal with stress. Some children appear to reduce their own stress by attributing their own performance to factors beyond their control, while others, as demonstrated by the heightened attribution to effort and the heightened anxiety of test-vulnerable group, maintain their attribution to effort while their performance under stress deteriorates. Understandably, their anxiety also rises.

Previous findings about heightened anxiety in girls (Dunn, 1968; Phillips, 1966) are confirmed by this study. But although the girls as a group were significantly more anxious than the boys, when the anxiety scores of the At-Risk and Normal children were examined separately, most of this effect is due to heightened anxiety in the At-Risk girls. The At-Risk test-vulnerable girls was the most anxious sub-group of the sample.

The second hypothesis, that At-Risk students are more vulnerable to stress, was confirmed by the self-evaluations and teachers' evaluations of performance under stress, but disconfirmed by the results of the stress manipulation.

Contrary to the expected results, an equal proportion of At-Risk and normal Seventh Graders deteriorate under test-like conditions. The contradiction between these two findings may be partially explained by differences in set for the tasks being measured. All the At-Risk children did more poorly than the normal controls on the measures of adaptive (task-related) and non-adaptive (anxiety-related) responses in school situations. However, all of these situations were relatively unstructured, that is, unaccompanied by direct instruction from the teacher, and they were all situations that immediately followed failure by that child, i.e. "getting a wrong answer", "losing one's place", etc. By contrast, when the stress was related to the math test, the failure was only implicit, "Some of you didn't do very well the other day". Under these conditions, only the most anxious At-Risk students, showed deteriorated performances, as did a portion of the normal population, presumably those high in "state anxiety". The set to "pay attention" and "do your best" given before the test-like exam, WRAT II, probably debilitated the performance for the most highly anxious students in both groups and enhanced the performance for those who had not attended sufficiently to the first exam, WRAT I. Since the At-Risk students whose performance was debilitated by test-stress were also the most competent and most anxious within the At-Risk group, the role of anxiety in affecting the test performance of At-Risk students seems crucial. Put another way, the At-Risk students who did

better under test-like conditions appear to constitute a sub-group of At-Risk students who feel "helpless", don't perform well if not structured, and although of normal intelligence, are of lowered academic competence. In several ways this is the most disabled sub-group of the sample. They earned the lowest marks and they are seen by their teachers as the least adaptive copers.

Since the At-Risk students investigated in this study were unselected by etiology, it is not surprising that the effects of some of the variables measured are less potent for one portion of this population than for another. However, even the variables which do not differentiate between all the At-Risk students and their controls do affect sub-groups differently. For example, attribution of control does not differ significantly between At-Risk and control students, but a measure of this ability (Effort minus Ability Attribution, TEA), is included in the function generated by the Discriminant Analysis.

The Effects of Failure

What implications do these findings have for an increased understanding of the effects of school failure? First of all, they challenge the role of intellectual deficit in school failure. Although the At-Risk group scored significantly lower, their mean I.Q. scores were still normal. All of these students had adequate intelligence to learn in school. Differences between the groups in mathematic ability and in grades were of a much higher order than the difference in intelligence.

Secondly, this data challenges the hypothesis that children who don't do well in school are simply uninterested, inattentive and unmotivated. In this study, any effects due to socio-economic differences in the valuation of education and attainment were ruled out by the relative homogeneity of the population. Yet significant differences remain between the successful and unsuccessful students. And rather than feeling more relaxed and less stressed in school, the At-Risk children, as a group, were more anxious and, by both their own and their teachers' ratings, more immobilized by stress-inducing situations in school. What emerges from this data is not a profile of an unconcerned, unmotivated student, but rather one with high levels of stress-related anxiety who lacks adaptive ways to reduce that stress.

Of course, the direction of any cause and effect relationship between vulnerability and heightened stress remains to be established. Is it the history of failing experiences that leaves these children unconfident, lacking in problem-solving

ability and deficient in coping strategies, or are these the children who are constitutionally more vulnerable to stress and, therefore, destined to more frequent failures? Doubtless this At-Risk population contains some children of heightened organismic vulnerability. Nevertheless, some of this data lends support to the hypothesized debilitating effect of failure. The most stress-vulnerable of the At-Risk students assessed, those whose test performance suffers, are not the least competent. Rather, they are more competent than the rest of the At-Risk students who appear unaffected or facilitated by the test-like condition. In this study, heightened stress vulnerability is associated with higher grades and higher mathematics ability within the At-Risk group. If it were the vulnerability that predisposed the failure history, one would assume that the opposite would be true, and the most vulnerable students would be the least competent.

The most vulnerable students are, however, the most anxious. This suggests that anxiety may play a crucial role in determining the effect of stress over school performance for At-Risk students. In this study, whenever the test-vulnerable students are compared to the others, this combination of increased competence with heightened anxiety is found. This is true when all the test-vulnerable students in both groups of the sample are considered, and it is also true when only the At-Risk test-vulnerable students are compared to the others in their group. This effect even appears when the most anxious sub-group of all, At-Risk test-vulnerable girls, are compared to all other At-Risk children.

This could mean that anxiety, while debilitating for students generally, acts to facilitate performance on tests for less competent At-Risk children and is a marker of increased competence in other At-Risk children. Remaining highly anxious, while it is debilitating on tests, and may be distressing, seems to be more adaptive for long range school success, such as grades, than becoming "helpless".

Implications for Remediation

The At-Risk students studied comprise a group of anxious, relatively unskilled adolescents with depressed self-concepts whose ability to cope with normal school stress is impaired. On school tests, they either perform less well than they are able to under unstressed conditions (presumably because of heightened anxiety) or they appear to reduce their own stress by considering their own performance beyond their control. Yet, these students are beginning high school, where they will be expected to take increasing responsibility for and control of their own learning, and where much of that learning will be judged by examination. Normal cognitive development will require them to make careful judgements, weigh alternatives and risk hypothesis. Neither heightened anxiety nor abdication of control for one's own performance are adaptive sets for such learning tasks or such performance requirements. Not only do these affective-cognitive deficits have serious implications for their developing autonomy, but they have equally serious implications for this future thinking and learning. To be effective, any remedial program their school devises must consider not only academic lags, but these affective and cognitive correlates as well.

In the previous study, (Stevens, 1979), specific training in generating and using more adaptive coping strategies in stressful situations was added to the academic remedial program of a similar group of At-Risk Seventh Graders. Unfortunately,

as described in that study, school disruptions prevented a valid assessment of that coping skills training program. However, the experience gained in designing, teaching and observing that program suggested several considerations for any future program. One was the need to establish that these At-Risk students did, in fact, lack adaptive coping strategies when under stress. The highly significant difference in adaptive coping responses between the At-Risk and control groups on the coping measures in this study provides such evidence.

Another consideration arising from the previous study was the advisability of designing the coping skill program to address a more specific area of stress-related deficit. The present study suggests that there may be two major sub-groups of At-Risk students: those who are more anxious but also more competent although they deteriorate under test-stress, and those who perform better on tests than they do in unstressed situations but are more "helpless", less academically able and less intelligent.

The second group is probably the more disabled. They would require not only intensive academic skill building but specific training in recognizing the role of effort in their own performance to begin to succeed in school. The successful attribution retraining programs reported for such children (Dweck, 1975; Andrews and Debus, 1978) offer a promising adjunct to the academic program designed for this group.

But although the first group, the test-vulnerable At-Risk sub-group, are more competent in several ways, they still

constitute a sub-group of anxious, underachieving students. They seem a promising target for an initial program to foster specific coping skills. Any intervention which helped these test-vulnerable At-Risk children deal more adaptively with their own test-anxiety would immediately increase their school success by raising their grades on tests. Hopefully, once their success rate begins to increase, school would also begin to appear less threatening and more rewarding.

If teaching these students how to recognize and control their own stress-induced anxiety and how to generate and use better problem-solving strategies could be shown to increase their success in school, then the link between failure expectancy and depressed performance would be further confirmed, and a promising avenue for reversing a history of school failure would be opened.

REFERENCE NOTE

Note I. Stevens R., & Pihl, R.O. The At-Risk student,
Identification and Remediation. manuscript submitted
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REFERENCES

- Ammons R. and Ammons A. The Full Range Picture Vocabulary Test, New Orleans, R.B. Ammons, 1948.
- Ammons R., Ammons C. The Quick Test (Q.T.): Provisional Manual Psych. Reports, 1962, 11; 111-161.
- Andrews G. and Debus R. Persistence and the causal perception of failure, J. of Educ. Psychol., 1978, 70:2; 154-166.
- Atkinson J. & Feather W. (eds.) A Theory of Achievement Motivation, N.Y., Wiley, 1966.
- Black F. Self concept as related to achievement and age in learning disabled children, Child Develop., 1975, 45; 1137-1140.
- Brickman P., Linzenmeier J. and McCareins A., Performance enhancement by relevant success and irrelevant failure, J. Person. and Soc. Psychol., 1976, 33:2; 149-160.
- Burgess T. and Wright D. Seventh-grade evaluation of the Ammons Quick Test (Q.T.), Psychol. Rep., 1962, 10; 791-794.
- Castenada B., McCandless R. and Palermo D. The children's form of the manifest anxiety scale, Child Develop., 1956, 27; 317-326.
- Chess S., Thomas A., Birch H. and Hertzig M. A longitudinal study of primary reactions in children, Comprehensive Psychiatry, 1960, 1:8; 103-112.
- Crandall V.C., Katkovsky W. and Crandall V.J. Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations, Child Develop., 1965, 36; 91-109.

- Diener C. & Dweck C. An analysis of learned helplessness: continuous changes in performance, strategy, and achievement cognitions following failure, J. Person. and Soc. Psychol. 1978, 36:5; 451-461.
- Dunn J. The approach avoidance paradigm as a model for the analysis of school anxiety, J. of Educ. Psychol., 1968, 59:6; 388-394.
- Dweck C. The role of expectations and attributions in the alleviation of learned helplessness, J. Person. and Soc. Psychol. 1975, 31:4, 674-685.
- Feld S. & Lewis J. The assessment of achievement anxieties on children, in C.P. Smith (ed.), Achievement-Related Motives in Children, N.Y., Russell Sage Found., 1969.
- Finger R. and Galassi J. Effect of modifying cognitive vs. emotionality responses in the treatment of test anxiety. J. of Consult. and Clinic. Psychol., 1977, 45:2; 280-287.
- Gaudry E. & Spielberger C. Anxiety and Educational Achievement, Australia, Wiley, 1971.
- Goldfried M., Linehan M. & Smith J. Reduction of test anxiety through cognitive restructuring, J. of Consult. and Clinic. Psychol., 1978, 46:1; 32-39.
- Hall G.S. Adolescence, N.Y., Appleton, 1904.
- Hallohan J., Gojar A., Cohen S., and Tarver S. The learning disabled as an inactive learner, J. of Learn. Disab., 1978, 11:4; 231-236.

- Hamburg B. Early adolescence: a specific and stressful stage of the life cycle, Chap. VI in Coelho G., Hamburg D. and Adams J., Coping and Adaptation, N.Y., Basic Books, 1974.
- Hartman L. The preventive reduction of psychological risk in asymptomatic adolescents: a behavioral approach; Unpub. Ph.d. dissert., McGill Univ., 1977.
- Hiroto D. & Seligman M. Generality of learned helplessness in man, J. of Person. and Soc. Psychol., 1975, 31; 311-324.
- Hussian K., Lawrence P. The reduction of test, state, and trait anxiety by test specific and generalized stress inoculation training, Cognitive Therapy & Research, 1978, 2:1; 25-38.
- Jastak J. & Jastak S. Wide Range Achievement Test (WRAT), Wilmington, Delaware, Guidance Assoc., 1965.
- Joestling J. & Joestling R. Comparison of scores on Quick Test and Stanford-Binét, Form L-M, Psychol. Reports, 1971, 29, 1178(a).
- Kestenberg J. Phases of adolescence: with suggestions for a correlation of psychic and hormonal organizations, II, Prepuberty diffusion and reintegration, J. of Amer. Acad. of Child Psychiatry, 1967, 6; 577-614.
- Ladwig G. Personal, situational and social determinants of preference for delayed reinforcement. Unpub. Ph.d. dissert, Ohio State U., 1963, as cited in J. Rotter, Internal vs. external control of reinforcement, Psych. Monog., 80:1, 1966.
- Lipman R. Effect of anxiety lead on concept formation, Amer. J. of Ment. Def., 1960, 65; 342-348.

- Mednick M. Relationship of the Ammons Quick Test of intelligence to other ability measures, Psychol. Reports, 1967, 20; 523-526.
- Murphy L. and Moriarity G. Vulnerability, Coping and Growth, New Haven, Yale University Press, 1976.
- Otto W. & McMenemy R. An appraisal of the Ammons Quick Test in a remedial reading program, J. of Educ. Measurement, 1965, 2; 193-198.
- Phillips B. An Analysis of Causes of Anxiety Among Children in School, U.S. Dept. of Educ. Project #2616, U. of Texas, Austin, 1966.
- Phillips B., Martin R., & Meyers J. Interventions in relation to anxiety in schools. In C.D. Spielberger (ed.) Anxiety: Current Trends in Theory and Research II, N.Y., Academic Press, 1972.
- Piers E. Manual for the Piers-Harris Self Concept Scale, Nashville, Counsellor Tests and Recordings, 1969.
- Platt J.J., Scura W.C. & Hannon J.R. Problem-solving thinking of youthful incarcerated heroin addicts. J. of Community Psychol 1973, 1; 278-281.
- Pless I., Snider M., Eaton A., Kearsley R. A rapid screening test for intelligence in children, Amer. J. of Diseases of Children, 1965, 109; 533-537.
- Poser E.G. Strategies for behavioral prevention in P.O. Davidson (ed.) The Behavioral Management of Anxiety, Depression and Pain, N.Y., Brunner/Mazel, 1976.

- Poser E.G. & King M. Strategies for the prevention of maladaptive fear response, Can. J. of Behav. Sci., 1975, 1; 279-294.
- Rotter J. Generalized expectancies for internal vs. external control of reinforcement, Psych. Monog., 1966, 80:1 (whole #609)
- Ruebush B.K. Anxiety in H.W. Stevenson (ed.) Child Psychology, The 62nd yearbook of the Nation. Society for the Study of Education, Chicago, U. of Chicago Press, 1963.
- Sarason S., Davidson R., Lighthall F., Waite R. and Ruebush B. Anxiety in Elementary School Children, N.Y., Wiley, 1960.
- Sarvis M. Evil self image, Mental Hygiene, 1965, 49; 308-310.
- Sattler J. Assessment of Children's Intelligence, Phila., Saunders, 1974.
- Spivack G., Platt J. and Shure M. The Problem Solving Approach to Adjustment, San Francisco, Jossey-Bass, 1975.
- Stevens R. Bilingual experience and psycholinguistic ability, McGill J. of Educ., 1:2, 1966.
- Thomas A., Chess S. Temperment and Development, New York, Brunner/Mazel, 1977.
- Wechsler D. Manual for the Wechsler Intelligence Scale For Children, Revised, N.Y., Psych. Corp., 1974.
- Wright P.G. and Gallagher E. A comparison of WISC-R and Quick Test scores of elementary and high school children, unpub. report, Baldwin-Cartier School Comm., 1977.
- Young F. and Brown M. Effects of test anxiety and testing conditions on intelligence test scores of elementary school boys and girls. Psych. Reports., 1973, 32; 643-649.

Linking Statement

This is the third in a series of three studies of children who fail in school. Previous investigations of this population have either centered around more effective differential diagnosis by etiology and presumed deficit, or else they have looked for more precise and effective academic interventions. The aim of the present series of studies has been to see if any generalizations can be made about students whose school leaving problems differ but who share the common experience of school failure.

This final study examines the efficacy of teaching better problem-solving strategies to a group of stress-vulnerable students. In the first study in this series, The At-Risk Student, a coping skill training program was developed and taught in school to a group of students who had previously been identified by their teachers as at-risk for school failure because of a history of school learning problems. This training was given as an adjunct to the on-going remedial academic program of these At-Risk students. After training, these students showed an increase in social problem solving ability and a trend towards heightened self-concept.

One consideration that arose from that study was the need to establish more precisely the pre-training effect of stress on these students. In the second study in this series, The Effects of Student Failure, it was demonstrated that these At-Risk students did, in fact, cope less well with normal school stress than their classmates. As well, some of the At-Risk Students in that second study showed depressed ability to solve mathematical problems when they thought they were taking a test.

The present study is aimed at examining the effectiveness of training such test-vulnerable At-Risk students, as well as a group of their otherwise normal classmates who are also test-vulnerable, to control their own maladaptive reactions to test-stress by using more effective problem-solving strategies.

STUDY III

LEARNING TO COPE WITH SCHOOL

A study of the effects of a Coping Skill Training program on the subsequent school performance of At-Risk and Otherwise Normal test-vulnerable students.

Abstract

A sample of forty Grade Seven students who had previously been found to solve fewer mathematics problems correctly when they thought they were taking a test, were individually assessed with a battery of intellectual, cognitive and affective measures, both prior and subsequent to a remedial coping skill building program. Nineteen of these test-vulnerable students were also considered to be at-risk for school failure because of previous problems in school. The remaining twenty-one, despite their vulnerability to tests, were normally successful in school.

Two coping skills training programs were taught to twelve of the At-Risk and eleven of the otherwise normal students in this test-vulnerable sample; the remaining seventeen students served as controls.

One training program was highly structured and included instruction in the use of a prescribed problem-solving sequence, relaxation, and verbal self-instruction. The other program encouraged the students to generate their own coping strategies.

After training, students showed a significant increase in the number and improvement in the quality of coping sets and strategies generated, increased performance on the WISC-R coding and mazes sub-tests, and a trend towards heightened resistance to test-stress and higher grades. Differences between the At-Risk and normal students and between the two treatment programs are reported and discussed. Results are discussed in terms of the remedial potential of a school-based intervention in the alleviation of stress-depressed school performance.

INTRODUCTION

It is not a simple matter to understand how a young adolescent performs when faced with normal stress in school. For example, in a previous study (Stevens, Pihl, 1979b) although a group of seventh grade students selected by their teachers as at-risk for school failure were found to be significantly more anxious than their classmates, and to have and use fewer and less adaptive behavioural options in the face of diverse stressful school encounters, they did not, as a group, deteriorate under test-stress to any greater degree than their normal classmates. Although it had been hypothesized that the At-Risk group would contain more test-vulnerable members than the normal group, when each child's performance under unstressed conditions and test-like conditions was compared, over two thirds of the At-Risk students, and the same number within the normal group, showed stable or enhanced performance when they thought they were taking a test. The remaining thirty percent of each group - the test-vulnerable students, or those, both At-Risk and otherwise normal, whose performance under test-like conditions decreased ten percent or more - are the subject of the present study.

This test-vulnerable population was chosen for several reasons. First, when their IQ's, grades and academic ability is compared with that of their classmates, this test-vulnerable subgroup seems to contain the more competent members within both the At-Risk and the Not-At-Risk group. Although their performance deteriorates on tests, they are more intelligent, earn better

grades and are better mathematicians than the remaining two-thirds of their own groups (Stevens, 1979b). They are also more anxious and feel more responsible for their own performance in school. By contrast, the previous study also showed that the two-thirds of the At-Risk group whose performance is stable or enhanced under a test-like set were significantly more "helpless" or less expectant of being able to improve their own performance through their own efforts than was the test-vulnerable group.

A second reason for selecting the test-vulnerable students for this experimental remedial intervention is that this more anxious but more competent adolescent had not previously been targeted for such a program. The other At-Risk sub-group, the "helpless" student, has, on the other hand, been the subject of several previous studies (Dweck, 1975; Andrews and Debus, 1978; Dweck and Reppucci, 1973) which have reported that training such students to re-attribute their own failure to lack of effort rather than to factors beyond their control increases their performance under stress, and even reverses the previously debilitating effect of failure.

But the anxious adolescent who continues to feel responsible for his own performance has traditionally been considered a clinical rather than a school problem. By contrast, college students who do poorly on tests because of their own anxiety have been the target of countless training and treatment programs. Many stress reduction techniques have been developed for, and assessed on, undergraduates (Hussian and Lawrence, 1978;

Spiegler, 1976; Meichenbaum, 1977; Goldfried, Linehan & Smith, 1978; Finger and Galassi, 1977). But little is known about the precise effect of test-stress over performance in younger and less able students. Although sympathetic teachers have always noted that some of their students would earn better grades if "test marks didn't count", the combined effect on the At-Risk student of previous failure and present deficit has often masked his further deterioration under test-like conditions, as general inability.

Traditional clinical treatment for test anxiety, which combined systematic desensitization (Wolpe, 1961) and relaxation techniques (Jacobson, 1938) to reduce debilitating anxiety, have more recently been augmented, and even supplanted, by treatments that contain a cognitive component. Cognitive restructuring or cognitive reappraisal (Ellis, 1962; Holroyd, 1976; Sarason, 1973) is reported as a treatment component in many recently reported studies, several of which also include the teaching of direct strategies for coping with debilitating stress (Goldfried, 1975; Meichenbaum, 1974; Meichenbaum & Cameron, 1973c). The crucial role of maintaining and controlling one's own on-task attention (Wine, 1971; Deffenbacher, 1978; D'Zurilla & Goldfried, 1971) has often been highlighted in this "coping skill" training. As well, the debilitating effect of self-defeating cognitions (Ellis, 1962; 1971; Beck, 1976; Mahoney & Thoresen, 1974) has been examined, and some clinicians reported heightened performance under stress after training in substituting positive for negative self directions (Wright, Stevens and Millelire, 1976; Meichenbaum & Cameron, 1974).

Several questions have not yet been clearly answered by these stress-reduction studies. First, the relationship between heightened anxiety and stress-debilitated performance has not been well established. Several studies (Finger & Galassi, 1977; Hussian & Lawrence, 1978; Goldfried et al, 1978) report a decrease in self-reported anxiety without a concomitant increase in test performance or grades. In a review of fifty four of these studies, Finger (1975) found improved performance in only thirty percent. In the previous study in the present series (Stevens, 1979) self-reports of anxiety and debilitated performance under test-like conditions were not significantly related. It seems possible to feel very upset by one's own anxiety without those feelings affecting performance. Conversely, it is possible to be so defended against one's own feelings as to not perceive or acknowledge their debilitating effect. Therefore, measures of anxiety reduction cannot be considered measures of improved performance under stress. Any study of the effect of an intervention designed to improve stress-debilitated performance should include measures of performance under stress.

Secondly, the extent and nature of the stress-debilitated performance needs to be established before looking for treatment effects from stress-reduction training. If, as was demonstrated in the preceeding study (Stevens, 1979) this test-vulnerable sub-group of students is actually more competent in several ways, then dependent measures, such as final grades, and increased performance on measures of ability, are only valid measures of improvement vis-a-vis pre-training levels of performance.

Thirdly, although the studies reporting the effective reduction of anxiety with coping skill training have used a variety of treatment components, such as self-instruction, relaxation, rehearsal, modeling and imagery, the relative therapeutic contribution of each of these components to increased coping ability has not been fully explored. For example, self-instruction is frequently included as a component in such treatment packages to facilitate the effect of more molar components (Meichenbaum, 1977, Chap V; Norton, MacLean and Wachna, 1978; Horan, Hackett, Buchanan, Stone and Demchik-Stone, 1977). But a recent study of the relationship between self instruction and performance documents constraints to the facilitation by self instruction and suggests that the "effectiveness of such training may depend on the subjects' past history" (Burron and Bucher, 1978).

Broadly speaking, the coping skills programs reviewed differ principally in whether or not they are based on a structured program of sequential steps to problem solving and stress-reduction, to be learned and used in place of the maladaptive stress reducers currently in the repertoire, or alternatively, they encourage those being trained to generate and use their own coping strategies.

Finally, the question of generalization from specific skill-building programs to wider areas of increased performance has seldom been satisfactorily answered. Several studies of anxiety reduction have reported decreased state anxiety or situation anxiety, but fail either to find generalization to other anxiety provoking situations, or a reduction in trait anxiety. (Kendall, 1978; Endler, 1975).

The present study has been designed with these concerns in mind. It addresses the following questions:

1. Can test-vulnerable At-Risk students and test-vulnerable students who are otherwise normal be taught to monitor and control their own debilitating stress reactions so that their performance under test-like conditions is enhanced?
2. Can these students be taught to generate and use more and better adaptive (ie. on-task) problem-solving strategies when under stress? Can they be taught to reduce their own expectancy of failure?
3. Will At-Risk students, who are significantly more anxious and less competent in many dimensions, including linguistic competence, than other students (Stevens, 1979), respond differently to such training from their vulnerable classmates who are not At-Risk?
4. Will training in generating effective problem-solving strategies and controlling debilitating cognitions and off-task behaviour while faced with stressful school situations, improve other areas of performance, including performance on measures of intelligence, grades and self-concept?
5. Will such training increase the ability cope with other stresses in school?
6. Will training increase the on-task vigilance of At-Risk and Not-At-Risk test-vulnerable students, and their on-task attention in class?

7. Does training in the use of specific stress-reduction techniques such as self-instruction and relaxation, increase the effectiveness of a coping skills training program for stress-vulnerable adolescents?

METHOD

OVERVIEW

Approximately twenty eight percent of a group of 849 Grade Seven students scored at least ten percent lower on a mathematics test given under test-like conditions than they had scored on an equivalent test given under relaxed conditions three days before. Most of these test-vulnerable students were considered to be normally successful in school by their teachers, but about twelve percent had been categorized as being at-risk for school failure because of previous problems in school. Two experimental samples of these test-vulnerable students: an At-Risk test-vulnerable group and a test vulnerable group who were otherwise normal, were given two weeks of coping skills training and their subsequent improvement on measures of problem-solving strategies, coping ability, intellectual performance, self-concept, and performance under stress was assessed by comparing it with the performance of two similar control groups of test-vulnerable students who had not received training.

Subjects

The subjects of this study were forty-nine test-vulnerable Grade Seven students, aged 12.0 to 14.1; twenty-one of these students, seven girls and fourteen boys, were considered to be at-risk for school failure. Of the remaining twenty-eight, ten were girls, eighteen were boys.

These students were all considered to be vulnerable to test stress because they were able to solve fewer mathematics problems under test-like conditions than they had been able to solve three days before under unstressed conditions. The twenty-one At-Risk students had been so designated because they had each had school learning problems in their preceeding school years.

Subject Selection

To identify the test-vulnerable students for this study all 849 Grade Seven Students* in the Baldwin-Cartier school commission were given two equivalent mathematics tests three days apart. The first was given under unstressed conditions, and the second under test-like conditions. All students who solved fewer problems correctly on the second test were considered to be vulnerable to test-stress.

The At-Risk students in this study were identified in a screening conducted in all Grade Six classrooms throughout this school commission in the Spring preceding their entry into Grade Seven. This screening is conducted annually in this commission to identify students at-risk for failure to cope with Grade Seven, the first year of high school. The validity and reliability of these identifications were established in two previous year-end screenings, Stevens, 1979ab).

All seventh grade students who were both test-vulnerable and rated as At-Risk comprised one portion of this sample; the test-vulnerable At-Risk group, there were twenty-one such students, fourteen boys and seven girls.

* except as described in Procedure section

In order to assess the relationship between vulnerability, a history of school failure, and treatment, a second group of test-vulnerable students who were otherwise normal was also selected. This second group was selected by choosing at random, from amongst all the students showing this vulnerability to tests, a classmate of the same sex from the same homeroom as each of the twenty-one test vulnerable At-Risk students. These twenty-one matched students, plus three girls and four boys to act as spares, constituted the test-vulnerable otherwise normal group.

Subjects were divided into two groups, experimental and control, in the following manner:

All of these Grade Seven students attended one of two high schools. One of these schools had a population of about 1500 students in Grades Seven through Eleven. The second, serving the same grades, contained about 500 students.

All of the students in the sample, both At-Risk and otherwise normal, who attended the larger high school constituted the experimental sample. Thirty-two of these forty-nine test-vulnerable students were in this group: fourteen At-Risk and eighteen otherwise normal.

The remaining seventeen students in the sample, seven At-Risk and ten otherwise normal, attended the smaller high school and constituted the control group. Although it would have been preferable to assign the experimental and control students randomly, the necessity of having all training occurring in one school (as described in Methods section) prevented this.

The sample, thus divided into experimental and control groups, made up four cells, as shown in Table I.

TABLE IDistribution of Sample

	<u>At-Risk</u>	<u>Otherwise Normal</u>	<u>Total</u>
Experimental	14 (8 ♂ 6 ♀)	18 (11 ♂ 7 ♀)	32 (19 ♂ 13 ♀)
Control	7 (6 ♂ 1 ♀)	10 (6 ♂ 4 ♀)	17 (12 ♂ 5 ♀)
Totals	21 (14 ♂ 7 ♀)	28 (17 ♂ 11 ♀)	49 (31 ♂ 18 ♀)

MEASURES

Several sets of measures were used in this study. First all of the seventh grade students were rated, near the end of their Grade Six year, in the Commission-wide Grade Six Screening. The Grade Six Screening Form (Stevens, 1979ab), devised for this series of studies, was used in this screening.

Then, each of the forty-nine students in the test-vulnerable sample was assessed in several ways. First their performance on three equivalent mathematical tests, one given under unstressed conditions and the other two given under test-like conditions prior to and immediately following a two-week Coping Skills Training Program, was assessed. Secondly, each of these students was tested individually before and after the training programs on a series of measures of their intellectual, coping and problem solving competence, as well as their anxiety and attribution to effort. Finally, each of the experimental students who had participated in the training programs filled out a questionnaire during a Booster meeting. Each of these measures will be described more fully in this section.

Grade Six Evaluation

Grade Six Screening Form (Stevens, 1979 ab). This is a questionnaire, developed for these investigations, which includes information deemed relevant and useful in planning the student's remedial program in Grade Seven, and, as well, a section which asks the teacher to make two judgements about the pupil.

One is to answer "yes" or "no" to the question: "Is this student likely to cope well with high school next year?" For the second, the teacher is asked to rate each pupil referred on a scale of 1 ("with ease") to 6 ("only if the school makes many modifications"), according to his or her ability to cope with school the following year. The reliability of the Grade Six Screening Form, and the validity of the judgements derived from answers to these two questions, were established in the previous study (Stevens, 1979ab) when the teacher's judgements were found to correlate very significantly ($s = .001$) with scores on a standard measure of cognitive and learning competence, The Pupil Rating Scale (Myklebust, 1971) as well as with grades, intelligence and measures of affective competence.

All students rated by their Grade Six teachers as "no" on the first judgement and "4, 5, or 6" on the second, were considered to be At-Risk for the purposes of the present study.

Measures of Test Stress

(1) Math Test I, Math Test II, Math Test III. The arithmetic section of the Wide Range Achievement Test (Jastak & Jastak, 1965) was used to produce a 102 item (some original problems added to , increase numbers in most difficult section) arithmetic test containing items of progressive difficulty from Grade 2 through Grade "16". This test was piloted on 123 grade seven students in this commission the year before. Items on the resultant tests were then scored and an error score for each item obtained.

Math Test I and Math Test II were then produced using this item analyses. Each form of the test contained forty two items of increasing but equivalent difficulty, as rated by the number of errors made in each item during the developmental testing. The equivalence of these two tests was confirmed in a previous study when mean scores on the two tests earned by a population of eighty six Grade Seven students were found to be nearly identical (Stevens, 1979b). Math Test III was produced for the present study by rearranging the items on Math Test II.

The math tests were prepared to resemble as closely as possible the format of Commission math tests, in consultation with the Commission's Mathematics Consultant. Math Test I was labelled "Mathematics Review", Math Test II was labelled "Mathematics Test", and Math Test III was labelled "Mathematics Examination Retest".

(2) Perception of Goal Attainment: To heighten the test-like dimension of Math Test II, each row of problems on this test, from the simplest to the most difficult, had a number in the right-hand margin under the meaningless heading "percentile average grade level". These numbers ran from 2.5 to 10.3 and were suggestive of grade equivalent criteria. They were devised so that grade seven level problems were marked "6-0" and "6-3". Math Test III contained a similar notation on each page. Since one characteristic of test-anxious children is their propensity to feel themselves being compared and found "wanting" by significant others in their environment (Sarason, 1960) this manipulation of goal

attainment was included as an additional source of potential threat on the two tests used under test-like conditions, Math II and Math III. It was used as an additional source of school stress against which to measure any effect of Coping Skills Training.

(3) Self Prediction of Performance - prior to the administration of each of the three tests, pupils were asked to estimate "how many right" answers they expected to have on the forty two problems. This prediction was made on a sheet attached to the test and collected by the teacher before the test began. Immediately after finishing each test, the students were again asked to predict "How many right" answers they thought they had. These predictions yielded the following scores: -

<u>Math Test I:</u>	Pre-prediction
	Post prediction
<u>Math Test II:</u>	Pre-prediction
	Post prediction
<u>Math Test III:</u>	Pre-prediction
	Post prediction

Since these predictions had reflected significant differences in test-stress in the previous study, they were used again in the present study as a potential source of data about changes in the student's perception of stress.

(4) Additional Stress-Related Measures. Five additional stress related measures were obtained immediately after the second test, Math II. Each student was asked to complete a questionnaire to compare his reaction on this test with his reaction to the

unstressed test given three days before - This questionnaire, designed for this series of study, contained five questions to measure the student's perception of task difficulty, value of achievement, and attribution to effort. The first question asked whether or not performance in the second (stressed) test, Math II, seemed "better or worse"; it was scored for worse answers only. The second question asked whether or not Math II seemed "easier" or "harder", and was scored for Harder answers only. Questions three and four were measures of attribution to effort and conversely, attribution to luck or forces beyond control. They yielded and Effort Attribution score, and a Non-Effort Attribution score. Question five was a measure of the importance of attainment for each student or how much he or she "cares". These measures were included to assess other potential difference in stress-perception with treatment.

To summarize, the three math tests and their associated measures yielded the following scores for each student in the experimental and control sample:

<u>Measure:</u>	<u>Measure Of:</u>
<u>Math Test I</u>	Unstressed performance
Pre-prediction I	
Post prediction I	
<u>Math Test II</u>	Stressed performance
Pre-prediction II	(pre-treatment)
Post prediction II	
"Worse")	
)	
"Harder")	Self-rated perception of
	difficulty under stress
"Care"	Value of attainment
Effort Attribution)	
Non-Effort Attribution)	Attribution of control over
	performance

Measure:Math Test III

Pre-prediction III

Post prediction III

Measure Of:Stressed performance
(post-treatment)

Measures Of Competence

It had been hypothesized that Coping Skill Training might enhance other areas of functioning in these test-vulnerable students, particularly in the At-Risk sub-group. To assess this, it was necessary to have measures of both pre-training and post-training levels of performance.

All experimental and control students were tested individually one week before the training period, and retested within one week following training using the measures herein described. All measures used in pre-testing were readministered in post-testing except the measure of general intelligence, the Quick Test, which, as noted, was included only to establish the intellectual equivalence of the control and experimental groups in this study.

(1) Quick Test (QT) (Ammons R. and Ammons C., 1962). This is a test of intelligence based on vocabulary definitions and is a shortened version of the Full Range Picture Vocabulary Test (Ammons R. & Ammons H., 1948). There are three forms of the Quick Test, each consisting of 50 words to be defined by pointing to one of four pictures on the presented plate. All three forms may be used together, making a 150 item test that can be administered in less than 10 minutes. This was the version used in this study. Test-retest reliability is high, ranging from .80 to .89 (Sattler, 1974). Mean is 100, S.D. is 15. The Quick Test has been used to assess a wide range of children and youths, including poor readers (Otto and McMenemy, 1965), children referred to a school psychologist (Joesting and Joesting, 1971), the tenth grade population of three midwestern high schools

(Mednick, 1967) pediatric out-patients (Pless, Snider, Eaton & Kearsley, 1965) and Grade Seven students (Burgess & Wright, 1962). Most relevant for the present study are the findings of an investigation made in this same school commission (Wright and Gallagher, 1978). This study compared the Wechsler Intelligence Scale for Children - Revised (WISC-R) and Quick Test scores of forty five students, aged 5 - 16, referred to the school psychologist. For the age five to eleven group, Quick Test scores correlated .57 with WISC-R Verbal, .73 with WISC-R Performance, and .69 with WISC-R Full Scale scores. For the eleven to sixteen year olds, these correlations were: WISC-R Verbal .93, WISC-R Performance .64 and WISC-R Full Scale .87.

The Quick Test was selected for use in this study because it had good reliability even when used by non-psychologists (Pless, et al, 1965) takes little time to give and seems the most valid and reliable estimate of intelligence available in such a format.

(2) Wechsler Intelligence Scale for Children - Revised (WISC-R) (Wechsler, 1971). Coding subtest; Mazes subtest; Two subtests from the Wechsler Intelligence Test For Children - Revised were also administered to all students on the sample before and after the training program. The WISC-R is a widely used individual intelligence test, standardized in over 2000 school aged children. The Coding subtest and the Mazes subtest, both subtests from the Performance, or non-verbal battery of the WISC-R, were selected for the present study because previous research has suggested that problem-solving instruction improved over-all non-verbal

WISC-R Performance (Wright et al, 1976; Meichenbaum & Goodman, 1971). The Coding subtest which requires a child to learn and then use a short series of symbols as a code, is thought to be a measure of vigilance. It tests the ability to remember and reproduce visual symbols. It is timed. It can also be considered a measure of "visual motor coordination, speed of mental operation and short term memory (Sattler, 1974). The Mazes sub-test, also a timed test, presents the child with a series of mazes of increasing difficulty to solve. It can be considered a measure of planning ability (Sattler, 1974) and requires rapid spatial judgements.

Although both of these sub-tests are relatively low level measures of over-all intelligence (Sattler, 1974), particularly in learning disabled or distractable children (Bannatyne, 1971; Lyle and Goyen, 1969) they have been included in this study because they are both measures of sustained on-task attention and planning which are traits known to deteriorate in failure-expectant children (Wright et al, 1976; Douglas and Peters, 1979; Diener & Dweck, 1978). In the present study it was hypothesized that these abilities would increase with training.

(3) Test Anxiety Scale For Children (TASC) (Sarason, Davidson, Lighthall, Waite & Ruebush, 1960). This is a 30 item yes or no questionnaire designed to measure trait anxiety. The questions are all related to test-like situations in school, following the Sarason paradigm that suggests that school tests represent the pivotal experience of anxiety for children. Test-retest reliability, from a sample of 320 students, is reported as .55 to

.78 (Sarson, et al, 1960). The Test Anxiety Scale for Children has been used as a measure of anxiety in studies of academic achievement (Phillips, Martin & Meyers, 1972; Ruebush, 1963), peer friendships (Phillips, Martin & Meyers, 1972), motivation to avoid failure (Atkinson & Feather, 1966) and learned helplessness in children (Dweck, 1975).

(4) Test Anxiety Scale Addenda (TASC-ADD). This was an extension of the Test Anxiety Scale for Children, developed for this study, and was administered immediately following the Test Anxiety Scale for Children for each student. It consists of seven probe questions, "What might you think or say to yourself?" to be asked after re-reading items #3,6,9,16,21,24 and 29 on the Test Anxiety Scale for Children. These are all TASC items dealing with the student's reactions when faced with a stressful school situation, e.g. "When the teacher asks you to get up in front of the class and read aloud, are you afraid you are going to make some bad mistakes?". Answers to these seven probe questions on the Test Anxiety Scale Addenda were scored for both quantity, the number of coping or task-directed self statements, and quality, a weighted score for positive task-related self directions, and positive coping or problem solving strategies ("I can do it") ("Concentrate" - "Don't let anyone distract you") minus negative self statements ("I can't do it") ("I'll get them all wrong; I'm gonna flunk!").

All protocols were scored blind by the investigator using the above scoring criteria (see Appendix). Eleven protocols, selected at random, were also scored by one of the research assistants using this scoring criteria sheet. Inter-rater reliability between the two scorers was .975 (see Appendix).

This measure was developed and included to assess any increase in the number and quality of problem-solving strategies with Coping Skills Training. The two scores obtained from this measure were TASC-Add I, the quality of coping sets and self-statements based on the scoring criteria, and TASC-Add II, the number of these coping sets and self-statements.

(5) Poor Self Evaluation Scale (Feld & Lewis, 1969). This is one of the four sub-scales identified in a factorial analysis of the Test Anxiety Scale for Children. It consists of six items related to self-rated comparison to peers. It was used in the present study as a measure of negative self-concept. Self-concept and anxiety are known to be correlated. Both preceeding studies in the present investigation of Grade Seven populations in this Commission (Stevens, 1979 ab) showed this correlation to be highly significant ($s = .001$). However the Poor Self Evaluation Scale is the only Test Anxiety Scale for Children sub-test which does not show a main effect for sex (all others show higher anxiety related scores for girls) and can thus, be considered to be the most orthogonal, (Feld & Lewis, 1969). Therefore, its cautionary use as a measure of negative self-concept in the present study seemed valid.

(6) "What Would You Probably Do" (WWYD). This is a measure of coping ability designed for this series of studies. In it, the student is asked to judge his own ability to cope with a series of stressful school situations. It consists of five described scenes, each with a choice of four or five behavioural responses. The student is asked to rate each described behavioural response as "like me" or "not like me". The first response to each scene is an adaptive coping response (i.e. task-related) and the last is a non-adaptive (i.e. off-task) response. All other described responses are filler items to reduce the likelihood of polar choices and are not scored. This measure yields two scores: What Would You Probably Do - Cope, the number of coping responses, and What Would You Probably Do - Non-Cope, the number of non-coping responses. A third composite coping score, SCOP was also computed for each student, by subtracting his non-coping from his coping responses.

(7) Teachers Check List (TCL) This is a teacher's version of What Would You Probably Do, also developed for this investigation. It assesses the teacher's estimate of each student's coping and non-coping responses. It follows the same format as What Would You Probably Do, except that there are one coping and two non-coping responses for each scene, as well as several filler themes. Teachers are asked to respond to each behavioural response as "likely" or "unlikely", for that student. It yields a score for the number of coping responses Teachers Check List - Cope, a score for the number of non-coping responses (divided by two to

make scores comparable to What Would You Probably Do, Teachers Check List - Non Cope, and a composite coping minus non-coping (TCOP).

(8) Effort or Ability Attribution Scale (EA) (Dweck, 1975)*.

This is a refinement of an earlier measure of attribution of control (Crandall, Katkovsky and Crandall, 1965) which was designed to measure how much the student considers his own performance to be the result of his own effort and, therefore, under his control, and how much he considers his own performance to depend on luck or ability and, thus, be uncontrollable. This test consists of five forced choice questions, all related to mathematics. It was designed for use in its author's study of the effect of re-attribution in "helpless" children. Two scores: attribution to effort and non-attribution to effort, were used in the present study to look for differences between the At-Risk and otherwise normal students, both prior to and subsequent to training. A previous study in this investigation (Stevens, 1979) showed differences in attribution of control between test-vulnerable At-Risk students and test-vulnerable students who were otherwise normal.

(9) Classroom Observations. Two five minute periods of classroom performance were sampled for each of the students both prior to and after training, by having trained classroom observers record on and off-task behaviour. These two observers were trained by the investigator until criteria of .98 interrater reliability was reached; reliability of observations between the two raters was

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.995 (see Procedure section). Any assignment-related activity: listening or responding to teacher, working on assignment, discussing assignments, was considered on-task. All other behaviour was considered off-task.

Observation sheets were prepared that noted "starting" time and "on-target" time. Five minute periods were controlled by use of a timed tape which signalled "5-4-3-2-1 Start", and five minutes later, "Stop". These timed signals were heard by the observer through earphones attached to the tape recorder she carried. The observer started a stop watch at the word, "Start", and stopped the watch whenever the student was off-task. When the "Stop" signal terminated the five minute period, the elapsed time on the stop watch was recorded as a measure of the student's on-target time during that period.

For each student in the sample, there were two five minute observation periods sampled in pre-testing, Obs. 1 & Obs. 11 and two more in post-testing Obs. III & Obs. IV. Difference in pre and post-training on-task behaviour was calculated by subtracting the combined post-testing scores (Obs. III + IV) from the combined pre-test scores (Obs. 1 + II).

(10) Grades. Two sets of grades were obtained for all students in the sample and used in this study as additional measures of the hypothesized effect of Coping Skills Training. Mid-term marks in language arts, (Jan E) mathematics (Jan. M) and overall mid-term grade average (Jan Tot), and end of year language arts (JE), mathematics, (JM), and overall average (J Tot).

In summary the measures of intellectual, academic and affective competence described, and used in this study, yielded the following scores for each of the students:

<u>MEASURE</u>	<u>MEASURE OF</u>
1. <u>Quick Test</u>	Intelligence
2. <u>Wechsler Intelligence Scale for Children - Revised - Coding subtest</u>	) Performance IQ) Planning Ability
3. <u>Wechsler Intelligence Scale for Children - Revised - Mazes subtest</u>	) Sustained On-Task Attention)
4. <u>Test Anxiety Scale for Children</u>	Anxiety
5. <u>Test Anxiety Scale - Addenda I</u>	Coping strategies as scored)
6. <u>Test Anxiety Scale - Addenda II</u>	Number of coping self instructions) Problem Solving Strategies
7. <u>Poor Self Concept</u>	Negative self evaluation
8. <u>"What Would You Probably Do" - Cope</u>	Coping responses) Self
9. <u>"What Would You Probably Do" - Non Cope</u>	Non-Coping responses) Evaluation
10. <u>Self-Cope (SCOP)</u>	WWYD Cope minus Non-Cope
11. <u>Teachers Check List -Cope</u>	Coping responses)
12. <u>Teachers Check List-Non Cope</u>	Non-Coping responses) Teachers Evaluations
13. <u>Teacher's Evaluation (TCOP)</u>	TCL Cope minus Non-Cope)
14. <u>Effort versus Ability Scale</u>	Attribution of control over own performance

<u>MEASURE</u>	<u>MEASURE OF</u>
15. Observation I)	pre-training classroom observations; on-task behaviour
16. Observation II)	
17. Observation III)	post-training classroom observations; on-task behaviour
18. Observation IV)	
19. January Language Arts (Jan E))	Mid-term Grades
20. January Mathematics (Jan. M))	
21. January Totals (Jan. tot))	
22. June Language Arts (JE))	Final Grades
23. June Mathematics (JM))	
24. June Totals (J Tot))	

Post Training Evaluation

A series of questions was designed to measure how much the students who had been given Coping Skills Training were using that training and finding it useful. These were answered by the students during the Booster Meeting held eighteen weeks after the program terminated.

First, all twenty two students (one dropped from sample for absence, (see Results) one moved) were asked to answer the question: "What was the thing you found the most fun this year in school?" The answers to this question were collected, to ensure that subsequent questions and answers would not alter responses to earlier ones, and the students were then asked: "What has been the thing you have found most useful?". A third question - "Are tests and exams harder or easier for you than when you started last fall?" was then answered, and answers collected.

After collecting answers to these three questions, the students were each asked to complete a seventeen item questionnaire by circling "yes" or "no" in answer to questions about the Coping Skills Training Program they had been given four and a half months before: could they describe it?; had it been useful during exams?; at other times in school?; should it be offered to other students? Comments were also invited. (Verbatim answers appear in Appendix). Although it would have been useful to make a more objective assessment of the students' use of the coping skills they had been taught, clinical considerations dictated otherwise. The brief

booster meetings were designed to ensure the maximal use of these skills in the forthcoming June exams (as reflected in the June grades) so it was not appropriate to include objective testing.

The responses to these questions served as a measure of the impact and usefulness of the training program.

PROCEDURE

Selecting At-Risk Students

As previously described, the At-Risk sub-group of this test-vulnerable sample had been identified in a screening conducted throughout the Grade Six classes in this school commission. The following procedure was used to make this identification.

About six weeks prior to the end of the school year in May, 1977, the thirty three Grade Six teachers in the Baldwin-Cartier School Commission, located in the Western end of Montreal Island, were asked to select those students they considered to be At-Risk for failure to cope well with Grade Seven for academic, cognitive, social or emotional reasons. This school commission serves approximately 5,000 elementary and high school students from a relatively homogeneous middle-class community (Stevens, 1966). Most of these teachers had taken part in two previous surveys of Grade Six students held in May 1975 and May 1976.

Grade Six is the final year of elementary school in this school system. In Grade Seven, most of the approximately 850 Grade Six students proceed to the larger high school with a population of close to 1,500 students, (about 250 of these, half in grade seven and half in grade eight are housed in an annex). However, about 120 of the Grade Six students, those living in the area of the smaller high school with approximately 500 students, enroll in this smaller school. Both schools follow the same basic curriculum for Grade Seven. A core of essential subjects: Language Arts, mathematics and geography, are taught by the same teacher to the same group of students in order to minimize the adjustment

problems of constantly changing teachers and lack of integrated assignments often associated with the first year in high school. Remedial catch-up classes in mathematics and language arts are provided for students with below level skills, and individual help is provided for students with more pervasive learning problems by trained special education teachers.

These grade six teachers had demonstrated their ability to make valid and reliable judgements about which of their students were at-risk for further failure in the two previous surveys when the students they so identified were found to be significantly less competent and confident and more vulnerable to stress than their normal classmates (Stevens, 1979ab).

Again, for the present study as in the previous two surveys, these teachers were asked to complete the Grade Six Screening Form for each pupil referred (see Measures). Ninety six Grade Six students were judged by their teachers to be At-Risk. On the Grade Six Screening Form, these students were rated as "No" on the first question, and as 5 or 6 on the 1 - 6 scale. For grade seven, these students were distributed as shown in Table II.

TABLE IIDistribution of At-Risk Grade Seven Students

	<u>Larger High School</u>		<u>Smaller High School</u>	<u>Totals</u>
	<u>Main Bldg.</u>	<u>Annex</u>		
<u>Total Number of Grade Sevens:</u>	607	125	117	849
<u>At-Risk Grade Sevens</u>	55	22	19	96

Test-Vulnerable Students

The test-vulnerable members of this Grade Seven population were identified using the following procedure:

In October 1977, about four months after the Grade Six Screening, and six weeks after these students had entered Grade Seven in their respective high schools, all Grade Seven students in both high schools (except those in the annex of the larger high school, $N = 125$) were given two equivalent forms of a mathematical test three days apart by their own core teachers within their own classrooms. Many of these Grade Seven teachers had participated in a similar investigation the preceding year, and all agreed to participate and to follow the protocols developed for the presentation of these two tests (see Appendix).

These two mathematics tests had been developed for these investigations, and their equivalence was confirmed in the preceding study (Stevens, 1979) (see Measures).

The procedure developed in that study was repeated for the present study of test-stress. The first mathematical test, labelled "Math Review" was given under unstressed conditions. Specific instructions were: "We've been asked to try these math problems, I don't know much about this..." The second, given three days later, was labelled "Mathematics Test" and given under conditions as closely as possible paralleling normal classroom test conditions: ("Pay attention... no questions, record your time," etc; see Appendix for exact protocols). The procedure established in the previous study (Stevens, 1979) was followed as closely as possible to ensure that a similar test-vulnerable

population was being obtained. All students whose score on the second test was ten percent or more lower than their score on the first, unstressed test, were considered to be vulnerable to test-stress.

It was expected that approximately thirty percent of the students tested would show depressed performance on tests, since that had been the incidence the previous year (Stevens, 1979). The number of such students in each school in this study are shown in Table III: The twenty-one test-vulnerable students who had also been rated as At-Risk made up one portion of this sample and a second group of twenty-eight test-vulnerable students drawn from the 180 who were otherwise normal, made up the second portion.

TABLE III

Distribution of Test-Vulnerable Grade Seven Students

	<u>Larger High School</u>	<u>Smaller High School</u>	<u>Totals</u>
<u>Total Number of Grade Sevens:</u>	607	117	724
<u>Test-Vulnerable Grade Sevens:</u>	170	31	201
(At-Risk)	(14)	(7)	(21)
(Otherwise Normal)	(156)	(24)	(180)
<u>Percent of Total</u>	28%	27%	

Pre-Testing

After the mathematics tests were completed and the experimental and control students selected, each of the forty-nine students in the sample was assessed individually to establish pre-training levels of intelligence, anxiety, coping ability, problem-solving strategies and attribution to effort. Four research assistants, trained in the use of these measures by the investigator, worked in both of the schools simultaneously so that all pre-testing could be completed in as brief a time as possible. These assistants were aware they were participating in an investigation of how "Grade Seven students learn in school" but were unaware either of the hypotheses being tested nor of which students were At-Risk or Not-At-Risk. All measures were read to the students by the testors to eliminate differences in reading ability. All pre-testing was completed in one week.

Classroom observations of on-target behaviour were obtained by two classroom observers trained by the investigator until interrater reliability between the investigator and each of the observers reached .98. Interrater reliability between the two investigators was .995 (see Appendix).

All classroom observations were made during core classroom periods. The teachers, having previously been briefed and agreed to the procedure, were shown the names of the students to be observed by the observer as she entered the class. The teacher noted the child's seat and row on the sheet for the observer, then proceeded with the normal classroom activity. Observers

sat in a chair at the side of the classroom near the front. Two five minute samples were usually taken during the same period, but not immediately following each other. Observers always waited for an initial period before beginning to record behaviour samples so the student could adapt, somewhat, to this interesting alien presence. Usually, as the teachers continued their lessons, the students soon lost interest in the observer.

The Teachers' Check List (see Measures) was completed by the core teacher for each student in the sample to complete the pre-testing.

Coping Skills Training

As soon as the pre-testing was completed, a two week, ten session, coping skills training program was initiated for the experimental test-vulnerable students. Students were seen daily, in groups of two, for one forty-five minute period. Each pair to be trained consisted of one At-Risk student and one otherwise normal student. Training was carried out by two teaching assistants, one had had previous teaching experience and the other had extensive experience with nursery school children and programs.

Two coping skills programs were designed for this study by the investigator who met with the teaching assistants for several weeks prior to beginning the training session as well as regularly during the two weeks of training to familiarize them with the coping skills programs. The assistants were aware they were teaching students to cope better with their own reactions to stress in school, but were unaware of which students were At-Risk and which were not, nor of their students' previous performance on the pre-training measures. They were also unaware of the hypotheses being tested.

To encourage regular attendance and maximum participation and carry-over, a certificate, modeled on the merit certificate awarded by this high school, was designed for this study (See Appendix). It was shown to each student at the initial meeting and displayed throughout the session. Each student was promised that he or she would receive this certificate upon completion of the Coping Skill Training Course, and each was presented with one at the final meeting.

The two coping skills programs were similar in many aspects. Both included discussion and analysis of stress-invoking situations in school and their performance - debilitating sequelae. In both programs, the role of self-control of behaviour was high-lighted. Both programs included practice in noticing problems and generating better problem-solving strategies, and overt and covert rehearsal of these strategies. Students practiced taking exams, real and imagined ("close your eyes - your French teacher is passing out a surprise exam..."), noticing self-reactions ("How do you feel... up tight? like laughing?... Is it fair?....unfair?) and monitoring for, and "turning off", distractors. Both programs included daily homework to extend practice.

The principal difference between the two programs was that one, the Structured Program was highly structured and included a study of the role of facilitating and negative self-statements (or "uppers" and "downers") and instruction and practice in generating and using facilitating self-instruction with a six step problem solving sequence. It also included instruction and guided practice in progressive relaxation, using a modified Jacobsonian model (Jacobson, 1938). The other program, the Cognitive Program, was aimed at encouraging students to generate their own cognitive coping strategies, ("How could you get the teacher on your side?... better marks on exams?").

The time allotted in the Structured Coping program for rehearsal of the self-instructional sequence was used instead in the Cognitive Coping program for discussing and generating common problems, (i.e. teachers who yell, act mean, boring classes)

common solutions, and in ordering goals. Both groups used the same materials. Both practiced using school exams, solving mazes, working on school-type work sheets while they rehearsed their coping strategies. In teaching both the Cognitive and Structured programs, the teaching assistants followed daily protocols to ensure uniformity (see Appendix).

Each pair of test-vulnerable students to be trained was assigned, at random, to either the Cognitive or the Structured coping skills program. Each teaching assistant taught both programs in alternate periods to ensure that program differences would be unaffected by differences in teachers. Immediately after each teaching session, each teacher filled out a "Daily Report" checklist. This consisted of a list of program components ("role playing", "self instruction") and served to remind the teachers of the different components in each program, as well as serving as a record that the components included in each program were covered.

Teachers were aware they were teaching one "Structured" and one "Unstructured" program, but given no further explanation (see Rationale - Appendix). The daily schedule for each teacher is shown in Table IV.

Since there were only six periods available in the school day in which these training sessions could be offered, it was necessary to eliminate two pairs of test-vulnerable students from the experimental sample of fourteen pairs. This was accomplished by removing two pairs at random from the sample. This left a sample of twenty-four students: twelve At-Risk, and twelve otherwise normal. Half of each sample were girls, half boys. All training

sessions were conducted in the same two classrooms daily for two weeks, students being excused from their regular program to attend. One of the boys ("Normal", Cognitive treatment group) missed most of the sessions due to a family emergency - and had to be removed from the sample in analyzing the results.

TABLE IV
Training Programs: Daily Schedule

<u>Period</u>	<u>Teacher I</u>	<u>Program</u>	<u>Teacher II</u>	<u>Program</u>
1	20* ‡	Structured	20 ‡	Cognitive
2	20 ‡	Cognitive	20 ‡	Structured
3	20 ‡	Structured	20 ‡	Cognitive
4	20 [↑]	Cognitive	20 [↑]	Structured
5	20 [↑]	Structured	20 [↑]	Cognitive
6	20 [↑]	Cognitive	20 [↑]	Structured

* { 1 At-Risk
1 Otherwise Normal

Post-Testing

One week after the termination of the two week training program, all 849 Grade Seven students in both the experimental high school and the control high school were given the third math test, Math III. This test, like the second test, was given under test-like conditions by each core teacher to his or her own core class. The following week, the research assistants re-tested each of the remaining twenty-three experimental students and the seventeen control students, individually, using the same measures of intelligence, coping ability, problem solving strategies, and attribution used in the pre-training assessment. Classroom observation of on-task behaviour were again obtained for each pupil in the sample, and core teachers again completed a Teachers Check List to rate the coping ability of each student.

De-Briefing

The post-testing finished three days before Christmas holidays were to begin. In those three days, the investigator visited the Grade Seven core classrooms and explained this study to the students. Many asked questions about "students who do poorly on tests" and other spontaneously contributed anecdotes about their own experiences.

During the debriefing visits in the experimental high school, those students who had participated in the Coping Skills Programs were asked if they wished to describe the program and their

reactions to it, and several lucid accounts of the nature of stress and strategies for coping were reassuring feedback on the programs. All the Grade Seven students were thanked for their participation, assured that none of the three Math Tests would "count", and given a roll of Life Savers as a token of appreciation.

Booster Meeting

Five months after the Coping Skills Training had been given, the teaching assistants met again with the students in the experimental sample whom they had trained. Students were seen as a group by their own teacher, the six Cognitive Coping trainees during one period, and the Structured Coping Group during another.

All students attended except one child who had moved. The students were first asked to complete a questionnaire designed for this follow-up meeting, which asked them to describe "what had been most fun and most useful in school this year" and then asked specific questions about their use of the coping techniques they were taught and developed in the training programs (see Measures). The groups discussed their experiences during the preceeding months, and then played a quiz game designed to review and rehearse program components.

This follow-up meeting was held for two reasons. First, it was designed to serve as a "booster" session to remind the students of the coping skills program, and to encourage the use of these stress-reduction skills in their forthcoming June examinations. It was hypothesized that this would serve to increase the probability that these skills would be used during the examinations and that this use would be reflected in one set of dependent measures, June grades. Secondly, during this meeting, each student answered these questions and completed an additional questionnaire (see Measures) which served to assess their recall, use, and rating of the treatment programs.

SUMMARY

To recapitulate, this study of the effect of stress-reduction training on the school performance of stress-vulnerable seventh graders was conducted using two groups of test-vulnerable students, an At-Risk group and an Otherwise Normal group. Each of these groups was divided into an experimental and a control group.

The students in the experimental group each received two weeks (ten sessions) of daily Coping-Skill training. Half of the trained students, both At-Risk and Otherwise Normal, were given a Structured program which included specific 'coping' strategies and a structured problem solving sequence, and half received a program which encouraged self-generation of coping strategies, the Cognitive program.

The resultant design, upon which analysis of the data from the dependent measures was conducted, was a 2 x 3 factorial design as shown on Table V.

TABLE V

Design for Analyses of Results

	At-Risk Students	Otherwise Normal Students	Totals
Structured C.S.T. Program	6	6	12
Cognitive C.S.T Program	6	5	11**
Untreated Controls	7	10	17
Totals	19	21	40*

* original sample (N=49) minus three experimental spares, two experimental pairs removed, plus one drop out** (see Procedure)

RESULTS

To simplify the presentation of this data, analyses will be presented in three parts. First, each group's performance on the three mathematics tests, Math I, Math II, and Math III, will be analyzed to assess the effect of training on subsequent performance under stress. Then the effect of training on cognitive, academic and affective competence will be analyzed by comparing pre- and post-training performance on the measures of competence. Finally, the post-treatment use and effect of coping skill training will be assessed by analyzing the data collected from the follow-up questionnaires.

Performance Under Stress

All of these students, both At-Risk and normal, had been selected for study because their mathematics performance was debilitated at least ten percent under test-like conditions. To assess whether or not Coping Skills training had been effective in reducing this test-vulnerability, the scores of all of the students in the sample on all three mathematics tests: Math I and Math II given before training and Math III given subsequent to training (as well as scores on the test-related measures, pre and post-predictions and pre-training ratings) were analyzed by means of analysis of variance, using the BMD 2PV program for repeated measures.

Main Effect for Treatment, Group and Time

Results were first analyzed for significant main effects and these appear in Tables VI, VII, VIII and IX. As can be noted in Table VI, before treatment the mathematics performance of these test-vulnerable students was actually decreased about twenty percent when they thought they were taking a test (Pre-training Stress Depressed Performance: -19.04, -20., - 19.04)

Treatment

No difference between treatments across both the At-Risk and otherwise normal groups had been hypothesized, and none appears (Table VI). When scores between pre-training and post-training stressed performance (Math III minus Math II) are compared, there is a trend towards improved resistance to stress with training: 12.96% and 17.14% for the experimentals, compared to 9.9% for the controls, but this difference is not significant. Although control and experimental means are very similar, the variance on all three tests is relatively large, as is the range of scores (Table VII). Therefore, these results can only be considered as interesting trends of possible treatment-related differences.

As can be noted in Table VI, the only significant main effect for treatment on these measures is the higher pre-treatment predictions made by the controls prior to the unstressed test, Math I $F(1,38) = 8.73$; ($s = .005$).

TABLE VI

PERFORMANCE UNDER STRESS: MAIN EFFECT FOR TREATMENT ONLY

Analysis of Variance: Results for the three treatments (Structured, Cognitive, and Control) for the total sample (At-Risk and Otherwise Normal students combined) on the pre- and post-treatment mathematics tests, and related measures. (n = 40; reported as means)

	Structured Program	Cognitive Program	Con- trols	F (2,38)	s
Math I (unstressed condition)	20.82	22.08	22.34	1.35	ns
Math II(pre-training stressed condition)	16.82	17.5	17.88	.65	ns
Math III(post-training stressed condition)	19.00	20.5	19.65	.55	ns
Pre-Training Stress-Depressed Performance: (<u>Math II - Math I</u>) Math I	-19.04	-20.00	-19.04	.12	ns
Post-Training Stress-Depressed - Performance: (<u>Math III - Math I</u>) Math I	8.74	- 7.16	-12.08	.90	ns
Increased Resistance to Stress: (<u>Math III minus Math II</u>) Math II	12.96	17.14	9.9	.34	ns
Pre-Predictions: Math I	29.0	30.6	34.68	8.73	.005
Math II	29.5	28.2	30.66	.36	ns
Math III	28.27	29.17	30.53	.88	ns
Post-Predictions: Math I	27.7	27.5	29.19	.72	ns
Math II	27.0	27.0	27.81	.60	ns
Math III	26.3	25.0	25.4	.59	ns
Pre-Treatment Ratings (after Math II)*:					
"Worse"	1.60	1.66	1.76	.51	ns
"Harder"	1.60	1.50	1.76	1.12	ns
Effort Attribution	.70	.92	1.00	.43	ns
Non-effort Attribution	1.60	1.75	1.65	.14	ns
Value of attainment	1.20	1.34	1.24	.28	ns

* yes = 1; no = 2

TABLE VII

Standard deviations and minimum to maximum ranges for Math I, Math II, Math III, for total sample (N = 40) by treatment group.

	<u>Structured</u>	<u>Cognitive</u>	<u>Control</u>
Math I:			
S.D.:	2.56	3.90	4.84
min. to max:	17 to 25	16 to 30	11 to 29
Math II:			
S.D.	2.82	3.45	4.45
min. to max:	12 to 21	14 to 25	6 to 24
Math III:			
S.D.:	3.52	4.06	4.20
min. to max:	14 to 26	15 to 27	13 to 28

Group

Table VIII shows the differences between the At-Risk and Otherwise Normal groups. In both previous studies of this population (Stevens, 1979 ab) significant differences in mathematics ability were found between At-Risk and normal students, and this difference also emerges in the present study. There is a main effect for group on each of the three mathematics tests, Math I, Math II and Math III $F(1,39) = 4.33$ to 9.45 ; ($s = .01$ to $.004$). The two groups did not differ, however, in their own predictions of achievement, which, as in the previous studies, were lower for both groups for the stressed condition. Nor did they differ on the measures of attribution and value of attainment, although the At-Risk group showed the same trend towards heightened attribution to effort previously displayed by At-Risk test-vulnerable students (Stevens, 1979b).

Time

Table IX shows time-related differences on these measures. Further confirmation of the difference in mathematics performance of these test-vulnerable students under varying conditions of stress and treatment are these highly significant differences over time. Scores among the three equivalent mathematics tests differ at the .00001 level ($F(2,68) = 43.58$). The prediction around those tests differ at the .0004 level ($F(1,26) = 16.5$). When all pre-predictions and all post-predictions are compared, these differences are also highly significant $F(2,52) = 6.6$; ($s = .003$).

TABLE VIII

PERFORMANCE UNDER STRESS: MAIN EFFECT FOR GROUP ONLY

Analysis of variance: Results for the two groups, At-Risk and Otherwise Normal (three treatments combined) on the pre- and post-treatment mathematics tests and related measures.
(n = 40, reported as means)

	At-Risk	Otherwise Normal	F (1,39)	s
Math I (unstressed condition)	19.68	23.19	9.45	.004
Math II (pre-training stressed condition)	15.68	18.52	6.8	.01
Math III (post-training, stressed condition)	18.44	20.95	4.33	.05
Pre-Training Stress-Depressed Performance: $\frac{\text{Math II} - \text{Math I}}{\text{Math I}}$	-20.78	-20.09	.07	ns
Post-Training Stress-Depressed Performance: $\frac{\text{Math III} - \text{Math I}}{\text{Math I}}$	- 9.64	- 9.25	.07	ns
Increased Resistance to Stress: $\frac{(\text{Math III} \text{ minus } \text{Math II})}{\text{Math I}}$	4.95	14.26	.01	ns
Pre-Predictions: Math I	31.33	32.24	.25	ns
Math II	29.17	29.48	.02	ns
Math III	29.53	29.38	.01	ns
Post-Predictions: Math I	27.29	29.65	1.79	ns
Math II	25.33	26.74	.51	ns
Math III	23.63	27.05	2.07	ns
Pre-Treatment Ratings (after Math II)*:				
"Worse"	1.72	1.66	.23	ns
"Harder"	1.63	1.71	.93	ns
Effort Attribution	1.0	.81	.56	ns
Non-effort Attribution	1.56	1.77	.79	ns
Value of Attainment	1.23	1.29	.21	ns

* yes = 1; no = 2

TABLE IXPerformance Under Stress: MAIN EFFECT FOR TIME ONLY

Analysis of variance: Differences over time between scores on Math I, Math II and Math III, and their related pre-test and post-test predictions, for both groups in the three treatment conditions (reported as mean squares; $n = 40^*$)

	<u>ss</u>	<u>df</u>	<u>ms</u>	<u>F</u>	<u>S</u>
Mathematics Tests (Math I, Math II Math III)	339.97	2,70	169.99	43.58	.00001
Predictions (Math I, Math II Math III)	452.61	1,26	452.61	16.5	.0004
Pre-predictions/ Post-predictions	207.57	2,52	103.78	6.6	.003

* $n = 32$ cases only for Predictions

Interactive Effects

No significant interactive effects emerge from these multifactorial analyses.

Performance Under Stress: At-Risk Students

The principal focus of this study was the performance of the test-vulnerable At-Risk students. The major hypotheses and questions concern this group. One major question addressed in this study was how the At-Risk students' responses to Coping Skill training would differ from those of test-vulnerable students who were otherwise normal. Another question concerned the efficacy of using self-instruction as a coping technique for At-Risk students. Therefore, the data was next analyzed for the At-Risk group and the Otherwise Normal group separately, using the Analysis of Variance SPSS program, Version G, one-way procedure. The results of these analyses appear in Tables X, XI and XII.

Contrary to the hypothesized results, neither treatment significantly increased test performance under stressed conditions for the At-Risk group (Table X). However, the trend towards improved performance under stress after treatment, previously noted for the total experimental sample (Table VI) is even more marked in this At-Risk group. This group improved 19.59% after the Cognitive treatment and 15.5% after the Structured treatment, as compared to a 7.57% improvement for the untreated controls. Here again, means are relatively similar, but there is a wide range of scores, as displayed in Table XI.

TABLE X

PERFORMANCE UNDER STRESS: AT-RISK GROUP ONLY

Analysis of Variance: Results by treatment (Structured, Cognitive, Control): reported as means. (n = 19)

	Struc- tured (n=6)	Cogni- tive (n=6)	Con- trol (n=7)	F (2,17)	S
Math I (unstressed condition)	20.17	20.83	20.14	.79	ns
Math II (pre-training stressed condition)	16.33	16.33	16.29	.41	ns
Math III (post-training, stressed condition)	18.50	19.5	17.29	1.85	ns
Pre-Training Stress-Depressed Performance: <u>Math II - Math I</u> Math I	-19.2	-21.07	-19.00	.48	ns
Post-Training Stress-Depressed Performance: <u>Math III - Math I</u> Math I	- 8.02	- 6.61	-13.62	.53	ns
Increased Resistance to Stress: <u>Math III minus Math II</u> Math II	15.51	19.59	7.57	1.08	ns
Pre-Predictions: Math I	28.67	32.3	33.0	1.41	ns
Math II	29.00	26.8	31.67	1.36	ns
Math III	29.67	30.83	27.80	.59	ns
Post-Predictions: Math I	27.83	27.00	27.0	.09	ns
Math II	27.80	28.16	21.2	2.34	.13
Math III	27.20	29.1	19.4	.99	ns
Pre-Treatment Ratings (after Math II)*:					
"Worse"	1.6	2.80	1.57	1.79	ns
"Harder"	1.6	1.67	1.43	.35	ns
Effort Attribution	.8	1.0	1.42	.22	ns
Non-Effort Attribution	1.6	1.67	1.43	.23	ns
Value of Attainment	1.0	1.33	1.29	.95	ns

* yes = 1; no = 2

TABLE XI

Standard deviations and ranges from minimum to maximum scores on the three mathematics tests by group (At-Risk and Otherwise Normal)

(n = 40)

	<u>At-Risk</u> (n = 19)	<u>Otherwise Normal</u> (n = 21)
Math I:		
S.D.	2.47	3.18
Min. to Max:	16 to 25	19 to 30
Math II:		
S.D.	2.35	2.15
Min. to Max:	12 to 21	15 to 25
Math III:		
S.D.	3.24	3.46
Min. to Max:	14 to 26	17 to 28

TABLE XII

PERFORMANCE UNDER STRESS: OTHERWISE NORMAL GROUP ONLY

Analysis of Variance: Results by treatment (Structured, Cognitive and Control) reported as means (n = 21)

	<u>Struc-</u> <u>tured</u>	<u>Cogni-</u> <u>tive</u>	<u>Con -</u> <u>trol</u>	<u>F</u> <u>(2,19)</u>	<u>s</u>
Math I (unstressed condition)	21.6	23.33	23.9	.69	ns
Math II (pre-training stressed condition)	17.4	18.66	19.0	.43	ns
Math III (post-training, stressed condition)	19.6	21.50	21.3	.44	ns
Pre-Training Stress-Depressed Performance: <u>Math II - Math I</u> Math I	-19.58	-20.3	-20.23	.04	ns
Post-Training Stress-Depressed Performance: <u>Math III - Math I</u> Math I	- 9.43	- 6.72	-10.21	.26	ns
Increased Resistance to Stress: <u>Math III minus Math II</u> Math II	13.48	16.98	13.02	.19	ns
Pre-Predictions: Math I	29.4	28.83	35.7	4.01	.04
Math II	30.2	29.50	29.1	.05	ns
Math III	26.6	27.50	31.9	1.45	ns
Post-Predictions: Math I	27.6	27.83	30.5	1.13	ns
Math II	26.2	25.60	27.67	.31	ns
Math III	25.4	26.0	28.22	.63	ns
Pre-Treatment Ratings (after Math II)*					
"Worse"	1.6	1.33	1.9	3.23	.06
"Harder"	1.6	1.33	2.0	6.23	.008
Effort Attribution	.6	.83	.9	.21	ns
Non-Effort Attribution	1.6	1.83	1.8	.14	ns
Value of Attainment	1.4	1.33	1.2	.33	ns

* yes = 1; no = 2

Within the normal sub-group, the same trend toward improved stress-reduction with training appears, but it is not as marked (Table XII). After training these students improve 13.48% and 16.98% over pre-training test performance, as compared to a little over 13% improvement for their untreated controls.

Within this sub-group, controls showed less of a significant shift in judgement under stress than both experimental groups. They answered "no" significantly more when asked if they felt the second stressed math test was "harder" or "worse" $F(1,20) = 3.23$ and 6.23 ; ($s = .06$ and $.008$). No other significant differences emerged between treatments in this sub-group.

It is important to note that each of these test-vulnerable groups of students continues to be vulnerable to test-stress despite the ameliorating effects of both time and treatment. Their performance on a math test given under relaxed conditions (Math I) remains better than their performance one month later (Math III) on an equivalent test given under test-like conditions. This is confirmation of the pervasive effect of their vulnerability. Both time and treatment appear to reduce this effect, and treatment appears to further add to this reduction.

This data also fails to confirm the facilitating effect of a structured Coping Skill program which includes specific strategies such as self-instruction. The students in the Cognitive training program which did not include specific strategies, but encouraged self-generated coping strategies, showed the most improvement on these measures in both the At-Risk and Otherwise Normal sub-group.

Measures of Competence

The second set of analysis were made on the data collected from the pre-treatment and post-treatment measures of intellectual, cognitive and affective competence. Before analyzing this data for treatment-related effects, it was first necessary to ensure that no systematic pre-treatment difference existed between the experimental and control groups by comparing scores on the pre-treatment measures. An analysis of variance using the SPSS program, version G, was performed on this data. Results of these analyses appear in Table XIII.

As can be noted, there is no significant difference between the groups in intelligence (QT), age, anxiety (Test Anxiety Scale for Children) and self-evaluated coping ability (What Would You Do?). Controls score higher on one pre-treatment assessment of cognitive performance, the Wechsler Intelligence Test for Children mazes sub-test, but this difference is only marginally significant $F(1,39) = 3.45$; ($s = .07$). The controls were also evaluated by their teachers in the pre-testing as better copers; they were rated significantly lower in non-coping responses (Teacher Check List - non-cope) $F(1,39) = 6.36$; ($s = .02$), and they were significantly higher in coping responses (Teachers Check List - cope) $F(1,39) = 13.10$; ($s = .0009$). On the composite measure of teacher-rated coping minus non-coping responses (TCOP) the controls also were rated significantly higher $F(2,38) = 11.66$; ($s = .002$).

On none of the pre-treatment measures does the experimental group demonstrate higher competency. Therefore, any post-

treatment increase in competence for the experimental group can more confidently be attributed to the effect of the treatment.

Main Effects: Treatment, Group, Time

After determining that pre-training levels of competence were equivalent, the data on these measures was then analyzed for significant main effects, using the BMD 2PV program for repeated measures. The results of these analyses appear in Table XIV.

Treatment

When the pre-and post-treatment scores on each measure are compared, the three treatment groups differ significantly in the number of coping strategies they generated $F(2,34) = 3.72; (s=.03)$ and in their teacher-rated ability to cope $F(2,34) = 7.68; (s=.002)$. They also differ in their performance on the WISC-mazes subtest, $F(2,34) = 3.48; (s = .04)$, and on the WISC-coding sub-test, $F(2,34)=2.26; (s = .12)$, although this difference is only marginal. Corresponding pre- and post-treatment means for each of the treatment groups on these measures appear in Table XV.

Training appears to increase the number of coping strategies these students generate. Both treated groups show gains on this measure, (Table X) the Structured group showing the most increase while control scores drop in post-testing. Both trained groups also show larger gains in WISC-coding performance, with the Structured group again showing the greater improvement.

As in the pre-training assessment (Table X), teachers continue to rate the controls as better copers in post-testing. Whether this is reflective of heightened competence in the controls, or difference in stress and evaluation between the large and smaller schools remains in question. The Structured group appears to

contain less able copers both before and after treatment, although this group makes the largest gain between assessments.

TABLE XIII

PRE-TREATMENT COMPETENCE: TOTAL SAMPLE

Analysis of Variance: Results of the experimental and control groups on all pre-treatment measures of competence, reported as means (n = 40)

<u>Variable</u>	<u>Measure</u>	Experi mentals (n = 23)	Controls (n = 17)	F (1,39)	<u>S</u>
<u>Intelligence</u>	Q.T.	101.4	96.4	1.7	NS
<u>Cognitive Ability:</u>	WISC-R mazes	16.17	18.4	3.45	.07
	WISC-R coding	57.3	54.1	.87	NS
<u>Anxiety</u>	TASC	15.5	12.9	1.7	NS
<u>Coping Strategies</u>					
Quality	TASC-Addenda I	- 3.05	- .19	1.73	NS
Number	TASC-Addenda II	11.52	10.82	.50	NS
<u>Negative Self Concept:</u>	S.C. scale	2.22	2.17	.008	NS
<u>Coping Ability-Self Rated:</u>					
Coping Responses	WWYD - Cope	4.6	4.20	1.9	NS
Non-Coping Res.	WWYD -Non Cope	1.0	.94	.4	NS
<u>Teacher-Rated Coping:</u>					
Coping Responses	TCL Cope	3.04	4.42	13.10	.0009
Non-Coping Res.	TCL Non-Cope	2.04	.71	6.36	.02
Composite	TCOP	1.00	3.71	11.66	.002
<u>Attribution of Control:</u>	EA	4.3	4.6	.06	NS
<u>Classroom On-Task Attention:</u>					
	OBs 1	408.3	357.9	1.84	NS'
	OBs 2	397.9	367.1	.89	NS

TABLE XIV

MEASURES OF COMPETENCE: MAIN EFFECT FOR TREATMENT, GROUP, TIME

Analyses of Variance: Pre/Post Treatment scores, reported as mean squares. (n = 40)

Variable	Treatment (df = 2,34)			Group (df=1,34)			Time (df=1,34)		
	ms	F	S	ms	F	S	ms	F	S
<u>Cognitive Ability:</u>									
WISC - mazes	45.5	3.48	.04						NS
WISC - coding	302.75	2.26	.12	1188.59	6.63	.02			NS
<u>Anxiety</u>			NS			NS	109.53	21.62	.0001
<u>Coping Strategies:</u>									
Quality			NS			NS	834.6	19.15	.0001
Number	49.09	3.72	.03	39.13	3.30	.08	21.02	2.2	.15
<u>Negative Self-Concept:</u>			NS	37.12	12.28	.001	2.38	5.65	.02
<u>Coping Ability - Self Rated:</u>									
Coping Responses) **			NS			NS			NS
Non-Coping Responses)									
Coping minus Non-Coping			NS	2.58	4.16	.05			NS
SCOP									
<u>Teacher-Rated Coping Ability:</u>									
Coping Responses) **			NS	4.33	2.84	.10			NS
Non-Coping Responses)									
Coping minus Non-Coping									
TCOP	21.70	7.68	.002	59.04	20.88	.0001			NS
<u>Attribution of Control:</u>			NS			NS	1.88	3.45	.07
<u>Classroom Observations:</u>			NS			NS	16927.18	3.12*	.03

* df = 3,90

** reported in combination by this analyses, BMD program 2PV, repeated measures

TABLE XV

Pre and Post treatment means for measures of competence on which there is a significant effect for Treatment. (n = 40)

<u>Variable</u>	<u>Structured</u>	<u>Cognitive</u>	<u>Control</u>
<u>Number of Coping Strategies</u>			
Pre -	11.64	11.41	10.82
Post	14.27	12.50	10.12
<u>Teacher-Rated Coping Ability</u>			
Pre -	0.18	1.75	3.73
Post	0.91	2.42	3.76
<u>WISC - Coding Subtest</u>			
Pre -	58.91	55.92	53.41
Post	68.36	64.50	60.24

Group

Several measures showed a main effect for group (Table XIV). The At-Risk and the otherwise normal students differed significantly on negative self-concept $F(1,34) = 12.28; (s = .001)$, self-rated coping ability $F(1,34) = 4.16; (s = .05)$ teacher-rated coping ability $F(1,34) = 20.88; (s = .0001)$ and WISC coding scores $F(1,34) = 6.63; (s = .02)$. Marginally significant differences also emerge between the groups in the number of coping strategies $F(1,34) = 3.3; (s = .08)$ and non-coping responses $F(1,34) = 2.84; (s = .10)$. The difference in their teachers' ratings of coping ability is highly significant $F(1,34) = 20.88; (s = .0001)$. The relevant means for these significant group differences appear in Table XVI. As can be noted, the test-vulnerable but Otherwise Normal students score more highly on all the measures of competence, and are significantly lower in non-coping responses and negative self-concept than the At-Risk students. These results confirm the findings in the two previous studies on this population of depressed competence in the At-Risk group (Stevens, 1979).

Time

Several time-related effects emerge when all of the pre and post treatment scores on these measures are compared, and these also are shown in Table XIV. Relevant means for these significant time-related differences appear in Table XVII. The most marked over all improvement over time is the highly significant decrease

TABLE XVI

Pre and post-treatment means for all measures on which there is a significant effect for Group. (n = 40)

<u>Variable</u>	<u>At-Risk</u>	<u>Otherwise Normal</u>
<u>Number of Coping Strategies</u>		
Pre -	10.47	11.62
Post	11.0	12.52
<u>Teacher-Rated Coping Ability</u>		
Pre -	.73	3.52
Post	1.47	3.57
<u>Teacher-Rated Non-Coping Ability</u>		
Pre -	2.32	.67
Post	2.16	.38
<u>Self-Rated Coping Ability</u>		
Pre -	3.21	3.76
Post	3.53	3.86
<u>Negative Self Concept</u>		
Pre -	2.79	1.57
Post	2.47	1.05
<u>WISC - Coding</u>		
Pre -	50.58	60.29
Post	57.79	67.33

TABLE XVII

Pre and post treatment means for all measures on which there is a significant effect for Time. (n - 40)

<u>VARIABLE</u>	<u>PRE-TREATMENT</u>	<u>POST-TREATMENT</u>
<u>Anxiety - TASC</u>	14.4	11.98
<u>Coping Strategies</u>		
<u>Quality</u>	- 1.35	4.53
<u>Number</u>	11.22	12.38
<u>Negative Self Concept</u>	2.20	1.78
<u>Attribution of Control</u>	4.3	4.6
<u>Classroom On-Task Attention</u>		
First Observation (I & III)	390.25	431.83
Second Observation (II & IV)	387.39	434.25

in anxiety ($F_{1,34} = 21.62; (s = .0001)$) shown by these seventh graders. This finding, as well as the overall drop in negative self-concept ($F_{1,34} = 5.65; (s = .02)$) confirms the findings in the first study in this series (Stevens, 1979a) which showed that At-Risk students who had had significantly depressed self-concepts at the end of elementary school, showed a significant increase in self-concept eight months after entering Grade Seven.

All the students showed a significant increase in the quality of coping strategies they generate on the second testing ($F_{1,34} = 19.15; (s = .0001)$) and a marginal increase in the number of such strategies ($F_{1,34} = 2.2; (s = .15)$). Everyone's classroom on-task behaviour increases significantly overtime ($F_{3,90} = 3.12; (s = .03)$) and there is an increasing attribution to effort ($F_{1,34} = 3.45; (s = .07)$).

Interaction Effects

Several significant interaction effects amongst these three major independent variables were also found in the analyses of variance. These are shown in Table XVIII. As can be noted, these interactions between the three treatments and the two groups in pre and post-testing are found on each of these measures of competence except anxiety ($F_{1,34}$ and $2,34 = 1.69$ to 6.25 ; $s = .2$ to $.005$).

Since the major interest in this study was the effect of coping skills training on the At-Risk sub-group of this test-vulnerable sample, it was decided that these interactive effects could best be analyzed by considering the effects of the two coping skills programs on the At-Risk and the Otherwise Normal samples separately. This required some additional analyses of variance which were performed using the SPSS program, version G, one way procedure, and the Multivariate program, version 5.2, and comparing the difference between pre and post treatment scores for each group as difference scores. The results of these analyses appear in Tables XIX and XX.

Improved Cognitive Ability

As can be noted, coping skill training appears to increase the cognitive ability of both the At-Risk and Otherwise Normal students, as measured by their increased scores on the two Wechsler Intelligence Scale subtests. The At-Risk students improved significantly on the coding sub-test with training, particularly with Structured Training ($F_{2,17} = 4.7$; $s = .05$).

TABLE XVIII

MEASURES OF COMPETENCE: INTERACTION EFFECTS

Analyses of variance: All significant interactive effects for Treatment (Structured, Cognitive, & Control) Group (At-Risk & Otherwise Normal) and Time (pre-training and post-training) (n = 40)

	<u>Treatment x Group</u> df = 2,34			<u>Group x Time</u> df = 1,34			<u>Treatment x Time</u> df = 2,34			<u>Interax</u> df=2,34		
	<u>ms</u>	<u>F</u>	<u>S</u>	<u>ms</u>	<u>F</u>	<u>S</u>	<u>ms</u>	<u>F</u>	<u>S</u>	<u>ms</u>	<u>F</u>	<u>S</u>
<u>Cognitive Ability:</u>												
WISC - mazes	50.19	3.12	.06	22.8	3.49	.07	21.58	3.31	.05			NS
WISC - coding	179.22	1.69	.20			NS			NS	74.75	2.37	.11
<u>Anxiety</u>			NS			NS			NS			NS
<u>Coping Strategies:</u>												
Quality			NS			NS	131.67	3.02	.06			NS
Number			NS			NS	19.70	2.07	.14			NS
<u>Negative Self Concept</u>			NS			NS	2.63	6.25	.005			NS
<u>Coping Ability - Self Rated:</u>												
Coping Responses												
Non-Coping Responses												
Coping minus Non-Coping												
SCOP	2.38	3.84	.03			NS			NS			NS
<u>Teacher-Rated Coping Ability:</u>												
Coping Responses			NS	3.16	5.52	.03			NS	1.42	3.87	.03
Non-Coping Responses												
Coping minus Non-Coping												
TCOP	2.83	3.03	.06			NS			NS			NS
<u>Attribution of Control</u>			NS	1.12	2.06	.16			NS			NS
<u>Classroom On-Task</u>												
Attention:	12034.25	2.19	.13			NS			NS			NS

TABLE XIX

MEASURES OF COMPETENCE: AT-RISK STUDENTS ONLY

Analyses of variance: Reported by treatment (Structured, Cognitive, Control) as mean score increase (pre to post treatment measures) (n = 19)

<u>Variable</u>	<u>Structured</u>	<u>Cognitive</u>	<u>Control</u>	<u>(F 2,17)</u>	<u>S</u>
<u>Cognitive Ability:</u>					
WISC - mazes	-.17	-.67	-2.86	.9	NS
WISC - coding	13.50	8.00	6.25	4.70	.05
<u>Anxiety</u>	-3.00	-2.00	-3.57	.4	NS
<u>Coping Strategies:</u>					
Quality	13.50	7.67	2.75	2.75	.12
Quantity	1.50	1.00	-.63	.47	NS
<u>Negative Self Concept</u>	0	.5	-1.29	10.01	.002
<u>Coping Ability Self-Rated:</u>					
Coping Responses	.33	-.17	.43	.9	NS
Non-Coping Responses	.17	0	-.57	.7	NS
Coping minus Non-Coping SCOP	.17	-.17	1.0	1.2	NS
<u>Teacher Rated Coping:</u>					
Coping Responses	.33	1.0	.71	.5	NS
Non-coping Responses	-1.17	.5	.13	3.66	.07
Coping minus Non-Coping TCOP	1.5	.25	.71	.34	NS
<u>Attribution of Control</u>	.17	.33	-.29	1.42	NS
<u>Classroom On-Task Attention</u>	-4.0	108.25	78.67	.22	NS

TABLE XX

MEASURES OF COMPETENCE: OTHERWISE NORMAL STUDENTS ONLY

Analyses of variance: Reported by treatment (Structured, Cognitive, Control) as mean score increase (pre to post-treatment measures). (n = 23)

<u>Variable</u>	<u>Structured</u>	<u>Cognitive</u>	<u>Control</u>	<u>(F 2,21)</u>	<u>S</u>
<u>Cognitive Ability:</u>					
WISC - mazes	1.0	3.17	- 1.3	(3.55*	.06
WISC - coding	5.2	9.17	6.7	(6.57**	.02
					NS
<u>Anxiety</u>	-1.6	-2.0	- 2.2	.06	NS
<u>Coping Strategies:</u>					
Quality	4.4	9.3	.9	3.36	.08
Quantity	4.0	1.17	- .8	3.51	.08
<u>Negative Self Concept</u>	- .20	- .33	- .80	.69	NS
<u>Coping Ability Self-Rated:</u>					
Coping Responses	0	- .2	- .2	.10	NS
Non-Coping Responses	- .4	- .2	- .2	.11	NS
Coping minus Non-Coping SCOP	1.0	.17	.5	.58	NS
<u>Teacher Rated Coping:</u>					
Coping Responses	0	.5	- .11	(3.01*	.10
Non-Coping Responses	- .67	.25	- .11	(4.69**	.03
Coping minus Non-Coping TCOP	1.0	1.0	.9	.92	NS
				2.2	.14
<u>Attribution of Control</u>	1.0	1.0	.9	.02	NS
<u>Classroom On-Task Attention</u>	83.6	30.8	169.6	1.54	NS

* for Structured Treatment

** for Cognitive Treatment

The Otherwise Normal students did not show a significant gain on this measure, but both Structured and Cognitive training increased their scores on the WISC-mazes sub-test relative to their controls ($F_{2,21} = 3.55$ and 6.57 ; $s = .02$ and $.06$) Table XX).

While the Wechsler-Coding sub-test is rather a low level indicator of general intelligence (Sattler, 1974), the increased scores of the At-Risk group on this measure after training does represent improvement on a standardized intellectual measure. Perhaps more relevant is the fact that this sub-test is frequently used as a marker for learning disability (Sattler, op cit), and improved performance on this and similar tasks may offer a clue to how learning disabled students function and how this functioning may be improved (see Discussion).

The increase in WISC-mazes scores for the Otherwise Normal group must be viewed with more caution. It is doubtless, at least in part, a reflection of the practice received by the experimental students who were exposed to solving mazes as part of both training programs. However, it is curious that this practice did not similarly improve performance on this measure for the At-Risk students.

All of the At-Risk students did less well in solving mazes on post-testing (Table XIX), but both experimental groups, as expected, did better than the controls. Although this difference is not significant, it is a reversal of pre-testing results when controls were marginally better.

Although practice appears to improve performance on the Wechsler Scale Mazes sub-test, for vulnerable but Otherwise Normal students, self-instruction does not. The Structured group, who had been taught to self-instruct while solving mazes improved less than the Cognitive group who had not been given instruction.

Improved Coping Ability

Both the At-Risk and Otherwise Normal groups also show increased ability to cope with stress after training, as indicated by their scores on the measures of coping strategies, and teacher-rated coping ability (Tables XIX and XX). Both show marginally significant increases in the quality and quantity of these coping strategies ($F_{2,17}$ and $2,21 = 2.75$ to 3.51 ; $s = .08$ and $.12$), although prior to training, their controls generated better coping strategies (Table IX). Teachers rate both At-Risk and Otherwise Normal students as showing significantly more gains in coping ability than their controls after training ($F_{2,17}$ and $2,21 = 3.01$ to 4.69 ; $s = .03$ to $.10$). For the At-Risk students, Structured training significantly decreased non-coping responses ($F_{2,17} = 3.66$; $s = .07$). However, Cognitive training appears to have the most marked effect in improving teacher-rated coping ability in the Otherwise Normals, ($F_{2,19} = 4.6$; $s = .03$).

Other Interactive Effects (Tables XIX and XX)

Treatment does not significantly improve self-rated coping ability for either group. Neither does it appear to increase attribution to effort, although there is a trend towards an increase with training on this measure for the At-Risk group. On-Task classroom attention increases over time for all students in the sample, except those in the At-Risk Structured sub-group, but there are no significant training related effects on this variable.

Contrary to predicted results, the students in both control groups show the greatest drop in negative self-concept, and among the At-Risk students, this difference is significant ($F_{2,17} = 10.01$; $s = .002$). This suggests that for these vulnerable twelve year olds, attending a small high school increases self-concept more than coping skill training.

Anxiety decreases for the total sample, but the controls in both groups show a trend towards the greater decrease.

Grades

Since both mid-term and final grades were issued subsequent to training, it was not possible to compare pre and post-treatment grades. However, by comparing these two sets of grades, one issued several weeks after coping skill training, and the second issued six months later at the end of the school year, any prolonged improvement in school performance, as reflected in grades, could be noted. Therefore an analysis of variance was performed to compare the grades of both groups in the three treatment conditions on the January and June reports. The BMD program 2PV for repeated measures was used for this multifactorial analyses, and the results are shown in Table XXI. Mean grades and standard deviations for each sub-group are shown in Table XXII.

As expected, the At-Risk students as a group, earn significantly lower grades than their otherwise normal classmates ($F_{1,24} = 13.85$; $s = .001$). As well, grades for both groups differ significantly from subject to subject ($F_{2,48} = 3.57$; $s = .04$). Grades on each subject also decrease significantly from the January to June report ($F_{2,48} = 2.48$; $s = .08$).

There is no significant effect for treatment across the groups. As can be noted in Table XXII, means are very similar and the variance is large. However some interesting trends towards improved functioning with training emerge from a comparison of the means within each group.

In the At-Risk group, Structured coping skill training is associated with the highest mathematics marks both on mid-term and final reports. Since these students had all initially demonstrated their test-vulnerability on mathematics test, this trend merits consideration. On both sets of grades, the mathematics marks of the At-Risk Structured group lead their total marks.

In the Otherwise Normal group, although immediately after training - total grades for the experimental students are lower than those of the controls, six months later both trained groups earned higher grades than the controls.

TABLE XXI
GRADES

Analyses of Variance: Results for the two Groups (At-Risk and Otherwise Normal) on each Treatment (Structured, Cognitive, Control) on two Reports (mid-term and final) for three subjects (Language Arts, Mathematics, Total). (n = 30*)

<u>Source</u>	<u>SS</u>	<u>d.f.</u>	<u>m.s.</u>	<u>F</u>	<u>S</u>
Group	1543.12	1	1543.12	13.85	.001
Treatment	651.69	2	325.83	.6	NS
Group X Treatment	396.72	2	198.36	.4	NS
Report	8.99	1	8.99	.3	NS
Report X Group	27.82	1	27.82	.9	NS
Report X Treatment	267.06	2	133.53	4.68	.02
Interax	10.03	2	5.02	.2	NS
<u>Error</u>		24			
Subject	299.66	2	149.83	3.57	.04
Subject X Group	9.36	2		.11	NS
Subject X Treatment	261.58	4		1.56	NS
Subject X Treatment X Group	184.54	4		1.10	NS
<u>Error</u>		48			
Report X Subject	171.87	2	85.93	2.48	.08
Report X Subject X Group	112.42	2	56.21	1.63	NS
Report X Subject X Treatment	250.05	4	62.50	1.81	.16
Interax	62.46	4	15.62	.5	NS
<u>Error</u>		48			

* BMD 2PV includes only cases with complete values; the ten missing cases were distributed throughout the cells.

TABLE XXII

GRADES

Means and standard deviations for At-Risk and Otherwise Normal groups, reported as means for each treatment condition, for January (mid-term) and June (final) Language Arts, Mathematics, and Total grades.

<u>At-Risk Students</u> (n = 19)						
	<u>Structured</u>		<u>Cognitive</u>		<u>Controls</u>	
	<u>$\bar{X}$</u>	<u>SD</u>	<u>$\bar{X}$</u>	<u>SD</u>	<u>$\bar{X}$</u>	<u>SD</u>
<u>January (Mid Term)</u>						
Language Arts	55.3	15.00	63.2	4.36	60.0	10.43
Mathematics	64.5	15.86	59.8	7.86	59.1	15.52
Totals	61.7	9.6	62.8	6.01	63.5	8.94
<u>June (Final)</u>						
Language Arts	48.0	13.28	62.8	10.54	56.7	18.59
Mathematics	57.8	12.52	53.2	5.79	49.8	23.98
Totals	57.0	5.58	63.4	5.77	61.0	10.74

<u>Normal Students</u> (n = 21)						
	<u>Structured</u>		<u>Cognitive</u>		<u>Controls</u>	
	<u>$\bar{X}$</u>	<u>SD</u>	<u>$\bar{X}$</u>	<u>SD</u>	<u>$\bar{X}$</u>	<u>SD</u>
<u>January (Mid-Term)</u>						
Language Arts	73.8	15.42	72.5	12.49	75.4	8.97
Mathematics	73.0	14.30	74.8	11.99	79.1	11.86
Totals	75.8	7.73	74.8	8.21	76.1	9.33
<u>June (Final)</u>						
Language Arts	74.3	14.04	73.5	11.04	71.1	9.27
Mathematics	71.0	13.46	62.0	10.93	71.1	11.93
Totals	77.4	7.23	76.0	7.1	71.7	7.10

Five Months Later:

Data From Booster Session Ratings

The final analyses made in this study were made on the measures of how much the students had used their Coping Skill Training.

To recapitulate, a follow-up Booster Meeting was held between the two teachers and the twenty two students remaining in the experimental sample four and a half months after the training was completed. During this meeting, a set of questions designed to evaluate the students' use of the coping skills they had been taught were answered. The students were asked: "what have you found the most fun this year?"; "what have you found the most useful?"; and "are tests and exams easier or harder now?". Then, each student completed a questionnaire about their knowledge and use of the Coping Skills program they had been given. Exact protocols and verbatim responses appear in Appendix

Of the thirty five choices of the "most fun", nine students chose "gym", nine chose "the ski trip", eight more chose specific subjects or school activities such as "movies" or "dances". The coping skill training course was one girl's choice for the most fun she had had all year.

Exploratory shop was the most frequent choice as "most useful", accounting for five point five or twenty five percent of the responses. The choice made with the next highest frequency was - Coping Skills Training. It was chosen by five or twenty two point seven percent of the students. All five of these students had been in the Structured Coping Skill program.

In answer to the third question, "are exams easier or harder than they were last fall?", twelve of these twenty-two test-vulnerable students or fifty-five percent said "easier". (This is a significantly high proportion($\chi^2 = 11.82$, $s = .01$); half of the students who found tests and exams "easier" had been in the Structured Coping Skills program, half in the Cognitive program. However, four of the five students who now found exams "harder" came from the Cognitive group.

The frequency of "yes", "no" and "Sometimes" answers to each of the twelve questions on the Questionnaire appear in Table XXIII. Eighteen of the twenty two students, or eighty two percent, said they could still describe their Coping Skill Program to someone. Seventeen, or seventy seven percent said they had used what they had learned in the program in their exams. Thirteen, or fifty nine percent, thought the coping techniques had "helped", twelve, or fifty five percent, thought they had helped "a lot".

To assess whether or not the coping skills learned in the training programs were considered useful students were then asked if they had used what they had learned at "any other time" in school, and if they had found them helpful. Thirteen, or fifty nine percent, said they had used these coping skills at other times, ten, or forty six percent, had found them "helpful" and seven, or thirty two percent, thought they had helped "a lot".

Ninety six percent of the students said they expected to use the coping techniques during their forthcoming June exams ... Sixty nine percent of the students, or fifteen of the twenty two, thought they would probably do better on exams if they worried less, only one student thought he would do better if he worried more.

Each student responded twice to questions about whether or not using coping techniques had made a difference on their last exam. Thirty six of the forty four responses, or eighty six percent, were affirmative. When asked if Coping Skill Training should be offered again to other students, twenty of the twenty two students, or over ninety percent said "yes". The comments ranged from: "It would help them to relax instead of worrying" to "It could help them get better marks". (See Appendix

TABLE XXIII

BOOSTER SESSION: RESPONSES TO QUESTIONNAIRE

(Tabulated by question; reported by treatment group. (Structured/
Cognitive)(n = 22).

		<u>Yes</u>	<u>No</u>	<u>Sometimes</u>
Could still describe Coping Skill Program?	<u>St.</u>	9	2	0
	<u>Cog.</u>	9	2	0
	<u>Totals</u>	18	4	0
Used in Exams?	<u>St.</u>	8	1	2
	<u>Cog.</u>	9	2	0
	<u>Totals</u>	17	3	2
Did it Work?	<u>St.</u>	4	1	6
	<u>Cog.</u>	9	2	0
	<u>Totals</u>	13	3	6
A lot?	<u>St.</u>	4	4	3
	<u>Cog.</u>	8	3	0
	<u>Totals</u>	12	7	3
Used Other Times?	<u>St.</u>	6	5	
	<u>Cog.</u>	7	4	
	<u>Totals</u>	13	9	
Did It Help?	<u>St.</u>	6	3	
	<u>Cog.</u>	4	5	
	<u>Totals</u>	10	8	(4 did not answer)
A Lot?	<u>St.</u>	4	5	
	<u>Cog.</u>	3	5	
	<u>Totals</u>	7	10	(5 did not answer)
Will Use in June Exams?	<u>St.</u>	11	0	0
	<u>Cog.</u>	10	1	0
	<u>Totals</u>	21	1	0
Better if Worry Less?	<u>St.</u>	7	4	0
	<u>Cog.</u>	8	3	0
	<u>Totals</u>	15	7	0
If Worry More?	<u>St.</u>	1	9	0
	<u>Cog.</u>	0	11	0
	<u>Totals</u>	1	20	0

Table XXIII (Continued)

		<u>Yes</u>	<u>No</u>	<u>Sometimes</u>
Coping Skills Training made a difference? (2 responses per student)	<u>St.</u>	17	5	
	<u>Cog.</u>	19	3	
	<u>Total</u>	36	8	
Should offer Coping Skill Training to others?	<u>St.</u>	10	1	
	<u>Cog.</u>	10	1	
	<u>Total</u>	20	2	

SUMMARY: "Yes" Responses:

Describe?	82%
Used in Tests?	77%
Work?	59%
A lot?	55%
Other Times?	59%
Help?	46%
A Lot?	32%
June?	96%
Worry Less?	69%
Worry More?	4.5%
Difference?	86%
Others?	91%

DISCUSSION

After Coping Skill Training, the test-vulnerable adolescents in this study were able to generate more adaptive problem-solving strategies and to modify their own previously debilitating cognitions while under stress. This training also increase their scores on Performance sub-tests of the Wechsler Intelligence Scale For Children. Some of these trained students were also rated by their teachers as showing significantly improved ability to cope with stressful school situations.

As well, four and a half months later, a majority of these students reported that they had used their newly acquired skills and found them helpful. More than eighty five percent of these students said they planned to use what they had learned during their future exams, and over ninety percent recommended offering a similar course to other seventh graders.

All of the students in the sample, both experimental and control, improved on some of the measures with time. They became less anxious and, their self-concept improved. They all improved in their ability to generate adaptive coping strategies and to stay on-task in class, and they all came to feel more in control , of their own learning (Table XVII).

Test-Vulnerable At-Risk Students

The group of test-vulnerable students of particular interest in this study, those At-Risk for future school failure because of a history of school problems, also showed these significant performance increments in coping responses, sustained vigilance, and teacher-rated ability to cope. As well, these At-Risk students showed a fifteen point five percent to nineteen point six percent improvement under the stress of test-taking, while their untreated Controls improved only seven point six percent, although this improvement on tests did not reach significance. Coping Skill Training did not significantly improve their grades, but, again, a trend towards improved functioning in mathematics after training for these At-Risk students is indicated by the fact that they earned higher grades in mathematics than their Controls in both mid-term and final reports.

Although the two treatments did not significantly differ in their effects on these At-Risk students, it should be noted that those in the Structured program, which included self-instruction, earned higher grades in mathematics, both at mid-term and in their final reports, than either those in the Cognitive program or the untreated Controls. The on-task vigilance of those in the Structured program, as measured by their improved Coding sub-test scores, also improved the most. On the other hand, the At-Risk students in the Cognitive program showed a bigger improvement in stress-debilitated performance on the mathematics test after treatment.

It should be remembered that special education support and tutoring was available in these high schools to both control and experimental At-Risk students, as required. Therefore, any performance increments shown by the experimental group reflects the effect of Coping Skill Training as added to their on-going remedial program. It could be argued that the effect of such training on unremediated students might not be as effective. However, it is more likely that since all good remedial techniques enhance a student's success, the good remedial support available in these schools made the additional enhancing effect of Coping Skill Training even more difficult to demonstrate in this study.

Otherwise Normal Test-Vulnerable Students

The rest of the test-vulnerable students in this study, the Otherwise Normal sub-group, show similar significant gains with training. Their Wechsler-Mazes scores improved significantly, they generated significantly more and better coping strategies, and their teachers rate them as the most improved copers. As well, they show a trend towards, improved final grades. As a group, the normal students show less of a trend than their At-Risk classmates towards improved performance on tests after treatment. Their test performance improved thirteen point five percent and seventeen percent, as compared with a thirteen percent improvement over time for the untreated controls.

The Otherwise Normal test-vulnerable students in this study did not respond very differently to the two training programs. For them, both programs enhanced maze performance and teacher-rated coping ability, although the non-structured Cognitive program was more effective.

Treatment Programs Compared

The two coping skills programs taught in this study differed only in that the Structured program was more directive, and included instruction and practice in the use of two specific coping techniques, self-instruction and relaxation, while the Cognitive program encouraged the students to generate their own coping strategies. Although a significant effect for one or the other of these experimental treatments appears on both of the Wechsler sub-tests and on the measures of increased coping strategies, no significant differences between the two treatments emerged on any of the measures in this study. However, the pattern of improved performance associated with each of the two programs, vis-a-vis the controls, did differ.

Although both programs included the same amount of practice in solving mazes, students in the Structured program did not improve significantly as compared with their Controls on the Wechsler Mazes sub-test, while those who had been in the Cognitive program did. This seems clear evidence that self instruction and relaxation did not facilitate performance on this measure while practice did. In fact, considering that the combined experimental sample improved on this measure, while the Structured sub-groups did not, self-instruction actually appears to depress performance on this timed measure for this population.

Nor did self-instruction and relaxation facilitate performance on the most direct of test-stress measures, scores on the post-treatment mathematics test, Math III. Here, again, the Cognitive

group did better than either the Structured group or the Controls. And when only the At-Risk sub-group is considered, the effectiveness of this Cognitive treatment is more pronounced. (Table X).

As might be anticipated, the students who had been specifically taught to self-instruct, the Structured Group, showed a larger increase, both in number and quality of such coping strategies and cognitions after treatment (Table XV). However, both the Structured and Cognitive groups improved on these measures relative to the controls. The specific coping techniques taught in the Structured program also improved on-task vigilance, as measured by the increased scores of the Structured group on the Wechsler-Coding sub-test, particularly those of the At-Risk students.

And as noted, the At-Risk students in the Structured program also earned higher mathematics grades than either those in the Cognitive program or the untreated Controls.

Self-Concept

The hypothesized increase in self-concept with Coping Skill Training was not substantiated by the results of this study. On the contrary, the controls showed significantly higher gains in self-concept in the month between pre and post testing than the experimental students. The most probable explanation is that this increase reflects the re-inforcing effect of attending a smaller high school. Going to school where students and staff can come to know one another appears to be more enhancing to one's

self-concept than Coping Skill Training. In the previous study of this population (Stevens, 1979a) while At-Risk students showed significantly lower self-concepts than their more able classmates, their depressed self concept had significantly improved from the end of Grade Six to the middle of Grade Seven, or seven months after they entered high school. In that study, Coping Skill Training somewhat enhanced self-concept vis-a-vis controls in the same school. The contradictory findings in the present study suggests that the smaller school which the controls attended was a less stressful setting than the larger high school which the experimental group attended. Slightly heightened competency in several areas for the controls in this study noted from the analyses of pre-test scores (Table IV) is further evidence of this, as are their significantly higher teachers' ratings and decreased anxiety in post-testing.

If this is the case, any treatment effects in the present study could only expect to be attenuated by comparison with this control group, and any significant effects which emerge can be considered to be robust enough to have overcome this attenuation.

This potential source of confounding would have been eliminated by using a control sample from the same high school from which the experimental sample had been drawn. But, as explained on the Methods section, the finite number of test-vulnerable students who were also At-Risk, predicted by the previous study in that school (Stevens, 1979), and found in the present study, did not allow for this. The other option, using a test-vulnerable control sample from another large high school within a different

school commission, would have undoubtedly increased other potential confounding, such as differences in curricula, schedules and back-up remedial support to the At-Risk students. All the students, experimental and control, in this study, were taught with the same basic curriculum and a similar educational philosophy. They all followed the same annual schedule of instruction, examinations and report cards. Also, of course, restricting this study to one school commission, and having administrative support for this program from that commission, greatly increased the co-operation and vigilance of the participating classroom teachers.

Therefore, more confidence can be attached to this enhancing effects on self-concept of attending a smaller school. Even though they were being compared with other students whose school also endeavoured to provide a successful school experience to all of its students, in this study, the vulnerable students who attended the smaller school showed this important affective gain.

It should also be remembered that these test-vulnerable students represent just one segment of the vulnerable population within these schools. As demonstrated in the previous study (Stevens, 1979b) over two-thirds of all students selected as being At-Risk for future school failure by their teachers do not belong to this test-vulnerable sub-group. Instead, although they are less anxious than these test-vulnerable students, they are also less competent and "helpless" or less expectant of controlling their own performance. Perhaps the improved self-concept associated with attending the smaller school on the test-vulnerable

students in this study is due to the fact that these students are both the most anxious and those who feel the most responsible for their own performance. It would be interesting, in a future study, to examine other relationships between autonomy, reinforcement, self-concept, and competence in the At-Risk student.

The Effect of Self Instruction

Some of the data in this study permits an examination of the role of self-instruction in improving the school performance of test-vulnerable Seventh Graders. The efficacy of this treatment technique is confirmed by some of these results, but not by others.

Self instruction appears to enhance the ability to generate task-directed strategies and sets, and to increase vigilance. But for tasks which require rapid spatial judgements, such as solving mazes, it is not as effective as encouraging students to generate their own problem-solving strategies, and it may even slow them down.

These findings contradict previous reports of facilitated maze-solving with self-instruction (Kendall, 1977; Parkes, Stewart and Kahana, 1968; Meichenbaum, 1971).

However, these previous studies were conducted on younger children. Perhaps the solving of mazes for young children is more of a problem in sustained attention, while in young adolescents, it become more related to the ability to make accurate rapid spatial judgements.

The enhancing effect of self-instruction on Wechsler-Coding performance for the At-Risk students in this study could be related to previous data on the performance of learning disabled students. A relatively low Wechsler Coding score is considered one marker of learning disability (Sattler, 1974; Bannantyne 1971).

The significant increase in scores on this measure for the At-Risk students who had been taught to give themselves task-directed self instructions suggests that one possible source of deficit in learning disabled students is either an excess of off-task self instructions or a lack of task-maintaining self-instructions.

This significant increase with training confirms previous findings of improved functioning on WISC-R Performance sub-tests after training in problem-solving (Wright, Millelire & Stevens, 1976; Meichenbaum & Goodman, 1971).

Assessing Stress Reduction

One issue raised for consideration prior to this study was the validity of assessing improvement in performance under stress by self-rated decrease in anxiety. Improved coping ability is also only an indirect measure of improved performance under stress. The results of the present study substantiate the need to distinguish between these criteria. The experimental students developed more and better coping strategies, and all of this test-vulnerable sample became less anxious as they progressed in Grade Seven, but all also continued to do less well under test-like conditions.

These results confirm previous findings (Finger, 1975; Finger and Galassi, 1977; Hussian & Lawrence, 1978; Goldfried, Linehan and Smith, 1978) about the discrepancy between these post-treatment criteria, although none of these previous studies used direct measure of performance under stress to assess the

effectiveness of training. The results of the present study also confirm the validity of another pre-study consideration: the need for pre-treatment as well as post-treatment measures of competence.

Research in Schools

As part of an investigation of the correlates of school failure, (Stevens, 1979ab) the present study was aimed at developing and assessing a school based intervention for students who had been identified in school as having school-related problems. It was, therefore, designed to be conducted in schools. All in situ studies pose different problems than those conducted in a laboratory, especially when a treatment outcome is being measured, and the present study is no exception. Basing this study in schools increased some problems in methodology and interpretation, and decreased others.

For instance, grouping together all students At-Risk for failure for whatever etiology produced a group with much within-group variation. Restricting the selection of this At-Risk group to teacher's ratings also increased the likelihood that the group would be a diverse one. However these constraints were necessary to fulfill the aim of this project - the assessment of a school based intervention to be used in school by teachers.

Another problem in this study was one common to all outcome studies in and out of the laboratory - the subjugation of clinical considerations in the search for methodological rigor. Clinical considerations, as well as sensible pedagogy, recognize that individual differences in verbal ability, confidence and learning style make any skill-building program more likely to be effective with some individual students, while a different program would better serve other students. Yet methodological considerations require that students matched on predetermined variables be

assigned at random to a program, and that they follow it in the same way for the same length of time. This can only serve to dilute the effectiveness of the intervention being studied, and reduce the rigor of the study's design.

In the present study, good pedagogy would have permitted the teachers to do what all good teachers do automatically - modify what is being taught by what is being learned. Unfortunately, this would have confounded rigorous evaluation of the programs. Although this conflict is not new in the study of complex behaviour, it becomes particularly relevant when practicality is juxtaposed with rigor and validity, as in school-based studies.

On the plus side, conducting this outcome study of Coping Skill Training for test-vulnerable students within a school increased the likelihood that generalization of the ability to cope to other school-related stresses would occur. Both the increase of general problem solving strategies shown by these students and their increase in teacher-rated coping ability confirms that it did.

Another plus - questions of practicality, teacher-acceptance, and usefulness of the intervention could all be assessed within the framework of the study. Given the problems that these issues often pose to the introduction of laboratory developed remedial techniques, a good case can be made for assessing experimental remedial programs for adolescents in schools, whenever possible.

Most modern high schools make some provision for meeting the needs of their most vulnerable students. Often this is accomplished by back-up support and individual or small group instruction from special education teachers. It seems sensible to suppose that if Coping Skill Training could be incorporated into such an on-going remedial program, the effect of both programs would be enhanced.

However, many more students, like the Normal sub-group in this study, suffer from debilitating problems in dealing with school-related stress but do not become identified as needing special help. For example, in this series of studies, twenty seven percent to thirty percent of all Grade Seven students do more poorly when they think they are taking a test. This suggests that some form of Coping Skill Training might profitably be added to the curriculum of all Grade Seven students. Just as teachers modify on-going mathematics and geography curricula to provide more structure and practice to those students who require them, the Coping Skill program described in this study might serve as a basis for this training, to be modified as the teacher found appropriate.

Successful students differ from unsuccessful students in many ways, as this series of studies has demonstrated. One important way in which they differ is in their ability to deal adaptively with stress. The present study suggests that this ability to cope, like reading and spelling, can be taught, and learned, where it seems likely to do the most good --- in school.

REFERENCES

- Ammons R. & Ammons H. The Full Range Picture Vocabulary Test, New Orleans, R.B. Ammons, 1948.
- Ammons R. & Ammons C. The Quick Test (QT), Provisional Manual, Psych Reports, 1962, 11; 111-161.
- Andrews G. & Debus R. Persistence and the causal perception of failure, J. of Educ. Psychol, 1978, 70:2; 154-166.
- Atkinson J. and Teather W. (eds.) A Theory of Achievement Motivation, N.Y., Wiley, 1966.
- Bannatyne A. Language, Reading, and Learning Disabilities, Springfield, Ill., Thomas, 1971.
- Beck A. Cognitive Therapy and Emotional Disorders, N.Y., International Universities Press, 1976.
- Burron D. & Bucher B. Self instructions as discriminative cues for rule-breaking or rule-following, J. of Exper. Child Psychol., 1978, 26; 46-55.
- Burgess T. and Wright D. Seventh grade evaluation of the Ammons Quick Test (QT), Psychol. Rep., 1962, 10; 791-794.
- Crandall V.C. & Katkovsky W. and Crandall V.J. Children's beliefs in their own control of reinforcements in intellectual academic achievement situations, Child Develop., 1965, 36; 91-109.
- Diener C. & Dweck C. An analysis of learned helplessness; continuous changes in performance, strategy, and achievement cognitions following failure, J. Person. and Soc. Psychol., 1978, 36:5; 451-461.

- Douglas V. and Peters K. Towards a clearer definition of the attentional deficit in hyperactive children in G. Hale and M. Lewis (eds.) Attention and the Development of Cognitive Skills, N.Y., Plenum (in press), 1979.
- Dweck C. The role of expectations and attributions in the alleviation of learned helplessness, J. Person and Soc. Psychol., 1975, 31:4; 674-685.
- Dweck C. and Reppucci D. Learned helplessness and reinforcement responsibility in children, J. Person. and Soc. Psychol., 1973, 25; 109-116.
- Deffenbacher J. Worry, emotionality and task-generated interference in test anxiety: an empirical test of attentional theory, J. Educ. Psychol., 1978, 70:2; 248-254.
- D'Zurilla T. and Goldfried M. Problem-solving and behavior modification, J. of Abnorm. Psychol., 1971, 78; 107-126.
- Ellis A. Reason and Emotion in Psycho Therapy, N.Y., Stuart, 1962.
- Ellis A. Growth Through Reason, Science and Behavioral Books, Palo Alto, 1971.
- Endler N. A person situation interaction model for anxiety in C. Spielberger and I. Sarason (eds.) Stress and Anxiety, Washington, Hemisphere Publ., 1975.
- Feld S. & Lewis J. The assessment of achievement anxieties in children, in C. Smith (ed.) Achievement-Related Motives in Children, N.Y., Russell-Sage Found., 1969.
- Finger R. The effects of modifying cognitive vs. emotionality responses in the treatment of test anxiety, unpub. PhD.

- thesis, U. of No. Carolina, 1975; as cited in Finger R. and Galassi J., Effects of Modifying Cognitive vs. Emotionality Responses in the Treatment of Test Anxiety, J. Counsell. & Clinic. Psychol., 1977, 45:2, 280-287.
- Finger R. and Galassi J. Effects of modifying cognitive vs. emotionality responses in the treatment of test anxiety, J. Counsell. and Clinic. Psychol., 1977, 45:2; 280-287.
- Goldfried M. Systematic desensitization as training in self control. J. Consult. and Clinic. Psychol., 1971, 37; 228-234.
- Goldfried M., Linehan M. and Smith J. Reduction of test anxiety through cognitive restructuring, J. of Consult. and Clinic. Psychol., 1978, 46:1; 32-39.
- Holroyd K. Cognition and desensitization in the group treatment of test anxiety, J. Consult. and Clinic. Psychol., 1976, 44; 991-1001.
- Horan J., Hackett G., Buchanan J., Stone I. and Demchik-Stone D. Coping with pain: a component analysis of stress inoculation, Cog. Therapy and Res., 1977, 1:3; 211-221.
- Hussian K. & Lawrence P. The reduction of test, state and trait anxiety by test specific and generalized stress inoculation training, Cognitive Therapy & Research, 1978, 2:1; 21-38.
- Jacobson E. Progressive Relaxation, Chicago, U. of Chicago Press, 1938.
- Jastak J. & Jastak S. Wide Range Achievement Test (WRAT), Wilmington, Del., Grudance Assoc., 1965.

- Joesting J. and Joesting R. Comparison of scores in Quick Test and Stanford-Binét, Form L-M, Psych. Reports, 1971a, 29; 1178.
- Kendall P. On the efficacious use of verbal self-instructional procedures with children, Cog. Therapy and Res., 1977, 1:4; 33-341.
- Kendall P. Anxiety:states, traits-situations?, J. Consult. and Clinic. Psychol., 1978, 46; 280-287.
- Lyle J. & Goyen J. Performance of retarded readers on the WISC and educational tests, J. of Abnorm. Psych., 1969, 74; 105-112.
- Mahoney M. and Thoresen C. Self control: Power to the Person, Monterey, Brooks-Call, 1974.
- Meichenbaum D. Examination of model characteristics in reducing avoidance behavior, J. Person. and Soc. Psychol., 1971, 17; 298-307.
- Meichenbaum D. Self instructional methods, in Kanfer F., Goldstein A. Helping People Change, N.Y., Pergamon, 1974, 357-391.
- Meichenbaum D. Cognitive-Behavior Modification: an integrative approach, N.Y., Plenum, 1977.
- Meichenbaum D. and Cameron R. Training schizophrenics to talk to themselves: a means of developing attentional controls, Behav. Therapy, 1973, 4; 515-534.
- Meichenbaum D. and Cameron R. The clinical potential of modifying what clients say to themselves. Psycho Therapy, 1974, 11; 103-117.

- Meichenbaum D. and Goodman J. Training impulsive children to talk to themselves: a means of developing self-control, J. Ab. Psychol., 1971, 77; 115-126.
- Mednick M. Relationship of the Ammons Quick Test of intelligence to other ability measures, Psych. Rep., 1967, 20; 523-526.
- Norton G., MacLean L. & Wachna E. The use of cognitive desensitization and self-directed mastery training for treating stage fright, Cog. Therapy and Res., 1978, 2:1; 61-64.
- Otto W. and McMenemy R. An appraisal of the Ammons Quick Test in a remedial reading program, J. of Educ. Measurement, 1965, 2; 193-198.
- Parkes H., Stewart M., & Kahana B. Portenus maze performance after training in self-directed verbal commands, Child Development, 1968, 39; 817-826.
- Phillips B., Martin R. and Meyers J. Interventions in relation to anxiety in schools, In C.D. Spielberger (ed.) Anxiety: Current Trends in Theory and Research II, N.Y., Academic Press, 1972.
- Pless I., Snider M., Eaton A., Kearsley R. A rapid screening test for intelligence in children, Amer. J. of Diseases of Children, 1965, 109; 533-537.
- Ruebush B. Anxiety in H. Stevenson (ed.) Child Psychology: the 62nd yearbook of the National Society for the Study of Education, Chicago, U. of Chicago Press, 1963.
- Sarason I. Test anxiety and cognitive modeling, J. Person. and Soc. Psychol., 1973, 28:1; 58-61.

- Sarason S., Davidson K., Lighthall F., Waite R., and Ruebush B. Anxiety in Elementary School Children, N.Y., Wiley, 1960.
- Sattler J. Assessment of Children's Intelligence, Phila., Saunders, 1974.
- Stevens R. & Pihl R. The At-Risk student: identification of the young adolescent with a history of school learning problems and an experimental remedial program, manuscript submitted for publication, 1979a.
- Stevens R. & Pihl R. Effects of school failure, manuscript submitted for publication, 1979b.
- Spiegler M., Cooley E., Marshall G., Prince H., Puckett S. and Slenazy J. A self-control vs. a counter-conditioning paradigm for systematic desensitization, J. of Counselling Psych., 1976, 23; 83-86.
- Wine J. Test anxiety and the direction of attention, Psych. Bull., 1971, 76; 92-104.
- Wolpe J. The systematic desensitization treatment of neurosis, J. of Nervous and Ment. Disease, 1961, 132; 189-203.
- Wechsler D. Manual for the Wechsler Intelligence Scale for Children - Revised, N.Y., Psych. Corp., 1974.
- Wright P., Millelire B. and Stevens R. The modification of distracting thoughts: a case study, submitted to J. of Learn. Disab., 1977.
- Wright P. & Gallagher E. A comparison of WISC-R and Quick Test scores of elementary and high school children, unpubl. report, Baldwin-Cartier School. Comm., 1977.

GENERAL DISCUSSION: IMPRESSIONS AND INTERPRETATIONS

Three years of assessing, listening to and teaching At-Risk seventh graders have produced, in addition to the data herein reported, some general impressions about how students who have experienced failure in school learn to deal with that failure. These impressions guide the interpretations to be made from this data. Four main generalizations seem to emerge.

The Effects Of Failure

First, much of the data collected confirm the original hypothesis of this investigation - that students who have not been successful school learners remain not only less academically skilled than their classmates, but they also become further disabled by their failure histories. The data in this investigation, confirming the findings of previous studies (Brickman, P, Linsenmeir, J, McCareins, A, 1976; Dweck, 1975; Crandall, 1965), shows that one significant way in which young adolescents differ is in how they react when faced with normal school stress. In these studies, those whose previous school histories had been normally successful, when faced with a stressful situation, paid more attention and took more precautions with their responses. In other words, they acted in a way that increased the likelihood of improved performance and increased learning. Those who had experienced more failure in school, in the face of stress responded by trying to avoid being on the spot, ruminated about their

own anxiety, and spent even less time on the learning task at hand. This difference in coping strategies is confirmed by both their own and their teachers' evaluation (Study II and Study III).

Coping With School

However, despite this, these eleven and twelve year old At-Risk students were, in the majority, pleasant, active and co-operative. As the third study demonstrated, when asked about school, they discussed activities they enjoyed and interests they were pursuing in school. They all were, or wanted to be, active participants in what was going on around them. Most of these Grade Seven students viewed their school as a reinforcing place, with entertaining activities. Despite their lack of success, they appeared to still enjoy going to school. Although they were demonstrably failure-expectant, and had diminished self-concepts, their responses show they still felt there were reward to be had at school. Understandably, this approach-avoidance situation maintained, for them, a high level of anxiety.

It was only when they began discussing their own performance in school, or attempted school-like tasks, that they became noticeably bewildered, defensive and self-deprecating ("I don't know many words"; "You shouldn't use me for this, I'm terrible at remembering."). This switch was remarked upon by the research assistants and repeatedly demonstrated in the discussions following de-briefing by the author.

This, then, is the second generalization to be drawn from these studies: When over-all adjustment is considered, these At-Risk students are, in fact, coping. The ability to adapt to, or to cope with, their histories of failure was almost universally present. Only one of the students reported as At-Risk in Grade Six became non-functioning in Grade Seven. In three successive years of surveying these Grade Seven classes, with this one exception, all of these students remained in school, and dealt with their studies, their peers and their teachers. Although there were many problems, and some crises, there was only one breakdown in adequate functioning.

One has to assume that many of these young adolescents are maintaining their own psychic health by looking for success outside the classroom. Avoidance, the coping strategy used by significantly more of the At-Risk students in this study, is, in terms of overall health, an adaptive response. Many failing situations are best dealt with by choosing an alternate arena for success. The coping strategies of these students only become maladaptive when considered vis-a-vis their future school learning.

Just as a closer look at learning disabled students confirms that these students are often able and keen learners in non-academic settings (Follow-up Study, McGill - M.C.H. Learning Centre, 1973), the present investigation of failure-disabled students has revealed that, as learning theory would predict, failure in school has left them less likely to use success-inducing techniques in school. But there is no reason to believe they would not be likely to use these techniques in a more rewarding milieu.

And in so far as non-academic sources of success replace the non-profitable academic pursuits of these students, the likelihood diminishes that the requisite time and attention needed for increased academic skill and improved school performance will be forthcoming.

However, if it were simply a matter of redirecting young adolescents away from their areas of lesser ability and towards more likely sources of success, the problem would be a much smaller one than it, in fact, is. All adolescents in our culture are expected to go to school and, therefore, any who cannot find a way to succeed in this universal experience cannot help but question their own competence. The demonstrated low self-concept and heightened anxiety of the failing students in the present study is confirmation of this effect. And the demonstrated link between school problems and adolescent delinquency (Berman and Seegal, 1976) in less favorable settings than enjoyed by the middle class students in the present study, as well as the increasing incidence of disfunction found in older adolescents (Platt, Spivack, Altman, Pieser, 1974; Spivack and Levine, 1963) attest to the sad fact that the adaptive adjustment displayed by the young adolescents in the present study cannot be counted upon for their peers in other settings, or even to continue for all of this population in the stressful years of older adolescence ahead.

Neither public law nor most parents permit the unsuccessful student to avoid further failure by opting out of school. To do so would be considered irresponsible and unmindful of the importance of an adequate education. Yet in their concern for

ensuring his future competence, these adults risk programming this student into recurring inescapable failure, and producing an unconfident, anxious, helpless child.

To prevent this from happening, schools have usually provided two, and more recently, three types of remediation. First, of course, the failing student has been helped to become more academically skilled. Then, counselling, flexible programming, and even closely monitored systems of reward and penalty, have been introduced to ensure that the student is exerting the requisite effort and attention. In the past decade, since mounting interest in learning disabilities and hyperactivity have called attention to the cognitive and behavioural prerequisites of school success, perceptual, linguistic and cognitive skill-building have been added to this remedial package. Yet, it was precisely the lack of subsequent school success obtained by these remedial interventions that has sparked the present investigation.

It is too early to ascertain whether or not the additional intervention of coping skill training given to the At-Risk students in these studies, will be any more successful in reversing the debilitating effects of prolonged failure. Some of the first year's grades of these students were marginally but not significantly higher. They did better, but not significantly so, on tests. None of the significant training-related increases in competence have yet been linked to significant performance increments. Still, the special education teachers in these high schools, with whom the results of these studies have been shared,

have begun including the teaching of these coping skills in their remedial programs, and they report that their students are doing better on tests and earning higher grades. One high school administrator has conducted an informal follow-up survey and reports lowered drop-out rates in grade nine and grade ten. These trends must await confirmation with controlled studies, but they are evidence that such further study is warranted.

Subjective Judgement

A third major inference that can be drawn from this investigation concerns the reliability of subjective judgement.

In these studies, simple teacher's judgement was a demonstrably reliable predictor of future student success. Sixth grade teachers predicted with great accuracy which of their students would earn the lowest grades in another school a year later. They also made highly accurate judgements about which of their students were the most anxious, intelligent, and confident, and which students used the most adaptive coping strategies.

These teachers had not been trained in making behavioural, data-based, observations. In fact, they had not been asked to do anything they had not already done - be aware of which of their students were not likely to be successful in school.

Yet the current trend in modern pedagogical planning is to downgrade, and even eliminate, such skilled subjective judgements. Mass educational planning, based on standardized data collection, and standardized pedagogical procedures (Engleman, 1979; McDaniels, 1979; Wofford, Anthony and Chavez, 1979), have gained in popularity and credibility. As statistical analysis becomes more sophisticated, and standardized measures capable of being analyzed by these sophisticated techniques proliferate, the validity of informed professional judgement has been forgotten. In the search for standardized comparability of data, social agencies (Coulson, 1979) and public educational bodies (Boucher, 1979a; 1979b) have encouraged the move towards the increased use

of standardized procedures and measures rather than subjective judgement. Yet standardized measures of intellectual ability, for example, particularly standardized group measures, are known to be unreliable predictors for At-Risk populations (Sattler, 1974). The depressed test performance of a significant proportion of the At-Risk population demonstrated in the present investigation is additional evidence of the suspect nature of assessments based solely on such objective measures.

The reliable judgements made by teachers in these studies, year after year, has been confirmed by other investigators (Shore, 1975; O'Shaughnessy, 1976). Such findings make a persuasive argument for including teachers' judgements in all assessments of student learning.

A corollary of this concerns the efficacy of basing investigations of school-related problems, and their solutions, within schools. By so doing, conflicting data may be investigated for new insights as it appears. Practical problems in implementation may be noted and dealt with as they develop, and the problem of generalization is greatly reduced. Best of all, the on-the-spot back up observations of knowledgeable teachers can be refined and mobilized to make any study of school performance more reliable, more valid and, ultimately, more useful.

Deficit or Pathology

The final observation to be made from this investigation concerns the pathology versus deficit models of disfunction. As behaviour has become increasingly accessible to measurement in the past one hundred years, judgements of task performance have become increasingly norm referenced. When an individual is unable to perform a given developmental task, this inability has come to be considered a skill deficit if that individual is below or near the age at which the task is normally mastered, and thereafter, evidence of pathology.

In the last decade, modern learning theory has generated an alternate paradigm in which task failure, regardless of age-appropriate behaviour, is considered to be evidence of missing skill, to be dealt with like any missing skill by appropriate teaching. There are obvious advantages in using normative criteria, and obvious dangers in unduly focussing on individual skill deficit. However, there is one clear advantage of the deficit over the pathology model for school-aged populations: any disfunction that can be conceptualized, and successfully treated, as a skill deficit, can potentially be added to the skill building program that this population is already receiving every day in school. This cannot help but be less disruptive to a child's normal routine, and less dismaying to him, than standard treatment for potential pathology which requires his part-time removal to a therapist's office, or full-time removal to a clinical setting.

The data in the present studies suggests that when the inability to cope adaptively with stress is conceptualized as skill deficit, and treated by training in more adaptive problem-solving strategies, as an adjunct to other skill-building programs in school, young adolescents without adequate coping skills can learn these missing skills and, thereafter, respond more adaptively to stressful situations. Good coping skills, like good word attack skills, can be taught and learned.

The At-Risk students in this series of studies were drawn from the diverse population of students who don't succeed in school. Yet despite this built-in diversity, there were some amazing commonalities. All were basically healthy. They came to school, they dealt with their classmates and their teachers, and they followed daily routines, with minor clashes and with insufficient success, but without breakdown.

However, this continued functioning was not without cost. As a group these At-Risk students showed depressed self-concepts and heightened anxiety. When faced with tests, they either became even more anxious, or else they came to feel a lack of control over their own performance. It therefore becomes the difficult task of those who plan for the education of these young adolescents to address both these commonalities and this diversity. They will need to be mindful of the powerful pull of these students' common experience of failure as well as of their individual differences in learning.

These studies have also documented several areas of school competence. For instance, they demonstrate that mass screenings can be conducted without sacrificing either valuable subjective evaluation or validity of judgement. They further demonstrate that although students with a history of failure feel anxious and unconfident, and behave maladaptively at times, they are usually still basically healthy and functioning when they enter adolescent.

Achieving competence is the basic developmental task of all adolescents in western culture. For any given child, this is an intricate balance of vulnerability and stress, failure and success, expectation and skill. Those who ultimately fail to find some adaptive accommodation to normal stress or who fail to become adequately skilled, are consigned to becoming less than fully adult. Considering both the functional waste and economic cost of such failure, it seems reasonable to pursue any reasonable avenue offered to increase this competence and prevent this failure.

This investigation has added to the growing body of evidence that previous learning affects cognitive set and prolonged failure affects future performance. In demonstrating that less adaptive coping sets can be changed to more adaptive ones these studies also offer additional evidence that these sets are accessible to the same modification as overt behaviour.

Learning to cope with stress by paying more attention to the task at hand, evaluating alternatives, and selecting better self-responses, is one way in which successful students differ from their unsuccessful classmates. This series of studies has shown that this difference indeed exists, but that it can also be reduced. By learning the strategies of success, At-Risk students can increase the likelihood of that success for themselves.

GENERAL REFERENCES

- Alpert R. and Haber R. Anxiety on academic achievement situations, J. Ab. and Soc. Psychol., 1960, 61; 207-215.
- Ambrosino S. and DelFonte T. A psychoeducational study of the hyperkinetic syndrome. Psychosomatics 14; 207-213; 1973.
- Ames L., Metraux R., Walker R. Adolescent Rorschach Responses, London, Brunner/Maxel, 1971.
- Anderson W. The relative effects of the Frostig program, corrective reading instruction, and attention upon the reading skills of corrective readers with visual perceptual difficulties, J. of School Psychol., 1977, 10; 387-395.
- Andrews G.R. and Debus R. Persistence and the causal perception of failure, J. of Educ. Psychol., 1978, 70:2; 154-166.
- Ashlock P. and Stephen A. Educational Therapy in the Elementary School, Springfield, Thomas & Co., 1966.
- Ausebel D. The effects of cultural deprivation on learning patterns in Webster S., The Disadvantaged Learner, San Francisco, Chandler Publ., 1966; 251-257.
- Axelrod S., Hall R., Weis L., Rohrer S. Use of self-imposed contingencies to reduce the frequency of smoking behavior, in Mahoney M. and Thoreson C. Self-Control: Power to the Person, Monterey, Brookes-Cole, 1974.
- Azrin N.A., Flores T. & Kaplan S. Job-finding club: a group assisted program for obtaining employment, Behav. Res. & Therap., 1975, 13, 17-27.
- Barsch R. Achieving perceptual-motor efficiency, Seattle, Special Child Publications, 1967.
- Bateman B. Learning disabilities, yesterday, today and tomorrow. Exceptional Child; 1964, 31; 167-176.
- Bateman B. An educator's view of a diagnostic approach to learning disorders, in J. Hellmich, (ed.), Learning Disorders, Seattle, Special Child Publications, 1965.
- Bateman B. Learning disabilities; an overview., J. of School Psychol., 1965, 3; 1-12.

- Bauman M. and Straughon J. GSR as a function of anxiety, stress and sex, Psychol. Rec. 1969, 19; 339-344.
- Beck A. Cognitive therapy: native and relative to behavior therapy, Behav. Therapy, 1970, 1: 184-200.
- Beck A. Cognitive Therapy and Emotional Disorders, N.Y., International Universities Press, 1976.
- Belmont L. and Birch H. Lateral dominance, lateral awareness and reading disability, Child Develop., 1965, 36; 57-91.
- Berman A. and Seegal A.W. Adaptive and learning skills in juvenile delinquents: a neuro-psychological analysis, J. of Learning Disab., 1976, 9: 583-590.
- Benson J. and Kennedy K. Learned Helplessness. The result of uncontrollable reinforcements or uncontrollable aversive stimuli. J. Person Soc. Psychol., 1976, 34; 138-145.
- Black F.W. Self concept as related to achievement and age in learning disabled children, Child Develop., 1975, 45; 1137-1140.
- Bluhm D. Discrimination reaction as a function of incentive related anxiety, Percept Motor Skills, 1965, 20; 131-134.
- Boches B. and Myklebust H. A neurological and behavioral study of children with learning disorders, Neurology, 1964, 14; 1.
- Boucher F. Les tests d'intelligence de l'avenir à compter de maintenant - Les Cahiers du Psychologue Quebecois, 1:7; 1979a
- Boucher F. L'Enquete sur les tests suscite des réactions, Les Cahiers du Psychologue Quebecois, 1:8; 1979b; 18-23; p. 12
- Bradshaw G. and Gaudry E. The effects of a single experience of success or failure on test anxiety, Austr. J. of Psychol., 1968, 20; 219-223. As cited in Gaudry E. and Spielberger C., 1971, op cit.
- Brandt K. and Fenz D. Specificity in verbal and physiological indicants of anxiety, Percept. Motor Skills, 1969, 29, 663-675.
- Brickman P., Linsenmeier J., McCareins A. Performance enhancement by relevant success and irrelevant failure, J. Person Soc. Psychol., 1976, 33:2; 149-160.

- Brod N. and Hamilton D. Binocularity and reading. J. of Learn. Disab., 1973, 6: 47-49.
- Burr K., McDowell R. Comparison of learning disabled and emotionally disturbed children on three deviant classroom behaviors. Exceptional Children, 1972, 39: 60-62.
- Callaghan R. Digit span and anxiety, Amer. J. Ment. Def., 1957, 61: 581-582.
- Camp B. Verbal mediation in young aggressive boys, Unpub. monog., U. of Colorado School of Medicine, 1975; as cited in D. Meichenbaum Cognitive Behavior Modifications, N.Y., Plenum, 1977.
- Castenada B., McCandless R. and Palermo D. The children's form of the manifest anxiety scale, Child Develop, 1956, 27: 317-326.
- Clements S. Minimal Brain Dysfunction in Children, Washington, D.C. symp. cosponsored by the Easter Seal Research Foundation of the National Society for Crippled Children and Adults and the National Institute of Neurological Diseases and Blindness, Public Health Service; 1966 as cited in Myers P. and Hammill D., 1969, op cit.
- Coleman J. and Sandhu M. A descriptive relational study of 364 children referred to a university clinic for learning disorders. Psychol Reports, 1967, 20: 1091-1105.
- Coleman J. and Rasaff B. Intellectual factors in learning disorders, Perceptual & Motor Skills, 1963, 63: 139-152, as quoted in J. Sattler, Assessment of Children's Intelligence, Phila, W. Saunders Co., 1974.
- Collins J.E. The Effects of Remedial Education, Oliver and Boyd, Edinburgh, 1961.
- Conant, J.B. The American High School Today, N.Y., McGraw-Hill, 1959.
- Coulson D. Computerized information storage and retrieval in a social service agency, report to Juvenile Court Citizens Committee, Pointe Claire; May, 1979.

- Cowen E., Zax M., Kelin R., Izzo L. and Trast M. The relation of anxiety in school children to school record, achievement and behavioral measures, Child Develop., 1965, 36; 685-695.
- Cox F. Correlates of general and test anxiety in children, Austr. J. Psychol., 1960, 12; 169-177, as cited in Gaudry E. and Spielberger C., 1971, op cit.
- Crandall V.C., Katkovsky W. and Crandall V.J. Children's beliefs in their own control of reinforcements in intellectual-academic achievement situations. Child Develop, 36; 1965, 91-109.
- Crandall V. Sex differences in expectancy of intellectual and academic reinforcement, in Smith C., (ed.), Achievement-Related Motives in Children, Russel Sage, N.Y., 1969, Chap. II; 11-46.
- Curr W. and Gourlay N. An experimental evaluation of remedial education, Brit. J. of Educ. Psychol., 1953, 23, 45-55.
- Deffenbacher J. Worry, emotionality and task-generated interference in test anxiety; an empirical test of attentional theory, J. of Educ. Psychol., 1978, 70:2; 248-254.
- DeHirsch, K. Gestalt Psychology as applied to language disturbances. J. of Nervous and Mental Disease, 1954, 120; 257-261.
- DeHirsch K., Jansky L. and Langford W. Predicting Reading Failure, N.Y. Harper & Row, 1966.
- DeLacey P.R., Nurcombe B., Taylor L. and Moffitt R. Effects of enrichment pre-schooling: an Australian follow-up study. Excep. Children, 1973, 40; 171-176
- Denny D. The effects of exemplary and cognitive models and self-rehearsal on children's interrogative strategies, J. of Exper. Child Psychol., 1975, 19; 476-488.
- Diener C. and Dweck C. An analysis of learned helplessness; continuous changes in performance, strategy and achievement cognitions following failure, J. Person Soc. Psychol., 1978 36:5; 451-461.
- DiLoreto A. Comparative Psychotherapy, an experimental analysis. Chicago, Aldene-Atherton, 1971.

- Doehring D.G. Patterns of Impairment in Specific Reading Disability, Bloomington, Indiana University Press, 1968.
- Doehring D.G. and Hoshko I. Classification of reading problems by the Q-technique of factor analysis, Cortex, 1977, 13; 281-294.
- Dollard J. and Miller N. Personality and Psychopathology, N.Y. McGraw Hill, 1950.
- Douglas V. Stop, Look and Listen, Can. J. of Behav. Science, 1972, 4: 259-282.
- Douglas V. and Peters K. Toward a clearer definition of the attentional deficit of hyperactive children in G. Hall and M. Lewis (eds) Attention and the Development of Cognitive Skills, N.Y., Plenum (in press), 1979.
- Duffy E. An explanation of "emotional" phenomena without the use of the concept, "emotion", J. General Psychol., 1941, 25; 283-293, as cited in Izzard C. Human Emotions, N.Y., Plenum, 1977.
- Duffy E. Activation and Behavior, N.Y., Wiley, 1962.
- Dunn J. The approach avoidance paradigm as a model for the analysis of school anxiety, J. of Educ. Psychol., 1968, 59:6; 388-394
- Dweck C. and Reppucci N. Learned helplessness and reinforcement responsibility in children, J. Person Soc. Psychol., 1973, 25; 109-116.
- Dweck C. The role of expectations and attributions in the alleviation of learned helplessness, J. Person Soc. Psychol., 1975, 31:4, 674-685.
- Dykman R., Ackerman P., Clements S. and Peters J. Specific language disabilities: an attentional deficit syndrome, in H. Myklebust, Progress in Learning Disabilities, Vol. II, 1971, 56-93.
- Eames T. A comparison of the ocular characteristics of unselected and reading disability groups. J. Educ. Res., 1932, 25, 211-215, as cited in Lawson L., 1967, op cit.

- Eglund B. Influence of examiner and examinee anxiety on WISC performance, Psychol. Rep., 1967, 21; 409-414.
- Ellis A. Reason and Emotion in Psychotherapy, N.Y., Stuart, 1962.
- Ellis A. Growth Through Reason, Science and Behavioral Books, Palo Alto, 1971.
- Endler N. A person-situation interaction model for anxiety in C. Spielberger and I. Sarason (eds.) Stress and Anxiety, 1975.
- Englemann S. The diagnosis and remediation of depletion: a task-analysis approach, presented at Quebec Assoc. for Children with Learning Disabilities conference; Montreal, March, 1979.
- Eriksen E. Childhood and Society, N.Y., Norton, 1950.
- Farber E., Spence K. Effects of anxiety, stress, and task variables on reaction time, J. Person, 1953, 23; 1-18, as cited in Gaudry E. and Spielberger, 1971, op cit.
- Farrell M., Derevensky J., Coates C., Hymovitch J., Stoloff D. and Zlotowski M. Personal, family and school factors affecting the successful achievement of elementary inner city children: some preliminary results, presented at Can. Ed. Res. Assoc. conference, New Brunswick, June, 1977.
- Farrell M. and Derevensky J. Self concept and academic achievement in Canadian inner-city children, presented at Can. Ed. Res. Assoc. conference, Ontario, 1978.
- Feld S. Longitudinal study of the origins of achievement strivings, J. Person Soc. Psychol., 1967, 7; 408-414.
- Feld S., Owen W., Sarason S. Interviews with parents of anxious and defensive young boys. Unpub. mans. N.I.M.H., 1963, as cited in Smith C., 1969, op cit.
- Feldheusen J. and Klausmeier H. Anxiety, intelligence and achievement in children of low, average, and high intelligence, Child Develop., 1962, 32; 403-409.
- Fendrich P. Visual characteristics of poor readers. Teach Call. Cont. Educ., 1935, 656, 54, as cited in Lawson L., 1967, op cit.

- Fenz W. and Epstein S. Manifest anxiety: unifactorial or multifactorial composition, Percept. Motor Skills, 1965, 20; 773-780.
- Ferster C. A functional analysis of depression. Amer. Psychologist, 1973, 28; 857-870.
- Finegold B.F. Why your child is Hyperactive, N.Y., Random House, 1975.
- Follow-up Study; Adolescent Program; unpublished report, McGill-Montreal Children's Hospital Learning Centre, 1973.
- Frostig M. Visual Perception in the brain-injured child, Amer. J. of Orthopsychiat., 1963, 33, 665-667.
- Frostig M., Lefever D. and Whittlesey J. The Marianne Frostig Test of visual perception, Palo Alto, Consult. Psychol. Press, 1964.
- Gagné R. and Briggs L. Principles of Instructional Design, 1974, as quoted in Meichenbaum D., 1977, op cit.
- Gaudry E. Parameters of learning curves, unpub. doct. disst., U. of Melbourne, 1967, as cited in Gaudry E. and Spielberger C. Anxiety and Educational Achievement, Australia, Wiley, 1971.
- Gaudry E. and Fitzgerald D. test anxiety, intelligence and academic achievement, in Gaudry E. and Spielberger C. Anxiety and Educational Achievement, Australia, Wiley, 1971, Chap. 20; 155-162.
- Gaudry E. and Bradshaw G. The differential effect of anxiety on performance in progression and terminal school examinations, Austr. J. Psychol., 1970, 22, 1-4; as quoted in Gaudry E. and Spielberger C., 1971, op cit.
- Gaudry E. and Spielberger C. Anxiety and Educational Achievement, Australia, Wiley & Sons, 1971.
- Gerber J. Psychological distances in the family as schematized by families of normal disturbed and learning problem children. J. Consult and Clinic. Psychol., 1973, 40; 139-147.
- Getman G.N. Visual success in reading success, J. of Calif. Optometric Assoc., 1961, 29:5; 1-4, cited in Myers P. and Hammill D., Methods for Learning Disorders, Can. Wiley, 1969.

- Gillingham A. and Stillman B. Remedial Training for Children with Specific Disability in Reading, Spelling & Penmanship. Cambridge, Educators Publ., 1965.
- Gjesme T. Sex differences in the relationship between test anxiety and school performance, Psych-Rep., 1972, 30; 907-914.
- Goldfried M. Systematic desensitization as training in self-control. J. Consult. and Clinic. Psychol., 1971, 37; 228-237.
- Goldfried M. and Trier C. Effectiveness of relaxation as an active coping skill, J. of Abnorm. Psychol., 1974, 83:4; 348-355.
- Goldfried M., Linehan M. and Smith J. Reduction of test anxiety through cognitive restructuring, J. Consult. and Clinic. Psychol., 1978, 46:1; 32-39.
- Goldsmith J. & McFall R. Development and evaluation of an interpersonal skill-training program for psychiatric in-patients, J. of Abnorm. Psychol., 84:1; 1975; 51-58.
- Goldstein K. After Effects of Brain injuries in War, N.Y., Grune & Stratton, 1942.
- Goldstein K. Human Nature in the Light of Psychopathology, N.Y., Schochen, 1963.
- Golick M. Language disorders in children: a linguistic investigation, unpublished Phd. dissert., McGill University, 1977.
- Goodman P. New Reformation: Notes of a Neolithic Conservative, N.Y., Random House, 1970.
- Gottlieb H., Strite L., Kellar R. and Hockersmith V. A cognitive-social learning model as applied to the rehabilitation of the chronic low back pain patient; presented at APA convention, 1975, as cited in D. Meichenbaum, Cognitive Behavior Modification, N.Y., Plenum, 1971.
- Gottzman R., Belmont I., Komener R. Admission and follow-up status of reading disabled children referred in a medical clinic, J. of Learn. Disab., 1975, 8.
- Greene R. Modification of smoking behavior by free operant conditioning methods, Psychol. Rec., 1964, 14; 171-178.
- Gray S.W. and Klaus R.A. An experimental pre-school program for culturally deprived children, Child Develop., 1965, 30; 887-898.

- Hall G.S. Adolescence, N.Y., Appleton, 1904.
- Hall S. Self control and therapist control in the behavioral treatment of overweight women, Behav. Res. and Therapy, 1972, 10; 59-68.
- Hallohan J., Gojar A., Cohen S., Tarver S. The learning disabled as an inactive learner, J. of Learn. Disab., 1978, 11:4; 231-236.
- Hallworth H. Anxiety in secondary modern and grammar school children, Brit. J. of Educ. Psychol., 1961, 31; 281-291.
- Hamburg B. Early adolescence: a specific and stressful stage of the life cycle, Chap. VI in Coelho G., Hamburg D. and Adams J., Coping and Adaptation Basic Books, N.Y., 1974, 101-124.
- Hammill D. and Larsen S. The effectiveness of psycholinguistic training, Except. Children, 1974, 41; 5-14.
- Haring N. and Phillip E. Educating Emotionally Disturbed Children, N.Y., McGraw-Hill, 1962.
- Harlow H. The formation of learning sets. Psychol. Rev., 1949, 56; 51-65.
- Hebb D. Drive and the CNS (conceptual nervous system), Psychol. Rev., 1955, 62; 243-255.
- Hebb D. A Textbook of Psychology, London, Saunders, 1958.
- Hill K. and Sarason S. The relation of test anxiety and defensiveness to test and school performance over the elementary school years; a further longitudinal study, Monog: Soc. Res. Child Develop., 1966, #104; 31:2.
- Hinshelwood J. Two cases of hereditary congenital word blindness, Brit. Med. J., 1911, 1, 608., as cited in Lawson, L. ophthalmological factors in learning disabilities, in H. Myklebust, Progress in Learning Disabilities, Vol. I, N.Y., Grune & Stratton, 1967; p. 147-181.
- Hinshelwood J. Congenital Word Blindness, London: Lewis, 1917, as cited in Jordon T. and Cegelka, (eds.) Exceptional Children, N.Y., M.S.S., 1972.

- Hiroto D. & Seligman M. Generality of learned helplessness in man, J. Person. Soc. Psychol., 1975, 31, 311-324.
- Hodges W., Spielberger C. The effects of threat of shock on heart rate for subjects who differ in manifest anxiety and fear of shock. Psychopathology, 1966, 2; 287-294, as quoted in Gaudry E. & Spielberger C., 1971, op cit.
- Hops H. Initial investigations into academic survival skill training, direct instruction and first grade achievement, J. of Educ. Psychol., 1974, 66:4; 549
- Hunt H. McV. Intelligence and Experience, N.Y., Ronald, 1961.
- Hussian K. and Lawrence P. The reduction of test, state and trait anxiety by test specific and generalized stress inoculation training. Cog. Therap. and Res., 1978, 2:1; 25-38.
- Illich I. Deschooling Society, N.Y., Harper & Row, 1970.
- Jensen A. Educational Difference, London, Methuen, 1973.
- John E., Karmel B., Corning W., Easton P., Brown D., Ahn H., John M., Harmony T., Prichip L., Toro A., Gercon I., Bartlett F., Thatcher R., Kage H., Valdes P., Schwartz E. Neurometrics, Science, 1977, 196:4297; 1393-1409.
- Johnson D.V. and Myklebust H.R. Learning Disabilities: Educational Principles and Practices, N.Y., Grune & Stratton, 1967.
- Johnson P. Children with learning disabilities: a 10 year follow-up study, address given at 1979 Intern. Conf., Assoc. for Children with Learn. Disab., San Francisco, February, 1979.
- Karnes M.B., Toska J.A. and Hodgins A.S. The effects of four programs of classroom intervention on the intellectual and language development of four year old disadvantaged children, Amer. J. of Orthopsychiatry, 1970, 40, 58-76.
- Kazdin A. The effect of suggestion and pretesting on avoidance reduction in fearful subjects. J. Beh. Therap. and Exp. Psychiatry, 1973, 4; 213-221.

- Kazdin A.E. Effects of covert modeling and modeling reinforcement on assertive behavior, J. of Abnorm. Psychol., 1974, 83; 240-252(a)
- Kazdin A.E. Effects of covert modeling, multiple models, and model reinforcement on assertive behavior. Behav. Therapy, 1976, 7; 211-222.
- Keller E. and Rawley V. The relations among anxiety, intelligence and scholastic achievement in junior high children, J. Educ. Res., 1964, 58:4; 167-170.
- Kendall P. Anxiety: states, traits - situations? J. Consult. and Clinic. Psychol., 1978, 46; 280-287.
- Kendall P. On the efficacious use of verbal self-instruction procedures with children, Cog. Therap. & Res., 1:4; 1977, 331-341.
- Kennedy W. & Willcutt H. Praise and blame as incentives, Psychol. Bull., 1964, 62; 323-332.
- Kephardt N. The Slow Learner in the Classroom, Columbus, Merrill, 1960.
- Kerrick J. The effects of manifest anxiety and I.Q. in discrimination, J. Ab. and Soc. Psychol., 1956, 52; 136-139.
- Kinsbourne M. Cerebral dominance, learning and cognition, in H. Myklebust (ed.) Progress in Learning Disabilities; Vol. III, N.Y., Grune & Stratton, 1975., 201-218.
- Kirk S.A. and Bateman B. Diagnosis and remediation of learning disabilities, Excep. Children, 1962, 29, 73-78.
- Kliman G. Psychological Emergencies of Children, N.Y., Grune & Stratton, 1968.
- Klinger E. Consequences of commitment to and disengagement from incentives, Psychol. Rev., 1975, 82; 1-25.
- Klinger E., Barta S., Kemble E. Cyclic activity changes during extinction in rats: A potential model of depression, Animal Learning and Behavior, 1974, 2; 313-316.

- Knight J. Anxiety, study problems, and achievement. The Personnel and Guidance J., 1964, 43; 45-46; in Child Develop. Abst., 33; 1959-1960.
- Lawson L. Ophthalmological factors in learning disabilities, in H. Myklebust, Progress in Learning Disabilities, Vol I, N.Y., Grune & Stratton, 1967, 147-181.
- Lewinsohn P., Weinstein M. & Shaw D. Depression: a clinical-research approach. In R. Rubin & C. Franke (eds.) Advances in Behavior Therapy, N.Y., Academic Press, 1969.
- Linden W. Practicing of meditation by school children and their levels of field dependence-independence, test anxiety and reading achievement, J. Consult. and Clinic. Psychol., 1973, 41; 139-143.
- Lindsley D. Emotion in S. Stevens (ed.) Handbook of Experimental Psychology, N.Y., Wiley, 1951, 473-516.
- Lipman R. Effect of anxiety level on concept formation, Amer. J. of Ment. Def., 1960, 65; 342-348.
- Lovell K., Johnson E. and Platt D. A summary of a study of the reading age of children who have been given remedial teaching, Brit. J. of Educ. Psychol., 1962, 32; 66-77.
- Lunneborg P. Relations among social desirability, achievement and anxiety measures in children, Child Develop., 1964, 35; 169-182.
- Luria A. Cognitive Development, Cambridge, Harvard University Press, 1976.
- Mahoney M.J. The self management of covert behavior, Behav. Therap., 1971, 2; 575-578.
- Mahoney M.J. Cognition and Behavior Modification, Cambridge, Ballinger, 1974.
- Mahoney M.J., Moura N., and Wade T. The relative efficacy of self reward, self punishment, and self monitoring techniques for weight loss, J. Consult. and Clinic. Psychol., 1973, 41; 65-69.

- Marmor J. The psychodynamics of realistic worry, Psychoanalysis and Social Science, 1958, 5; 155-163, as cited in D. Meichenbaum, Cognitive Behavior Modification, N.Y., Plenum, 1977.
- Marlow P. Social and vocational adjustment of young adults who, as children, experienced a developmental remedial program for learning disabilities, address given at 1979 Intern. Conf., Assoc. for Children with Learn. Disab., San Francisco, February, 1979.
- Maston C. The school counsellor as collaborative consultant; a program for counselling and teaching in the secondary school classroom, Adolescence IX: 33, 1974.
- Matyniak K. Effects of thirst motivation on the distribution of attention, Unpub. Sr. Hons. Res., Wayne U., 1963; as quoted in Solley C., Effects of stress on perceptual attention, Chap. I in Rourke B. (ed.), Explorations in the Psychology of Stress and Attention, Canada, Longmans, 1969.
- Malmo R. Activation: a neuro-psychological dimension. Psychol. Rev., 1959, 66; 367-386.
- Malmo R. Experimental approach to the symptom mechanisms in psychiatric patients, Psychiat. Res. Reports, 1959, 7, as in Fischer W., Theories of Anxiety, N.Y., Harper, 1970.
- McCandless B., Castenada A., and Palermo D. Anxiety in children and school starters. Child Develop., 1956, 27; 385-391.
- McClelland D., Atkinson J., Clark R. and Lowell E. The Achievement Motive, N.Y., Appleton, 1953.
- McDaniel G. Research strategies for L.D. children, presented at ACLD conference, San Francisco, February, 1979.
- McFall R.M. and Marston R.R. An experimental investigation of behavior rehearsal in assertive training, J. of Abnorm. Psychol., 1970, 76; 295-303.

- McFall R.M. and Lillesand D.B. Behavior rehearsal with modeling and coaching in assertive training, J. of Abnorm Psychol., 1971, 77; 313-323.
- McFall R.M. and Twentyman C.T. Four experiments in the relative contributions of rehearsal, modeling, and coaching to assertive training, J. of Abnorm. Psychol., 1973, 31; 199-218.
- McNamara H. Distribution of incidental attention during learning under stress. Unpub. study, Meniger Foundation, 1961, as quoted in Solley C., 1969, op cit.
- Meichenbaum D. Examination of model characteristics in reducing avoidance behavior, J. Person. Soc. Psychol., 1971, 17; 298-307.
- Meichenbaum D. Self instructional methods. In Kanfer and Goldstein A. (eds.) Helping People Change, N.Y., Pergamon, 1974.
- Meichenbaum D. Cognitive modification of test-anxious college students, J. Consult. and Clinic. Psychol., 1972, 39:3; 370-380.
- Meichenbaum D. Cognitive factors as determinants of learning disabilities; presented at NATO conf. on The Neuropsychology of Learning Disorders, Denmark, June 1975.
- Meichenbaum D. Cognitive Behavior Modification, N.Y., Plenum, 1977.
- Meichenbaum D. and Goodman J. Reflection, impulsivity and verbal control of motor behavior. Child Develop., 1969, 40; 785-797.
- Meichenbaum D., Goodman J. Training impulsive children to talk to themselves: a means for developing self-control, J. of Abnorm. Psychol., 1971, 75; 115-126.
- Meichenbaum D. and Cameron R. Stress inoculation: A skills

- training approach to anxiety management, Unpub. manuscript, U. of Waterloo, 1972(b)
- Meikle S. and Kilpatrick D. Changes in perceptual motor and reading test scores in a remedial reading group. The Canadian Psychol., 1971, 12; 254-269.
- Messer S. The effect of anxiety over intellectual performance on reflection-impulsivity in children, Child Develop., 1976, 41; 723-735.
- Millen L. The relationship between self concept, social desirability and anxiety in children, unpub. MSc. Thesis, Penn State U., 1966, as cited in Piers E., The Piers-Harris Children's Self Concept Scale, Counselor Recordings Tests, Nashville, 1969.
- Miller R., Brickman P. and Bolen D. Attribution vs persuasion as a means for modifying behavior, J. Person. Soc. Psychol., 1975, 31; 430-441.
- Minkin N., Braukmann C., Minkin B., Timkus G., Timkus B., Fixen D., Phillips E. and Wolff M. The social validation and training of conversational skills, J. Appl. Beh. Anal., 9:2; 127-139.
- Montague E. The role of anxiety in serial rote learning, J. Exp. Psychol., 1953, 45; 91-98, as quoted in Gaudry E. & Spielberger C., 1971, op cit.
- Montague D. Arithmetic concepts of kindergarten children in contrasting socio-economic areas, Elem. School J., April, 1964.
- Morgan W.A. A case of congenital word-blindness, Brit. Med. J., 1896, 2:1378, an H.R. Myklebust (ed.) Progress in Learning Disabilities, Vol. 4, N.Y., Grune & Stratton, 1979.
- Moss H. Comments in Smith C. (ed.), Achievement-Related Motives in Children, N.Y., Russel Sage, 1969; 213-219.
- Moss H. and Kagan J. The stability of achievement and recognition seeking behavior from childhood to adulthood. J. Ab. and Soc. Psychol., 1961, 62; 543-552.

- Murphy L. and Moriarty A. Vulnerability, Coping and Growth, New Haven, Yale Univ. Press, 1976.
- Myklebust H. Development and disorders of written language, N.Y., Grune & Stratton, 1965.
- Myklebust H. Learning Disabilities definition and overview in H.R. Myklebust (ed) Progress in Learning Disabilities, Vol I. N.Y., Grune & Stratton, 1968.
- Muehl S. and Forell E. A follow-up study of disabled readers-variables related to high school reading performance, Reading Research Quarterly, 1973, 9; 110-123.
- Nichols J. Congenital dyslexia, Canad. Med. Assoc. J., 1960, 82, 575, as cited in Lawson, L., op cit.
- Nichols J. An approach to the development of achievement motivation. Invited address at the meeting of the New Zealand Psychological Society, Wellington, Aug. 1975, as cited in Nichols, J., 1976, op cit.
- Nichols J. When a scale measures more than its name denotes: the case of the test anxiety scale for children. J. Consult. and Clinic. Psychol., 1976, 44:6; 976-985.
- Novaco R. Anger control: The development and evaluation of an experimental treatment, Heath, Lexington, 1975.
- Odier C. Anxiety and Magical Thinking, N.Y., Int. Univ. Press, 1956; as quoted in Sarason S., 1960, op cit.
- O'Donnell P. The effects of Delacato training on reading achievement and visual-motor integration, Disst. Ab. Inter., 1969, 30, 1079-1080, as cited in Ross A., 1976, op cit.
- O'Shaughnessy R. The language of teacher decision making in individualizing instruction, unpub. MA thesis, McGill Univ., 1976.
- Orton S. Specific reading disability, strephosymbolia, J. Amer. Med. Assoc., 1928, 90; 1095-1099, as cited in Lawson L., op cit.
- Orton S. Reading, Writing and Speech problems in Children, N.Y., W. Norton, 1937.

- Orton S. Visual functions in strephosymbolia, in Lawson, L., 1967, op cit.
- Owen F., Adams P., Forrest T., Stalz L. and Fisher S. Learning disorders in children, sibling studies, Monog of the Soc. for Res. in Child Develop., 1971, 36.
- Painter G. The effect of a perceptual and sensory motor training program on perceptual and motor spatial abilities of kindergarten children. Except. Children, 1966, 33, 113-119.
- Pelham W. and Ross A.O. Selective attention in children with reading problems, J. of Abnorm. Child Psychol., 1977, 5:1; 1-8.
- Penick S., Fillion R., Fox S., Stunkard A. Behavior Modification in the Treatment of Obesity, Psychosom. Med., 1971, 33; 49-55.
- Phillips B. An analysis of causes of anxiety among children in school. US of Ed., Proj. #2616, U. of Texas, Austin, 1966.
- Piers E. The Piers-Harris Children's Self Concept Scale, Nashville, Counselor Recordings and Tests, 1969.
- Pihl R.O. Learning disabilities; intervention programs in the schools, in H.R. Myklebust, 1975, Progress in Learning Disabilities, Vol. III, N.Y., Grune & Stratton, 1975; 19-48.
- Pihl R.O. and Parkes M. Hair element content in learning disabled children, Science, 1977, 198; 204-206.
- Pihl R.O., Parkes M., and Stevens R. Non-specific intervention with learning disabled individuals, paper presented at NATO conf. on Rehabilitation, Treatment and Management of Learning Disabilities, Quebec, June 1978.
- Platt J., Spivack G., Altman D. and Peizer S. Adolescent problem solving thinking, J. Consult. and Clinic. Psychol., 1974, 42; 787-793.
- Postman N. & Weingartner C. Teaching as a Subversive Activity, N.Y., Delacarte Press, 1969.
- Ramos A., Schwartz E., John E.R. Long term recording from cortical and sub-cortical neurons in untrained cats, Physiology and Behavior, 1976, 16:6; 803-806.

- Ridberg E., Parke R., and Hetherington E., Modification of impulsive and reflective cognitive styles through observation of film mediated models, Develop. Psychol., 1971, 5, 369-377.
- Robbins L. The accuracy of parental recall of aspects of child development and of child rearing practices. J. Ab. and Soc. Psychol., 1963, 66; 261-270.
- Robbins M. Neurological organization and reading, Read. Res. Quart, 1966, 2, 57-58.
- Rosen B. and D'Andrade R. The psychosocial origins or achievement motivation, Sociometry, 1959, 22, 185-218.
- Rosner J. Screening for perceptual disfunction, J. of Amer. Optometric Assoc., 1970, 4, 858-866.
- Rosner J. Helping children overcome Learning Difficulties, N.Y., Walker Co., 1975.
- Ross A. Psychological Aspects of Learning Disabilities and Read-in Disorders, N.Y., McGraw-Hill, 1976.
- Rotter J.B., Liverant S. and Crowne D. The growth and extinction of expectancies in chance controlled and skilled tests, J. of Psychol., 1961, 52, 161-177.
- Rotter J. Generalized expectancies for internal versus external control of reinforcement, Psych. Monograph, 1966, 80.
- Rourke B. and Orr R. Prediction of the reading and spelling performances of normal and retarded readers: a four year follow-up, J. of Abnorm. Child Psychol., 1977, 5:1; 9-20.
- Rourke B. and Finlayson M.A. Neuropsychological significance of variations in patterns of academic performance: Verbal and visual-spatial abilities. J. of Abnorm. Child Psychol., 1978, 6:1; 121-133.
- Rourke B. and Czudner G. Age difference in auditory reaction time of "brain damaged" and normal children under regular and irregular preparatory interval conditions, J. of Experiment, Child Psychol., 1972, 74; 372-378, as cited in Ross A., 1976, op cit.
- Rourke B.P. Issues in the neuropsychological assessment of children with learning disabilities, Can. Psychol. Rev., 1976a, 17; 89-102.

- Rourke B.P. Reading retardation in children: Developmental lag or deficit? in R. Knights & D. Baker (eds.) Neuropsychology of Learning Disorders, Baltimore, Univ. Park Press, 1976b.
- Rourke B. Brain-behavior relationships in children with learning disabilities. Amer. Psychol., 1975, 30; 911-920.
- Ruebush B. Interfering and facilitating effects of test anxiety, J. Ab. and Soc. Psychol., 1960, 60:2; 205-206.
- Safer D. and Allen R. Hyperactive Children: Diagnosis and Management, Baltimore, Univ. Park Press, 1976.
- Sarason S., Davidson K., Lighthall F., Waite R., and Ruebush B. Anxiety in Elementary School Children, N.Y., Wiley, 1960.
- Sarason I. Test anxiety and intellectual performance, J. Ab. and Soc. Psychol., 1963, 66:1, 73-75.
- Sarason I. Test anxiety and cognitive modeling, J. Person. Soc. Psychol., 1973, 28; 58-61.
- Sarvis M. Evil self image. Mental Hygiene, 1965, 49; 308-310.
- Sattler J. Assessment of Children's Intelligence, Phila., Saunders, 1974.
- Satz P. and Friel J. Some predictive antecedents of specific reading disability: a preliminary two year follow-up, J. of Learn. Disab., 1974, 7, 437-444.
- Satz P., Rardin D., and Ross J. An evaluation of a theory of specific developmental dyslexia. Child Develop., 1977, 42; 2009-2021.
- Schactel E. Metamorphosis, Basic Books, N.Y., 1959, as quoted in Fischer W. Theories of Anxiety, N.Y., Harper Row, 1970.
- Seligman M.E.P. Helplessness: on Depression, Development and Death, San Francisco, Freeman, 1975.
- Seligman M.E.P., & Maier S. Failure to escape traumatic shock, J. of Exper. Psychol., 1967, 74; 1-9.
- Seligman M.E.P., Maier S. and Geer J. The alleviation of learned helplessness in the dog. J. of Abnorm. Psychol., 1968, 73; 256-262.
- Shore B. Information for individualizing instruction by elementary and high school teachers, Bull. Can. Soc. for Study of Educ., 2:6; 1975.

- Sieber J. and Kameya L. The relationship between anxiety and children's need for memory supports in problem-solving. Res. Memor. #11., Stanf. Center For Res. & Dev. in Teaching, Stanford, 1967, quoted in Gaudry E. & Spielberger C., 1971, op cit.
- Silverberg N., Iverson M., and Goins J. Which remedial reading method works best? J. of Learning Disabilities, 1973, 6, 547-556.
- Sinclair K. The influence of anxiety on several measures of classroom performance. Austr. J. Educ., 1969, 13; 296-307, as quoted in Gaudry E. & Spielberger C., 1971, op cit.
- Smith C. Achievement Related Motives in Children, Russell Sage, N.Y. 1969.
- Solley C. Effects of stress on perceptual attention in Rourke B., Explorations in the Psychology of Stress and Anxiety, Longmans, Canada, 1969, Chap. I.
- Spence K. A theory of emotionally based drive (D) and its relation to performance in simple learning situations, Amer. Psychol., 1958, 13; 131-141.
- Spiegler M., Cooley E., Marshall G., Prince H., Puckett S. and Slenazy J. A self-control vs. a counter-conditioning paradigm for systematic desensitization. J. of Counselling Psychol., 1976, 23, 83-86.
- Spielberger C. The effects of anxiety on complex learning and academic achievement in Spielberger C. (ed.), Anxiety and Behavior, N.Y., Academic Press, 1966.
- Spielberger C. and Gorsuch R. The development of the state-trait anxiety inventory in Spielberger C. & Gorsuch R. (eds.) Mediating Processes in Verbal Conditioning, U.S. Public Health Service, Wash., 1966.
- Spielberger C. and Smith L. Anxiety (drive), stress and serial position effects in serial-verbal learning. J. Exp. Psychol., 1966, 72; 589-595.

- Spielberger C. & Weitz H. Improving the academic performance of anxious college freshmen. Psych. Monog., 1964, 78, #13.
- Spielberger C., Lushene R. and McAdoo W. Theory and measurement of anxiety states in Catell R., Handbook of Modern Personality Theory, Chicago, Aldine, 1971.
- Spivack G. and Levine M. Self-Regulation in Acting Out and Normal Adolescents, Report #M4531, National Institute of Health, Washington, 1963.
- Spivack J., Platt J., Shure M. The Problem Solving Approach to Adjustment. Jossey-Bass, 1975.
- Spivack G., Platt J. and Shure M. The Problem-solving Approach to Adjustment, San Francisco, Jossey-Bass, 1976.
- Spivack J. and Shure M. Social Adjustment of Young Children: a cognitive approach to real life problems, San Francisco, Jossey-Bass, 1974.
- Stavrianos B. and Landsman S. Personality patterns of deficient readers with perceptual-motor problems. Psychology in the Schools, 1969, 2; 109-123.
- Steg J. and Rapoport J. Minor physical anomalies in normal, neurotic, learning disabled and severely disturbed children. J. of Autism and Childhood Schizophrenia, 1975, 5:4; 299-307.
- Stevens R. Helping Teenagers Learn, paper presented at C.E.C. conference, N.Y., April 1974.
- Strauss A. and Lehtinen L. Psychopathology and the education of the Brain-injured Child, N.Y., Grune & Stratton, 1947.
- Taylor J. A personality scale of manifest anxiety, J. Ab. and Soc. Psychol., 1953, 48: 285-290.
- Taylor S.E. Eye movement in reading Facts & Fallacies, Am. Educ. Res. J., 1965, 2; 187-202.
- Thomas A. and Chess S. Temperament and Development, N.Y. Brunner Mazel, 1977.
- Thoresen C. and Mahoney M. Behavioral Self-Control, N.Y., Holt, Rinehart and Winston, 1974.

- Tori C. and Worrell L. Reduction of human avoidant behavior, J. of Consult and Clinic. Psychol., 41:2; 1973; 269-278.
- Trexler L. and Karsh T. RET, placebo, and no treatment effects on public-speaking anxiety, J. of Abnorm. Psychol., 1972, 79; 60-67.
- U.S. Dept. of Health, Education and Welfare. Education of the Disadvantaged, Bull: #5-237-37073-68; 1970.
- Verma P. Effect of anxiety reinforcement and intelligence in learning a difficult task. J. of Exper. Child Psychol., 1976, 22; 302-308.
- Veroff J. Social comparison and the development of achievement motivation in Smith C. (ed.), 1969, op cit, Chap. III; 46-101.
- Veroff J., Goldsmith R. and Taylor L. Effects of achievement motivation and self esteem on generalization of children's preferences. USPHS Report, 1966, as quoted in Smith C. (ed.) 1969, op cit.
- Vernon P.E. Intelligence and cultural environment, London, Melthuen, 1969.
- Vygotsky L.S. Thought and Language, Cambridge, M.I.T. Press, 1962.
- Walter D., Denzler L., Sarason I. Anxiety and intellectual performance of high school students. Child Develop., 1964, 35; 917-926.
- Webster S. The Disadvantaged Learner, S.F., Chandler Publications, 1966.
- Wechsler D. Manual for the Wechsler Intelligence Scale for Children Revised, Psych. Corp., 1974.
- Wener A.E., Rehm L. Depressive Affect: a test of behavioral hypotheses, J. of Abnorm. Psychol., 1975, 84; 221-227.
- Wine J. Test anxiety and direction of attention, Psych. Bull., 1971, 76, 91-104.
- Witty P. and Kopel D. Heterophoria and reading disability,

- J. Educ. Psychol., 1936, 27; 222-230, as cited in Lawson L., 1967, op cit.
- Wofford J., Anthony C., Chang J. Direction services: a response to public law 94;142, presented at ACLD conference, San Francisco, February, 1979.
- Wolff S. Children Under Stress, London, Penguin Press, 1969.
- Wolpe J. Psychotherapy by Reciprocal Inhibition, Stanford Univ. Press, Palo Alto, 1958.
- Wright J.E. A comparison of systematic desensitization and social skill acquisition in the modification of social fear, Behav. Therapy, 1976, 7; 205-210.
- Wright P.G., Millelire B., Stevens R. The modification of distracting thoughts: a case study, submitted to J. of Learn. Disab., 1977.
- Wright P.G. Depression in normal subjects: predisposing cognitive factors and precipitating situations, unpub. Phd Dissert., McGill Univ., 1977.
- Young F. and Brown M. Effects of test anxiety and testing conditions on intelligence test scores of elementary school boys and girls, Psych Reports, 1973, 32; 643-649.

APPENDICES

APPENDIX A-1
COPING SKILLS COURSE I
Weekly Outline

1st Week

What is coping? making it, facing up to hassles

What are stresses? hassles? problems?

 generate examples: 1,2,3, etc.

 summarize, note commonalities

 introduce notion of sharing

How do they make you feel?

 examples (from above and other)

Homework: two kids collect a hassle and how they felt before,

 during and after.

 introduce notion of diaries

 agree on "pay off" or "forfeit"

2nd Week

Hear Homework

Review Coping, Hassle - Behaviour and Feelings

Introduce Donut  skill surrounded by distractors

Problem: What to do to get through surround

 Merely define problem here, discuss ways later

 Review behaviours and feelings.

Add Thoughts (as self-statements) Give examples -

Role Playing: review of a hassle, analyzed as Behaviours,

 thoughts and feelings.

Detective game

Homework - collect self-statements daily in diary.

Appendix A-1

3rd Week

Hear homework on self-statements - note "uppers" & "downers"

Discuss thoughts as self-statements

Role Playing - review of a hassle, analyzed as behaviour, thoughts, feelings (elicit examples)

Detective game - one describes "Scene", other questions to elicit behaviour, thoughts, feelings

Homework: How did I cope?

4th Week

Homework report on self-statements (note some are "uppers", others "downers")

Introduce replay - anyone can ask "replay" and elicit what is being said to oneself.

Role play (try with a student) one of the described hassles and negative self-statements (reviewing behaviour, thoughts and feelings).

What's keeping you in the surround (garbage)?

Changing "downers" ↓ to "uppers" ↑

Introduce - cutting a path through the garbage (by positive self-statements) 

Homework: Daily Diary

How did I Cope? - clear hassle, including behaviour, thoughts, feelings - before, during, after.

5th Week

Review: How to cut a path?

Positive self-statements

Collect homework (label uppers and downers)

Appendix A-1

Discuss controlling and changing behaviour

reducing stress by (increasing skill
(increasing knowledge of stress
(avoidance

controlling) thoughts as discussed, changing negative self-
changing) statements to positive self-statements

controlling) feelings
changing)

Introduce relaxation to control feelings - teach rationale, method

Play detective - "what/how" could you change?

Practice relaxing

Homework: daily diary - including behaviour, thoughts, feelings

Cite one good example: How did you cope?

Relaxation

6th Week

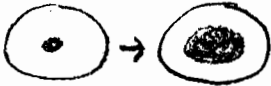
Collect homework - How did you cope? - role play if possible

Review behaviour, thoughts, feelings

Feelings as signals to cope

Review cutting a path - cool it?

psych yourself up?

Introduce  = Increasing skill, reduces anxiety

Practice relaxing (hands & arms - face, head, neck)

Homework - How did you cope? or cool it? - give examples

Relaxation

7th Week

Review all concepts

If you were telling a friend what we've learned, describe coping, hassle, negative/positive self-statements, anxiety, role of relaxation ("cooling it"), role of heightened feelings - signal to cope.

What do I need to know?

Appendix A-1

Play: What do I need to know?

e.g. John is supposed to meet his mother in town. Will he be late if he takes the 2:30 bus?

$$24 + = y + ?$$

China exports 2,000,000 worth annually? Is that more or less than Canada exports?

Relaxation Practice

Homework: continue diary

assignment sheet: What's the question and What are the answers?

or What do I need to know?

Relaxation

Wind-Up

5 min: Any hassle? Any solved problems

Review game: Pick a question (questions on all included concepts)

Review: Hard Problem Solving (3^o)

Do these steps always solve all the problem?

Review path from:

1. Garbage
2. Cutting path cool it
3. Increasing Skill

All knowing is cumulative i.e. therefore pay off for self control is staying on path to learning more

Feedback from kids on course: What worked?
What didn't?
Should we give it again?
If yes, how to make it better?

Appendix A-2

Structured Coping Skill Program

Day 1:

materials: mazes

Introduction: For the past three years, we've been looking at all Grade 7 students in this school commission to see how they learn. Our goal has been to make high school a more successful learning experience for all students. What we've learned has helped us to improve teaching methods and decrease school failures. The high school drop-out rate is now very low and each year more graduates go on to college. Now we want to see how high school can be more successful for all kids. You are part of a group of about 50 kids at several high schools chosen at random to meet daily for 2 weeks to try out some ways to be more successful. We will meet like this, two of you and me, every day, same place, same period - excused by teacher, principal - all parents have been notified of this Grade 7 survey. (certificate - show and promise). One of the things we'll be working on is figuring out what kinds of things here at St. Thomas might keep a student from learning as well as he or she can - from getting the best grades he/she can.

For instance, lots of kids would get better grades but they can't always remember everything they learned when it comes time to take the exam. They seem to get distracted by the exam itself. One of the ways to be more successful: Knowing how to continue work in spite of distractions.

Distractions - things that take one's mind off of work - called

Appendix A-2

stress, problems, hassles (give example of some incident that was stressful and interfered with your carrying on - e.g. having my car stall on St. Catherine Street in the middle of traffic - everyone honked - my heart started thumping - couldn't start the car).

We are not referring here to individual personal problems - we all have different problems - we hope to concentrate on common school-based problems on going through a normal day.

What was your last hassle? (see if each can come up with one)

(Ask) "Did it take your mind off what you were doing before?"

By the way - part of what we're going to do will involve sharing some of these experiences - some might be embarrassing - we have to be able to trust each other - so we have 2 rules for this time together.

1. Nothing said here is repeated outside (except to your Mom and Dad of course).

2. No laughing at each other - AGREED!! SO
(on board)

DISTRACTOR - something that takes your mind off what you should be or want to be doing.

STRESS, HASSLE OR PROBLEM - is what distracts us.

NOW: We are going to call COPING what we do to reduce the stress, get ourselves back on target.

One way to cope, or get ourselves back is to tune in on what we are thinking to ourselves, or saying to ourselves at the time? You know, we talk to ourselves all the time - helps us solve our

Appendix A-2

problems, direct our attention - but sometimes - when we are a little upset, we say things that distract ourselves - For example: (When I was trying to start the car, I was saying - "can't you go faster", "what's the matter with you?", "don't be so dumb"). What do you say to yourself when you are under stress (elicit negative self-statements).

We all do that - some people call those negative self-statements - sort of "telling yourself off" - trouble is - those negative self-statements only distract you even more - take your mind off of what you are doing - As long as I'm telling myself off I can't think about how to start again!

Has it ever happened to you during an exam? You might not expect an exam or it looks harder than you thought and you find yourself thinking "OH! OH! I'm going to flunk this - it looks too hard." "What will I do??!!" All of these are negative self-statements. Some kids call them downers because they take your mind off of the math or the French you are trying to do.

EVER HAPPEN TO YOU? (try to elicit examples) on exam.

Of course, we give ourselves "uppers" too. Sometimes, not too often, but if I say "not bad" to myself - I feel a little smarter for a little while.

What do you say to yourself if you like something you did?
O.K. so we've talked about: (elicit examples-write on board)

Distractors (kids define)

take mind off what doing

Stress

" "

what distracts us

Appendix A-2

Self-Statements (kids define)

what we think or say

- (neg) self-statements

or downers

+ (pos) self-statements

or uppers

downer - takes mind off or distracts

upper - puts mind back on what we want to do

So the first step if you want to get in control of your own head - not to be distracted if you don't want to be - is to learn to recognize when you are under stress, what you are saying to yourself. When you can handle those things that stress and distract you - we'll call it coping. i.e. coping is recognizing that you are being stressed and not letting it distract you.

HOW DO WE DO THAT?

One way is to make sure what you say to yourself is an upper - not distracting - is helping you to keep your mind on what you are doing!

For example: (pass out maze sample)

Let's see how long it takes us all to do one of these - (start stopwatch as all start - stop when all 3 are done) (if one is very slow - say "let me show you my trick!")

Now - watch me: (take another maze - talk way through; be sure to finish with an upper)

"Now you try" (to faster kid)

"Now your turn, but you just whisper"

"Me again, but I'm going to say it to myself".

(use 2 more mazes for each student)

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Now we'll try again (time again) (if not faster give kids some to take home and) Practice a couple of them talking your way through - we'll try again tomorrow. The trick of it is that when you are giving yourself sensible instructions that keep your mind on what you are doing, you don't get so easily distracted.

That's what we will try to do about the things that upset or stress - it's particularly important with exams - to be able to keep your mind where you want it.

Review - On Board

What is - STRESS? DISTRACTOR? SELF-STATEMENTS? NEGATIVE SS, POSITIVE SS, COPING (why do I want to learn how to cope?)

HOMEWORK - collect a stress - what happened?

what did you say to yourself?

what happened = describe the scene

self statements = script

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Day 2:

Yesterday we talked about some things to increase your success in school-to help you learn more, do better on exams. How you can get more in control of what's happening to you.

We talked about:

Distractors - what's that? - "can you give me an example?"

Stress

Self-Statements - "+" and "-"

Coping = 1. "recognizing when you are being stressed"

2. turning the distractor off: one way is by self-instruction (we'll talk about other steps in coping later)

So we found a stress or problem has 2 parts:

1. What you <u>did</u> (the <u>scene</u>)	=	<u>Okay to call</u> <u>Behaviour</u>
2. What you <u>said</u> to yourself (<u>script</u>)	=	Thoughts

Our homework was to collect a stress and be able to share the scene, or Behaviour, and the script, or Thoughts.

Stresses _____ (after each account get them to label "behaviour", "thoughts")

Okay- We've talked about 2 parts of a hassle or stress - there's a third part - when you were (example) - How did you feel? (if they say "scared", "nervous", say "okay, me too" and "I know I was scared/nervous because my hands shook (stomach fluttered, heart thumped, etc!)) Do you get signs from your body when you are under stress? _____ (elicit all the somatic correlates _____ you can. Write on board.)

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Okay, that's how we know we're being stressed. But when, say, you are taking an exam and your (example of somatic symptom), it takes your mind off your work, the same way your negative self-statements do.

So, these feelings can be distractors too.

Remember how when we talked our way through the puzzle the script we used kept our minds on what we were doing and kept our distracting thoughts away. We called those thoughts - "uppers" because they kept our mind on what we were doing - part of learning to cope is learning to change the downers we give ourselves into uppers.

Let's see how we could do that (use examples from homework).

What could you have said to get yourself back on track?

_____ (generate examples - kids can
_____ help each other)

So a downer which distracts you can be changed into an upper which gets you back on what you are learning/studying - the exam you are taking, etc.

Well, the same thing can happen with distracting feelings - they are signs or signals that we are getting tense because of a stressful problem. So, before these feelings distract us too much - here's what we'll do - we'll relax our muscles, our whole bodies, so that the tenseness goes down a bit and we can keep our mind on our work. Clench fists - relax very slowly to count of 30.

Do you feel like you are floating, etc.?

Next relax whole arms to shoulder.

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(repeat) and you can start telling yourself - "o.k. - now 'I'll relax so I can get back to what I want to do here".

O.K. we'll practice that some more - next time when we feel that we are facing a stress - that will be the signal to start our relaxing.

So (back to blackboard) now we can add another step to coping

1. Give yourself a "+" self statement or ↑
2. Relax ("cool it")

Let's practice: What's your worst subject (use answers)

Okay - close your eyes and imagine you are walking into French /English class and the teacher starts passing out sheets - you forgot that the exam was today! You look at the test and you can't answer the first question: That's the scene

What are your thoughts? (open eyes to label)
(all work at labelling "uppers/downers"

How do you feel? _____
(these can all be signals to cope

Now close your eyes again.

Same scene - walk into class - forgot exam - cannot answer first question - say (repeat downer) - now change it to an upper.

Okay - now your head is pounding (or other somatic sense). Relax your hands - count to 5 - now your arms. - Can you begin to feel it? - and tell yourself "relax" - what's a good thing to do now" - what might you do?

(Generate alternatives) 1. skip it.

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2. read it over - can you do part?
3. does it make sense?
4. good - now go on ...

So, the third step in coping (on blackboard) 1. ↑
is to ask yourself "What's best to do now? 2. cool it
3. ?

Close eyes again

So you go on working away then suddenly teacher says "finish up
- only five more minutes - be sure to check your whole paper" and
you feel (heart beat, etc.) again, what will you do?, say?

Is it _____ (talk out loud to yourself)
good

It takes some practice - but it will come to you.

Review (stress 3 parts) - Behaviours

Thoughts

Feelings

To cope - 1. recognize signs (body, thoughts)
2. change downers to uppers.
3. relax - cool it.
4. ask yourself - What's best next - tell yourself
what to do.

(GET THE KIDS TO WRITE AGAIN.)

Homework: 1. collect a hassle, describe behaviour, thoughts,
etc. How did you cope?
2. relax - twice - once in school or on bus; once at
bedtime.

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Day 3:

material: coping scenes

Review: Homework. How did I cope?

1. _____
2. _____
3. _____

Did you give yourself useful instructions?

Uppers are personal - if they work for you.

Uppers are like a compliment - they make you feel more successful - want to try.

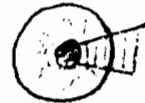
Downers - turn you off - make you sad/mad - feel like not trying.

Do you remember someone giving you a compliment? Did you feel it for awhile.

Scolding or insult - sometimes stops you.

You don't have to wait to let someone else turn you on or off - learn to do it for yourself.

A "BAD DAY" is when a day starts with a downer - e.g. have a fight on the bus and you forgot your homework. (generate examples) Then you go to class and you cannot get your mind on the lesson. COPING is cutting a path through the fog so you can think about the lesson.



How: 1. recognize distraction



2. change downers to uppers ↓ → ↑

3. relax

4. what's best to do now (i.e. listen ?

to teacher, find place, go to next question, etc.)

(put signs on board. Let kids label and define.

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Let's practice relaxing:

Tighten hands - I'll count slowly to 15

You can tell yourself -- relax -- very good -- feel the tension go -- now I can think better.

Now again: tighten arms -- count to 10

 tighten legs -- count to 10

Now: practice coping: (use scenes)

(one kid reads - the other self-instructs out loud)

(afterwards always label behaviour, thoughts, feelings, strategies)

(continue to last 5 minutes)

Review:

1. 
2. cutting path (coping 1,2,3,4 above)
3. uppers/downers

Homework:

Collect a hassle and coping. Label behaviour, thoughts and feelings before, during and after.

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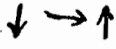
Day 4:

Homework: How did I cope? - behaviours, thoughts, feelings,
before, during and after the scene.

(fill out as he describes - leave blanks after story - query to
fill any blanks - Get 1st student to do as above and yourself.

Review (put on blackboard)

1.

2. steps in coping:
1.  notice somatic signs and self-statements
 2.  change self statements
 3. relax - relax
 4. ? what's best to do - several answers
 5. self instruction - s.i., s.i.
 6.  good for me!

(erase above and let each rewrite and rehearse)

Let's check

Practice -  - noticing

Are you getting good at tuning in on your feelings? (discuss)

Can you feel when your muscles are tight? Recognize signs of being
stressed? How about tuning in on your thoughts?

Here's a game to check - I'll say "replay" - you have to tell me
what you're thinking just then - try it on me - "replay" - I was
thinking I wonder if he's paying attention or is this too complica-
ted. See - I can go on talking ... "REPLAY" (get kids to monitor
their own thoughts)

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Now let's try relaxing - me first, then you, then you - on hands, arms and legs.

Tighten hands: Now I'm tight so I'll start ...

(keep talking) 4,5,6,7,10.

Now arms - relax - that's good 6,...7...8.....10.

Now legs - keep your eyes shut - now tighten stomach - very tight - and then relax - slowly --- feel warm -- slowly, slowly.

Covert Rehearsal Now you are very relaxed, keep your eyes closed - try to imagine you are sitting in a French exam - feeling relaxed - trying your best -- maybe you don't have all the answers -- but I'll think of what to do next. Relax - relax - read the next question 6 ... 7 ... 8 ... 9 ... 10 open eyes slowly - wiggle toes.

Self-Instruction Have you found it useful to give yourself a script - when, what happened?

Now: remember we talked about ways to get the teacher to be on your side. What were they?



asking a question

Homework:

1. Pick a class and do all three today - see what happens. It doesn't have to be your worst class but would be best if it is. If there's a class where you don't usually do this, try it then.
2. Imagine the most stressful exam scene you can think of:

Pass out exams and model coping steps.

- a) rehearse out loud
- b) rehearse correctly.

(after each - ask - "any suggestions".)

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Day 5:

materials: mock exams

Review Homework:



How did it work? (let each relate)

In which class? What happened just before? What happened while you practiced these three things? Did it feel funny to face the teacher? Were you able to do it subtly? What followed? What was the effect? Did the kid next to you ask what you were doing? Was there any reaction from the teacher? Did she notice?

Today - try it in 2 periods: one of which should be your worst subject.

Imagine the worst exam you have ever written:

1st child - describe behaviours, thoughts, feelings

2nd child - asks questions - What happened just before? followed?

What could you tell yourself to try? (generate some s.i.'s) (If any trouble say) - maybe it would work better if you closed your eyes. (If no self instructions forthcoming, suggest some until a comfortable one comes along - same thing for both kids scene)

Now we'll see if relaxing helps: me first, then you (#1) then you (#2). close eyes - tighten hands - now relax ... slowly ... count to 15. Now #1 (count softly) Now #2 (softly)

Now my turn again - try relaxing your stomach ... slowly ... slowly ... everything now 14.... 15. Now tighten the big muscles in your bottom - relax - slowly ... slowly ... 14... 15.

Now while you are floating start to imagine yourself (describe scenes 1 and 2 from homework) - you start to feel tense but you

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relax instead - gently, gently -- keep your mind on(i.e. math)
What do I need to do now? I'm doing fine now - feeling okay -
going well... keep relaxed -- o.k. now rest a bit and we'll start
to wake up (rouse them gently).

Can you begin to feel how instructing yourself can keep your mind
on your work and off your tenseness? (discuss a bit)

Do you find it easy to give yourself an upper? a compliment? when
you deserve it (give examples) What do you usually say? Do you
find it easier to relax now?

Have you tried any of this yet outside of here? How did it work?
Now let's practice again.'

Do mock exam -(use scene as described for homework). Do 2-3 ques-
tions. Stop. Talk way through.

Choose one student to self instruct out loud (check that he goes
through 1 - 6 coping sequence). Second student to give feedback.
Then second student practices and 1st gives feedback.

Now we three try, talking subvoce - carry on with exam - I will
model this for you. Very good!!

Review: - Why should I learn how to cope?

What are all the steps in coping with a stress?

How can your heart beating loudly help you cope?

How does an upper make you learn better?

How does relaxing help you do better on an exam?

What gets a teacher to be on your side?

Homework: 1.  in 2 classes
2. optional - Any successful coping.

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Day 6:

material: exams, cards

Review homework:

Did you try    in 2 periods.

What happened: before? during? after?

Did you notice any change in teacher (each kid answers)

Why does it work sometimes better than others (depends on teacher?
which classroom?)

Any coping incidents to share; (teacher, #1, #2)

(Always after account - get kids to label behaviour, thoughts,
feelings) How I coped (steps 1-6)

Review:

If you were telling a friend what we've learned here up to now,
how would you describe it. (write all elements and definitions
and board - check for inaccuracies)

(to second child) Would you describe it the same way - what would
you add?

EMPHASIZE (role of self-control - getting and staying in charge of
your own head and what you do!)

Common turner-offers in class

Things to watch out for:

1. Boredom - Do you ever find your mind wandering during a boring lesson? What can you do to turn yourself on. (discuss) (suggestion: snapping a rubber band for daydreamers; saying "off" to yourself.)
2. Someone else fooling around - again - What can you do to turn on. (Introduce card "distraction" to remind self to label this and

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get back on target.

3. something bad happens - you keep thinking of it. label distraction (use card). What does it make the teacher think?

(Role play) looking bored while the teacher talks (let one kid be teacher, or you if they don't want to): Teacher says: he doesn't care", "he isn't interested", "he's not a good student".

Things to change: Do you ever find people misunderstand what you meant. They might think you weren't paying attention, or trying hard enough or that you weren't interested in what they are saying.

Solutions:

for paying attention: Well, we've already thought of facing the teacher (h) and asking a question - same thing works for parents and friends - someone says - you aren't listening" - instead of saying, I was!! try  - any other suggestions.

people think you aren't trying (a hard one): look more interested - ask questions - any other suggestions.

Well - let's think about this one!! (even say) - How can I make you believe I'm trying? (Role Play)

People think you aren't interested in what they are saying:

Again  :

One thing that bothers people: - interrupting

- taking too long to answer.

Solutions include: staying on point (use "off" card for cue)

smile

ask questions.

(role play)

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EMPHASIZE: self instruct by use of labels - distraction, eyeball,
on - off. (Role Play)

See if you get any opportunity to use self-labels today.

Now let's practice our relaxing again:

Who wants to lead first? (if no volunteer) - say me first, then 1st,
then 2nd kid.

Today we'll just start by relaxing - we already know when we feel
tight - so - close eyes: - relax hands - slowly etc. (1 - 15)

Now #1, then #2.

Go through sequence - hands, arms, legs, bottoms -- THEN - now let
your whole face sag - slowly - loosely - let your chin drop -
slowly ... slowly... now you are all floating.

Start to imagine - it's a test you don't know the answer - slowly
... slowly ... slowly... tell yourself - it's okay, I'll go on to
the next ... slowly ... feel it floating again ... keep imagining
the test (your stomach starts to flutter - or as described) .. you
say relax, relax, back to the test - What do I need to do next?

... now you are looking at the test again... good.. relax.. relax.

Now #1 - What are you saying (keep relaxing) - let #1 instruct out
loud) ... good... Now #2 What is happening ... good. now tell
yourself "doing fine" ... good... (check limpness and feedback).

Now we'll start to wake up... slowly though... you open your eyes
and wiggle your toes... good... feel a little rested.. good!!!

Anyone think of any other things we should work on about exams?

O.K. well - let's practice again.

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(pass out practice exams)

#1 - models coping steps

#2 - gives feedback

#2 - rehearse covertly(to himself) for 3 minutes

#1 - give out loud feedback

Ask - any suggestions?

Homework: remember - see if you can use self-labels

on cards - "distraction"

" stay-on"

"off"



etc.

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Day 7:

materials: cards
reading/thinking
problems

Review: Homework - using labels

Remember we were going to try to use labels to help ourselves
not turn off. (go through cards - labels distraction etc.)

Which labels did you use? (Student #1, #2)

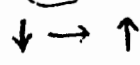
I used ... (relate some incident)

OK, did it work to get you back on target?

Review: uppers (positive self-statements)

and what is a downer (- s.s.)

and the steps in coping?

1.  notice signs
2. 
3. relax
4. ? what's best to do?
5. s.i., s.i., s.i.,
6.  compliment yourself.

Let's talk about #5 a bit - what does it mean?

Self instruct: What might you say to yourself?

- a. Go on to the next one.
- b. Think! Which one makes sense?
- c. What else do I need to know?

For example: try this riddle:

John is supposed to meet his mother in town. Will he be late if
he takes the 2:30 bus.

China exports \$2,000,000 worth of goods annually. Is that more
or less than Canada does?

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you might say (more self instructions)

d. Do I understand the question?

e. Try relaxing.

f. Doing well - good

g. Is this right? - check to be sure that all of these are good, useful self instructions.

What other would we add? (see if they generate any new aids to better thinking skills)

Let's try just the self-instruction while we practice this time: (use reading-thinking skills problems, with the quickest child reading, second student trying self-instruction)

(let one child talk to himself through to one answer, then switch; you take a turn, too. See that self instructions suggested are used (go on to next, I think, what else I need to know, I'll check) (Explain class exclusion)- start by throwing out anything it can't be - then you don't have to worry about that.

Let's try another one: (RT #2 - same procedure)

Good - that's good problem-solving practice.

Now we'll practice our relaxing . This time #1, you do all body parts and tell us what scene we are setting and how we feel. #2 - tell us your self-instructions out loud.

Have you tried relaxing outside of here - Does it work? Why does it work? (because when muscles slack, body signs of stress are reduced)

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Is anybody still using the 3 steps to get the teacher on your side?
(get descriptions)

Let's try again tomorrow - pick a class and



Homework for tomorrow:

- (as above) 1.  2. relax at bedtime
3. each child collects a stress and records six steps and all self instructions.

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Day 8:

materials: mazes
stopwatch
R-T skills
sample exam
h • ? sheets

Homework Review: What was your problem, how did you cope?

(go through steps) (emphasize self-instruction)

Were they all uppers

Did you have any trouble with any step?

Let's review what we have learned:

1. What's this:



2. How do you cut a path to the skill or to what you know:

right: by using the first three steps of coping parts:



1. notice 2. ↓ → ↑ 3. relax

3. h • ? Yes, getting the teacher on your side.

Do you think this helps you to learn too? - why? (see if they can describe eliminating distractors)

There is a hidden reward

Ever notice that sometimes the more you know about something the more fun it is - Remember when you first started ice skating when you were a little kid or skiing - at first it hurt and you were cold and you fell down. But after a while - it got easier and you moved faster - and got warmed up - and it got to be more fun. Do you remember anything like that? (give ample opportunity to express examples).

IK, so the more we know, the more fun it is - and the more fun it is the more we practice and the better we get.

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So the better we get, the better we get - works for everything - hockey, playing cards, guitar, French, math. The longer you go to school, the easier it is to learn - the more you know the more you learn.

learn more → more fun → more practice →

learn more → more fun → more practice →

So if you can think of a way to keep your mind on the lesson, you have a little more chance to get good at math - French - whatever. For homework - let's try this out - what's your most boring class? (example French) OK today in (French), tell yourself you have to learn one new thing - a new word, or verb conjugation - something - even just memorizing something you didn't know by heart before - If you can't find anything, ask a question and remember the answer. Try it - see if it works for you.

First these puzzles.

(give one maze to 1st child - you take a turn - directing yourself out) O.K. - Now #2, you try one - Direct yourself to yourself out loud (all watch)

Did you get distracted? It looked like you were both on target all the time - Good!

Now we'll try one more all together: (pass out second one). We'll time this one (record time for all three.

Did you self-instruct?

Now we'll practice answering questions. (reading/thinking skill #3) I'll go first. (read passage aloud - self instruct - use "not this"

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"couldn't be this", "let me check")

Now your turn. (#1 tries - see if he's using Not This, Let me Check,) Now #2 (as above)

OK - Now our relaxation.

Let one child direct entire relaxation sequence; hands, arms, etc. etc. - when relaxed, say: slowly... slowly.. very good.

Now, I'm going to give you a scene (still relaxed, eyes closed)

Scene 1 - It's exam week - you've been studying all week - you're getting tired of all this work - You walk into French and the teacher puts the first question on the board - your stomach (hands) start to flutter (shake) - you say to yourself - Now is time to relax - What does that question say? What should I do first?- good - Now, you're reading it - Relax ... but you can't read one word - you raise your hand but the teacher just shakes his head - You feel your stomach again - tell yourself... relax...What's the best thing to do - I'll try reading the rest - See if I can figure out - Good you're doing fine - Keep reading - tell yourself - couldn't be 'raison' so must be 'maison'. I'll try - keep going - Picture yourself starting to write your answer - tell yourself - Way to Go - Good I'm coping.

(allow a few seconds, then say) OK scene's over - we'll leave you there coping with your exam. Now we'll start to wake up - wiggle your fingers, toes, open your eyes - very good.

That was good. Now we'll try taking a test with distractions.

(give one a sample test) - you are taking this test and #2 - you start distracting (bang pencil, tap foot, etc.) keep working and

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self-instruct out loud and you, #2, be the kid in the next seat who daydreams, whispers, bangs around - you don't care how you do.

#1 - see if you can keep working, tell yourself what to do.

(let them practice - if one has trouble with role - you take over as self-instructor or distractor)

Now we'll switch parts: (try again with reversed roles)

Very good - you screen out well!

Homework for tomorrow:

1. Learn something new in your most boring class.

2.    sheet: Fill this out for 2 classes - at least 3 in each space - can you ask 3 questions - or raise your hand 3 times - Try it. Also - keep track of any new good s.i.'s.

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Day 9:

materials: mock exams
R/T skills

First let's see how our homework went? What did you learn that was new?

Describe scene: Any s.i.'s, didn't you give yourself a compliment?

Now me: (describe something new and s.i.'s and compliment)

OK, next: collect    sheets. (discuss)

Any new good self-instructions?

Yesterday we were talking about why the more you learn the more you learn. If I were your mother who had just walked in here, how would you explain it to me?

↳ Learns more → more fun → more practice ↶

Good.

So this    could lead to this ↑

Doesn't only get teacher on your side - gets yourself on your side (role play) I'm your teacher I hear you've learned how to keep your mind on your work even if you are distracted. How do you do that? (elicit free response - then)

Let's list the steps (put down #'s - let #1 fill in)

What about No. 5, what are self instructions? (elicit examples)

Why do they work? Keep your mind on what you're doing, etc?

And No. 6 (elicit the reinforcing effect of a compliment)

Let's practice again:

First, we'll relax again - close your eyes - hands, arms, legs, buttocks, face, neck - now add shoulders - say slowly... slowly..

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now loosen your stomach - good - very good - relax.

Now this time it's your final exam in French - You've done your best all year but you know you usually go down on exams. You are sitting worrying about it, when you feel your heart start to beat hard. Tell yourself - relax - I'll do my best - now keep this scene in mind - you're waiting for the teacher to write on the questions - and keep listening about that as you open your eyes - slowly... slowly.

Model: (pick a pen) now - look at the first question - read it (write on board "à l'imparfait: J'étais très content (être) adverti avec toi chez l'horloger"

(to #1)- What will you say to yourself - good - go on - tell yourself what to do - keep on trying - good.

Now (#2 - on board) Here is another "au futur".

Je (être) chasi le meilleur

Tu (avoir) pâlir de frayeur.

Ils (avoir) rougir de honte.

Tell yourself what to do - good - very good - Do you think you'll try that on your next exam?

Now let's rehearse exams with distractions. (pass out as yesterday - one writes, the other distracts - reverse) Did you keep yourself on target? good.

Now, let's practice our reading (R/T skills). This time try it talking to yourself - then tell us which answer you choose (one models - then second student models) Did you check? Great!!

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(If not well done you model one - say) I'm going to take a turn.

Homework:

Review:

1. It's up to you this time

Jot down in which class you remembered to try any of these
class

h



2. Relax at bedtime.

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Day 10

materials: strips for game
candy
mazes
mock exam

1. Did you remember to relax at bedtime? Is it getting any easier?
This is our last day, but I hope you'll continue to practice relaxing at bedtime, just to remind yourself of what you've learned about coping.
2. What about (   on board) getting the teacher on your side?
(collect homework sheets) Was it easier in any of these classes?
Why? Was it harder where you need it the most?
Although this is our last day to meet we are going to try to get together again in a month or so. Do you think you might keep trying this? Good - maybe if you see each other it will remind you.

Now, since it is our last day - let's review everything we've done and then I have a game for you (point to box and prizes)

First, let's practice thinking with our puzzles (pass out three mazes) I'll time us. How are we doing compared to before? We'll try again (pass out 3 more). OK - pretty good! Did you remember to tell yourself what to do?

Now with exams: Who wants to be the teacher? (give model exams)
I'll be the distractor - you (to other student) see if you can keep yourself on track - talk out loud.

OK - any suggestions (discuss what worked, what was hard, how we coped).

Appendix A-2

Now our relaxing: (Go through entire sequence)

(after all relaxed) Keep your eyes closed. Now imagine this scene - you walk into class - your teacher says - Here is a surprise math test - Work as hard as you can - I want you to do as well as you can - pay attention - if you feel your body starting to tense - tell yourself - now I must start the coping steps - relax - keep going - relax... Now you come to one you aren't sure how to do - tell yourself - OK - I'll just go on to the next one - maybe I'll come back if I can - nobody gets them all right - It's okay - Now I'll see if I can do part of the next one - good! - I kept going - Picture yourself taking a deep breath - say to yourself I just have to keep trying my best! good! all right - we'll leave you there working on your math test - open your eyes - wiggle your fingers, toes, etc.

(Bring out fishing box filled questions:) i.e. What does coping mean? What's an upper? What's a downer? What are the steps to coping? How practice make things more fun? etc. etc.

(after each answer, ask 'do you agree?' 'Is that the answer?')

(Keep taking turns until all slips are gone. - If time remains, talk about course) i.e. Do you think you will use any of these things we've learned? How will you remember? Do you think it will help you on tasks and exams? Will it help you learn more? Why?

(pass out candy)

Appendix A-3

Cognitive Coping Skill Program

Day 1:

materials: mazes

Introduction: For the past three years, we've been looking at all Grade 7 students in this school commission to see how they learn. Our goal has been to make high school a more successful learning experience for all students. What we've learned has helped us to improve teaching methods and decrease school failures. The high school drop-out rate is now very low and each year more graduates go on to college. Now we want to see how high school can be more successful for all kids. You are part of a group of about 50 kids at several high schools chosen at random to meet daily for 2 weeks to try out some ways to be more successful. We will meet like this, two of you and me, every day, same place, same period - excused by teacher, principal - all parents have been notified of this Grade 7 survey. (certificate - show and promise). One of the things we'll be working on is figuring out what kinds of things here at St. Thomas might keep a student from learning as well as he or she can - from getting the best grades he/she can.

Ways to Succeed - to succeed in High School, we need:

- 1) to be able to do the work - skill in math, english, etc.
- 2) to be able to take responsibility for managing own studying, life, etc. - other kids, teachers, homework, exams.

Kids can have problems with any of these.

Skill - may not have learned enough math, or French or English to be able to do his work well - either may not have been taught this

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yet, or just not good in this subject. Or other kids might bug him or he could have a teacher he doesn't get along with. What examples have you seen (put on board as they describe). Let's put these in order - what do you think is the #1, #2, etc. problem for most kids.

There is some evidence kids do better if they have a chance to talk about what is and isn't going well so one of the things we'll be doing each day is to take a few minutes to see if you have any of these to get off your chest - any stresses:

What are stresses? - things that take your mind off your work.

SHARING Here we have to be able to talk to each other confidentially.

We may share some embarrassing or private experiences, so we have

2 rules: 1. We do not repeat anything outside this room.

2. No teasing or laughing.

What was the hardest thing (biggest change) for you coming to high school? - different for boys or girls - different if take bus?

How could we do better? - (On Board) - suggestions.

One problem that lots of kids mention is finding rooms.

Let's try some puzzles.

All three - time _____ Once more (all) - time _____

Last time (all) - time _____

What is the most common school problem - GUESS?

EXAMS - kids that know the answer or have studied, but get uptight on exams and can't get it all out or remember is all.

Does this ever happen to you? - DISCUSS.

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What have you done?

Now, the other side of the coin:

What's working best for you here?

What's the thing you like least in High School

Some people think and feel better if they set sensible goals
- long and short term. i.e. finish homework by 6; get up in
time for the bus.

HOMEWORK: Set 2 school-based goals for this week.

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Day 2:

Review: Homework - Your goals (put on board)

Keeping track: How will you know - let's see how you'll decide if you met your goal.

O.K. that's what you could do - What could your teachers do to help you?

(If needed) - Yesterday we talked about what kids think are the biggest problems in school - let me tell you what teachers think.

(discuss) a) kids don't listen; b) assignments are not completed;
c) kids don't remember what they learned before;
d) kids forget books and supplies.

(If needed) How could Grade 6 prepare you better?

(discuss) a) more independent work? b) more homework or less homework; c) more projects.

Does your teacher usually realize what you are thinking?

Can you usually explain if something goes wrong?

Are exams fair?

What keeps kids from doing well on exams?

Here's a problem for some kids: What is your worst subject?

Imagine this scene: You walk into French/English class and the teacher starts passing out sheets. You forgot that the exam was today - you look at the test - you can't answer the first question.

What would you do? What would most kids do?

Review: common problems; common solutions (ways to do better) and problems around exams.

Homework: Find 2 ways to get better grades on exams aside from studying.

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Day 3:

materials: scenes

Homework: How could you do better on exams?

Discuss antecedents.

When something goes wrong, like a bad exam mark - does it affect your day? Discuss (share your experiences)

How can you avoid this?

Can you avoid all problems:

Should there be changes in the way school exams are given?

Would kids do better if there were fewer exams? more exams?

Let's practice: (read each scene individually)

Scene I - (discuss) What would you do?

What's best to do?

Scene II

Scene III

Do exams help you learn? (find out what you need to study more)

Do most kids learn well in school?(if they pay attention, if they try their best)

Homework: Interview one Grade 7 kid about exams?

Ask them if they help you learn?

Appendix A-3

Day 4:

materials: mock exams

Review: How (we thought) we could do better on exams?

Homework: What did your questions show?

Do they help you learn?

Is it worth the tenseness caused?

yes	no

How could exams be more helpful: i.e.

return and discuss them; give you a chance to
try again after a bad exam, etc.

Any new problems for our list? I thought of some:

This problem: Teacher is cranky, how can you get her to be on
your side (discuss) Who wants to try this today?

Boring classes: find something interesting. Is it always possible
to make a boring class interesting for yourself (discuss how the
more you know the more you want to know)

Should kids change or should the school change?

For instance: Close your eyes, I'll set a scene for you.

I'm your teacher in French. I'm going to give you an exam - you
weren't expecting this - open your eyes - Here you are:

Begin: (after 2 minutes) Stop.

What was your reaction - too easy? too hard? fair? unfair? Why?

How did you feel - like laughing? uptight?

Is that the way you'd really feel?

Homework: What's the most stressful exam scene you can imagine?

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Day 5:

materials: mock exam

Homework: (have each describe most stressful exam scene)

How did you feel?

Did it keep you from doing your best on the exam?

How could you keep this from worrying you?

(get suggestions from kids)

Label which are outside (teachers) changes, which are inside (student):

Also yesterday we talked about getting the teachers to be on your side? Did you try? What did you do? Did it work?

(encourage all to discuss)

Now, we've been talking about getting more out of school by setting more clear cut goals - Let's see how that's going.

(discuss original goals - how closely they are being met)

Do they need revision upward? downward?

Now let's add one more item to goals (i.e. bedtime, homework, writing more legibly, paying closer attention, etc.)

(Discuss the need for setting criteria - a mark to know when you've reached your goal.

(After previous discussion is finished) Let's practice again:

I'm your teacher. Here is another exam. Do the best you can -

See if you can work quickly. (leave them about 3 minutes)

Stop: While we are really in the midst of it, let's see how you feel about exams: (use questions if needed, student suggestion first)

1. When you are taking an exam do you tune out all the noise around you?

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2. Do you sometimes find your mind is wandering?
3. Do you wonder if everyone else is going faster than you?
4. Do you wonder if you'll have enough time to finish?
5. Do you wish you were somewhere else - like home watching TV?
6. Do you ever feel like getting up and walking out?
7. Does it ever feel good to be taking an exam?

Homework: Try in 2 classes to get the teacher to be on your side.

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Day 6:

materials: mock exams

Review: Homework:

Which periods did you think about getting teacher to be on your side? How did it work? (encourage free discussion)

Any other thing you tried to make school work better?

If you were telling a friend what we were doing, how would you describe it?

(If they aren't sure or answers are incomplete say:)

What we are doing here is: There is some evidence that kids do better in school if they are allowed to discuss their problems and think of new ways to be more successful. (emphasize the role of free expressions - not to keep things bottled up)

Do you ever get bored in class? Tell us about it.

Do other kids ever take your mind off? Give us an example.

What do you do? What else?

Do people ever think you aren't trying or aren't interested in what they are saying? What do you do? (if answers are incomplete, fill in)

Now let's check: How are you coming on the goals you set?

(everyone reports) Does it help you organize to set goals?

Now let's practice exam taking again: (pass out mock exams)

We'll work for 3 minutes (then see what comes out in ensuing discussion) Are you getting more used to exams? Do all exams make you feel the same? Only in worst subject? Only if haven't studied?

Homework: Check out some situation where your teacher or parent or friend didn't understand what you meant? How you got them to understand better.

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Day 7:

materials: reading/thinking
skills

Review homework:

When did someone not understand what you meant? (thought you weren't listening or didn't try, etc.) What happened? What could you have done?

Review: We have talked about problems.

1. common problems to all students
2. biggest —————> smallest
3. common off-putters
4. what to do about them
5. getting the teacher on your side
6. practice taking exams

(problem list from Day 1 session was typed for presentation to Vice-Principal.)

Why have we done this - talked about problems? (discuss fully)

1. to get these problems off our minds.
2. to practice common school problems like exams so we can get used to solving them.
3. to make a list for feedback to the administration.

So just as we practiced taking an exam - let's practice with an assignment (R/T #1) (let best reader read, 2nd child answers; take turns - you take a turn too)

OK - let's try one more (R/T #2)

Now let's check up on how our goals are being fulfilled (get feedback from each child)

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(if working perfectly, say:) Maybe you should have set higher goal - how could you make it a little harder?

(if not fulfilled, say:) First, where is it going wrong, maybe we need to add some steps. (keep discussion open)

Does it help you to have a goal to work towards?

Homework: Again try getting the teacher on your side!

Each child collect a problem and tell us what you did to solve it.

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Day 8:

materials: mazes
reading/thinking
skills
mock exams

Anything to discuss?

Homework yesterday was to collect a problem and tell us how you solved it (let 1st child describe fully)

(to #2) Would you have solved it the same way? Are there any other ways that would have been useful?

Where on our list of biggest to smaller problems would you have put this one? (to #2) Did you have one to share too?

So eliminating some of these common problems helps keep our mind on our work - Of course the more time you think about your work the better you'll get but also the more fun it will be.

Remember when you were a little kid and first started to ice skate or ski - Your feet hurt and you were cold but after a while you got better, moved faster and it got to be more fun; more fun → more practice → got better → more fun → more practice → so the better you got, the better you got.

The longer you go to school - the better you get.

See if it works for you.

Now let's practice again (pass out 3 mazes) Let's check our time.

Now again (3 more)

Do you think practice makes it easier?

Now we'll practice answering questions (reading/thinking skills).

We'll read it to ourselves and take turns answering - see if all agree.

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Now, let's try with a scene: It's exam week, you've been studying all week - you're getting tired of all this work. You walk into French and the teacher puts the first question on the board - you can't read one word.

What would you do? And you? (discuss and list alternatives)

Any others?

Now let's see how you are meeting your goals? Are you (name goal)?

Does it help you do better in school? How? Will you set goals for yourself after we stop meeting?

And now you (#2) Are you (name goal)? Does it help you do better in school? How? Will you set goals for yourself after this week? Like what, for example?

Now we'll practice taking an exam (pass mock exam)

While you work, I'm going to walk around, look over your shoulder.

See if you can keep on working. (allow it longer, it holds interest)

Does it ever happen to you in exams that the teacher comes around and distracts you? How does it make you feel? What do you do?

(discuss fully)

Homework for tomorrow:

Let's practice getting the teacher on my side (G.T.T.O.M.S.) again.

Which class will you try it in?

Also keep track of any new ways to solve the problems on our list.

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Day 9:

materials: reading/thinking
skills

Homework: 1. G.T.T.O.M.S (each child takes turn with following)

Which class did you try it in? What did you try?

Did it work? How do you know? Would you try that again?

2. Any new ways to solve the problems on our list?

(discuss fully)

Yesterday, we talked about why "the more you learn, the more you learn". If I were your mother and walked in now - explain it to me (get a volunteer). Would you add anything (2nd student)

Do you think you could tell your teachers about that in a way they would appreciate?

How would you explain to your teachers what we have been doing here?

What about setting goals?

(review goals - how close to meeting, need to modify?)

Now let's see if we can use some of these things.

Scene: It's your final exam in French - you know you usually go down in exams and you are worrying about it. The teacher starts writing on the board (write on board) "à l'imparfait: j'étais très content (être) adverti avec toi chez l'horloger".

(discuss how they would handle, approach this)

One more practice: (reading/thinking skills)

Let's try them by ourselves (all do one silently) -(when all finished, say) OKAY let's check answers - what did you get? Now what kinds of problems might arise from that kind of work? Discuss!

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Any other suggestions for making school a better place for you to learn in? Anything still bothering kids in school to be added to our list?

Homework:

1. For our last day, it's up to you to collect GTTOMS in any class you remember - remember what you try.
2. Review your goals - change any/add any?

Appendix A-3

Day 10:

materials: strips for game
box
candy
mazes
practice exams

Homework: Which class did you collect G.T.T.O.M.S? What did you try? Did it work? How do you know? Would you try that again? (each student has a turn)

What about Goals (on board) (again, each student has a turn)

Where are you now? What will you plan next? Same - harder?

Although this is our last day to meet, we'll try to get together again in a month or so. Do you think you might keep trying to G.T.T.O.M.S. and follow goals? Good!

Now for the last time, let's review some of the things we've done: Then, I have a game for you (point to box and prizes).

First, let's practice our puzzles (pass out mazes to all - time)

We'll try again - Do you think we've improved?

OK, Now I'd like to hear your responses to some questions - called feedback. (read)

1. Do you think practicing puzzles made you do better? (record both answers) Why? (record)
2. Now about exams - do you think practicing exam-taking will make any difference when it comes to the real thing? Why? Why not?
3. Do you think discussing exams was more or less useful than practicing? Why?
4. Now about goal setting: was it useful? Should kids set clear

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goals or just do the best they can as they go? (discuss) Why?

How did it help you? (If not, why not?)

5. What about G.T.T.O.M.S.? Is that a useful thing to try?

OK, (bring out box and prizes)

Questions:

1. What are three common problems Grade 7 students have?

2. Why does talking it over help?

3. Why set goals? etc., etc.,

(after each answer, ask - Do you agree? Is that the best answer?)

(Keep taking turns until all steps are gone)

(if time remains - ask:) Do you think you'll use any ideas we have discussed? Should we have more groups like this? Why?

APPENDIX B-1

Pupil's Name _____ School _____

Teacher's Name _____

Grade Six Screening

May - June, 1975

English _____

1. Last report card grades

Math. _____

French _____

2. Teachers' Ratings:

A. Is this student likely to do well in high school? _____

If no, why not? _____

His particular weaknesses: _____

Strengths: _____

B. Have you observed any behaviour on your part or on the part of this student which might influence this student's learning? You might include certain successful techniques you have employed:

C. Circle any of the following that describe this student:

Socially:

a leader

shy

talks all the time

competent

easygoing

"never notice him"

a loner

hard to handle

reserved

scatterbrained

lots of friends

"doesn't settle down"

good with adults

silly

a troublemaker

uncommunicative

tense

likeable

APPENDIX B-1

Academically:

works hard
doesn't need to work hard
can't remember what he learned
disorganized
learns easily

one of the best in
the class
slow to understand
inattentive
lazy

3. Formal Evaluation: (Cumulative Record & Consultant's Finding)

I.Q. _____

L.A. CTBS or other

Reading _____

Spelling _____

MATH. Board-wide exam. in Computation & Number Theory:

December exam. _____

March exam. _____

June exam. _____

4. This student will probably cope with high school:
(circle most appropriate)

1. With ease
2. With little difficulty
3. In most aspects of school life
4. As well as most grade 7 students
5. Only with help
6. Only if the school makes many modifications
- * 7. Not at all

* eliminated on subsequent forms by request

APPENDIX B-2

Self-rated Coping Ability

What would you probably do?

- A. If the teacher gives you back an exam and you see you got a low mark:
- | | | |
|--|---------|-------------|
| 1. You would start right on to try to figure out why | like me | not like me |
| 2. It would make you mad | like me | not like me |
| 3. It would make you feel awful | like me | not like me |
| 4. It would be hard to stop thinking about that low mark for awhile | like me | not like me |
| 5. You would probably feel too bad to keep on working the rest of the period | like me | not like me |
- B. The teacher calls on you and you don't know the answer:
- | | | |
|---|---------|-------------|
| 1. The next time she calls on you, you'd try to give as good an answer as you could to make up for it | like me | not like me |
| 2. The next time she calls on you, you'd be a little worried so you'd probably say anything that seemed right | like me | not like me |
| 3. The next time you might try saying "I don't know" | like me | not like me |
| 4. For the rest of the period, you might try not looking at the teacher so she wouldn't call on you | like me | not like me |
- C. An announcement over the loudspeaker asks: "Will the following students report to the vice-principal" and your name is called
- | | | |
|---|---------|-------------|
| 1. You would wonder what for? | like me | not like me |
| 2. You would think: "What have I done?" | like me | not like me |
| 3. You would have trouble keeping your mind on your work for a few minutes. | like me | not like me |
| 4. You wouldn't be able to stop wondering about it | like me | not like me |
| 5. You'd think it might be better not to go. | like me | not like me |

APPENDIX B-2

Self-rated Coping Ability

- D. You don't understand what you are supposed to do next in class:
- | | | |
|--|---------|-------------|
| 1. You'd ask someone next to you | like me | not like me |
| 2. You'd ask the teacher | like me | not like me |
| 3. You wouldn't want to ask so you'd try to see what the other pupils are doing | like me | not like me |
| 4. You say to yourself: "I don't know what to do" and do something else | like me | not like me |
| 5. You say to yourself: "I don't know what to do" "forget it" and wait until the teacher come over to tell you | like me | not like me |
- E. You are in front of the class giving a presentation with another pupil, and you forget what to say next:
- | | | |
|--|---------|-------------|
| 1. You'd ask him to show you the place | like me | not like me |
| 2. You'd ask the teacher for help | like me | not like me |
| 3. You might feel too embarrassed or dumb to figure out what to do | like me | not like me |
| 4. It would be best to do nothing until your partner or your teacher help you out. | like me | not like me |

Appendix B-3

Teacher-rated Coping Ability

T. C. L.

From your experience with _____ in class, please indicate (by circling "LIKELY" or "UNLIKELY") whether or not the described reaction is one you would expect from this student. Some statements may seem difficult to judge in relation to this student, but please make a response to each.

A. You return an exam on which for some reason, he/she has done poorly:

1. He/She would begin to look over his/her paper to see where he/she had gone wrong.	likely	unlikely
2. He/She would seem discouraged.	likely	unlikely
3. He/She would seem upset or angry.	likely	unlikely
4. He/She would seem upset or angry, and become less attentive for the rest of the period	likely	unlikely
5. He/She would become upset and stop trying to follow the lesson altogether.	likely	unlikely

B: You call on him/her and he/she gives a wrong answer, or can't answer. If you call on him/her right away again:

1. He/She would word his/her answer more carefully.	likely	unlikely
2. He/She would mumble or give a shorter answer.	likely	unlikely
3. He/She would say "I don't know."	likely	unlikely
4. He/She would look upset or confused.	likely	unlikely
5. He/She would appear to be too confused or disturbed to be able to answer.	likely	unlikely

C: His/Her name is one of several announced over the loudspeaker that "the following pupils will please report to the office at the end of the period".

1. He/She would wonder, perhaps out loud, "What for?"	likely	unlikely
2. He/She would wonder, perhaps out loud, "What have I done?"	likely	unlikely

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Teacher-rated Coping Ability

3. He/She would become upset and have to be reminded to go on with his/her work.	likely	unlikely
4. He/She would become upset and have great difficulty paying attention for the rest of the period.	likely	unlikely
5. He/She would be too upset or distracted to work for the rest of the period.	likely	unlikely

D: He/She doesn't understand something he/she is supposed to do in class:

1. He/She would quietly ask me or someone else.	likely	unlikely
2. He/She would quietly try to find out from someone else without directly asking.	likely	unlikely
3. He/She would try to figure out what to do but give up and start to daydream or clown around.	likely	unlikely
4. He/She would quickly lose interest in his/her work, give up trying and daydream or clown around.	likely	unlikely
5. He/She would sit just there doing nothing until you went over to his/her desk.	likely	unlikely

E: He/She is giving a presentation with another student, and loses his/her place:

1. He/She would quietly ask the other student to help him/her.	likely	unlikely
2. He/She would quietly ask you for help.	likely	unlikely
3. He/She would look upset or distracted and ask "what shall I do now?"	likely	unlikely
4. He/She would seem extremely upset or distracted.	likely	unlikely
5. He/She would become unable to proceed.	likely	unlikely

Appendix B-4

Study III: Classroom Observation Sheet

School _____

Name _____

Date: _____

start time _____

on target time _____

Name _____

Date: _____

start time _____

on target time _____

Name _____

Date: _____

start time _____

on target time _____

Appendix B-5

TASC addenda:

Read:

#3 (again)

(then:) "What might you think or say to yourself?"

#6 (again)

(then) What would you probably think or say to yourself?

#9 (again)

(then) What might you think or say to yourself?

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#16 (again)

(then) What might you think or say to yourself?

#21 (again)

(then) What might you think or say to yourself?

#24 (again)

(then) Whay would you probably think or say to yourself?

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#29 (again)

(then) What might you think or say to yourself?

Appendix B-6

TASC Addenda Scoring Criteria

A. (Positive)

+ Self Statement

(1) General (+ 1 point)

examples: "I can do it" "I can figure that out"
"Try your best" "This shouldn't be too hard"

(2) Task specific: redirect to task (+ 2 points)

examples: "I'm good at math" "What does it say to do"
"Look at the problems" etc.

B. (Negative)

- Self Statement

(1) General (- 1 point)

examples: "I can't do it" "I'll make mistakes"
"Oh, oh, she is going to call on me"
"This is awful" etc.

*Any statement containing negatively-tinged words e.g.
"mistake", "wrong", "fail" as in "Try not to get mis-
takes",
except "I never make mistakes", "I'm sure I won't
be wrong" etc. "Anybody can make mistakes"

(2) Task specific (- 2 points)

examples: "I'm gonna flunk" "I can't do this kind of
work" "I'll get them all wrong"

C. Neutral Self Statements (0 points)

examples: "Hope I get it right" "Try to do it" "Don't
get nervous" "Anybody can make mistakes"

D. General Set

(1) Positive (+ 1 point)

"I'd be thinking about what I had studied"
"I don't worry about tests"
"I like to write on the board"
"thinking of getting it right, doing well."

(2) Negative (- 1 point)

"I'd be worried, wondering if I was going to
fail", "I'd feel nervous, I'm always wrong",
"I can't do hard math".

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TASC Addenda Scoring Criteria

D. General Set

(3) Neutral (0 points)

"Showing off" "I'd just try it"
"I'd just go on"

E. Coping Strategies (self instruction to redirect to task to cope)

(1) General (+ 2 points)

(note: strategies more reflective than A)

examples: "Remember to think" "Concentrate" "Be calm" "See what you can do" "Don't let anyone disturb you" "Give yourself an upper"

(2) Specific to task (+ 3 points)

examples: "Answer in complete sentences" "Try the easy ones first, then the hard ones" "Get my mind back on my work"

F. Relax

(1) General Set (+ 2 points)

examples: "I'd just try to relax"

(2) Self Instructions (+ 3 points)

examples: "Try to relax" "Take a deep breath and relax slowly" etc.

Appendix B-7
Preprediction Form - Math I, II, III

Name _____

Pre-test Prediction

Estimated number right

☐

42

Appendix B-6

WRAT I (Math I)

BALDWIN-CARTIER SCHOOL BOARD

MATHEMATICS REVIEW

Name: _____

Date: _____

Teacher: _____

1.
$$\begin{array}{r} 32 \\ 24 \\ +40 \\ \hline \end{array}$$

2. $6 \times 2 =$

3.
$$\begin{array}{r} 29 \\ -18 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 32 \\ \times 2 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 43 \\ + 6 \\ \hline \end{array}$$

6.
$$\begin{array}{r} \$4.95 \\ \times 3 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 726 \\ -349 \\ \hline \end{array}$$

8. $2\frac{1}{2} + 1\frac{1}{2} =$

9. $1\frac{1}{2} \text{ hr} = \underline{\hspace{1cm}} \text{ min.}$

10. $\frac{1}{3} + \frac{1}{3} =$

11. $1\frac{1}{3} \text{ ft.} = \underline{\hspace{1cm}} \text{ in.}$

12. $\frac{15}{5} =$

13. $9 \overline{) 4527}$

14. Add:
$$\begin{array}{r} 6\frac{1}{4} \\ 1\frac{5}{8} \\ 4\frac{1}{2} \\ \hline \end{array}$$

15.
$$\begin{array}{r} 4\frac{5}{6} \\ 3\frac{1}{3} \\ + 2\frac{1}{2} \\ \hline \end{array}$$

16. $\frac{1}{2} \text{ yd} = \underline{\hspace{1cm}} \text{ in.}$

17. $1\frac{3}{4} = \underline{\hspace{1cm}} \frac{\hspace{1cm}}{4}$

18. $56 \overline{) 695}$

Appendix B-8
(WRAT I (Math I))

MATHEMATICS REVIEW /2

19. $\frac{2}{3} = \frac{\quad}{12}$

20. $2\frac{1}{3}$ doz. = _____

21. Subtract $10\frac{1}{4}$
 $\quad 7\frac{2}{3}$

22. Find average:
32, 16, 45, 39, 27
Ans. _____

23. Write as decimal:
 $\frac{1}{2}\%$ = _____

24. $4\frac{1}{5} \times 3\frac{1}{3} =$

25. Write as percent:
 $\frac{3}{8} =$

26. $\frac{8}{9} \times \frac{9}{4} \times \frac{1}{2} =$

27. $\frac{2}{9} \div \frac{1}{2} =$

28. Write as decimal:
 $\frac{2}{3} =$ _____

29. 15% of 175 = _____

30. $8.2 \overline{) 62.703}$

31. $6^2 =$ _____

32. The complement of an angle of 45° is _____

33. If $a = 7$, $b = 3$,
Then $a^2 + 3b =$ _____

34. $x = 2$, $y = 7$
 $x^2 + 2y =$ _____

35. Change to familiar numerals:
M C X L II = _____

36. 70 sq. ft. = _____ sq. yd.

37. Factor:
 $x^2 - 14x + 49 =$ _____

38. Add:
 $-x - y - 23$
 $\quad x - y + 23$

Appendix B-8
WRAT I (Math I)

MATHEMATICS REVIEW /3

39. $\frac{r^2 - 5r - 6}{r + 1}$

Ans. _____

40. $\sqrt{4mp} = 8$
 $m =$ _____

41. $\frac{7}{17} = \frac{6}{x}$

$x =$ _____

42. Find root:
 $2x^2 - 36x = 162$

Ans. _____

Post-Prediction:

Estimated number right

42

Appendix B-9 - WRAT II (Math II)

BALDWIN CARTIER SCHOOL BOARD

Mathematics Test

Time: _____

Name: _____

Date: _____

Teacher: _____

Percentile Average
Grade Level

1. $4 \times 2 =$ _____

2.
$$\begin{array}{r} 23 \\ 42 \\ + 50 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 75 \\ + 8 \\ \hline \end{array}$$

2.5

4.
$$\begin{array}{r} 23 \\ \times 3 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 94 \\ - 64 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 3.84 \\ \times 4 \\ \hline \end{array}$$

2.8

7.
$$\begin{array}{r} 452 \\ 137 \\ + 245 \\ \hline \end{array}$$

8. $6 \div 2 =$ _____

9.
$$\begin{array}{r} \$62.04 \\ - 5.30 \\ \hline \end{array}$$

3.2

10.
$$\begin{array}{r} 229 \\ 5048 \\ 63 \\ + 1381 \\ \hline \end{array}$$

11. $9 \div 3 =$ _____

12. $\frac{7}{9} - \frac{5}{9} =$ _____

3.7

Appendix B-9
WRAT II (Math II)

Mathematics test / 2

Percentile Average
Grade Level

13.
$$\begin{array}{r} 823 \\ \times 96 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 809 \\ \times 47 \\ \hline \end{array}$$

15. $\frac{2}{5}$ of 35 = _____

4.1

16. $\frac{2}{3}$ of 24 = _____

17.
$$\begin{array}{r} 27 \overline{) 384} \\ \hline \end{array}$$

18.
$$\begin{array}{r} 5 \\ -1 \frac{1}{3} \\ \hline \end{array}$$

4.6

19.
$$\begin{array}{r} 6 \frac{1}{2} \\ - 4 \frac{2}{5} \\ \hline \end{array}$$

20. Multiply:
$$\begin{array}{r} 6.23 \\ \times 12.7 \\ \hline \end{array}$$

21. Find the average of
24, 18, 21, 26, 17
Ans: _____

5.1

22. Write as a percent:
.42 = _____%

23. Write as decimal:
 $\frac{1}{5}$ = _____

24. $\frac{3}{10} \div \frac{3}{4}$ = _____

5.7

25.
$$\begin{array}{r} 2.9 \overline{) 308.85} \\ \hline \end{array}$$

26. 20% of 120 = _____

27. 5^2 = _____

6.1

28. Write as common fraction
in lowest terms:
.04 = _____

29. $.25 \div 1 \frac{1}{5}$ = _____

6.5

Appendix B-9Percentile Average
Grade LevelWRAT II (Math II)

30. $2x^3$
x _____
31. The complement of an angle of 30° is _____ 7.0
32. $.33 \frac{1}{3} \times 2 \frac{1}{4} =$ _____ 33. 66 sq. ft. = _____ sq. yd. 7.2
34. Change to familiar numerals:
M D C X C I = _____
35. Find interest on \$1,200
at 6% for 70 days.
Ans. _____ 8.3
36. Add:
 $x + y = 99$
 $-x + y = 27$

37. Factor:
 $r^2 + 25 - 10r$
Ans. _____ 8.7
38. $c^2 - 7c - 18 =$ _____
39. Find interest on \$300 at $4\frac{1}{2}\%$ for 7 mo. 9.2
Ans. _____
40. $\sqrt{2ax} = 6$
x = _____
41. $\frac{9}{19} = \frac{8}{z}$
z = _____ 9.5
42. Solve for a:
 $3a^2 - 24a = 273$ 10.3

Post-Prediction:

Estimated number right

Appendix B-10

Post WRAT II (Math II)

Name: _____

Questionnaire

Circle me

1. Compared to the first time:

- a. did you do better this time ?
- b. did you do worse ?
- c. did you do about the same ?

yes no
yes no
yes no

2. Was this test:

- a. easier ?
- b. harder ?
- c. about the same ?

yes no
yes no
yes no

3. If you didn't do very well this time do you think it is because:

- a. you haven't been taught this work ?
- b. you aren't very good in maths ?
- c. you should have tried harder ?

yes no
yes no
yes no

4. If you did better this time, is it because

- a. you worked harder ?
- b. it was easier ?
- c. you were luckier ?

yes no
yes no
yes no

5. Do you feel

- a. on tests like this it is always important to do well ?
- b. a student can only do his best ?
- c. tests like this are not too important ?

yes no
yes no
yes no

Appendix B-11

Math III

BALDWIN CARTIER SCHOOL BOARD

Mathematic Examination

Re-Test

Time: _____

Name: _____

Date: _____

Teacher: _____

1. 452
 137
+ 245

2. 6 ÷ 2 =

3. \$62.04
 -5.30

4. 229
 5048
 63
+ 1381

5. 9 ÷ 3 =

6. $\frac{7}{9} - \frac{5}{9} =$ _____

7. 4 x 2 =

8. 23
 x 3

9. 23
 42
+ 50

10. 94
 -64

11. 75
 + 8

12. 3.84
 x 4

percentile average 3.8
grade level

$$13. \quad 6 \frac{1}{2} \\ - 4 \frac{2}{5} \\ \hline$$

$$14. \text{ Write as a percent: } .42 \quad \underline{\hspace{2cm}} \%$$

$$15. \quad 2.9 \overline{) 308.85}$$

$$16. \text{ Write as common fraction in lowest terms: } .04 = \underline{\hspace{2cm}}$$

$$17. \text{ Multiply: } 6.23 \times 12.7 = \underline{\hspace{2cm}}$$

$$18. \text{ Write as decimal: } \frac{1}{5} = \underline{\hspace{2cm}}$$

$$19. \text{ 20\% of 120 = } \underline{\hspace{2cm}}$$

$$20. \quad .25 \div 1 \frac{1}{5} = \underline{\hspace{2cm}}$$

$$21. \text{ Find the average of } 24, 18, 21, 26, 17 \\ \text{Ans: } \underline{\hspace{2cm}}$$

$$22. \quad \frac{3}{10} \div \frac{3}{4} = \underline{\hspace{2cm}}$$

$$23. \quad 5^2 = \underline{\hspace{2cm}}$$

$$24. \quad \begin{array}{r} 823 \\ \times 96 \\ \hline \end{array}$$

$$25. \quad \begin{array}{r} 809 \\ \times 47 \\ \hline \end{array}$$

$$26. \quad \frac{2}{5} \text{ of } 35 = \underline{\hspace{2cm}}$$

$$27. \quad \frac{2}{3} \text{ of } 24 = \underline{\hspace{2cm}}$$

$$28. \quad \begin{array}{r} 27 \overline{) 384} \\ \hline \end{array}$$

$$29. \quad \begin{array}{r} 5 \\ -1 \frac{1}{3} \\ \hline \end{array}$$

$$30. \text{ The complement of an angle of } 30^\circ \text{ is } \underline{\hspace{2cm}}$$

Percentile average
grade level 6.9

31. 66 sq. ft. - _____ sq. yd.

32. $2x - 3$
x _____

33. $.33 \frac{1}{3} \times 2 \frac{1}{4} =$ _____

34. Change to familiar
numerals:
M D C X C I = _____

35. Find interest on \$1,200
at 6% for 70 days.
Ans: _____

36. Factor:
 $r^2 + 25 - 10r$
Ans: _____

37. Find interest on \$300 at $4\frac{1}{2}\%$ for 7 mo.
Ans: _____

38. $\frac{9}{19} = \frac{8}{z}$
z _____

39. Add:
 $x + y = 99$
 $-x + y = 27$

40. $c^2 - 7c - 18 =$ _____

41. $\sqrt{2ax} = 6$
x = _____

42. Solve for a:
 $3a^2 - 24a - 273$

Percentile average 10.3
grade levelPost-Prediction:

Estimated number right

Appendix B-12

Study III: Coping Skill Training

DAILY REPORT

Period _____	S	NS	Approx time
Review		_____	_____
Group discussion		_____	_____
Directed sequence/instruction		_____	_____
Self instruction		_____	_____
Free discussion		_____	_____
role Playing/modelling		_____	_____
List making (problems, solutions etc.)		_____	_____
Rehearsal		_____	_____
Review program		_____	_____
Homework assigned		_____	_____
Comments:			

Appendix C-1

INTERRATER RELIABILITY: CLASSROOM OBSERVATIONS

	<u>Observer I</u>	<u>Observer II</u>	<u>XY</u>
Student I	262	255	66810
Student 2	240	240	57600
Student 3	304	303	92112
Student 4	243	240	58320
Student 5	287	282	50934
Student 6	278	277	77006
Student 7	300	300	80000
	527362	518287	522782
	<u>x 7</u>	<u>x 7</u>	<u>x 7</u>
	3691534	3628009	3659474

$$EX = 1914; \quad EY = 1897$$

$$(EY)^2 = 3663396$$

$$(EY)^2 = 3598609$$

$$EXEY = 3630858$$

$$r = .995$$

Appendix C-2

INTERRATER RELIABILITY

Test Anxiety Scale For Children - Addenda

(N = 11)

$$(EX)^2 = 316$$

$$(EY)^2 = 48$$

$$E(XY)N = 6248$$

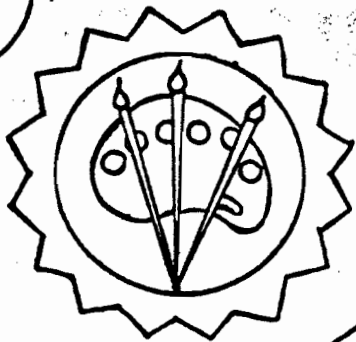
$$EX^2N = 7777$$

$$EY^2N = 5302$$

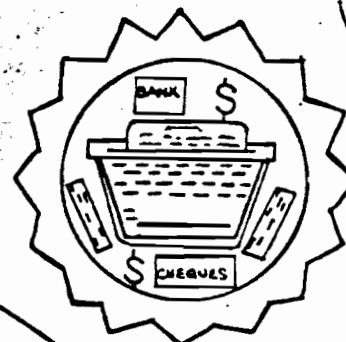
$$EXEY = 418$$

$$R = \frac{(6248 - 418)}{(7777 - 361) \times (5302 - 484)} = \frac{5830}{5977 - 4817}$$

$$r = 97.5$$



St. Thomas High School

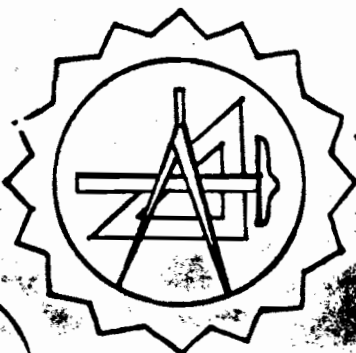


AWARD

THIS CERTIFIES THAT

DANIELLE GINGRAS

HAS BEEN AWARDED THIS
CERTIFICATE FOR
COMPLETING THE COURSE
IN
COPING SKILLS



Teacher

Rene Stevens

Dept. Head

date

Appendix D-2
Introduction to Individual Testing
(Studies II and III)

We are going to be talking to some Grade 7 Students to try to find out more about how kids learn in school. We've selected about 100 Grade Seven's out of the 800 or 900 at St. Thomas to represent what typical students are like. This will take about one period.

First, I want to see how many words you know:

(Q.T.) Intro

Now I want to know how you feel about some things in school:

TASC

WWYD

E/A

IARS

Now this is a questionnaire (etc.) I.E. INTRO

Now I want to see how you use some imagination. MEPS INTRO.

Any questions? Since we want to get the most honest look we can of typical students, I'd appreciate your not discussing your answers with your friends until we are finished next week. Naturally your answers are entirely confidential. No one else will see them. All results are anonymous.

Appendix D-3

Rationale: Coping Skill Programs: Study III

(presented to instructors and students)

For Structured Program:

There is some evidence to suggest that certain high school students would do better in school if, in addition to being taught academic subjects, they were also taught how to solve problems better and to think logically. This is a program designed to see if teaching such coping skills to Grade Seven pupils will help them do better in school.

For Cognitive Program:

There is some evidence to suggest that certain high school students would be better in school if, in addition to being taught academic subjects, they were also given a regular opportunity to discuss their problems and to solve them with some help from interested, supportive adults. This is a program designed to see if helping Grade Seven students find ways to solve their own problems helps them to do better in school.

Appendix D-4

Rationale & Protocol, Math Tests: Studies II & III

To: All Secondary One Geography Teachers,
St. Thomas High School

From: Renée Stevens, Psychologist

Re: Grade 7 Evaluation - Test Performance Study

As any teacher knows, one reason it is difficult to evaluate certain pupils is because they seem to over-react to tests and become unable to show what they have learned. We find this problem throughout school, from the early grades through graduate school in University. Some teachers have even suggested that "examinations measure anxiety more than learning." However, it has been demonstrated that "test-anxious" students can be helped to control their own anxiety and therefore do better on exams. The first step, of course, in such a program is to identify these students. Our recently completed Grade 7 Evaluation, which sampled over 100 pupils of all levels of achievement was aimed, in part, at identifying those students whose performance is debilitated by stress. However, the best and most valid way to measure a student's test performance is to sample it directly. Hence this study.

Two mathematics test will be administered to all secondary one pupils. Both math tests are of equal difficulty, having recently been standardized on Grade 7 students at John XXIII. The first test will be given in as unstressful a way as possible. It is called a "Review", instructions will be low-key, and it is untimed. The second test will be administered two days later. It will be given under more "test-like" conditions. It will be labelled "Mathematics Test," instructions will be rigorous, it will be timed, and pupils will be set to be more vigilant. Since both tests have been carefully matched to be of equal difficulty, it is postulated that any difference between a pupil's scores will reflect his differential reaction to the stress of test conditions. It is expected that some students will do better on the second test. But it will be those students who do much more poorly on the second test that will concern us when we plan our remedial program.

We are asking your cooperation to administer these tests as normally as possible so that we can get the best possible measure of your pupil's usual performance.

Appendix D-4

Rationale & Protocol, Math Tests: Studies II & III

To that end:

- 1) In consultation with some of the B.C.S.C. program coordinators and department heads, it has been decided to administer these tests during geography period to all Grade 7 pupils, even though only those included in the Grade 7 Evaluation sample will be evaluated.
- 2) Test One - "Mathematics Review," will be administered on Wednesday, March 30, during your first geography period.
- 3) Test Two - "Mathematics Test," will be administered on Friday, April 1, also during the first geography period.
- 4) You will appreciate the need to make the administration of these tests as similar as possible from class to class so that their results can be compared. Exact protocols for administration have been prepared. Your cooperation in following them is, of course, essential to the reliability of this study.
- 5) At the termination of the study and remedial program, results will be available to participating teachers, pupils and parents.

Appendix D-4

Protocol 1: Grade 7 Test Performance Study

For: Test One - Tuesday October 25, 1977

1) First announce:

Today We Have Been Asked To Take Some Time For This
Math Review. You'll See That Some Of The Problems Are Very Easy,
Some Are Too Hard For This Grade. See How Far You Can Get.
Before You Start, Look Over The Test And Please Estimate How Far
You Will Get On This sheet.

2) Pass out Mathematics Review and Pre-Prediction sheet to each pupil.

3) Collect Pre-Prediction sheet before pupils begin to take the test. Then tell them to go ahead.

4) Answering any questions with:

I Don't Know Too Much About This. Just Do The Best You
Can With It.

5) Five minutes before the period ends:

Before You Hand Your Papers In, Please Estimate How many
you got right On The Post-Prediction At The End Of The Test.

Appendix D-4

Protocol 2: Grade 7 Test Performance Study

For: Test Two - Friday October 28, 1977

1) First announce:

Some Of You Didn't Do Very Well On That Test Last Tuesday
We Are Going To Have Another One. This Time You Will Be Timed
And Your Marks Will Be Checked Very Carefully. I (Or Your Math
Teacher) Will Want To Speak To Anyone Who Doesn't Do As Well As
We Think He Should This Time. Since Many Of Your Parents Ask
About How We Teach Math On Parent's Night, These Marks Will Be
Available To Your Parents If They Wish. So Pay Attention.
Record The Time When You Start. Again, Please Fill Out This Card
Before You Begin The Problems.

2) Pass our "Mathematics Test" and Pre-Prediction sheet

3) Collect Pre-Prediction sheets - announce:

It Is Now : (Time)

4) Answer any questions with:

I Cannot Discuss Anything About This Test Until After It
Is Over.

5) Five minutes before the period ends:

You Only Have Five More Minutes. Be Sure To Record The Time
Before You Hand Your Paper In, And To Estimate The Number You Got
Right.

Protocol 2 (Continued)

- 6) After all tests are in, pass out Questionnaires.

Announce:

You Have Been Asked To Fill Out These Questionnaires

About The Tests You Have Taken. Please Answer All The Questions
Either 'Yes' or 'No'.

- 7) Answer all questions:

These Math Tests Are Being Used For The First Time.

That's The Reason For The Questionnaire.

Appendix E-1

FOLLOW UP SESSION: VERBATIM RESPONSES (BY GROUP)
(AR = At-Risk; N = Normal)

QUESTION 1: WHAT WAS THE THING YOU FOUND THE MOST FUN THIS YEAR IN SCHOOL?

Structured Coping Group:

Student #1 (AR ♀)

Thing I found most fun this year was the ski trip, but if that is not what you mean. I found doing experiments in science fun, using the equipment.

Student #2 (N ♀)

I think it was this coping skills program it gave me time off from class, I learned a lot. and i got life savers. All I put in it came out a time cause I did what you said and got a 100% on a test.

Student #3 (AR ♂)

the most interesting thing that I did was sports that I had joined especially field hockey and volleyball. But I think school is boring.

Student #4 (N ♀)

The thing I have found most fun is PD because Degraff is nice and all we do is tell jokes and do our homework.

Student #5 (AR ♂)

moves and Danses.

Student #6 (N ♂)

I found gym and math the most fun this year. I also found the ski week loads of fun. The cross-country skiing was hard, but fun.

Student #7 (AR ♂)

Math and Science because I like it and a pay more attention than the other classes.

Student #8 (AR ♂)

The thing I found the most was that I went on the ski trip.

Student #9 (N ♂)

Gym.

Student #10 (AR ♀)

When the kids went on the ski trip. and they had dances volleyball.

Appendix E-1

Student #11 (N♀)
The ski trip.

Cognitive Coping Group:

Student #1 (AR♂)
The thing I found the most fun was when I went to Round Hearth. When I went there went cross country sking and some othere thing. The meals where good to.

Student #2 (N♂)
I would think sports. there are more activities to do rather than just work, work, work. I would also think classes. You go to different classes for different subjects rather than take all subjects in one class. If you stay in a class for a whole day you feel bored and tired of studying in the same class.

Student #3 (AR♀)
The trips we had this year. The activities we had. The movies. The play. The most thing I found fun this year was the school we would finish early. The sports. and Hollidays.

Student #4 (N♂)
The subject I found most fun was Ex shop and Geography because we do different things every week and we draw and colour and make things.

Student #5 (AR♀)
I think the thing that was most fun is the gymnastics in gym. And when we went skating at the arena and played different sports on the ice. And also the ex-shop classes are alot of fun.

Student #6 (AR♀)
The most fun thing this year was gym. Because last year and years before you couldn't do things you do now like for instance: We have uneven bars, a trampoline, those rings that hang, mini tramp, and we played vollyball for a long enough time. Not like we just played it for 1 period.

Student #7 (N♀)
I think it would be a ski trip I went on with some kids in my class. It was realy the first trip I went on in school.

Student #8 (AR♂)
The big change between elemantary and high school. like eating at school. Getting your books out of lockers instead of desks. And going to different classes instead of being cooped up in one class.

Student #9 (AR♂)
The ski trip. It was fun you were allways outside in the fresh air and you got allot of of exercise.

Appendix E-1

Student #10 (N3)

holidays, and free periods when you do anything you want.

Student #11 (N2)

The ex shop classes were the most fun. You could do alot of things that you wouldn't normally get to do like drafting. The play Anne of Green Gables and all the movies and activities were fun. Gym is fun too.

Appendix E-2

Student #3 (AR ♀)

having Sports in school after school and having a bus that comes later.

Student #4 (N ♂)

The thing most useful was Technical Drawing in Ex Shop because it opened up a new future career for me and it help me get interested in Drafting and Architecture.

Student #5 (AR ♀)

Math, because when you grow older you need to know your math. Ex-shop, expecially in Mrs. Baur's class because we learnt alot about banking. Mrs. Howard's class we learn about art and get to do things with your hands.

Student #6 (AR ♀)

Ex Shop: Because all the things I took. Well when I took printing its not all that useful and drawing really wasn't all that usefull the Best one is comerce & tequniques when I go to the bank I will know what to do and I think its a very useful course otherwise I would probably never would have learned.

Student #7 (N ♀)

The most useful thing I have found is my homeroom teacher she realy inceragis me. Some of my other teachere I fell don't realy care as long as the do wath they have to that is all right with them. They don't care my homeroom teacher realy helps me like school just they way she act some of my other teachers realy discerage me.

Student #8 (AR ♂)

I think going to different classes. And a lot of people in the school.

Student #9 (AR ♂)

ex-shop I guess. because it gives you an little Idea what it's like and how you can learn from it.

Student #10 (N ♂)

P.A. system, and are helpful principals

Student #11 (N ♀)

The ex shop course in Buisness has helped alot especially if you have a bank account. It also gives you an idea if you might want to do that sort of thing for a living.

Appendix E-3

QUESTION 3: ARE TESTS AND EXAMS HARDER OR EASIER FOR YOU THAN
WHEN YOU STARTED LAST FALL? WHY?

Structured Coping Group:

Student #1 (AR♀)

I find the test are just as hard or easy as they ever were because if you study and pay attention in class it (they) should be just as easy or hard. And if you don't get all worried about you will probly do fine.

Student #2 (NF)

Not harder or easlier, the same (a bit easy not much). I used the hints but I still got average. Some seem hard and some seem easy. It has to do all lot with tests. Hard test: geography, science, math. Easy tests: french, english, religion.

Student #3 (AR♂)

the tests are harder than they were before last fall. because since we know more its hard to keep every thing in your mind esspessuerely when you got 3 tests the same day one after another.

Student #4 (NF)

They are hardere because the more we are taught the harder they get.

Student #5 (AR♂)

about the same. The tests are about the same because its still a test wether your in grade six, or if your in grade 7.

Student #6 (NF)

The tests are a bit easier now because I am not so tense and scared of it. I can also think better now, then before when I worried whether I was doing well on it or not.

Student #7 (AR♂)

The test and exams are not so hard. Because I sit up and pay atenchie in the classes.

Student #8 (AR♂)

The tests are easier now than then because I study alot.

Student #9 (NF)

Easier. Because when I have an exam I get relaxed.

Student #10 (AR♀)

The test maybe a bit easier because I have worked harder.

Student #11 (NF)

Easier. I've learned how to cope with them and know what the test are mostly about.

Appendix E-3

Cognitive Coping Group:

Student #1 (AR³)

Harder because the teachers are giving harder test and less time to study for them.

Student #2 (N³)

I would think a little harder. Because the harder the test if you fail you know where you went wrong and the next time the test comes back you wont fail.

Student #3 (AR³)

There easier. Becuase, wene I came here we had to pick a wish kind of and I picked to study harder and ever since I have been getting good marks.

Student #4 (N³)

Easier. because I don't get nervous anymore or only sometimes and forget all the answers. and it helps me study a lot more. And I can cope with the test much easier.

Student #5 (AR³)

Harder. Because we have to learn, so they kind of make the tests and exams harder so that we might study a little harder.

Student #6 (AR³)

Easyer. Because when I started last fall I didn't know what the tests were going to be like. And I got low marks but now I know what to expect now that I've had him for the year. Well I know what to expect from all my teachers now.

Student #7 (N³)

No answer.

Student #8 (AR³)

Easier, because we worked a lot this year and learnt a lot of new things. And I catch on to new things fast.

Student #9 (AR³)

there about the same now and they might change or they might not change. I allways get about the same mark every test.

Student #10 (N³)

easier because with all the ways to treat a test you just think it is a piece of paper with a lot of writing.

Student #11 (N³)

Easier because I know now that the tests in high school are just the same as the tests in elementary school. It's not harder because it is still at our level.

Appendix E-4

QUESTION 4: SHOULD WE GIVE THIS COURSE AGAIN TO OTHER KIDS?

Structured Coping Group:

Student #1 (AR?)

Maybe, because maybe some kids might need help so I think you should only do it for those who have trouble with school or exams.

Student #2 (NF)

Yes, cause other kids will like to know some ways to help you on tests and other times in school. It was a very good programme. I liked it. You should make it avabile to other kids because it is very usefull.

Student #3 (AR?)

Yes, it helps to you to understand your self and helps you to stay cool during a test.

Student #4 (NF)

Yes, it is good to know and you miss some classes. You make it twice a day.

Student #5 (AR?)

Yes, it could help them to get beter marks.

Student #6 (NF)

Yes, it could help them to relax more on an exam, instead of worring of over the exam.

Student #7 (AR?)

Yes, it helps sometimes

Student #8 (AR?)

Yes, maybe they need it.

Student #9 (NF)

Yes, they should know what to do if they panic in a test.

Student #10 (AR?)

Yes, because It might help them Just because I didn't work on me I mit on them.

Student #11 (NF)

Yes, it might help them to cope.

Cognitive Coping Group:

Student #1 (AR?)

Yes, it will help the kids alot more, because they will not worry as much.

Appendix E-4

Student #2 (N...)

Yes, it will help other kids who dont know how to cope with an exam. I think what we did last november to solve and give answers to problems of school helped the school and I think it should be done again.

Student #3 (AR...)

Yes, it helps you alot by working harder which is much easier.

Student #4 (N...)

Yes, It helped me and I think that it will help other kids.

Student #5 (AR...)

Yes.

Student #6 (AR...)

Yes, It may help them with there school work.

Student #7 (N...)

Yes, I think it is good for the kids to be able to talk about what the think of the way the school works and they way the teachers work at making us learn. I think that the teachers should care more about the kids that try to learn and to incerage the ones that want to learn. To forget about the ones that don't realy care. It dose not help the kids that want to learn to have to what after to kids that don't care.

Student #8 (AR...)

Yes, it helps them to work harder. Besides my parents.

Student #9 (AR...)

No, I don't think that it help's you. It just a waste of time.

Student #10 (N...)

Yes, It will help us understand more about the school program. Could we do this again.

Student #11 (N...)

Yes, There would still be kids that get too nervous befor exams and, as a result fail them.