

ATTRIBUTION RETRAINING PAIRED WITH STRATEGY TRAINING:
AN INTEGRATIVE TREATMENT APPROACH FOR
MOTIVATIONAL PROBLEMS IN
LEARNING DISABLED ADOLESCENTS

by

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Attribution Retraining Paired with Strategy Training: An Integrative

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ABSTRACT

Motivation to learn and achieve in learning disabled adolescents is threatened by chronic failures. Consequently, many learning disabled students learn to doubt their capability to effectively cope with learning problems. Attribution theory provides a conceptual framework where specific self-perceptions and subsequent expectations for school success are explored. Learning disabled students need to reconceptualize their beliefs about academic behavior as controllable and changeable. While expectations for success are an integral part of continued motivation for learning disabled students, it is the use of effective task strategies which provides the outlet for students' newly acquired attributions.

The present study investigated the effects of attribution retraining paired with strategy training on maintenance of strategic behavior, on metacognitive awareness of strategy use, and on task-specific and general attributions. Thirty-two learning disabled adolescents participated in the intervention study. They were randomly assigned to either a control group, a strategy only group, or a strategy plus attribution retraining group. The strategy selected was the FIRST-Letter Mnemonic Strategy which was designed to improve recall performance. The mnemonic, BELIEFS, provided structure for three goals in the attributional intervention component: (1) to teach adaptive attributions made to direct effort in strategy use; (2) to provide attributional and performance feedback; and (3) to provide a self-instructional model that directs alternative attributions for academic outcomes.

The results indicated between group differences in recall performance, in awareness of strategy use, and in task-specific and general attributions. Results at posttest indicated clear evidence as to the effectiveness of the mnemonic strategy on recall of information. Both treatment groups answered more recall performance questions correctly than the control group. However, only the attribution retraining group maintained good recall performance over time. In addition, these students showed substantially more metacognitive awareness than the strategy and the control group. In general, students receiving attribution retraining held perceptions which were significantly more internal, stable, and controllable for task-specific and general attributions.

A number of possible limitations of this investigation are discussed and recommendations for future strategy and attribution research are provided. Practical suggestions are also offered to remedial instructors.

DEDICATION

For my mother,
Leona Esther Warkentin Sawatsky,
who has modeled inner strength and beauty,
with appreciation, love, and the deepest respect.

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TABLE OF CONTENTS

| | |
|--|-----|
| Approval | ii |
| Abstract | iii |
| Dedication | v |
| Acknowledgements | vi |
| I. Introduction | 1 |
| II. Literature Review | 8 |
| The Strategies Intervention Model | 10 |
| The Role of Metacognition | 17 |
| Attribution Theory | 18 |
| Patterns of Causal Attributions in LD Students | 20 |
| Review of Treatment Approaches | 26 |
| Methodological Issues: New Directions for Research ... | 38 |
| III. Method | 42 |
| Subjects | 42 |
| Selection Criteria | 42 |
| Settings, Subjects, Personnel | 43 |
| Training Materials and Independent Measures | 46 |
| Strategy Training Tasks | 46 |
| Metacognitive Awareness Measure | 47 |
| Attribution Measures | 49 |
| Design of the Study | 50 |
| Procedures | 55 |
| Pretest Procedures | 55 |

| | | |
|-----|---|-----|
| | Intervention Procedures | 57 |
| | Posttest Procedures | 59 |
| IV. | Results and Discussion | 60 |
| | Strategic Behavior | 61 |
| | Metacognitive Awareness | 65 |
| | Attributional Changes | 68 |
| | Task-Specific Attributional Changes | 69 |
| | General Attributional Changes | 73 |
| | Changes in Attributional Style: A Descriptive Look | 82 |
| | Task-Specific Attributional Responses | 83 |
| | General Achievement Attributional Responses | 86 |
| V. | General Discussion | 91 |
| | Summary and Integration of Results | 91 |
| | Implications for Future Research | 102 |
| | Implications for Practitioners | 107 |
| | REFERENCES | 111 |
| | APPENDIX A: Provincial and School District Guidelines | 117 |
| | Identification and Placement of SLD | 118 |
| | Statement of Provision of Services - Coquitlam | 122 |
| | Statement of Provision of Services - Delta | 124 |
| | APPENDIX B: Review of Attribution Retraining Studies | 126 |
| | APPENDIX C: Letters of Information and Consent | 134 |

| | |
|--|-----|
| APPENDIX D: Strategy Training | 140 |
| Lesson Plans | 141 |
| The Training Tasks | 148 |
| Pre/posttest Measures | 154 |
| Scoring Procedures | 162 |
| APPENDIX E: Metacognitive Awareness of Strategy Use | 164 |
| Operational Definitions | 165 |
| Scoring Procedures | 166 |
| APPENDIX F: Attribution Measures | 167 |
| General Achievement Causality Measure | 168 |
| Task-Specific Attribution Measure | 170 |
| Procedures for Encoding and Classifying Responses | 171 |
| Operational Definitions for the Attributional Categories . . | 172 |
| APPENDIX G: The Final Causal Dimension Scale | 174 |
| The Modified Scale | 175 |
| Administration Format | 176 |
| Modifications of Wording Structure | 177 |
| Scoring Procedures | 178 |
| APPENDIX H: Attribution Retraining | 179 |
| Antecedent Attribution Lesson Plan | 180 |
| The Mnemonic Frame BELIEFS | 181 |
| Rationale for Steps to BELIEFS Mnemonic | 182 |

LIST OF TABLES

| | | |
|----------|---|----|
| Table 1 | The Strategies Intervention Model | 12 |
| Table 2 | Learning Strategies Curriculum | 13 |
| Table 3 | Four Levels of Generalization | 16 |
| Table 4 | Characteristics of Students in the Study | 45 |
| Table 5 | Intervention Phases in the Three Group Design | 52 |
| Table 6 | Means and Standard Deviations for Recall Performance Across Pre/posttest and Maintenance Tasks | 62 |
| Table 7 | Means and Standard Deviations for Metacognitive Awareness of Strategy Use | 66 |
| Table 8 | Means and Standard Deviations for Task-Specific Attributions on the Causal Dimensions of Locus of Causality, Stability, and Controllability | 70 |
| Table 9 | Means and Standard Deviations for a Success Experience on the Causal Dimensions of Locus of Causality, Stability, and Controllability | 75 |
| Table 10 | Means and Standard Deviations for a Failure Experience on the Causal Dimensions of Locus of Causality, Stability, and Controllability | 78 |
| Table 11 | Means and Standard Deviations for an Unexpected Experience on the Causal Dimensions of Locus of Causality, Stability, and Controllability | 80 |

LIST OF FIGURES

| | | |
|------------|--|-----|
| Figure 1 | Cognitive and Affective Determinants of Attribution Theory | 21 |
| Figure 2 | The Role of Emotion in the Attributional Framework | 22 |
| Figure 3 | Metacognitive Awareness of Strategy Use Interview | 48 |
| Figure 4 | The Mnemonic BELIEFS | 51 |
| Figure 5 | Attributional Responses given to a Task-Specific Situation at PRETEST | 84 |
| Figure 6 | Attributional Responses given to a Task-Specific Situation at POSTTEST | 85 |
| Figure 7 | Attributional Responses given to General Achievement Situations at PRETEST | 88 |
| Figure 8 | Attributional Responses given to General Achievement Situations at POSTTEST | 89 |
| Figure 9. | Means for a Task-Specific and General Achievement Situations on the LOCUS OF CAUSALITY Dimension | 96 |
| Figure 10. | Means for a Task-Specific and General Achievement Situations on the CONTROLLABILITY Dimension | 97 |
| Figure 11. | Means for a Task-Specific and General Achievement Situations on the STABILITY Dimension | 100 |

CHAPTER ONE

INTRODUCTION

By adolescence there is a high probability that learning disabled students will experience the indirect effects of a learning handicap as manifested by poor self-perception, lowered self-concept, or reduced motivation. Disability in a basic learning process may be the root problem, but it must be considered not only by itself but also in relation to other problems that it may precipitate (Deshler, 1978, p. 68).

Motivation to learn and achieve in learning disabled adolescents is threatened by compounding failures. These students are consistently characterized as possessing motivational problems (Deshler, 1978; Licht & Kistner, 1986). Disabilities in basic learning processes interfere with achievement in school-related tasks, and consequently, these students experience repeated failures. Chronic failure may result in the development of maladaptive beliefs about their ability to succeed at future academic tasks. Thus, many learning disabled students come to view their efforts as futile (Licht, 1983; Licht & Kistner, 1986; Licht, Kistner, Ozkaragoz, Shapiro, & Claussen, 1985; Thomas, 1979). Motivation to achieve--the goals students set for themselves and the extent of effort and involvement in their school work--is influenced by the outcome of student performance. In response to chronic failure experiences, many learning disabled students learn to doubt not only their intellectual capacities, but the ability to cope effectively with learning problems (Licht, 1983; Torgesen, 1980; Torgesen & Licht, 1983).

The Learning Disabled Adolescent

Who is the learning disabled adolescent? Operational definitions of measurable characteristics of learning disabled students remain a matter of considerable debate. These definitional problems arise, in part, from the varying demands of administrators, teachers, and researchers (Wong, 1986). The administrator who is responsible for providing funding for appropriate services for learning disabled students considers the discrepancy criterion as primary. "Generally, a discrepancy of two or more years on grade equivalent scores or a similar discrepancy on standardized score comparisons is recognized as significant" (see definition below).

The teacher who is responsible for the diagnosis and remediation of learning disabled students needs an operational definition that pinpoints specific areas for diagnosis. It is the interpretation of a comprehensive diagnostic assessment which allows the teacher to establish appropriate instruction for each individual student. "These (basic problems) may be manifested in extreme difficulties in thinking, listening, talking, reading, writing, spelling or computing" (see definition below).

The perspective of the researcher on the definition of learning disabilities is that of specificity and exclusiveness. "The purposes of LD research are to investigate the characteristics of LD, to test the appropriateness of particular conceptual frameworks, and to examine the effectiveness of particular interventions" (Wong, 1986, p. 15). Wong emphasizes the importance of exclusive selection criteria to ensure homogeneity of subjects in research studies. Accordingly, subjects for research would be targeted given specific characteristics.

The definition of learning disabilities advanced by the Ministry of Education in the Province of British Columbia is outlined in the manual of Policies, Procedures, and Guidelines for Special Programmes and reads as follows:

Learning disabilities is a processing disorder involved in understanding or using symbols or spoken language. These disorders result in a significant discrepancy between estimated learning potential and actual performance. Generally, a discrepancy of two or more years on grade equivalent scores or a similar discrepancy on standardized score comparisons is recognized as significant. This discrepancy is related to basic problems in attention, perception, symbolization and the understanding or use of spoken or written language. These may manifest in extreme difficulties in thinking, listening, talking, reading, writing, spelling or computing (Section No. 3.26; see Appendix A).

Attribution Theory

Attribution Theory provides one conceptual framework for examining motivational problems in learning disabled adolescents. Attribution theorists have conceptualized the cognitive-behavioral relationship between specific self-perceptions and subsequent expectations for future school success and performance behaviors (Weiner, 1986). This theory of motivation has important implications for understanding achievement thought and behavior. Within this theoretical construct, individual differences in motivation are due, in part, to the students' interpretation of their own academic successes and failures. Attributions are the internal explanations that individuals give when

they succeed or fail at tasks. "The answer to a 'why' question regarding an outcome is considered a cause" (Weiner, 1986, p. 22). It is pertinent to note that a cause is "imposed or inferred by an attributor" (p. 22). As such, one individual's judgment of a cause may differ significantly from the beliefs of another.

What are the consequences of these attributional self-statements that contribute to the motivational and performance deficits observed in learning disabled students? Current research provides validity to the conceptualization that many LD students develop maladaptive patterns of causal attributions, and consequently, enter a detrimental cycle. Three components may be identified in this cycle: (1) repeated failures may lead LD students to believe they lack ability to overcome or cope with learning problems; (2) these beliefs will negatively affect future effort and achievement outcomes; and (3) the affective reactions to repeated failures may lead to low self-esteem and low self-concept of ability (Licht, 1983).

Research Intent

If causal ascriptions influence achievement behavior, then the challenge for researchers and practitioners is twofold: (1) to assist learning disabled students in becoming cognitively aware of their attributional responses; and (2) to train alternative attributions that enable these students to take responsibility for their successful academic outcomes and persist with purposeful effort in difficult tasks. Hence, remedial efforts must not only be directed at providing realistic successful learning outcomes, they must also emphasize teaching these students to think adaptively about their

failures (Andrews & Debus, 1978; Butkowsky & Willows, 1980). The remedial package must focus on both the instructional/task variables and on the affective, motivational beliefs underlying the learners' academic behavior. Learning disabled students need to reconceptualize their beliefs about academic behavior as controllable and changeable.

Attribution retraining may be one critical component of an effective intervention program. This treatment approach attempts to alter maladaptive causal perceptions of success and failure. In effect, students who attribute failure to causes such as low ability, insufficient effort, or task difficulties are trained to ascribe failure to an internal, controllable cause such as directing their effort in using appropriate strategies. Through repeated emphasis on the importance of effortful, strategic behavior in producing successful outcomes, learning disabled students may learn to take more responsibility for their learning outcomes.

While expectations for success are an integral part of continued motivation for learning disabled students, the use of effective task strategies provides an outlet or medium for the students' newly acquired attributions. Teaching these students to simply try harder becomes an issue of concern if appropriate strategies for skill and knowledge acquisition are lacking (Licht & Kistner, 1986). For many students with cognitive and skill deficits, attributing failure to lack of effort negates any effort expended on their part. Perhaps the most effective approach to ensuring that changes in effort attributions will be accompanied by improved performance is through the use of an integrated approach of strategy plus attribution retraining. Licht & Kistner (1986) suggest that students will use increased effort if they are

taught how to try harder. Students may be more motivated to use task strategies if they perceive that effort in strategy use results in performance gains.

Strategy intervention is an approach whereby students are taught how they may learn and perform tasks autonomously (Schumaker, Deshler, & Ellis, 1986). Within the Strategies Intervention Model developed and espoused by these authors, a strategy is defined as "a technique, principle, or rule which enables a person to function independently and solve problems in ways that will result in positive consequences for the person and others around him/her" (Schumaker et al., 1986, p. 333). However, if learning disabled students lack awareness of the purpose and goal of utilizing metacognitive strategies for skill mastery, they may fail to use these strategies spontaneously (Licht, 1983; Licht & Kistner, 1986). To ensure that students will be motivated to use an effective strategy, they must believe that the strategy will contribute to their academic success. The source of this belief is born out of an awareness that the strategy has indeed worked. Motivation to use effort then, by actively engaging in strategic behavior, may be the key to the continued use of strategies. As such, the retraining of attributional beliefs must be paired with other aspects of metacognitive training in instructional research.

Research Questions

The focus of the present study is threefold: (1) to investigate the effects of attribution retraining paired with strategy training on the maintenance of strategic behavior; (2) to determine changes in

metacognitive awareness of strategy use in study behavior; and (3) to examine general and task-specific attributional changes in causal reasoning for success and failure at academic tasks. Specifically, this study is designed to answer the following questions:

1. Strategic Behavior: What are the effects of attribution retraining paired with strategy training on recall performance as measured by the posttest and maintenance tasks?
2. Metacognitive Awareness of Strategy Use: What are the effects of attribution retraining paired with strategy training on the metacognitive awareness of strategy use as indexed by metacognitive assessments at pretest and posttests?
3. Attributional Causal Dimensions: What are the effects of attribution retraining paired with strategy training on changes in locus of causality, stability, and controllability, at specific recall tasks and at school-related tasks?
4. Attributional Style: What are the effects of attribution retraining paired with strategy training on predominant attributional responses given at specific recall tasks and at school-related tasks?

CHAPTER TWO

LITERATURE REVIEW

As learning disabled adolescents enter the junior high school environment, they are expected to cope with rigorous academic demands. The learning difficulties confronting these students may be exacerbated by attitudinal or motivational problems that interfere with their achievement efforts (Licht, 1983). There often exists a large gap between academic expectations and student performance. Recent research highlights the importance of strategy instruction for increasing learning effectiveness (Schumaker et al., 1986). Learning disabled students can be taught "how to learn" by using existing skills and knowledge in a strategically optimal fashion (Ellis & Lenz, 1987).

Many learning disabled students, however, fail to use strategies spontaneously (Licht & Kistner, 1986; Torgesen & Licht, 1983). Teaching these students how to use a new strategy or enabling them to experience success when they use the strategy is not sufficient. It does not ensure that they will maintain or use the strategy in new situations when they are not explicitly instructed to do so (Licht & Kistner, 1986). Efficient learning then does not consist solely of the acquisition of background knowledge and learning strategies. The learner must be able to use and control this background knowledge and strategic behavior appropriately. This self-awareness and self-regulation is the student's metacognition (Baker & Brown, 1984; Wong, 1985). In addition to awareness and self-regulation of strategic behavior, learners must believe that the strategy will contribute to

their academic success. Motivation to use effort in strategic behavior may be the critical link to the continued use of the strategy. Attribution retraining provides a framework within which maladaptive beliefs toward academic success and failure may be altered. This may be included as an integral part of an instructional package that focuses on effective strategies, self-awareness and control of these strategies, and motivation in their continued use.

Three theoretical paradigms provide the backdrop for examining the effects of attribution retraining paired with strategy training. Specifically, this integrated approach is designed to investigate the effects of training on the maintenance of newly acquired strategic behavior and on attributional changes. The chapter begins with a presentation of the Strategies Intervention Model. The critical features of this model utilized in the present investigation are discussed. The role of metacognition in the maintenance of strategic behavior is then examined. Motivation in this study is explored within the attributional paradigm. Following an overview of the theory, patterns of causal attributions in learning disabled students and subsequent expectations for achievement are reviewed. This theoretical construct provides the basis for reviewing treatment approaches in attribution retraining. The chapter concludes by outlining key issues in strategy training, metacognitive training and attribution retraining appropriate to the present study.

The Strategies Intervention Model

"Learning strategies are defined as techniques, principles, or rules that will facilitate the acquisition, manipulation, integration, storage, and retrieval of information across situations and settings" (Alley & Deshler, 1979, p. 13). This instructional model for learning disabled adolescents is designed to teach students how to learn rather than to teach students specific skills and content. Learning strategies are effective tools which allow these students to cope with the curricular demands. The University of Kansas Institute for Research in Learning Disabilities has conducted programmatic research that attends to the educational needs of learning disabled adolescents. A profile of the learning disabled adolescent emerges as a result of comprehensive research. The following statements represent characteristics of the learning disabled learner as they relate to the demands of the high school setting (Schumaker et al., 1986):

- (1) academic and cognitive factors are the most powerful in differentiating LD from low-achieving adolescents;
- (2) given current programming practices, LD adolescents demonstrate a plateauing of basic skills across the high-school grades;
- (3) LD adolescents demonstrate deficiencies in study skills and learning strategies;
- (4) many LD adolescents exhibit immature executive functioning.

In light of the characteristics exhibited by learning disabled adolescents, a Strategies Intervention Model (SIM) has emerged. This model is made up of three major components with each component

consisting of several subcomponents. To clarify for the reader the specific subcomponents addressed in the present investigation, the SIM framework is presented in Table 1. Within the curriculum component of this model are a set of task-specific learning strategies which are designed to enable the learning disabled adolescent to cope with high school demands. The Learning Strategies Curriculum consists of three instructional strands (see Table 2): the Acquisition Strand; the Storage Strand; and the Expression and Demonstration of Competence Strand. The Acquisition Strand consists of strategies which enable the students to access relevant information from written materials. The Storage Strand provides students with strategies for cognitively organizing, storing, and retrieving information. Finally, the Expression and Demonstration of Competence Strand enables students to complete assignments, to express themselves effectively in writing, and to take tests (Nagel, Schumaker, & Deshler, 1986).

The teaching methodology designed by Deshler, Alley, Warner, & Schumaker (1981) consists of eight structured and systematic steps:

- STEP 1: PRETEST - Make the student aware of his or her current learning habit.
- STEP 2: DESCRIBE - Describe the new learning strategy.
- STEP 3: MODEL - Model the strategy for the students.
- STEP 4: VERBAL REHEARSAL - Have the students verbally rehearse the strategy to automaticity.
- STEP 5: CONTROLLED PRACTICE - Have the students practice the strategy with controlled materials.
- STEP 6: GRADE-APPROPRIATE PRACTICE - Have the students practice the strategy with grade-level materials.

TABLE 1

The Strategies Intervention Model

| CURRICULUM COMPONENT | INSTRUCTIONAL COMPONENT | ORGANIZATIONAL COMPONENT |
|--|--|--|
| "What" will be taught | "How" strategies will be taught | "Accommodation and adoption" |
| Task-Specific Learning Strategies ^a | Acquisition Procedures ^a | Communication Procedures |
| Executive Strategies | Generalization Procedures | Management Procedures |
| Social Skill Strategies | Maintenance Procedures | Evaluation Procedures |
| Motivation Strategies | Group Instructional Procedures | Teacher Training and Adoption Procedures |
| Transition Strategies | Material and Instruction Modification Procedures | |

Note. From "Intervention issues related to the education of LD adolescents" by J. B. Schumaker, D. D. Deshler, and E. S. Ellis. In Psychological and educational perspectives on learning disabilities (p. 334), by J. K. Torgesen & B. Y. L. Wong (Eds.), 1986, New York: Academic Press.

^aThe acquisition procedures of a task-specific learning strategy are the focus of the present investigation. X

TABLE 2

Learning Strategies Curriculum

| ACQUISITION | STORAGE | EXPRESSION AND DEMONSTRATION OF COMPETENCE |
|--------------------------|-------------------------------------|--|
| Word Identification | FIRST-Letter Mnemonica ^a | Sentences |
| Paraphrasing | Paired Associates | Paragraphs |
| Self-questioning | Listening and Note-taking | Error Monitoring |
| Visual Imagery | | Themes |
| Interpreting Visual Aids | | Assignment Completion |
| Multipass | | Test Taking |
| SOS | | |

Note. From FIRST-Letter Strategy: Learning Strategies Curriculum by D. R. Nagel, J. B. Schumaker, and D. D. Deshler, 1986, Lawrence: Excel Enterprises, Inc.

^aThe FIRST-Letter Mnemonic Strategy is selected as it is designed to improve recall performance.

STEP 7: POSTTEST - Skills mastery test.

STEP 8: GENERALIZATION

- (1) Orientation - students are made aware of the different settings and contents in which the strategy can be applied.
- (2) Activation - students are given practice with the strategy in a variety of materials and content.
- (3) Maintenance - periodic probes are made to ensure continued use of the strategy.

Research shows that the maintenance and generalization of newly acquired learning strategies rarely occur spontaneously (Borkowski, Johnson, & Reid, 1985; Licht & Kistner, 1986; Licht & Torgesen, 1983). Generalization may be defined as "the extent to which a student uses and effectively adapts a skill outside the setting in which it was learned" (Lenz, Alley, Schumaker, & Deshler, 1981). In order to promote generalization of the strategy in the learning disabled adolescents, a ~~two-stage plan~~ was developed (Lenz, Schumaker, Alley, & Deshler, 1981). The first stage, largely mediated by the teacher, involves procedures emphasizing modeling, verbal rehearsal, feedback, and controlled practice of materials during the acquisition of the strategy. Self-instruction is incorporated into the first stage as a means by which the student acquires and regulates the strategy across a variety of tasks. The second stage involves procedures emphasizing variables controlled for by the student (e.g., motivation, awareness of appropriate use of the strategy) after the strategy has been learned (Ellis, Lenz, & Sabornie, 1987). These researchers maintain that generalization be thought of as the framework in which the strategy instruction is couched.

Four levels of generalization are addressed within this framework (Ellis et al., 1987, p. 9): (a) antecedent generalization; (b) concurrent generalization; (c) subsequent generalization; and (d) independent generalization. These four levels are illustrated in Table 3. Antecedent generalization and concurrent generalization are considered in the present investigation and will be examined in further detail.

Antecedent generalization refers to activities which students engage in before instruction in the learning strategy begins. The objective at this level of generalization is to enlist the student's commitment to learn. The "Pretest and Commitment to Learn" is the first step which is designed with activities which attempt to motivate and address attitudinal problems that may hamper the learning process. The major focus of antecedent activities is to encourage students to think about the strategy generalization. That is, students need to envision the broader contexts in which strategies may be applicable and the concrete benefits they can offer for improving performance at school-related tasks (Ellis et al., 1987).

Concurrent generalization occurs during the direct instruction and acquisition of the strategy. Direct instruction of the strategy, modeling the strategy, explicit feedback, and enlisting the learner as a "collaborator in learning" through self-instruction (Meichenbaum, 1977, 1983) are procedures used in this level of generalization (see STEPS 2 to 5). These techniques enable the student to be directly involved with the strategy and to experience concrete benefits through improved performance. The corrective feedback given allows the student an understanding of the appropriate and inappropriate uses of the strategy.

TABLE 3

Four Levels of Generalization

| LEVEL OF GENERALIZATION INSTRUCTION | EMPHASIS | PRIMARY MEDIATORS |
|-------------------------------------|--|--|
| Antecedent | Changing negative student attitudes that might ultimately affect generalization behaviors. | Remedial Teacher |
| Concurrent | Student acquiring the skill well enough for it to become generalized. | Remedial Teacher Content Teacher Peers |
| Subsequent | Applying the skill to various contexts, situations, and settings. | Remedial Teacher Content Teacher Peers |
| Independent | Student using self-instruction to mediate generalization. | Student Remedial Teacher |

Note. From "Generalization and adaption of learning strategies to natural environments: Part 2: Research into practice" by E. S. Ellis, B. K. Lenz, and E. J. Sabornie , 1987, Remedial and Special Education, 8, p. 9.

Learning strategy instruction explicitly explains why and how a strategy is used by describing and modeling the learning procedure, and it attends to coaching the student's application of the strategy (Ellis et al., 1987). In addition, learning strategies incorporate essential features of cognitive and metacognitive training (Wong, 1985). The role of metacognition and self-instruction has been examined by researchers for increasing learning effectiveness (Meichenbaum, 1977, 1983; Wong, 1985).

The Role of Metacognition in Strategic Awareness and Behavior

Metacognition, as defined by Wong (1985), is an individual's introspective awareness of his or her own cognitive processes, and the self-regulation of these processes. The impact of metacognitive theory is evident in the development of the learning strategies approach (Alley & Deshler, 1979). Implicit in this remedial instructional package is a basic tenet that students must actively participate and take responsibility for their own learning (Meichenbaum, 1977, 1983). The self-instructional component included in the learning strategies model enables these students to regulate newly acquired strategies in an autonomous manner.

One limitation within the metacognitive perspective is that one's knowledge of strategic behavior does not guarantee its use (Wong, 1985). Learning disabled students' awareness of strategy may not be sufficient; motivation is critical to the self-regulation of an effective strategy. The beliefs that learning disabled students hold about the causes of success and failure at achievement tasks may hamper the continued use of the strategies. Students must believe that effort in strategic behavior will contribute to their

school success. Attribution retraining may be incorporated with other aspects of metacognitive training to ensure maintenance and generalization of a strategy.

Attribution Theory

Attribution theory accords cognition a central role in mediating student learning and motivation to learn. Cognitive processes--evaluation, judgment, problem-solving, and affective appraisal--play an essential role in determining why students behave as they do. A guiding principle of attribution theory is that individuals seek to discover or understand why they have succeeded or failed at an event or task (Weiner, 1986). A pattern of reasoning develops over time as the result of consistent interpretation of experiences; and it is assumed that this reasoning about the causes of success and failure mediates a student's performance at a given academic task (Weiner, 1979).

Students formulate causes of success and failures in achievement in a number of ways. To elaborate, individuals attempt to explain their success or failure in achievement situations by assessing their ability--aptitude and learned skills--in relation to their fellow students; by evaluating the amount of effort or attention needed to accomplish the task; by judging perceived help or hindrance from teachers, parents, or peers; by assessing their physiological state--mood, health, or maturity; by viewing the task as difficult or easy; and by luck (Weiner, 1984).

The core of attribution theory is the grouping of these perceived causes into three dimensions. An introspective examination begins with

locus of causality, that is, a differentiation between causes which are located within a person from those considered outside a person. Students' emotional reactions following success and failure at academic tasks form an important aspect of this three-dimensional paradigm. The degree of control an individual experiences over the outcomes of performance along the internal/external dimension will mediate changes in self-esteem. This dimension is associated with a number of affective reactions--pride, shame--which reflect how people feel about themselves and their capacity to accomplish school tasks successfully (Weiner, 1980).

The second dimension, constancy, defines causes on a continuum ranging from stable to unstable--the degree to which the cause may be modifiable over time and across situations. Causes are generated as selective to specific situations or generalized across a variety of tasks. Weiner (1986) identifies this distinction as specific or global. The causal structure, constancy, accounts for changes in expectations regarding future success at related tasks (Weiner, 1984, 1979).

The third dimension, responsibility, refers to the volitional control in expending effort needed to accomplish a task and the intent for appropriate use of existing or newly acquired strategies. Students' understanding of their role in the outcome of performance has subsequent consequences for expectations and future behavior. If a student perceives that effort and effective strategy use determines a positive outcome, then further energy will be expended in utilizing these problem-solving skills. In contrast, if no causal relationship is perceived between effort and outcome, and effective strategies are not in the students' active repertoire of academic behavior, a

generalized perception of lack of control may lead to helpless behavior. Learned helplessness is characterized by the perception that one's actions are independent of desired outcomes. The expectation of failure will result in a lack of incentive to expend effort (Weiner, 1979).

Figures 1 and 2 present information assimilated from Weiner's (1980, 1984, 1985, 1986) propositions on the cognitive and affective determinants of Attribution theory. Individuals approach an academic task with an achievement history--information gained through prior outcomes and feedback--and with an intact causal schemata--a pattern of reasoning. Following an achievement outcome and its immediate affective responses, a causal ascription will be sought. Chosen internal attributions will generate further distinct emotions which, in turn, have subsequent expectancy shifts in future outcomes and behavioral consequences.

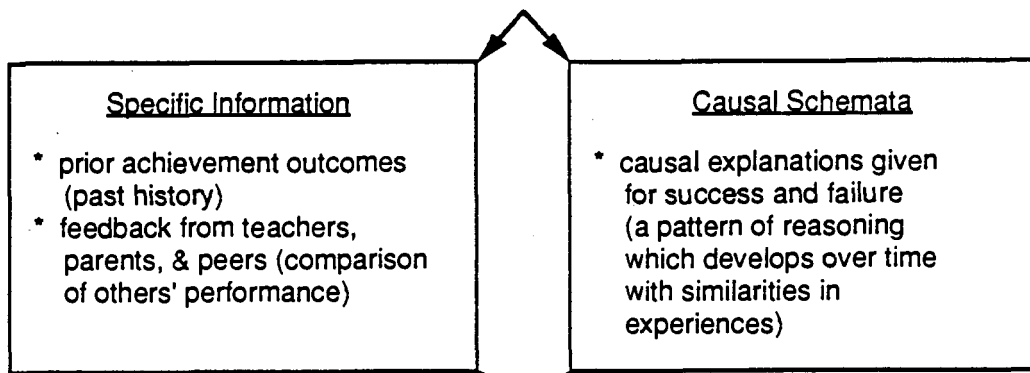
Patterns of Causal Attributions in Learning Disabled Students

Current literature depicts learning disabled students as developing maladaptive patterns of causal ascriptions for their academic successes and failures (Pearl, 1982; Pearl, Bryan & Donahue, 1980). What an individual believes to be the cause for success and failure may influence subsequent behavioral and affective responses in future achievement performance. Licht (1983) proposes that LD students are at risk for entering a low-motivational/low-achievement cycle. Beginning early in school years, these students experience repeated failures. As a result, many LD children doubt their abilities to succeed and gradually come to view their efforts as futile (Torgesen, 1980; Torgesen & Licht, 1983). They tend to give up easily,

FIGURE 1

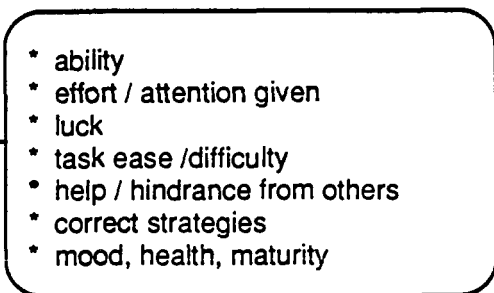
Cognitive and Affective Determinants of Attribution Theory

Causal Antecedents

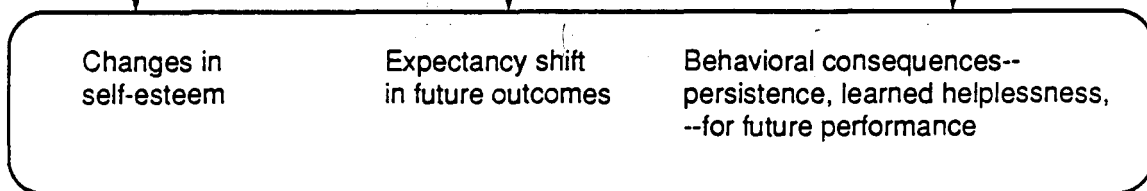
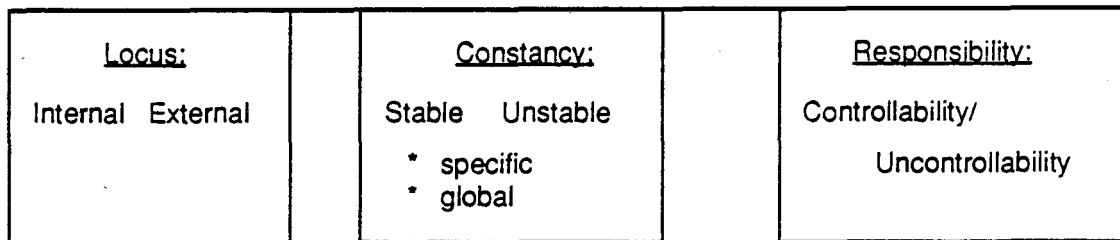


OUTCOME OF AN ACHIEVEMENT TASK

Causal Ascriptions in Achievement Domains



Causal Dimensions



Affective, Cognitive, and Behavioral Responses

M
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S

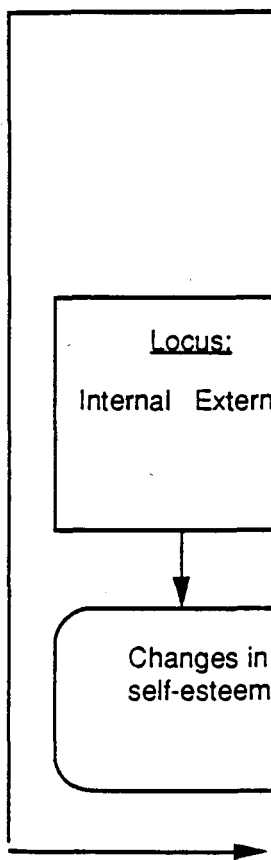
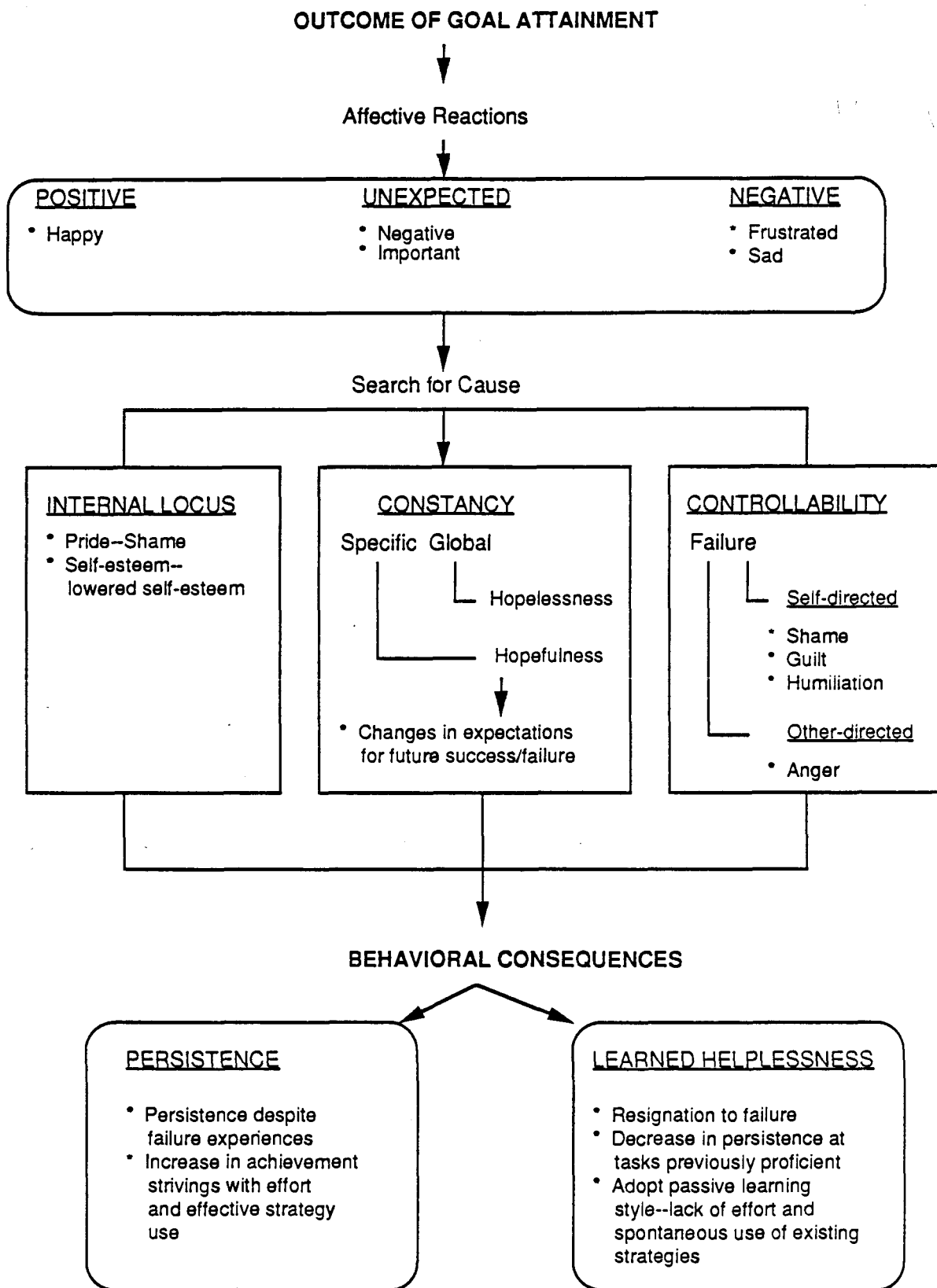


FIGURE 2

The Role of Emotion in the Attributional Framework



particularly on difficult tasks, resulting in further failure and frustration. The overall level of performance of these individuals deteriorates and this, in turn, reinforces the belief that they lack the ability to work effectively with their learning problems. As this belief is strengthened through failure experiences, these LD students do not take credit for successful outcomes. Instead, success at a school task is ascribed to external and uncontrollable factors such as teacher help, ease of task, or luck (Licht, 1983; Licht & Kistner, 1986; Licht, Kistner, Ozkaragoz, Shapiro, & Clausen, 1985).

The first component identified in Licht's (1983) proposed cycle is that repeated failures may lead learning disabled students to believe they lack ability to cope with learning problems. Well documented is the notion that repeated failures in achievement situations can lead students to believe that lack of ability is the cause for failure and purposeful effort will not change the outcome of their performance (Licht, 1983; Licht & Kistner, 1986; Pearl et al., 1980; Weiner, 1979). Learning disabled children are more likely than their non-disabled peers to attribute their failure experiences to insufficient ability and less likely to attribute them to insufficient effort (Pearl, 1982; Pearl et al., 1980; Pearl, Bryan, & Herzog, 1983). Licht (1983) points out that students employ problem-solving behaviors when they believe their difficulties are surmountable. On the other hand, learning disabled students who view their academic difficulties to reflect limited ability, and therefore, out of their control, give up when encountering difficult tasks. Distinguishable in this attributional pattern is the belief that an internal locus of control has been supplemented by external factors over which the student has no influence.

The second component in the cycle is that maladaptive beliefs will affect future effort and achievement outcomes. Students who do not ascribe achievement outcomes to be within their control reflect an attitude of "learned helplessness". That is, these individuals believe that they are powerless in controlling or changing the outcome of an academic task (Dweck & Reppucci, 1973). Learning disabled students are likely to avoid challenging tasks. Believing that their efforts are fruitless, these students show decreasing persistence and deterioration in utilizing existing problem-solving behaviors. Consequently, their academic performance falls below their capabilities (Andrews & Debus, 1978; Diener & Dweck, 1978; Licht, 1983; Licht, et al., 1985; Pearl et al., 1980).

① A salient characteristic of learned helpless behavior is the lack of persistence at difficult academic tasks. Studies comparing "mastery-oriented" students with "helpless" students demonstrate a significant difference in their responses to failure. "Helpless" students attribute the cause for their failures to uncontrollable factors, taking less responsibility for their overall academic outcomes. In contrast, "mastery-oriented" students tend to engage in solution-directed behaviors, utilizing strategies such as self-instruction and self-monitoring (Butkowsky & Willows, 1980; Diener & Dweck, 1978; Dweck, 1975; Dweck & Reppucci, 1973; Pearl et al., 1983). Extrapolations to LD students from Dweck's research findings appear warranted. Conceivably, learning disabled students may exhibit learned helplessness behavior and may not think they can change the outcome of their performance by changing a strategy or persisting with the task. Rather, they may see their learning difficulties as unmodifiable. It is important to note that

learning disabled students may possess effective strategies in their repertoire, but that they may not be motivated to use them since they view their difficulties as stable and unmodifiable.

Torgesen (1980) provides a conceptual framework for viewing the learning disabled student as an "inactive learner," one who does not assume responsibility for his/her own learning. These students may not necessarily lack the skills and strategies required to perform the task, but differ from achieving students in the spontaneous and appropriate use of efficient strategies (Pearl et al., 1983; Torgesen, 1980; Torgesen & Licht, 1983; Wong, 1980). One possible explanation for learning disabled students' failure to produce effective strategies may involve the reasoning about their past performance. Years of academic failure may communicate the message that active participation in one's own learning process will not change the academic outcome. As a consequence, learning disabled students develop a helpless attitude toward their learning. Repeated failures may be teaching these students that active involvement and a high level of motivation in school tasks will have little effect on the subsequent outcome (Torgesen, 1980; Torgesen & Licht, 1983; Wong, 1980).

Licht (1983) hypothesizes that patterns of causal attributions in learning disabled students not only affect problem-solving behaviors in achievement situations, but they may also mediate affective responses. Failures that have been attributed to insufficient ability produce feelings of shame and humiliation (Weiner, 1980, 1985). An individual's self-concept of ability will have an impact on his/her motivation to persist and work hard, especially when faced with a difficult task. Motivation to study and learn will

have consequences for academic success. Because students with positive self-concepts and high expectations for success tend to take responsibility for their learning and believe in their ability to master academic tasks, they persist in difficult situations despite failure. The cycle continues as increased effort raises the possibility of success at the task, and success confirms a positive self-concept. In contrast, students such as LD individuals who have a low self-concept of ability and low expectations for future success may have little faith in their ability to master instructional tasks.

Motivational problems arise as these students come to doubt both their intellectual capacities and their ability to cope with their learning difficulties.

Review of Treatment Approaches in Attribution Retraining Programs

The discussion on patterns of causal attributions in LD students has distinct implications for an intervention approach. Proposed in this thesis is that the motivational state--the beliefs and attitudes that each student brings to the learning task--has an integral effect on remediation with learning disabled students. To challenge the causal schemata which underpins the acquisition and maintenance of knowledge and strategy use may be a critical focus for educators. Attribution retraining may be included as one of the major thrusts in intervention involving: (1) knowledge and skill acquisition; (2) strategies that aid in the development of knowledge and skills; and (3) causal beliefs that affect self-concept of ability and expectations for future success.

Attribution retraining may be evaluated in terms of two primary goals.

First, some learning disabled students need to acquire an alternate belief

about their responsibility for successful academic outcomes. Success may then be causally ascribed to an internal, controllable factor--purposeful effort in effective strategy use. Second, as these students cannot be protected from failure, they must be directly taught to cope with failure experiences.

Some learning disabled students need to develop an adaptive attributional belief regarding failure in which failure may also be perceived as an outcome for which each student is responsible--by persisting with effort and strategy use, or monitoring the need for additional help.

Following is a review of attribution retraining studies which have been selected on the basis of critical features explored in the present investigation. The studies are examined within two programmatic frameworks: (1) external-control programs, and (2) self-management techniques. The first emphasizes an external source of control for inducing attitudinal and behavioral changes, and the latter focuses on self-regulated sources. More specifically, external control programs examine the effects of reinforcement training schedules, contingent social reinforcement, and attributional feedback training. The self-management techniques include participant modeling, self-instruction, and strategy-training. The studies reviewed here are limited to classroom studies. They utilize both individual techniques and combined approaches in attempting to alter maladaptive attributional beliefs. A table summarizing the relevant studies is presented in Appendix B.

Reinforcement Training Schedules. Reinforcement training schedules have been a critical feature in several of the attribution retraining programs designed to remediate performance deficits of students exhibiting

learned helpless behavior. Varying schedules of success and failure experiences along with attribution retraining have been compared for their effectiveness in increasing students' persistence at subsequent learning tasks. In studies using reinforcement training schedules, the focus has been on performance feedback. Persistence at tasks was measured by number of trials attempted, response latency, or time at task (Chapin & Dyck, 1976; Dweck, 1975; Fowler & Peterson, 1981).

Dweck (1975) established the first attribution retraining program by demonstrating that the debilitating responses to failure could be altered by changing children's attributions for failure. Two groups were investigated on tasks involving arithmetic problems. One group received success-only experiences (continuous reinforcement), while the other group received attribution retraining with success and failure experiences (partial reinforcement). While the success-only group continued to display marked deterioration in performance following failure, the group taught to attribute failure to insufficient effort persisted and maintained the task goal despite failure.

Chapin and Dyck (1976) noted that Dweck (1975) did not isolate the reinforcement variables from the attribution retraining. One group in the Dweck study received continuous reinforcement while the trained group received partial reinforcement. Chapin & Dyck (1976) questioned whether partial reinforcement, rather than attribution retraining, was responsible for the enhancement of persistence at arithmetic problems. These researchers investigated two levels of partial reinforcement (single and multiple failure lengths) with the presence or absence of attribution retraining. The results

demonstrated that the effects of attribution retraining on persistence at difficult reading tasks was modified by scheduling experiences with both success and failure. When used together, partial reinforcement along with attribution retraining was superior in inducing persistence than when the individual forms of treatment were used separately.

Fowler and Peterson (1981) replicated and extended the results of the Chapin and Dyck (1976) study to determine whether a "direct" method of attribution retraining (attribution feedback and self-instructional strategy) would be more effective than the "indirect" method (attribution feedback only) used by Dweck (1975) and Chapin and Dyck (1976). The results of this study confirmed that partial reinforcement scheduling along with attribution retraining was a critical component of increasing persistence in achievement behaviors and attributions to effort. However, Fowler & Peterson (1981) found that the "direct" attributional method of cognitive modeling and covert rehearsal was not more effective than the "indirect" method (performance feedback) in altering the students' ascriptions of failure to lack of effort.

These classroom studies provide support for the role of reinforcement in both success and failure experiences in learning disabled students. In part, attributions to effort allow these students the belief that they are able to cope with their failure experiences and persist with purposeful effort.

Social Reinforcement with Attribution Retraining. The effects of reinforcement control on the induction and maintenance of adaptive attributional patterns has been the focus of several studies. Social reinforcement techniques--contingent praise or token reinforcement--have

been compared with self-management techniques for their effect on increasing effort attributions. The major goals of attribution retraining are to instill in students an internal locus of causality which is changeable and controllable, and to increase personal responsibility for persisting with the use of effective strategies. To enable students the possibility of reaching these goals, researchers need to further explore the most beneficial source of reinforcement control. Reinforcing experiences may be distinguished on the basis of generating expectancies of internal or external control (Bugental, Whalen, & Henker, 1977).

Bugental et al. (1977) examined hyperactive boys' causal attribution schemata within two behavioral-change strategies: (1) external monitoring and control (social reinforcement), and (2) internal monitoring and regulation (self-controlling speech). It was hypothesized that the treatment strategies would have differential effects depending on the child's personal causation schemata. According to this hypothesis, children who viewed academic outcomes as due to external factors (luck or teacher bias) should benefit more from a treatment approach which controls the external environment. In turn, those children who perceived a personal control in determining their outcomes (effort attributions) should benefit from self-control programs which enhance their perceptions of causality. The results indicated that behavior change, as predicted, was greater when the child's causal attributions matched the intervention techniques. Children who made high attributions to external causes were significantly more responsive to the reinforcement intervention than to the self-control strategy.

The ultimate goal of attribution retraining is to increase personal responsibility in academic outcomes. The above study shows that the sequence in which reinforcement is given is an important factor in fostering students' academic responsibility. For learning disabled students who have low expectations for control, the first step towards personal responsibility may be to experience a predictable, consistent environment through systematic or regular external, social reinforcement (Bugental, 1977). This initial step may be a necessary prelude to the training programmes emphasizing self-management techniques.

Feedback and Attributional Training. A majority of the attribution retraining programs utilize verbal feedback as a technique for linking problem-solving activities to a specific attribution--effort or lack of effort.

Verbal attributional feedback allows the student to reassess the role of effort in producing successful outcomes. These studies demonstrate that providing effort feedback enhances task persistence. In addition, feedback influences students' attributions to effort as a primary causal factor in academic outcomes (Andrews & Debus, 1978; Chapin & Dyck, 1976; Dweck, 1975; Medway & Venino, 1982).

Schunk (1982) extended this research by demonstrating that not only was effort feedback essential for promoting students' sense of self-efficacy, the wording of the feedback communicated was a critical factor. This study examined the effectiveness of two verbal feedback approaches. In one treatment group, the trainer responded to the student's performance by the statement, "You've been working hard." In the second treatment group, the verbal feedback was "You need to work hard." Attributional feedback in the

first treatment group--the acknowledgement of effort--resulted in increased improved performance and feelings of efficacy. Conversely, with the second treatment group, stressing further effort may have undermined the actual effort expended on the part of the student (Schunk, 1982). As attributional feedback contains an element of social reinforcement, acknowledgement of expended effort may be perceived as approval, whereas, the need for further effort may imply disapproval.

Similarly, Miller, Brickman, and Bolen (1975) also found that the specific wording of attributional feedback was conveying different messages to the students. The persuasive message, "You should try more on arithmetic," was not an effective motivator. However, positive feedback given through the statement, "You're working harder in arithmetic," was effective at improving arithmetic performance and self-esteem. The superiority of effort acknowledgement over a persuasion technique point to the importance of the message communicated. The way in which information is presented to students as they attempt to cope with academic expectations may be central to the development and maintenance of adaptive attributions.

External-based control programs have been successful in inducing skill development, in enhancing persistence at tasks, and in altering attributions for failure to lack of effort. However, the goal of attribution retraining is responsibility for successful outcomes and the capability to cope with failure experiences. The focus in self-management techniques is to challenge the present causal beliefs for success and failure in school tasks, and to emphasize personal responsibility in changing these beliefs.

Three components in self-managing techniques emphasize ways in which learning disabled students come to learn responsibility for their learning outcomes. Meichenbaum (1977, 1983) stresses three critical phases in the cognitive restructuring of current beliefs. First, students must be observers of their thoughts, feelings, and behavior. In attribution retraining programs this would involve the participant becoming aware of causal beliefs that influence achievement behavior. Second, the student is involved in a substitution phase. The awareness gained as an observer allows for the substitution or development of new attributions. Third, the students need to cognitively restructure old patterns with new adaptive attributions. Students need opportunities to practice adaptive attributions in a controlled environment while working with an effective strategy.

Participant Modeling. Learning disabled students may learn adaptive attributions and behaviors by observing the behavior of models. Systematic modeling may be central to attribution retraining programs where students are exposed to new response patterns (Bandura, 1977). The initial step in moving from an external to an internal source of control--from an external-based control to self-management techniques--is to provide students with systematic modeling of adaptive attributions and appropriate behavioral responses.

Schunk (1981) compared the use of two instructional techniques-- modeling or didactic instruction--with students learning division operations. It was hypothesized that effort attribution would lead to higher achievement, persistence, self-efficacy, and accuracy of self-appraisal in the cognitive modeling treatment but not in the didactic instruction. Would providing

students with modeling, guided practice, corrective feedback, and self-directed mastery foster the development of skills and would these procedures promote self-efficacy? This method of instruction allowed students opportunity for participation in effective problem-solving and adaptive attributions rather than simply being exposed to explanatory principles. Students observed a model work through a problem, verbalizing the solution strategies to arrive at a solution. Modeling then may have provided the initial step for students to move toward self-regulation of their learning process.

The results of this study supported this contention; cognitive modeling was more effective than didactic instruction in enhancing skill development. As the students experience achievement gains, the validity of the information may serve to reinforce the role of effort in successful outcomes. However, the hypothesis that effort attributions would promote gains in self-efficacy, persistence, and skill development for the modeling group failed to receive support. Schunk (1981) pointed out that since the modeling provided the students with valid information concerning the strategies and difficult skills that they would encounter, attributions made to effort may have been overridden. It may be formulated that effort in strategy use modeled by the investigator may be the initial step for retraining attributions. An additional composite to an effective attribution retraining program would be the direct involvement of students with strategies and skill development. This would allow the students direct experience with the role of effort in producing successful outcomes and persisting despite failure.

Self-Instruction. Self-instructional cognitive interventions have been a recent focus for initiating behavior change (Meichenbaum, 1977, 1983). This intervention approach is based on the premise that cognitions influence behavior. Thus, by changing cognitions, behaviors can be altered. One method of examining the cognitive beliefs of learning disabled students is by monitoring their overt self-statements. "Think aloud" procedures direct the students to attend to their steps in thinking as they move through a task. While attribution measures largely consist of retrospective data, valuable information about the student's cognitive processes may be gained through a "think aloud" method. This procedure forces conscious attention to the task or motivational state (Kellogg, 1982; Nisbett & Wilson, 1977).

Diener and Dweck (1978) monitored the nature and timing of motivational statements made during failure experiences. They found marked differences in both the pattern of performance and in the nature of verbalizations emitted by "learned helpless" and "mastery-oriented" students following failure. The "mastery-oriented" children were more concerned with the solution to the problem rather than its cause. They expressed self-monitoring statements such as "I've got to slow down and think more clearly"; positive affect statements, "I love a challenge"; and high expectancies for success, "I've almost got it." In contrast, "learned helpless" children emitted statements which could interfere with the problem-solving task, "I'm getting confused" or "I never did have a good memory." These statements emphasize the perceptions of feelings of lack of control over the outcome.

The Diener and Dweck (1978) study points to the importance of directly reteaching adaptive attributional beliefs by addressing the self-statements made by these students. The focus in self-management techniques in attribution retraining is to challenge the cognitive underpinnings influencing performance deficits. This method emphasizes personal responsibility on the part of the student in changing his/her causal beliefs of failure and success. Adaptive attributions, in turn, may be crucial to influencing academic behavior.

Reiher and Dembo (1984) addressed the dimension of credibility in addition to the self-management procedure. Two hypotheses were formulated: first, the subjects receiving self-instructional training would show increased achievement motivation as measured by task persistence with changes in attributions to effort as compared to a control group receiving no training; second, the experimental group receiving rationale training would show more substantial change than the self-instruction alone or control group. While the first hypothesis received support, the added dimension of rationality did not produce significant differences. Reiher and Dembo (1984) outlined several factors to be taken into consideration in future research. First, timing devoted to the credibility aspect of the training was minimal. Second, the information may have not been powerful enough. What information to be included and how this information is presented may be a key factor in providing a rationale for attributional change. The issue of credibility is important as learning disabled students must view active participation in their learning process as reasonable for future success.

Strategy Training. Licht and Kistner (1986) suggest that students will use increased effort if they are taught how to try harder. Effective task strategies may be essential to effective attribution retraining programs as they provide the direction for students' effort. Effort in learning disabled students' achievement behaviors cannot stand alone. It must be directed toward a goal which has concrete benefits. An integrative treatment approach of attribution retraining paired with strategy training may ensure that changes in attributions to effort in strategy use will be accompanied by improved performance. While "effort" may be viewed as the "energizing" component to motivation, "strategies" may be the "directive" component (Anderson & Jennings, 1980). Students may be more motivated to use task strategies if they perceive that effort in strategy use results in performance gains.

Anderson and Jennings (1980) pointed out that while the energizing component, "effort", has been the focus in many of the attribution retraining studies, the directive component, "strategy use", has been largely ignored. These researchers (1980) examined whether attributing failure to a controllable factor, ineffective task strategies, would lead to higher expectations for success than attributing failure to uncontrollable factors such as lack of ability. Specifically, the reactions to failure were compared with subjects perceiving task outcome as strategy determined (controllable) versus ability determined (uncontrollable). Results indicated that when subjects were induced to perceive initial failure as due to ineffective strategy use, rather than lack of ability, experiences of failure promoted further expectations for success. As students are taught to attribute failure to the

use of ineffective strategies, and are directed to how they may attain a goal through utilizing these strategies, effort becomes purposeful.

Reid and Borkowski (1986) examined the validity of attribution retraining in their strategy model. Three training conditions were compared for their effectiveness with hyperactive children: self-control (self-management training and strategy training in paired associate and sort recall tasks); self-control plus attribution condition (same training as self-control plus antecedent and program-specific beliefs about the importance of effort in improving performance); and control condition (strategy training without self-control or attribution instructions). Analysis of the short-term treatment effects indicated that students in the self-control plus attribution treatment group showed significantly higher strategy scores on strategy transfer tasks, produced greater gains in attributional beliefs, and decreased in impulsivity. Long-term assessment revealed that the use of acquired strategies and changes in attributional beliefs persisted over a ten month followup. The program-specific attributional beliefs had been "permanently" altered by this type of interactive training. In order to alter maladaptive beliefs which have developed over the years through chronic failure, attribution retraining programs must be incorporated into cognitive and metacognitive interventions which teach skills and strategies.

Methodological Issues in Attribution Retraining Procedures: New Directions for Research

Attribution research attempts to understand achievement behavior through analyzing cognitions about the causes of success and failure. Much

of the theoretical work attempting to test the attribution model (Weiner, 1986) uses four causal explanations: ability, effort, luck, and task ease. Outcomes of academic performance may also be attributed to causes such as strategy use, external assistance (help from teachers, parents, or peers), physiological factors, learning conditions, and will to succeed (Bar-Tal, Goldberg, & Knaani, 1984). These attributions are classified along three causal dimensions (Weiner, 1979): locus of causality, stability, and controllability.

One of the critical limitations in prior attribution retraining studies is the tool by which changes in attributional beliefs were measured. Causal attributions are latent cognitive beliefs that are not observable, but presumed to exist because their effects are observed in behavior (Whitley & Frieze, 1985). As such, the psychometric tools were indirect measures of causal beliefs. To determine initial beliefs about the causes of success and failure, subjects are often instructed to respond to a forced-choice questionnaire with limited causal perceptions: ability, effort, task difficulty, and luck. While these perceived causes are the most noted in achievement situations (Weiner, 1984), forced-choice measures may fail to identify the causal beliefs held by underachieving, learning disabled students. The sole use of a forced-choice questionnaire does not take into account the life experiences of the subject (Weiner, 1983). A further constraint comes into play when the meaning of student responses is interpreted by a researcher and classified on the three dimensions (Bar-Tal, et. al., 1984). A free-choice approach may be the most suitable method for eliciting students' subjective

causal explanations for success and failure. This method relies on individual reports of experiences and their meaning for that individual.

Attribution researchers need to be clear about the type of attributional information they are seeking. The phrasing of the attribution question affects the type of information given by participants. Whitley and Frieze (1985) identify two question wording styles. The first style can be referred to as informational attributions. These questions ask participants the extent to which they possess ability, the extent to which the task was easy or difficult, and the extent to which effort was given to a task. The focus for these questions is the extent to which these causal factors are present in the situation. Students are not asked how these causal factors influence the outcome. This wording style gives us information about the student, but does not reflect the perceived cause of the outcome. A causal attribution wording style is the second style identified by Whitley and Frieze (1985). Questions are phrased in a manner which ask the students what causal factors influence, determine, or cause an outcome. This question style is appropriate to measurement instruments used in attribution retraining studies. Measurable changes in perceived causes of events due to the attribution retraining can then be detected.

A second limitation in attribution retraining studies is the context in which attributions are elicited. There is a need to differentiate between general attributions or pervasive self-perceptions held by the participants, and those given with regard to a task-specific situation. Some studies elicit causal explanations given to general achievement situations, while others pinpoint attributional responses given to a specific task. It may be posited

that the attributions given in these contexts differ. The following example serves to clarify this distinction. Students may attribute lack of effort as the causal explanation for a hypothetical failure experience. This response allows them to maintain a measure of self-esteem where if effort were applied, there could be perceived success. Given effort, academic success may be perceived as within their control. Failure in the task-specific situation would force these students to search for an alternate cause, especially if effort had been applied. When researchers claim changes in attributional self-statements due to attribution retraining, they need to clarify the type of attributions changed. Two questions need to be posed by researchers: (1) are the changes made within task-specific attributions, that is, those emulating from the immediate treatment, and (2) are these changes in self-perceptions generalized to general achievement situations?

Prior research provides the backdrop for conceptual and methodological issues considered in the present investigation. Chapter three describes the subjects participating in the study, the training materials selected, the dependent measures examined, the design of the study, and the procedures used.

CHAPTER THREE

METHOD

Subjects

Selection Criteria. The selection of participants for the study focused on students who had been identified as learning disabled in accordance with school district and provincial guidelines (see Appendix A). These students were reported to have a history of learning problems, and to have received specialized help throughout the elementary grades. All students were presently receiving assistance in a Learning Disabilities Resource Centre.

School district officials selected four learning disabilities resource teachers who were enthusiastic about the benefits of strategy and attribution retraining for their students. These teachers nominated students at a preliminary meeting with the investigator. Each identified learning disabled student selected was experiencing difficulties with study demands of the high school curricula, particularly those subject areas involving reading. They were assessed by their teachers as being in need of a study strategy which could improve their recall in test-taking situations.

As the study under investigation relied on the identification of learning disabled adolescents through school district and provincial guidelines, it has a notable constraint. In order to protect confidentiality of the LD students, diagnostic records cannot be obtained. As such, homogeneity of subjects cannot be assumed. In addition, consistent procedures used for the identification of the LD students under question cannot be assured. Within

this constraint, however, the investigator procured homogeneity in the sample through the following methods:

- (1) Assurance given from school district personnel with regards to the identification of each student as learning disabled;
- (2) Students described by their teachers as experiencing motivational problems in school-related tasks;
- (3) Students experiencing difficulty coping with the reading demands at the high school level as measured by the Gates-MacGinitie Form D standardized reading test. The mean average reading level for subjects selected was a grade equivalent score of 5.6 with a range of 2.7 to 8.5;
- (4) Criteria set at 80% for a prerequisite memorization and recall list learning task (established in manual, Nagel, Schumaker, and Deshler, 1986);
- (5) Students lacking metacognitive awareness of strategy use in study behavior, as measured by the Metacognitive Awareness structured interview. The criteria level was established at 80%.

Setting. Subjects. Personnel. Thirty-two learning disabled students were recruited from four junior high schools in two districts in the suburbs of Vancouver, British Columbia. These schools served students from a variety of backgrounds in grades eight, nine, and ten. Consent was sought from both the school principal and the learning disabilities resource teacher. A letter of information was then sent to the parents/guardians of the prospective participants. Written permission on the parts of both students

and parents/guardians was required (see Appendix C). The researcher explained to the students the purpose and goals of the study. While participation in the study was voluntary, commitment until completion was emphasized as crucial. The researcher was responsible for all steps in the data collection. All training sessions took place in a separate room from the Learning Disabilities Resource Centre to ensure a setting free from distraction.

Three subjects dropped out after initially agreeing to participate in the study. The rate of attrition was 9%; one girl and one boy from the control condition, and one boy from the strategy plus attribution retraining condition were dropped from the study following the pretest measures. Their data were excluded from the results of the study. This resulted in thirty-two subjects, fourteen girls and eighteen boys (see Table 4). Students ranged in age from 13 years, 0 months to 16 years, 0 months, with a mean age of 14 years, 4 months. Students were formed into groups of three to five subjects in terms of their high school timetables. Each group was then randomly assigned to an experimental or a control condition: strategy plus attribution retraining condition; strategy only condition; and control condition.

The ten students assigned to the strategy plus attribution retraining condition consisted of five boys and five girls. Students were evenly distributed in grades eight and nine with a mean age of 14 years, 5 months. The average reading level for this group was grade 5.8. Seven boys and four girls formed the strategy only condition. Four were registered in grade

TABLE 4

Characteristics of Students in the Study

| Group | Subject # | Age (yr. mo.) ^a | Sex | Grade Placement | School | Reading Level ^b |
|-------|-----------|-------------------------------|-----|--------------------|--------|-------------------------------|
| S.A. | 1 | 14.6 | F | 8 | 1 | 7.5 |
| S.A. | 2 | 13.6 | F | 8 | 1 | 6.5 |
| S.A. | 3 | 14.1 | F | 8 | 1 | 4.8 |
| S.A. | 4 | 14.3 | F | 8 | 1 | 5.5 |
| S.A. | 5 | 14.2 | M | 9 | 1 | 4.2 |
| S.A. | 6 | 14.9 | F | 9 | 1 | 5.0 |
| S.A. | 7 | 15.1 | M | 9 | 1 | 4.5 |
| S.A. | 8 | 15.5 | M | 9 | 4 | 7.5 |
| S.A. | 9 | 14.10 | M | 9 | 4 | 7.3 |
| S.A. | 10 | 13.4 | M | 8 | 4 | 5.0 |
| S | 1 | 14.1 | M | 9 | 2 | 4.4 |
| S | 2 | 13.10 | F | 9 | 2 | 4.7 |
| S | 3 | 13.11 | F | 8 | 2 | 4.9 |
| S | 4 | 14.11 | M | 9 | 2 | 4.9 |
| S | 5 | 14.5 | M | 9 | 2 | 4.9 |
| S | 6 | 13.10 | F | 8 | 4 | 6.5 |
| S | 7 | 16.0 | F | 10 | 4 | 7.4 |
| S | 8 | 14.0 | M | 8 | 4 | 8.5 |
| S | 9 | 14.3 | M | 8 | 4 | 8.0 |
| S | 10 | 14.10 | M | 9 | 4 | 7.1 |
| S | 11 | 15.2 | M | 9 | 4 | 5.6 |
| C | 1 | 15.2 | M | 9 | 2 | 5.7 |
| C | 2 | 14.3 | M | 8 | 3 | 5.2 |
| C | 3 | 14.6 | F | 8 | 3 | 5.5 |
| C | 4 | 13.2 | M | 8 | 3 | 4.5 |
| C | 5 | 13.10 | F | 8 | 3 | 2.7 |
| C | 6 | 14.1 | F | 9 | 3 | 5.0 |
| C | 7 | 13.6 | M | 8 | 3 | 4.8 |
| C | 8 | 13.0 | M | 8 | 3 | 3.3 |
| C | 9 | 13.5 | F | 8 | 3 | 7.5 |
| C | 10 | 14.3 | F | 9 | 3 | 4.0 |
| C | 11 | 15.1 | M | 9 | 3 | 7.2 |

Note. S.A. is the Strategy plus Attribution Retraining Group.
 S is the Strategy Only Group
 C is the Control Group

^aMEAN AGE: S.A. - 14.5; S - 14.6; C - 14.0

^bMEAN READING LEVEL: S.A. - 5.8; S - 5.9; C - 5.0

eight, six in grade nine, and one in grade ten with a mean age of 14 years, six months. The average reading level for this group was at grade 5.9. Of the eleven students in the control condition, six were boys and five were girls. Seven students were enrolled in grade eight and four in grade nine. The mean age of these students were 14 years, 0 months. They were reading at a grade level of 5.0. These subjects are described in Table 4 according to group, subject number, age, sex, grade placement, school, and current reading level.

Training Materials and Dependent Measures

Strategy Training Tasks. The FIRST-Letter Mnemonic Strategy is taken from the Storage Strand of the Learning Strategies Curriculum (Nagel, Schumaker, and Deshler, 1986). This particular strand of strategies is designed to train students to organize, store, and retrieve information. This particular strategy was chosen for two primary reasons: (1) to improve junior high learning disabled students' ability to cope with the study and test-taking demands of the high school curriculum; and (2) to enable these students to see the benefits of a strategy which could be learned relatively quickly and could alleviate recall difficulties in test-taking situations.

The FIRST-Letter Mnemonic was presented as a means to facilitate memorization and recall of information in a list. The five steps used to design mnemonic devices that would aid in recall were as follows:

- F** Form a word
- I** Insert a letter or letters
- R** Rearrange the letters
- S** Shape a sentence
- T** Try combinations

Five types of lessons were administered in order that students acquire and master practice of the FIRST mnemonic. Each of these five lessons were devoted to mastering one of the steps of the strategy. The five lessons are presented in Appendix D.

The pre/posttest and maintenance measures for assessing the students' skill with regard to memorizing and recalling information in list-learning tasks are obtained from the strategy manual. Each task consists of ten questions and one point is given for each complete and correct answer. The researcher rescored all list learning tasks to ensure reliability (see Appendix D).

Metacognitive Awareness Measure. A structured interview was developed by the researcher to examine metacognitive awareness and regulation of strategic study behavior on the part of learning disabled high school students. The interview consisted of five questions that elicited metacognitive knowledge about how each student would apportion study time and regulate their study behavior to meet the demands of the task (Baker and Brown, 1984; Wong and Wong, 1986). The five strategy questions are presented in Figure 3.

FIGURE 3**Metacognitive Awareness of Strategy Use Interview**

1. **APPORTION OF STUDY TIME**
"When" and "how long" would you study for this test?
2. **STRATEGY EMPLOYMENT OF STUDY SKILLS**
"How" would you study for this test? Show me the way you would go about studying for a test on this chapter?
3. **KNOWLEDGE OF MAIN IDEAS/DETAILS**
"What" information do you think is important in this paragraph?
"What" is the main idea of this paragraph?
"What" details support that main idea?
4. **STRATEGY FOR SELECTING MAIN IDEA/DETAIL**
"How" do you pick out the important information in this paragraph?
"How" do you choose the main idea/supporting details?
5. **STRATEGIES FOR RECALL**
"How" do you attempt to remember this information?

Attribution Measures. There is a need in current research to differentiate between general attributions--those beliefs held about the causes for success or failure in achievement situations--and task-specific attributions--causal reasons given for the success or failure at an immediate task. For this purpose, a General Achievement Causality Measure was developed by the researcher in order to examine antecedent causal reasoning with regards to school-related tasks. The structured interview consisted of three hypothetical academic situations for learning disabled adolescents: a success experience, a failure experience, and an unexpected experience. According to Weiner (1986), causal search is elicited by each of these events. The researcher provided the students with a relevant achievement situation and with the outcome information. In order to alleviate the danger that the researcher and the subject may not agree on the meaning of causal attributions given, a free-response procedure was used (Russell, 1983). The subjects were asked to explain the outcome by giving reasons plausible with their own school experience. This structured interview is presented in Appendix F.

The students were then asked to place each of their three situational responses on The Final Causal Dimension Scale (Russell, 1983). This measure was designed to assess how each subject would perceive the causal attributions he or she has made in terms of causal dimensions. A set of nine items was written by Russell (1983) to examine the three causal dimensions espoused by Weiner (1979): locus of causality, stability, and controllability. The scale is presented and itemized by causal dimension in Appendix G.

The task-specific attributional situation concerned memorizing and recalling information from a list-learning task. The score on the pre-posttest recall measure was then used to elicit perceptions from the students as to why they may have received their score. The measure was designed by the researcher in order to elicit attributions made at current experiential task (see Appendix F). Again, the free-choice responses were placed by the students on The Final Causal Dimension Scale.

The mnemonic, BELIEFS, provided structure for three goals of the attributional intervention component of the study: (1) to teach adaptive attributions made to direct effort in using effective strategies; (2) to provide attributional and performance feedback during the controlled practice phase of the study; and (3) to provide a self-instructional model that directed alternative attributions for school-based success and failure. BELIEFS, designed by the researcher, has its theoretical base in Meichenbaum's (1983) basic types of metacognitive self-statements. The mnemonic is presented in Figure 4. The rationale for each of the steps in the strategy is provided for in Appendix H.

Design of the Study

A non-treatment and two treatment groups were compared: a control condition, a strategy only condition, and a strategy plus attribution retraining condition. The study employed a randomized treatment design. The design of the study is described in Table 5 according to group and procedures used.

FIGURE 4**The Mnemonic Frame BELIEFS**

- B Be aware** of your present thinking.
How am I feeling about approaching this task?

- E Express** these thoughts and feelings to yourself. Distinguish between the positive and negative statements.

- L Leave aside the negative statements.**
Put any self-statements aside which inhibit you from using the steps of the strategy.

- I I can succeed!**
Use a self-directing statement which is positive.

- E Excellent thinking!**
Use self-reinforcing statements.

- F Focus on "how" to succeed.**
Use the steps of an effective strategy.

- S Steps of the Strategy.**
Verbally rehearse the steps to the strategy.

TABLE 5
Intervention Phases in the Three Group Design

| Control | Strategy Only | Strategy plus Attribution Retraining |
|---|---|---|
| Pretest Measures | Pretest Measures | Pretest Measures |
| | | General Attribution Retraining Session 1 session |
| | Intervention | Intervention |
| | Strategy and Performance Feedback 4 wk. period | Strategy, Performance, and Attribution Feedback 4 wk. period |
| | Verbal Rehearsal and Written Protocol | Verbal Rehearsal and Written Protocol |
| | FIRST Mnemonic 1 session | FIRST Mnemonic BELIEFS Mnemonic 1 session |
| Posttest Measures | Posttest Measures | Posttest Measures |
| 10 -14 day time lapse Maintenance 1 | 10 -14 day time lapse Maintenance 1 | 10 -14 day time lapse Maintenance 1 |
| 10 -14 day time lapse Maintenance 2 | 10 -14 day time lapse Maintenance 2 | 10 - 14 day time lapse Maintenance 2 |

Students in the control condition did not receive the strategy training or the attribution retraining. As such, this condition provided the baseline data on all pre/posttest measures and eliminated alternative explanations for the results of the study such as history or maturation.

The strategy only condition emphasized the training of a specific strategy for recall. The FIRST- Letter Mnemonic Strategy was developed by Nagel, Schumaker, and Deshler (1986) as an efficient method to improve student performance in test-taking situations. The acquisition and controlled practice aspect of this recall list learning strategy was the focus for the present study. Feedback on appropriateness of the mnemonic used and performance on the recall task was given.

In the strategy plus attribution retraining condition, students received the same specific strategy training as did students in the strategy only condition. In addition, they were given training to enhance general and task-specific attributions. A general attribution session initiated the study for this group (see Appendix H). It consisted of a three part dialogue: (a) a discussion regarding their pretest scores on the recall list learning task, and the reasons they gave for the causes of the failure or success at this task, (b) a general discussion about their performance at school-related tasks, and the beliefs they held about the causes of failure and success, and (c) an activity which involved each student finding one personal area that they believed successful for them and the reasons for that success. The researcher followed up this activity with a discussion about school success and its relationship to beliefs held. The need for directing effort in utilizing effective strategies was encouraged. The training of task-specific

attributions consisted of the identical feedback given to the strategy only condition about appropriateness of the mnemonic used and performance on recall tasks. In addition, feedback was given about the relationship between directing effort in using an effective strategy and performance at the task. Causes for discouragement or failures were discussed and persistence at strategy use was encouraged by the researcher.

To recapitulate the four research issues addressed were the following:

1. Strategic Behavior: What are the effects of attribution retraining paired with strategy training on recall performance as measured by the posttest and maintenance tasks?
2. Metacognitive Awareness: What are the effects of attribution retraining paired with strategy training on the metacognitive awareness of strategy use as indexed by metacognitive assessments at pre and posttests?
3. Attributional Beliefs: What are the effects of attribution retraining paired with strategy training on changes in locus of causality, stability, and controllability, at specific recall tasks and at school-related tasks?
4. Attributional Style: What are the effects of attribution retraining paired with strategy training on predominant attributional responses given at specific recall tasks and at school-related tasks?

PROCEDURES

Pretest Procedures

Individually-administered pre-training assessments were conducted for all students. A General Achievement Causality Measure was given to determine general beliefs about the causes of school failures and successes. The taped interview consisted of three hypothetical academic situations: a success experience, a failure experience and an unexpected experience. The researcher initiated causal thinking by providing a non-academic practice example. She then read the passage orally alongside the students. This procedure was used in order to alleviate any decoding difficulties that might interfere with the understanding of the passage. Classification of the categories and the operational definitions are presented in Appendix F.

The free-response attributions were placed on a causal dimensional scale, The Final Causal Dimension Scale (Russell, 1983). This scale examined the causal attributions in terms of locus of causality, stability, and controllability dimensions (Weiner, 1986). The three causal dimensions were assessed by a nine-item measure, with three items per dimension. Two modifications were made by the researcher. First, its ten-point scale for each item was compressed into a five-point scale for each item. This alteration was made to facilitate a learning disabled population where differentiation in scale could be more clearly understood. Second, modifications in wording were made. Each item was presented first in its original wording, and then again with alternate wording. This was to ensure

comprehension of items with this specific sample group. The administration format, modifications in wording structure, items by causal dimension, and scoring procedures are presented in Appendix G.

Next, a Metacognitive Awareness of Strategy Use Scale was administered to determine L.D. students' metacognitive knowledge about critical study behaviors. It is this metacognitive knowledge that would allow students to choose and modify strategies to meet the demands of task (Wong and Wong, 1986). Students were presented with a passage from a Social Studies chapter that they were studying. They were asked to reread the passage and to think about what they had read. The researcher then presented the students with the following protocol and the five strategy questions in a taped interview:

This year in your Science and Socials Studies classes you will need to remember a lot of information for tests. I will be teaching you a way to remember information that will help to improve your test scores. But first, I need to know how it is that you study for a test. Imagine that you will be tested on a text passage such as this (passage in Socials text currently being studied). Your test is three days away.

The scoring procedure for this interview included the allotment of one point for each question for a total five possible points. Operational definitions and acceptable responses for each strategy question are outlined in Appendix E.

A Recall Performance Pretest measured the student's skill with regard to memorizing and recalling information from a series of lists (FIRST- Letter

Mnemonic Strategy Manual, 1986). Instructions were taken from the FIRST-Letter Mnemonic Manual (1986) and are as follows:

On the sheet of paper I have given you are typed three lists. You have 20 minutes to memorize the information in these lists. You may use the 3" x 5" cards or ruled paper I have given you and any memorization technique you know to help you memorize the information. At the end of 20 minutes, I will collect the lists and any notes that you have made. Tomorrow, I will give you a quiz over the information (p. 15).

The scores on the pretest served as the base for the Task-Specific Attribution Measure (see Appendix F). Reasons for the causes of success or failure in the actual situation were elicited. The researcher presented the student's score on the pretest and asked whether this mark was considered a good or bad mark. The student was then asked to give reasons why he or she received the mark. Again, these free-choice responses were placed on The Final Causal Dimension Scale (Russell, 1983).

Intervention Procedures

Training on the acquisition and controlled practice of the FIRST-Letter Mnemonic Strategy took place over a four week period, consisting of 12 sessions for a time period of 50 minutes each. Intervention took place in four steps: Describe, Model, Verbal Rehearsal, and Controlled Practice. All training procedures remained identical to those set forth in the manual with few exceptions. First, changes were made in the Verbal Rehearsal Step. The students were asked to verbally rehearse the steps to the strategy in

sequence over a three day period. This step was extended to facilitate automaticity of strategy steps on the part of learning disabled students.

Second, changes were made in the controlled practice of the strategy. Students were required to formate words or sentences using the first letter in a list of words to be learned. Students experienced a degree of frustration with the strategy as they expressed difficulties with spelling. Modifications in the strategy were made by the researcher. The first lesson entailed the instruction, FORM A WORD. Students experienced quick success as the word was clearly evident in the list. The second lesson added the instruction, INSERT A LETTER. The researcher provided a teacher-generated mnemonic. This was followed by a group-generated mnemonic. The third lesson, REARRANGE THE LETTERS was accomplished by the students working in pairs. They were instructed to help the other student with a unique mnemonic. The fourth lesson required the students to SHAPE A SENTENCE. This step was done individually with the researcher coaching when needed. The final lesson enabled the students to TRY COMBINATIONS. This was attempted individually with no assistance from the researcher or their peers. The objectives and lesson plans are outlined in Appendix D.

Third, changes were made in the mastery tests used at each step of the strategy. The students were given opportunity to take their mastery test in both oral and written form. The researcher read out the mastery question to the students. Each student was first required to answer the question orally. When the students reached mastery, they were given the written test. This modification was interjected by the researcher for two reasons: (1) to

ensure that the students were not rushing into the test without preparation; and (2) to explore differences in test scores given oral and written forms given that spelling was expressed by the students as extremely difficult.

While the control group received only the pre/posttest measures, the strategy only and strategy plus attribution retraining groups received identical procedures and protocol to that of the manual. In addition, the strategy plus attribution retraining group received one additional session in which a general attribution discussion was held. Training in this group also included the learning and application of the mnemonic, BELIEFS, a self-instructional attributional strategy. This also provided the differential feedback system between the two treatment groups. (see Appendix H).

Posttest Procedures

Following intervention, written recall for the mnemonics, FIRST and BELIEFS was performed. Posttest measures were administered in the same manner as in the pretesting procedures. An immediate skill posttest was conducted for performance on a recall task. This was followed by the Task Specific Attribution Measure and the Final Causal Dimension Scale. The Metacognitive Awareness of Strategy Use was again administered. Two maintenance recall tasks were given after a 10 to 14 day time lapse. This was followed up with the General Achievement Causality Measure.

Upon completion of the study, each student was thanked for his or her participation. Appropriateness of the strategy for study tasks was discussed with each student. All were encouraged to direct their achievement effort in using strategies which were effective for them.

CHAPTER FOUR

RESULTS AND DISCUSSION

The results of the study are discussed in three sections. The first section reports findings as to the effects of attribution retraining paired with strategy training on recall performance at posttest and on the maintenance of strategic behavior. The second section describes changes in metacognitive awareness of strategy use in study behavior as influenced by the attribution retraining and strategy treatments. The final section addresses whether attribution retraining mediates changes in task-specific and general attributional beliefs toward school-related behavior. Differential effects of the treatment are examined by changes in the three causal dimensions espoused by Weiner (1979): locus of causality, stability, and controllability. In addition, changes in attributional style--the predominant causal self-statements given in general achievement and task-specific situations--are described.

This study examined differences between three groups: control, strategy only, and strategy paired with attribution retraining. A series of one-way analyses was performed to examine between group differences on recall performance, metacognitive awareness of strategy use, and attributional changes in causal dimensions. To pinpoint specific between-group differences, Tukey's multiple comparison procedure was used. For all analyses, an alpha level of .05 was used.

Strategic Behavior

What are the effects of attribution retraining paired with strategy training on recall performance as measured by the posttest and maintenance tasks?

The pretest, posttest, and maintenance tests used in this study are taken from the FIRST-Letter Mnemonic Manual (see Appendix D). This recall measure consists of ten questions using recognition, retrieval, and application skills (see test measures in Appendix D). Tests of this sort are realistic to those given in the classroom. The primary purposes for selection of the strategy are intended: (1) to aid learning disabled students to meet the testing demands at the high school level; and (2) to alleviate recall difficulties in test-taking situations. To this extent, results found in the study may be generalized to "real-life" educational settings.

Within the above test, recall was measured across a variety of tasks. While the list-learning tasks were taken from the Science domain, items in the memorization task were not drawn from the same item pool (protists, digestion, mammals, and plants). Thus, these tests are not identical tests. Because different measures were used at pretest and posttests, changes within groups cannot be detected with repeated measures analyses. As a result, analyses focus on between group differences through a series of one-way analyses of variance.

Means and standard deviations for all pretest and posttest measures are presented in Table 6. A preliminary one-way analysis of variance was performed on pretest recall performance. Results revealed no statistically reliable differences among the three groups [$F(2, 31) = .04, p > .05$]. These

TABLE 6

Means and Standard Deviations for Recall Performance
Across Pre/posttest and Maintenance Tasks^a

| Measures | Experimental Conditions | | | | | |
|-----------------------|-------------------------|--------|----------|--------|----------|--------|
| | S.A. | | S | | C | |
| | (n = 10) | | (n = 11) | | (n = 11) | |
| | M | SD | M | SD | M | SD |
| Pretest ^b | 6.00 | (1.94) | 6.00 | (1.95) | 5.82 | (.87) |
| Posttest ^c | 8.90 | (.99) | 8.09 | (1.30) | 5.73 | (.90) |
| Main #1 ^d | 7.90 | (1.52) | 6.27 | (1.79) | 5.82 | (1.33) |
| Main. #2 ^e | 8.70 | (1.25) | 6.91 | (1.70) | 5.36 | (1.21) |

Note: S.A. is the Strategy plus Attribution Retraining Group.
S is the Strategy Only Group.
C is the Control Group.

^aA possible score = 10

^bRange at Pretest for S.A. = $10 - 4 = 6$
S = $10 - 4 = 6$
C = $8 - 5 = 3$

^cRange at Posttest for S.A. = $10 - 7 = 3$
S = $10 - 6 = 4$
C = $7 - 4 = 3$

^dRange at Main. #1 for S.A. = $10 - 6 = 4$
S = $9 - 4 = 5$
C = $8 - 4 = 4$

^eRange at Main #2 for S.A. = $10 - 7 = 3$
S = $10 - 5 = 5$
C = $7 - 4 = 3$

results indicated that the groups were equivalent in recall performance at the beginning of training.

In order to examine between group differences on the posttest recall measure, a one-way analysis of variance was conducted. Findings yield a statistically reliable difference between groups [$F(2, 31) = 24.73, p < .001$]. Both the attribution retraining and the strategy training groups answered more recall performance questions correctly than did the control group (Tukey's multiple comparison procedure, $Q = 3.49, p < .05$). The attribution retraining group did not differ in recall, however, from the strategy only group (Tukey, $p > .05$). The added component of attribution retraining did not significantly influence recall performance over that of strategy training. This gives evidence as to the effectiveness of the mnemonic strategy on recall of information.

The issue under question concerns the effectiveness of attribution retraining on the maintenance of strategic behavior. A key to maintenance and generalization is motivation. There is sufficient evidence to assert that learning disabled students are highly subject to developing motivational problems; these problems are detrimental to both the acquisition and generalization processes involved in learning a new skill (Licht & Kistner, 1986). To test this assertion, motivation was addressed through attribution retraining and was included as an integral part of strategy training.

Is attribution retraining a critical component to the continued use of the strategy? A one-way analysis of variance yielded a statistically reliable difference at maintenance #1 [$F(2, 31) = 5.08, p < .01$]. Students receiving attribution retraining performed with greater accuracy at the recall task than

did either the strategy only group or the control group (Tukey, $Q = 3.49$, $p. < .05$). The strategy group did not significantly differ in recall from that of the control group. Important to note is the differential recall between the attribution retraining group and the strategy only group.

A final maintenance test was administered three to four weeks after the immediate posttest. One-way analysis of variance revealed a statistically reliable difference among the groups [$F(2, 31) = 14.69$, $p < .001$]. The attribution retraining group significantly differed from both the strategy and the control group in recall performance (Tukey, $Q = 3.49$, $p. < .05$). Support is given for the claim that a motivational component may be critical for the continued use of a strategy.

At the heart of the Strategy Intervention Model is a metacognitive and self-instructional component which enables students to understand the concrete benefits of using the strategy. It should be expected then that the strategy only group would also continue to use a strategy that was beneficial to them. Recall performance at maintenance #1, however, revealed no significant difference with that of the control group. Results at maintenance #2 indicated a different performance pattern. The strategy only group differed significantly in recall from that of the control group (Tukey, $Q = 3.49$, $p. < .05$). The strategy group did perform with greater accuracy on the recall performance test than did the control group.

To summarize, there is evidence to support the claim that beliefs held by the students with regard to success and failure in school-related tasks may influence performance at tasks. Teaching students to address these

beliefs through the added metacognitive and self-instructional motivational component of the strategy may be one critical link to its continued use.

Metacognitive Awareness of Strategy Use in Study Behavior

What are the effects of attribution retraining paired with strategy training on the metacognitive awareness of strategy use as indexed by metacognitive assessments at pre and posttests?

In this section, results are presented which describe changes in metacognitive awareness of strategy use in study behavior that arose between groups receiving treatment and the non-treatment control group. A preliminary one-way analysis of variance revealed no significant pretest differences among the groups on metacognitive awareness [$F(2,31) = .02, p > .05$]. Means and standard deviations for pretest and posttest measures are presented for each group in Table 7.

There were significant effects for metacognitive awareness at posttest [$F(2, 30) = 6.51, p < .01$]. Overall, the metacognitive awareness of strategy use in study behavior for students receiving attribution retraining reliably exceeded that of participants in the strategy only and the control groups (Tukey, $Q = 3.49, p < .05$).

It was expected, however, that significant gains in metacognitive awareness also be evident in the strategy only group. One goal of the strategy was to increase students' awareness of the concrete benefits of strategy use in study behavior. Presumably, individuals given the strategy training would be substantially more advanced in metacognitive knowledge

TABLE 7

Means and Standard Deviations
for Metacognitive Awareness of Strategy Use^a

| Measures | Experimental Conditions | | | | | |
|----------|-------------------------|--------|---------------|--------|---------------|--------|
| | S.A. (n = 10) | | S (n = 10) | | C (n = 11) | |
| | M | SD | M | SD | M | SD |
| Pretest | 2.00 | (1.41) | 1.91 | (.94) | 1.91 | (1.04) |
| Posttest | 3.80 | (.79) | 2.60 | (1.35) | 1.91 | (1.38) |

Note: S.A is the Strategy plus Attribution Retraining Group.
S is the Strategy Only Group.
C is the Control Group.

^aA possible score = 5

of study behavior than those in a non-training group. While the posttest means were higher for the strategy group, there were no statistically reliable differences between the strategy group and the control group (see Table 7).

To summarize, patterns of differential metacognitive awareness amongst the three groups are important to note. Retraining students to think adaptively about their successes and failures in school-related tasks may not only give rise to an attitude of persistence in strategy use, it may provide the frame for expanding awareness in other aspects. These students were reliably more aware of strategy use in study behavior. Awareness of both the present motivational state and the demands of a given task need to be stressed for students to persist in effective strategy use.

The discussion thus far has focused on the role of attribution retraining in two predominant ways: (1) how it affected the continued use of the strategy as measured by recall performance; and (2) how it mediated changes in metacognitive awareness of strategy use. The issue of how students' level of metacognitive awareness affected performance is one which has yet to be explored. Can it be assumed that the attribution retraining group's higher scores on metacognitive awareness of strategy use in study behavior mediated superior performance at recall tasks? This assumption is not warranted without correlational data between individual metacognitive scores and recall task scores. This correlational analysis was not performed due to the small sample size within each group (S.A. = 10; S = 11; C = 11). Support for the relationship between metacognitive awareness and performance at a task remains indirect. Further research on this issue is clearly in order.

Attributional Changes

What are the effects of attribution retraining paired with strategy training on changes in locus of causality, stability, and controllability, at specific recall tasks and at school-related tasks?

A critical perspective on attributions, frequently overlooked in instructional research, concerns differentiating general antecedent attributions and task-specific attributions. Antecedent attributions are defined by Reid and Borkowski (1987) as "pervasive self-perceptions about the causes of learning operative in a child at the time a new instructional program is initiated". Task-specific attributions are those that "emanate from the immediate treatment intervention" (p. 3). Both types of attributions--general and task-specific--are considered in this study with learning disabled adolescents.

Two measures were designed by the researcher to distinguish between perceived attributions for the causes of success and failure in school-related hypothetical situations--general beliefs brought to the strategy intervention--and causal attributions given with regard to a specific task. Students were asked for causal thinking given three hypothetical situations--success, failure, and unexpected. In addition, retrospective causal reports were elicited immediately following a pre-intervention task.

These responses were then placed on a three dimensional causal scale developed by Russell (1983). Data presented here describes

changes in locus of causality, stability, and controllability ascribed to in a task-specific situation and in general hypothetical situations.

Task-Specific Attributional Changes in Three Causal Dimensions

Locus. Locus of causality refers to causes perceived as internal or external to the individual (Weiner, 1979). Three items on "The Final Causal Dimension Scale" (Russell, 1983) examine locus of causality. With a total possible score of 15, a high score on this subscale indicates that the cause is perceived as internal.

The pre/posttest means and standard deviations for locus of causality for a program specific task are presented in Table 8. A preliminary one-way analysis of variance was performed. Pre-training results yielded no statistically reliable differences on locus of causality in a task-specific situation among the three groups [$F(2, 31) = 1.87, p > .05$]. The means on the pretest measure indicated that the scores for each of the groups on locus of causality were moderately internal: S.A. = 9.6; S = 11.8; and C = 9.8.

The task-specific attribution measure was administered immediately following the recall performance posttest in order to assess the effects of the strategy and attribution intervention. Examination of posttest scores revealed significant group differences in locus of causality [$F(2, 30) = 7.95, p < .01$]. Individuals having received attribution retraining perceived their responses as due to internal factors to a significantly greater degree than those individuals in either the strategy or the control group (Tukey, $Q = 3.49, p < .05$).

TABLE 8

Means and Standard Deviations for Task Specific Attributions
on the Causal Dimensions of
Locus of Causality, Stability, and Controllability^a

| Dimensions | Experimental Conditions | | | | | |
|--------------------------|-------------------------|-----------------|-----------------|-----------------|----------------|-----------------|
| | S.A. (n = 10) | | S (n = 11) | | C (n = 10) | |
| | Pre | Post | Pre | Post | Pre | Post |
| Locus of Causality | 9.60 *(3.37) | 13.20 (1.62) | 11.82 (2.18) | 11.64 (1.75) | 9.82 (3.16) | 10.00 (2.00) |
| Stability | 6.60 (4.58) | 10.90 (.99) | 6.45 (4.70) | 5.91 (1.30) | 5.45 (2.66) | 4.50 (1.51) |
| Controll- ability | 8.00 (3.68) | 13.30 (.95) | 9.09 (3.08) | 11.82 (1.72) | 7.82 (3.25) | 9.00 (2.58) |

Note: S.A is the Strategy plus Attribution Retraining Group.

S is the Strategy Only Group.

C is the Control Group.

* Standard Deviations appear in brackets

^aA possible score = 15

Stability. Stability refers to causes perceived by the individual as stable (invariant) versus unstable (variant) in nature (Weiner, 1979). Three items on the Final Causal Dimension Scale examine stability. High scores indicate that responses given are perceived to be stable in nature.

A one-way analysis of variance at pretest indicated no statistically reliable differences among the three groups on the dimension of stability [$F(2, 31) = .25, p > .05$]. The respective means were: S.A. = 6.6; S = 6.5; C = 5.6. Responses given on the pretest measure indicated that these learners perceived the causes of success or failure at these specific tasks to be unstable.

Posttest analysis on the stability dimension revealed a statistically reliable difference among the three groups [$F(2, 30) = 68.80, p < .001$]. If directly teaching students to attribute their success or failure at achievement tasks to persistence in strategy use is adaptive, it would be expected that participants receiving this training would perceive their responses as more stable. Results supported this contention. The attribution retraining group yielded scores significantly higher on the stability dimension than either the strategy only or the control group (Tukey, $Q = 3.49, p < .05$).

Results also indicated a significantly reliable difference between the strategy only and the control group. Caution is required in interpreting these results. While the variance in scores for the strategy only group was reasonably more homogeneous at posttest than pretest, the mean for stability remained relatively the same. The mean for the control group, however, dropped at posttest. This may account for the statistical difference

observed. Both the strategy only and the control group perceive their responses as moderately unstable (see Table 8).

Controllability. Controllability refers to the degree to which causes are perceived to be under the control of the individual (Weiner, 1979). Three items on Russell's (1983) Final Causal Dimension Scale measure controllability. High scores on this subscale reveal the extent to which individuals perceives causes to be under their control.

Findings at pretest revealed no significant difference among the three groups [$F(2, 31) = .46, p > .05$]. The respective means and standard deviations are found in Table 8. The mean scores for controllability indicate that these participants perceived their causes as moderately under their control. Posttest analysis indicated a statistically reliable difference between the treatment groups and the non-treatment group [$F(2, 30) = 13.70, p < .001$]. The effects of strategy training gave rise to increased perceptions of controllability (Tukey, $Q = 3.49, p < .05$). To this extent, students experienced a strategy that has worked for them. This may have allowed them to see that they have greater control over their performance scores.

There was no statistically reliable difference between the attribution retraining group and the strategy only group. While both feedback and self-instruction in attribution retraining given to effort in strategy use may have influenced perceptions in causes as internal and stable in nature, it may be the effective strategy that affected perceptions of controllability.

To summarize, attribution retraining and strategy training alter students' perceptions within a program-specific task. Evidenced here are gains in perceptions of locus of causality, stability, and controllability due to

the impact of attribution retraining. Directly addressing students' motivational state is critical as it may alert these students to greater responsibility for achievement behavior. Teaching students an adaptive attribution such as effort in strategy use may influence how they regard persistence at a task. While attribution retraining influences perceptions of internal locus and stability, it is the strategy itself that offers a greater sense of controllability.

General Attributional Changes in Three Causal Dimensions

While this study thus far has examined changes in the three dimensions of causality within a program-specific situation, there is further interest in exploring students' perceptions toward generalized achievement behavior. Students receiving strategy and attribution retraining demonstrate recall performance gains and make changes in locus of causality, stability, and controllability. Would these changes be extended to general hypothetical situations? For this purpose, changes in the three causal dimensions will be examined for a hypothetical success situation, a failure situation, and an unexpected situation.

Success Experience. The means and standard deviations for locus of causality, stability, and controllability in a hypothetical success situation are presented in Table 9. A one-way analysis of variance revealed no significant differences among the groups on the dimension of locus [$F(2, 31) = 1.64, p > .05$]. All groups perceived their responses to be moderately internal for a success experience. Analysis of the posttest data showed a statistically reliable difference between the groups [$F(2, 31) = 3.82, p <$

.05]. Participants in the attribution retraining group perceived their causes for success to be significantly more internal than did those in the strategy only or control group (Tukey, $Q = 2.89$, $p. < .05$).

On the stability dimension, pretest analysis again indicated no significant differences among the groups [$F(2, 31) = .76$, $p. > .05$]. The means presented in Table 9 indicate that students in all groups perceived the causes of this hypothetical success experience to be unstable. Findings at posttest, however, revealed a statistically reliable difference among the groups [$F(2, 31) = 12.64$, $p. < .001$]. The attribution retraining group had significantly higher scores on stability than did the strategy group. In turn, the strategy only group had significantly higher scores than did the control group (Tukey, $Q = 2.89$, $p. < .05$). The successful maintenance of the strategy as indicated by recall performance scores could partially account for the substantial stability difference. Maintenance of skill over time may then influence perceptions of stability. These findings must be interpreted with some caution, however. There is a great deal of variability in scores for the attribution retraining group (S.D. = 3.06).

Finally, pretest scores on controllability revealed no significant difference among the three groups [$F(2, 31) = .16$, $p. > .05$]. All group means revealed perceptions which were moderate in controllability for a hypothetical success experience. Posttest analysis indicated a statistically reliable difference among the groups [$F(2, 31) = 9.14$, $p. < .001$]. The attribution retraining group held perceptions which were significantly more controllable for a successful experience than did the other two groups. The scores of the strategy only group also indicated significant differences with

TABLE 9

Means and Standard Deviations for a **Success Experience**
on the Causal Dimensions of
Locus of Causality, Stability, and Controllability^a

| Dimensions | Experimental Conditions | | | | | |
|--------------------------|-------------------------|-----------------|----------------|-----------------|-----------------|-----------------|
| | S.A. | | S | | C | |
| | (n = 10) | | (n = 11) | | (n = 11) | |
| | Pre | Post | Pre | Post | Pre | Post |
| Locus of Causality | 10.50 *(1.18) | 13.30 (1.57) | 8.82 (2.68) | 12.55 (.69) | 10.27 (2.72) | 11.64 (1.69) |
| Stability | 3.40 (.70) | 9.40 (3.06) | 3.64 (1.21) | 6.18 (1.60) | 4.00 (1.34) | 4.82 (1.47) |
| Controll- ability | 8.90 (2.28) | 13.60 (1.08) | 8.18 (3.03) | 11.45 (1.69) | 8.73 (3.72) | 10.73 (1.85) |

Note: S.A is the Strategy plus Attribution Retraining Group.

S is the Strategy Only Group.

C is the Control Group.

* Standard Deviations appear in brackets.

^aA possible score = 15.

those of the control group (Tukey, $Q = 2.89$, $p < .05$). As was shown in the task-specific situation, the improved performance due to effective strategy use may have imparted a greater sense of controllability for students' successful experiences.

Failure Experience. It may be reasoned that changes in locus of causality, stability, and controllability for a hypothetical successful experience be augmented by the successful use of a strategy. A related question concerns the extent to which these changes in perceptions of locus, stability, and controllability apply to a hypothetical failure situation. One plausible drawback to the strategy is that it requires students to maintain 100% mastery throughout acquisition of the strategy. There is not the direct teaching of adaptive attributions in a failure experience. To this extent, it is informative to assess the generalizability of changes made to hypothetical failure experiences.

A significant pretest difference was present among the groups in locus for a failure situation [$F(2, 31) = 5.29$, $p < .05$]. The mean for the attribution retraining group was substantially lower and with greater variance than that of the other groups (Tukey, $Q = 2.89$, $p < .05$). The unusually low score for one participant in this group at pretest resulted in the low mean for locus in a failure situation (see Table 10). Locus of causality for a failure situation was not significant at posttest [$F(2, 31) = 1.59$, $p > .05$]. All groups maintained a high internal locus of causality for failure.

Do students receiving strategy and attribution retraining perceive failure to be less stable following training than at pretest? There were no pretest differences among the groups [$F(2, 31) = .66$, $p > .05$] and all groups

perceived failure as moderately high in stability (see Table 10). Posttest analysis points to a significant difference among the groups in their perceptions of stability for a failure experience [$F(2, 31) = 19.07, p < .001$]. Students having received attribution retraining held perceptions that failure was more unstable than did the strategy group (Tukey, $Q = 2.89, p < .05$). Teaching students to persist in effective strategies may lead them to perceive failure as less stable in their achievement outcomes.

Finally, do the students receiving training perceive failure to then be under their control to a greater extent? No statistically reliable differences in controllability existed at pretest [$F(2, 31) = .43, p > .05$]. The pretest means indicated moderate perceptions of uncontrollability for failure (see Table 10). There is, however, a significantly reliable difference at posttest [$F(2, 31) = 12.14, p < .001$]. The attribution retraining group perceived failure to be under their control to a significantly greater degree than did the strategy or the control groups (Tukey, $Q = 2.89, p < .05$). It may be the inclusion of a self-instructional component, which addresses persistence in strategy use despite frustration or failure, that allows these students to see failure outcomes as within their control.

To summarize, the added component of attribution retraining to that of strategy training may result in altered perceptions of causality for failure. These students perceive failure to be due to internal factors, as less stable in outcome, and within their control.

Unexpected Experience. Weiner (1985) suggests that individuals search for causes when failure and unexpected outcomes have occurred.

TABLE 10

Means and Standard Deviations for a **Failure Experience**
on the Causal Dimensions of
Locus of Causality, Stability, and Controllability^a

| Dimensions | Experimental Conditions | | | | | |
|--------------------------|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | S.A. (n = 10) | | S (n = 11) | | C (n = 11) | |
| | Pre | Post | Pre | Post | Pre | Post |
| Locus of Causality | 9.80 (3.79) | 12.50 (2.60) | 13.45 (1.81) | 10.73 (1.56) | 13.09 (2.59) | 12.18 (2.99) |
| Stability | 11.90 (2.64) | 4.90 (1.45) | 11.64 (1.69) | 7.27 (2.00) | 10.73 (2.94) | 10.09 (2.21) |
| Controll- ability | 6.30 (1.64) | 11.20 (2.49) | 6.18 (1.83) | 8.64 (1.29) | 6.82 (1.66) | 7.09 (1.87) |

Note: S.A is the Strategy plus Attribution Retraining Group.

S is the Strategy Only Group.

C is the Control Group.

* Standard Deviations appear in brackets.

^aA possible score = 15

To examine this claim, an unexpected successful academic outcome was included in the general achievement attribution measure. Does attribution and strategy training influence perceptions of causality given an unexpected outcome?

Pre/posttest means and standard deviations for the three causal dimensions are presented in Table 11. No statistically reliable differences in locus of causality for an unexpected success experience were found at pretest [$F(2, 31) = .28, p > .05$]. All groups held perceptions which were moderately internal. Posttest analysis revealed that the attribution retraining group held perceptions for an unexpected success experience which were significantly more internal than those held by the strategy and control groups [$F(2, 31) = 9.16, p < .001$]. The strategy group also held significantly more internal perceptions than did the control group (Tukey, $Q = 2.89, p < .05$). When these students experienced unexpected success, causes were attributed to internal factors. It may be reasoned that effort directed toward strategy use allowed students to modify perceptions for success under conditions when failure has normally occurred.

If unexpected successful experiences occur for learning disabled students, do they see the causes for the outcome as stable in nature? The analysis performed at pretest indicated no significant difference among the groups [$F(2, 31) = .33, p > .05$]. The means presented for each group point to perceptions that are unstable for unexpected outcomes (see Table 11). Posttest analysis revealed a statistically reliable difference [$F(2, 31) = 22.07, p < .001$]. The attribution retraining group's perceptions of causes for unexpected success were significantly more stable than those in the strategy

TABLE 11

Means and Standard Deviations for an **Unexpected Experience**
on the Causal Dimensions of
Locus of Causality, Stability, and Controllability^a

| Dimensions | Experimental Conditions | | | | | |
|--------------------------|-------------------------|-----------------|----------------|-----------------|----------------|----------------|
| | S.A. (n = 10) | | S (n = 11) | | C (n = 11) | |
| | Pre | Post | Pre | Post | Pre | Post |
| Locus of Causality | 7.40 *(3.57) | 13.40 (1.58) | 8.18 (2.56) | 10.18 (2.79) | 8.36 (3.14) | 8.82 (2.86) |
| Stability | 3.50 (.71) | 8.80 (2.04) | 3.73 (1.01) | 5.73 (1.49) | 3.82 (.98) | 4.18 (1.25) |
| Controll- ability | 8.10 (3.90) | 13.20 (1.48) | 7.45 (2.81) | 9.64 (3.04) | 7.55 (3.27) | 8.36 (2.58) |

Note: S.A is the Strategy plus Attribution Retraining Group.

S is the Strategy Only Group.

C is the Control Group.

* Standard Deviations appear in brackets.

^aA possible score = 15.

group. In turn, the strategy group held significantly more stable perceptions than did the control group (Tukey, $Q = 2.89$, $p < .05$). These results point to the generalized perceptions of stability for unexpected successful outcomes. As within the task-specific situation and the hypothetical success experience, the attribution retraining component influences perceptions of stability beyond that of the strategy.

Are the causes given for unexpected successful outcomes perceived to be controllable? While there were no significant differences among the three groups at pretest [$F(2, 31) = .11$, $p > .05$], statistically reliable differences were observed at posttest [$F(2, 31) = 10.56$, $p < .001$]. The attribution retraining group generalized perceptions of controllability to unexpected outcomes over that of the remaining groups (Tukey, $Q = 2.89$, $p < .05$). As with the success experience, maintenance in performance over time may have given greater perceptions of controllability (see posttest means in Table 11).

To recapitulate, students receiving direction in developing adaptive attributions tend to view the causes for success and unexpected success as substantially more internal, stable, and controllable. Failure is attributed to causes that are internal, unstable, and under their control. The findings in the general attribution achievement measure at posttest give further support for the inclusion of an attribution feedback and training component in strategy instruction. It may be such training which aids in the generalizability of adaptive attributions.

Changes in Attributional Style--A Descriptive Look

What are the effects of attribution retraining paired with strategy training on predominant attributional responses given at specific recall tasks and at school-related tasks?

In this final section, changes in attributional style--the predominant responses given about the causes of success and failure in task-specific and in general hypothetical achievement situations--are described.

The free-choice approach used in this study relies on the causal responses given by the participants and their interpretation of these responses. A review of attribution retraining studies discussed in Chapter two indicates that many of the studies violate basic principles in the study of attributions for the following reasons: (a) the subjects are limited through forced-choice questionnaires to four basic causes--ability, effort, task ease/difficulty, and luck; and (b) the interpretation of these causes with regard to the dimensions are imposed by the researchers.

To alleviate these methodological problems, the present study explores the range of causes expressed by students for explaining academic success and failure in both program-generated tasks and in hypothetical achievement situations. Of further interest is student evaluations of these responses on the three dimensions. The nine categorical responses expressed by these learning disabled participants are listed as following:

- (1) Effort / Lack of Effort
- (2) Strategy Use / Lack of Strategy Use
- (3) Task Ease / Difficulty

- (4) Luck
- (5) Ability / Lack of Ability
- (6) External Assistance
- (7) Physiological Factors
- (8) Learning Conditions
- (9) Will to Succeed--Motivation

The procedure for encoding and classifying student responses, as well as the operational definitions for each category are presented in Appendix F.

Task Specific Attributional Responses

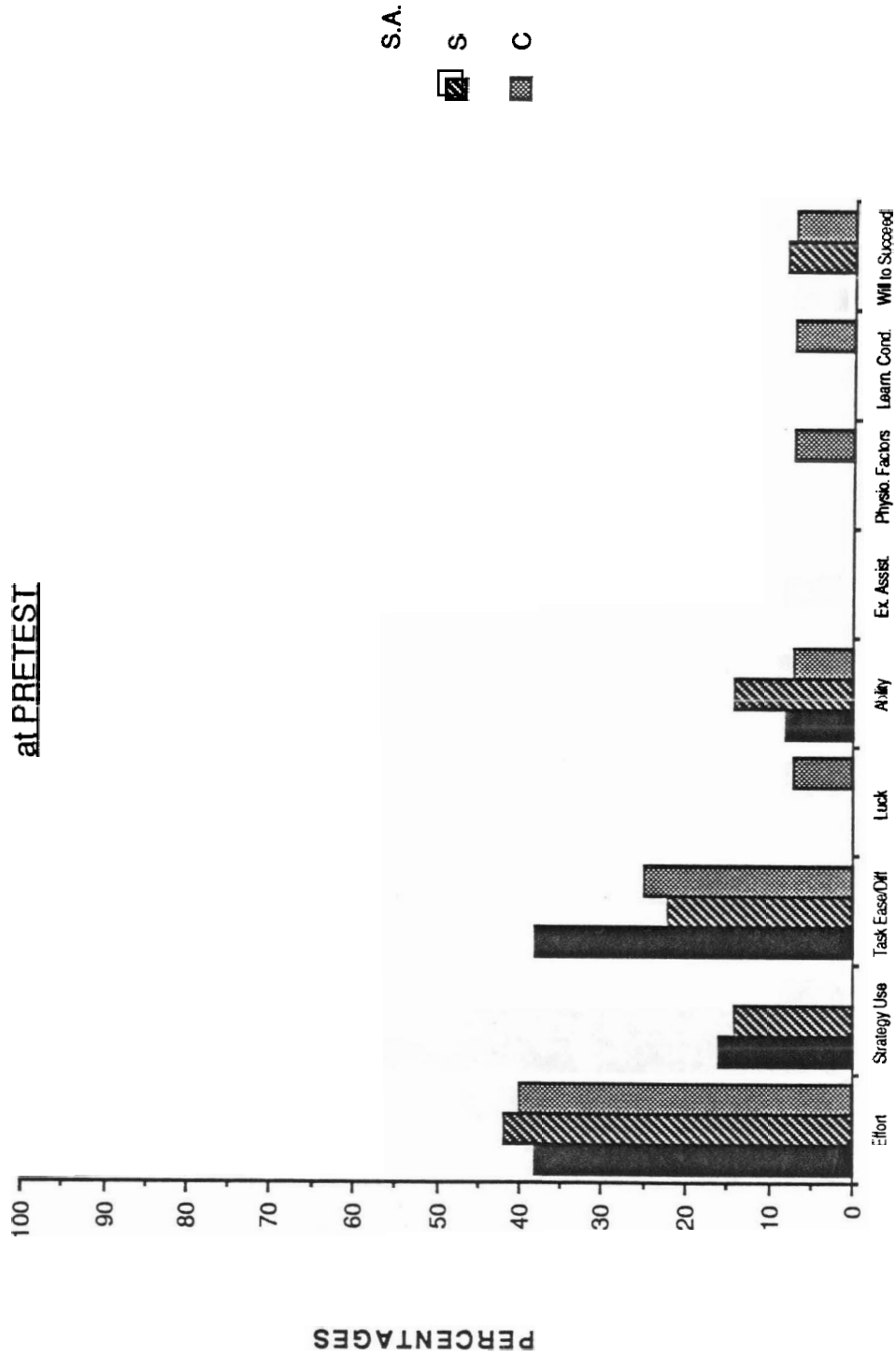
Presentation of attributional responses given to a task-specific situation at pretest and posttest are shown in Figures 5 and 6. The predominant response reported by students at pretest is that of effort. Students perceived that effort is responsible for success or failure outcomes. Noted on the graph is that task ease / difficulty is also a major response given by these participants. In contrast to that of effort, this cause is assumed to be external in nature. It is interesting then that students in all groups perceived their causes as moderately internal in locus and somewhat under their control. However, the primary effort attributional style given by these groups was evaluated as moderately unstable in nature (see discussion on the three dimensions for a task-specific situation). To sum, effort was perceived to be the primary cause for success or failure in a pre-test task-specific situation. It was evaluated as internal, moderately controllable, but relatively unstable.

Do strategy and attribution retraining have an impact on the attributional style of students? Figure 6 points to a diversity in predominant

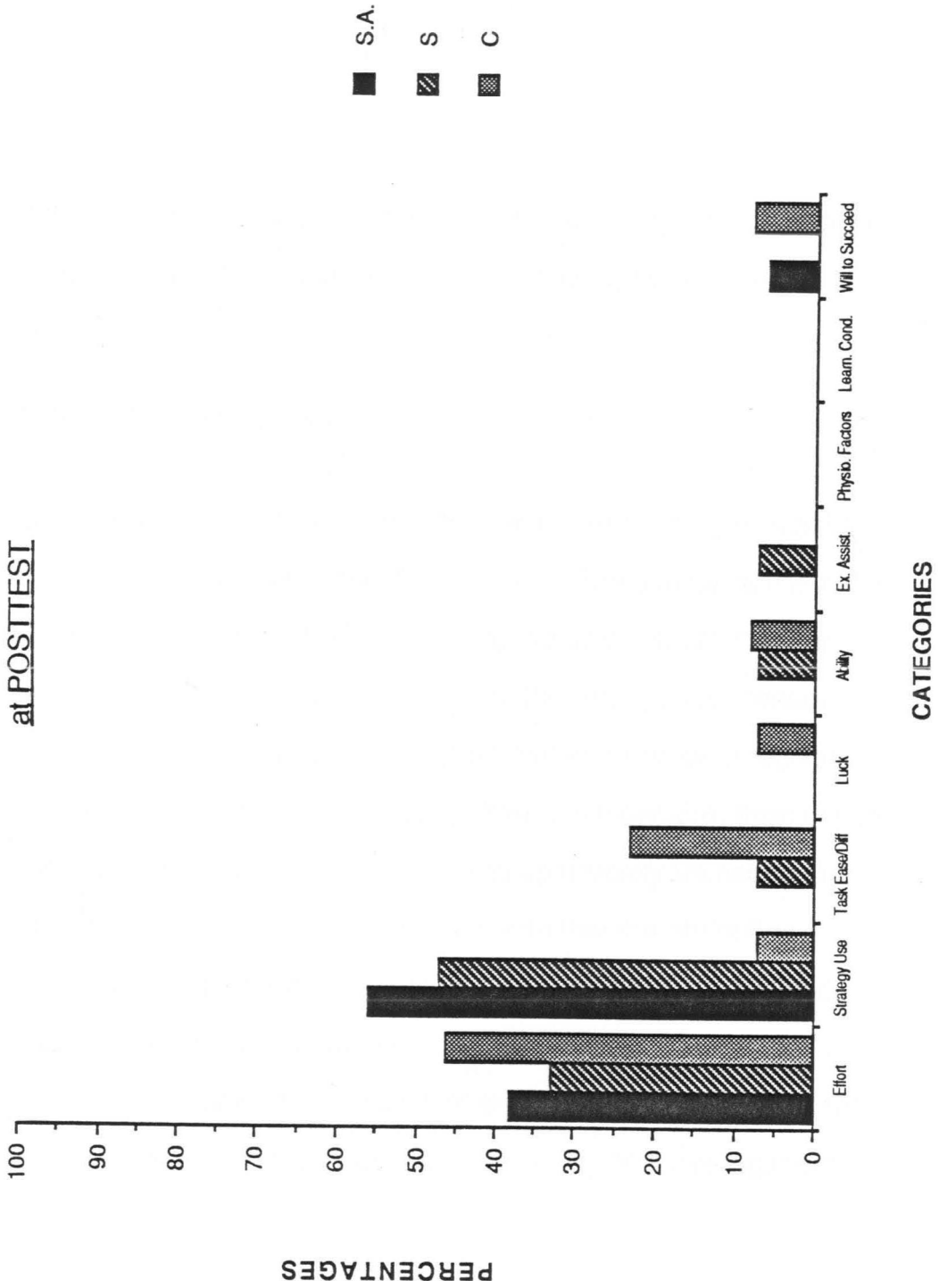
FIGURE 5

Attributional Responses Given to a Task-Specific Situation

at PRETEST



Attributional Responses Given to a Task-Specific Situation



responses reported by the students at posttest. Both treatment groups dropped slightly in effort attributions while having expressed increased strategy attributions. This would be expected as the students have directly experienced a strategy which has been effective for them. The effort and strategy attributions were interpreted somewhat differently by these students. Individuals receiving attribution retraining evaluated these causes as significantly more internal and stable in nature than did the strategy group. However, both treatment groups evaluated their responses as high in controllability.

General Achievement Attributions

Students may be motivated to use an effective strategy if they believe that strategy will have concrete benefits for them. The source of this belief would be the awareness that the strategy has worked. Recall that the attribution retraining group maintained use of the strategy, as measured by performance scores. This group also demonstrated more metacognitive awareness, as measured by the metacognitive questionnaire, than did the strategy or the control group. This group was specifically trained to direct effort in strategy use. It should be expected then that the attribution retraining group would alter attributions to strategy use in generalized hypothetical achievement experiences.

Responses examined in the pretest situations indicated predominant effort attributions given for all groups (see Figure 7). However, general achievement attributional responses at posttest revealed a different pattern. Note that in Figure 8 the strategy plus attribution retraining group

substantially dropped in their effort attributions. The strategy and the control groups' responses fell in a similar percentage range to that of the pretest situation. The attribution retraining group offered instead strategy explanations for hypothetical success, failure, and unexpected outcomes. Thus, it appears that the strategy attributions given by this group had generalized to a variety of situations.

A final question needs to be addressed. Do attributions given to a task-specific situation differ from those given to general achievement situations? Percentage responses reported in Figures 6 and 8 demonstrate a critical distinction. Note that there were differences in attributional responses given in the two distinct situations. While both treatment groups predominantly offered responses to strategy use in the program-specific task, it was the attribution retraining group that maintained an attributional style of effort and strategy use in general achievement situations.

The strategy only group, on the other hand, dropped substantially in the strategy attribution and gave attributional responses to effort. It is of further interest to note that this group also offered responses to task ease / difficulty. It may be that the experience with an effective strategy allowed these students to perceive achievement tasks as easier. However, as they were not directly taught the adaptive attribution of effort in strategy use, they did not generalize this response over a variety of situations.

To summarize, a descriptive look into the attributional responses reported by learning disabled adolescents offers critical information to attribution research. The learning disabled students in this study perceived effort as the primary cause for success and failure in both task-specific and

FIGURE 7

Attributional Responses Given to General Achievement Situations

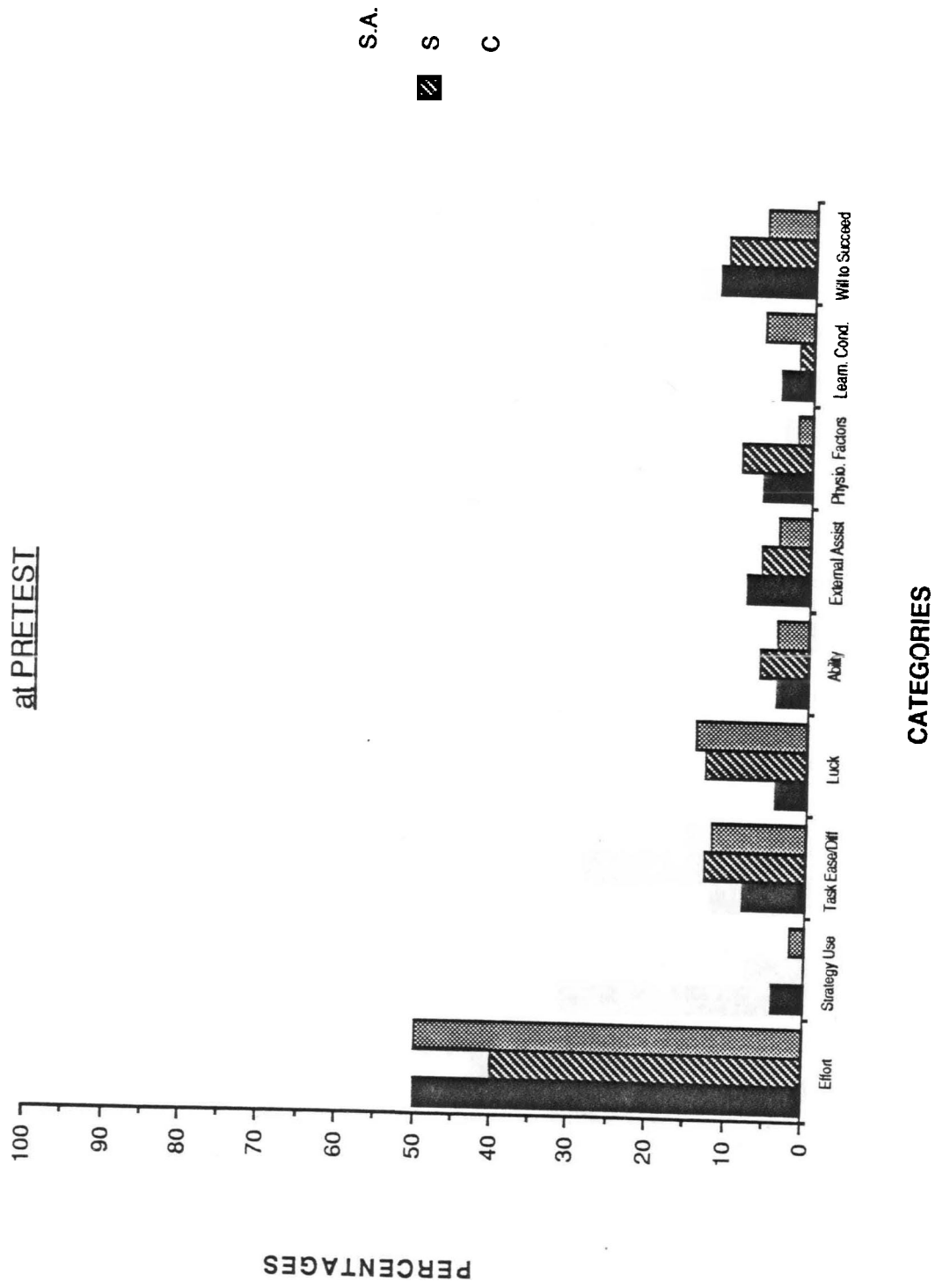
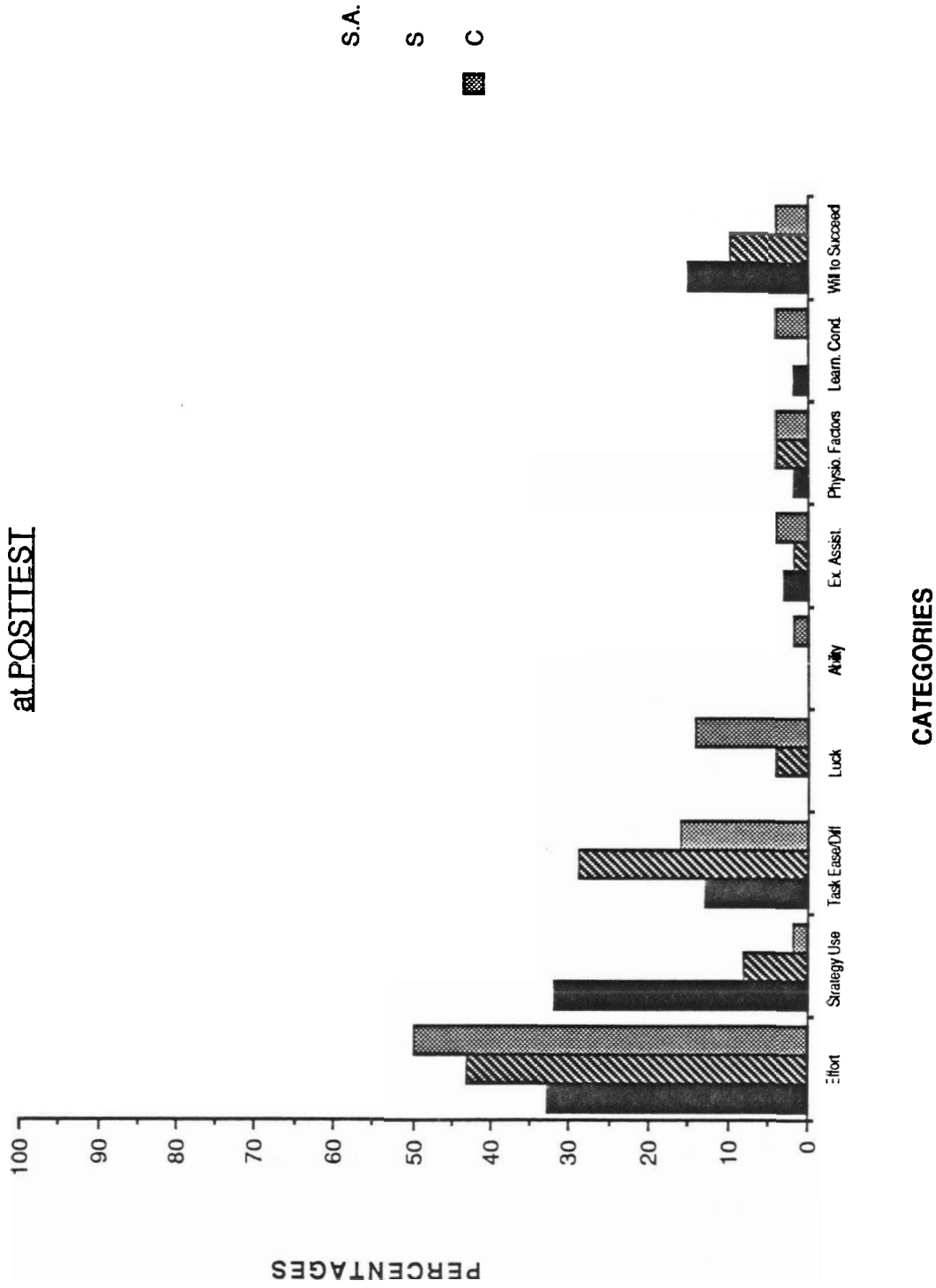


FIGURE 8

Attributional Responses Given to General Achievement Situations



general achievement situations. Incorporating an attributional component to that of strategy training may not only influence persistence at a task, it may also provide the key to adaptive attributions which can be generalized beyond the immediate program. To this extent, the present intervention has met the outlined challenge for researchers and practitioners: (1) it has assisted learning disabled students in becoming aware of their attributional patterns; and (2) it has directly trained adaptive attributions that may enable these students to take further responsibility for their academic outcomes.

CHAPTER FIVE

GENERAL DISCUSSION

This chapter includes a discussion of the substantive findings in this intervention study in relation to other findings in attributional research. Implications for future research are drawn. Limitations of this investigation are reviewed and recommendations for future strategy and attribution research are provided. This chapter concludes with practical suggestions offered to remedial instructors. Specifically, critical features of an effective instructional package and a theory-based method for addressing motivational problems underlying the student's academic behavior are outlined.

Summary and Integration of Results

What are the effects of attribution retraining paired with strategy training on recall performance as measured by the posttest and maintenance tasks?

There was no significant difference in recall performance at posttest between the strategy group and the attribution retraining group. The treatment groups having received strategy training scored significantly higher scores on the recall performance tasks than did the control group. This finding provides general support for the effectiveness of the learning strategies model on performance behavior (Schumaker & Deshler, 1986).

The critical issue under investigation concerns the effectiveness of strategy instruction on the maintenance of newly acquired strategic

behavior. To promote maintenance and generalization of strategies, four levels of generalization are built into the Strategies Intervention Model (Schumaker et al., 1986). The first two levels, antecedent and concurrent, are considered in this study. It may be predicted then that students exposed to this Strategies Intervention Model would maintain the strategy following acquisition. Results of this study fail to support this contention. The group receiving the strategy only treatment significantly differed in recall performance from that of the attribution retraining group at maintenance 1 and 2 tasks. These students drop in their mean recall performance following acquisition of the strategy. Directly addressing the motivational beliefs underlying learning disabled students' strategic behavior, however, promotes maintenance in recall performance. In addition to the rationale and purpose provided for in the strategy group, the students receiving attribution retraining continue with strategic behavior following the acquisition phase. The results in this study provide further research support for the inclusion of an attribution retraining component in a strategy model (Reid and Borkowski, 1986). It may be stressed that learning disabled students need to envision the broader contexts in which the strategy is applicable and experience the concrete benefits it offers. They also require motivation to use the strategies.

What are the effects of attribution retraining paired with strategy training on the metacognitive awareness of strategy use as indexed by metacognitive assessments at pre and posttests?

The Strategies Intervention Model incorporates cognitive and metacognitive features essential to effective learning. Participant modeling, peer coaching, explicit performance and strategy feedback, and self-instruction provided in this model give opportunity for awareness of strategic behavior and self-regulation of this behavior. Therefore, it may be expected that there would be no statistically reliable difference between the two treatment groups on metacognitive awareness at posttest.

Findings in this study failed to support this prediction. Students receiving attribution retraining scored significantly higher on the metacognitive awareness questionnaire than did those in the strategy group. There was no statistically reliable difference between the strategy only and the control group. The posttest means for the strategy only group, however, did show heightened awareness of strategy use over those students in the control group.

The students receiving attribution retraining demonstrated more metacognitive knowledge about how they would apportion study time and regulate study behavior than either the strategy or the control group. Students' growth in metacognitive awareness of strategy use in study behavior was determined by the Metacognitive Awareness Questionnaire. A mastery level of 80% was established. The attribution retraining group approached awareness level of 80%. The post-intervention mean for this group was 3.8 out of a total possible score of 5. Attribution retraining enabled these students a growth in metacognitive awareness of strategy use from 20% to 76%.

Metacognitive knowledge of strategic behavior, however, does not guarantee its use (Wong, 1985). The key to the continued use of strategic behavior is likely to be motivation. Attribution theory supports this proposal. Reasoning about the causes of future success and failure mediates performance at academic tasks (Weiner, 1979, 1984).

What are the effects of attribution retraining paired with strategy training on changes in locus of causality, stability, and controllability, at specific recall tasks and at school-related tasks?

Responses given to pre-intervention task-specific situations were perceived by these learning disabled students as moderately internal in locus of causality, moderately unstable, but somewhat within their control. Perceptions in task-specific situations altered as a result of the strategy and attribution retraining. Students receiving attribution retraining held causal perceptions which were significantly more internal and stable than did the strategy and the control group. However, both the attribution retraining and the strategy training groups held causal perceptions which were significantly more controllable than those held by the control group. This gives support to Licht and Kistner's (1986) contention that it is the effective use of the strategy that offers increased perceptions of control.

Do perceptions in locus of causality, stability, and controllability differ when given in response to general achievement situations? Further, do perceptions differ with regards to a success, failure, or unexpected situation? An indepth examination of the means presented for the task specific

situation in contrast to those in the success, failure, and unexpected general achievement situations reveals noteworthy distinctions.

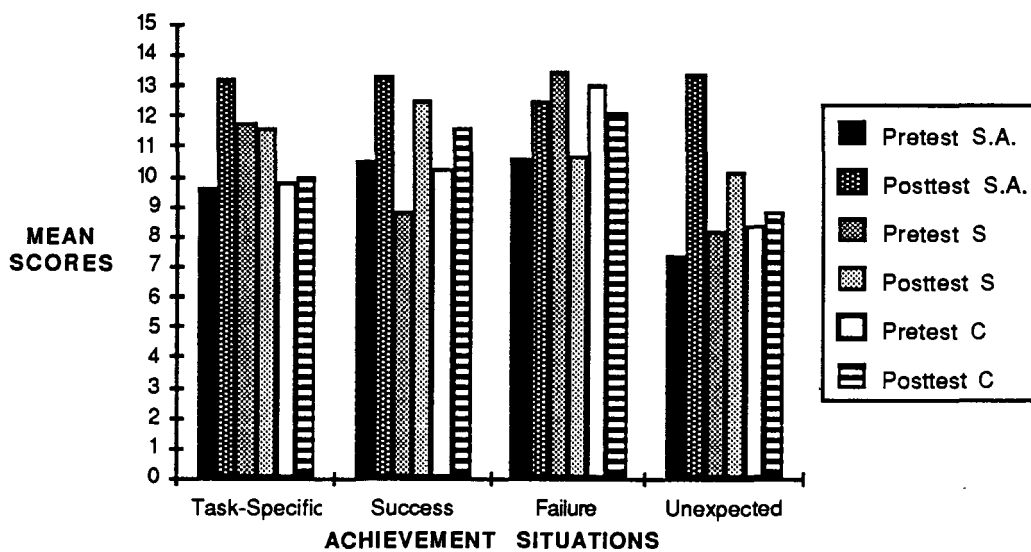
Locus of Causality. Figure 9 indicates that at pretest, locus of causality in a hypothetical success situation was perceived as moderately internal. These pretest means are similar to those found in the task-specific situation. Success then was initially viewed by these students as within their control. In the failure situation, however, pretest mean scores reveal perceptions high in internal locus. Failure was initially perceived as due to a cause within themselves. These students perceived causes for failure as due to internal factors to a greater degree than with success experiences. In contrast, the means for the unexpected situation at pretest reveal lower perceptions of internal locus. If success were to occur unexpectedly, causes would be perceived as due less to internal factors than in the success or failure experiences.

Posttest analysis reveals that students receiving attribution retraining perceived their causes for success and unexpected success to be significantly more internal than students in the strategy or control groups. There were no significant differences found among the three groups for a failure experience at posttest.

Stability. Figure 10 presents the pre and posttest means for stability in the task-specific, the success, the failure, and the unexpected situations. Distinct from the moderately unstable perceptions held in the pre-intervention task-specific situation, students gave responses in the hypothetical success and unexpected experiences which were perceived by the students as unstable in nature. Initially, all students did not perceive

FIGURE 9

Pretest and Posttest Means
for a Task-Specific and General Achievement Situations
on the **LOCUS OF CAUSALITY** Dimension.



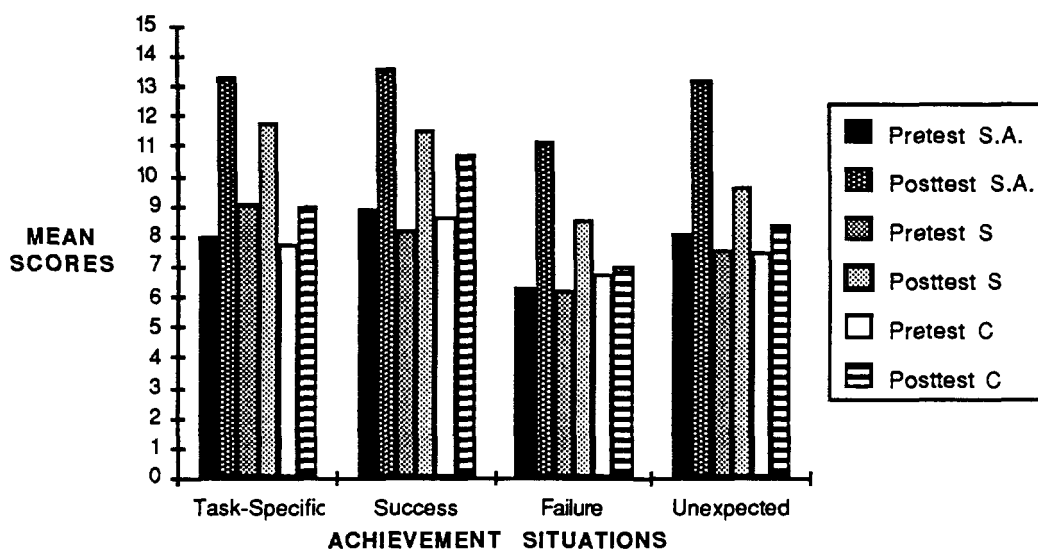
Note: S.A. is the Strategy plus Attribution Retraining Group.

S is the Strategy Only Group.

C is the Control Group.

FIGURE 10

Pretest and Posttest Means
for a Task-Specific and General Achievement Situations
on the **CONTROLLABILITY** Dimension



Note: S.A. is the Strategy plus Attribution Retraining Group.

S is the Strategy Only Group.

C is the Control Group.

success or unexpected success as a stable in their achievement outcomes. Responses given to failure, on the other hand, were viewed as stable experiences. These learning disabled students viewed failure in achievement situations as experiences which could not be modifiable. It is this causal structure that Weiner (1979, 1984) claims is accountable for changes in expectations for future success.

Attribution retraining and strategy training had an effect on learning disabled students' perceptions of stability. Posttest analysis indicates that the attribution retraining group held perceptions that were significantly more stable in the success and the unexpected experiences than did the strategy group. The strategy group, in turn, held perceptions which were significantly more stable than did the control group. Students undergoing alterations in their beliefs about the causes of success and failure were able to change their expectations regarding future success (Weiner, 1979, 1984). The effects of the attribution and strategy treatment enabled these students to perceive failure as less stable. The added component of attribution retraining to that of strategy training allowed these students to perceive failure as changeable. In part, this supports Licht & Kistner's (1986) contention that it is the strategy which allows students to view their academic behavior as changeable. Posited in this thesis is that strategy training alone is not sufficient. It must be accompanied with an attribution retraining component which directly addresses changes in expectations for future success. Stable causes are offered at both the specific task and generalized across a variety of tasks.

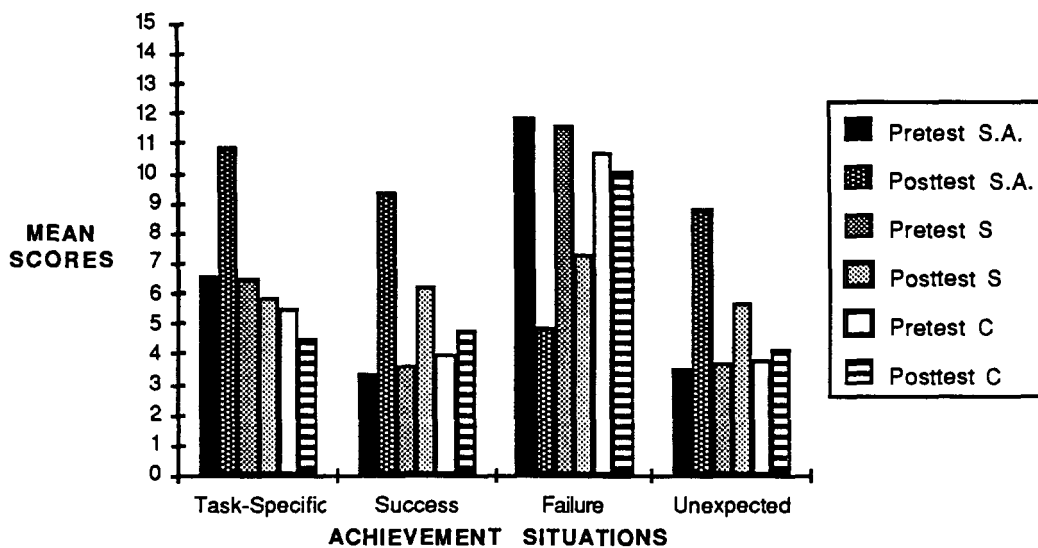
Controllability. Figure 11 presents pretest and posttest means for controllability in the task-specific situation and in the three general achievement situations. Pretest means show perceptions which were moderately high in controllability for the success and unexpected situations. These means fall closely with those found in the task-specific situation. These learning disabled students believed that they did have a degree of controllability in their successful achievement outcomes. However, they perceived failure to be somewhat uncontrollable. Based on Weiner's model (see Figure 1), perceptions of uncontrollability mediate learned helpless behavior. The motivational problems encountered by these learning disabled students may reflect a learned helpless attitude toward their academic outcomes.

Findings at posttest, however, indicate that attribution retraining plays a role in generalizing perceptions of controllability across achievement situations. The attribution retraining group perceived causes for success and failure as significantly more controllable in success, failure, and unexpected situations than did either the strategy or the control group. This contrasts findings in the task-specific situation where there were no significant differences in controllability between the two treatment groups. A workable strategy allowed these students to see that they were able to have control in their performance outcomes. However, important to note is that with the attribution retraining group, these perceptions of controllability were generalized to general achievement situations.

Attribution retraining has an impact on perceptions of control in learning disabled students. Weiner (1979) suggests that students'

FIGURE 11

Pretest and Posttest Means
for a Task-Specific and General Achievement Situations
on the **STABILITY** Dimension



Note: S.A. is the Strategy plus Attribution Retraining Group.
S is the Strategy Only Group.
C is the Control Group.

understanding of their role in the outcome of performance will have subsequent consequences for future behavior. Attribution retraining then enables these students to experience expectancy shifts for future academic outcomes. In addition, it may provide the opportunity for students to make behavioral changes by persisting with effort in strategy use.

What are the effects of attribution retraining paired with strategy training on predominant attributional responses given at specific recall tasks and at school-related tasks?

Responses given by learning disabled adolescents are not limited to the four causal ascriptions for achievement behavior suggested by Weiner (1979). They extend to include responses of strategy use, external assistance, physiological factors, learning conditions which help or hinder learning of a task, and the will to succeed (Bar-Tal et al., 1984).

The predominant response offered in each situation at pretest is that of effort. This appears to contradict earlier research on the causal attributions of learning disabled children. They are described as developing maladaptive patterns of causal attributions for their academic success and failures (Pearl, 1982; Pearl et al., 1980). Causal ascriptions for success are attributed to external and uncontrollable factors such as teacher help, ease of task, luck (Licht & Kistner, 1986; Licht et al., 1985; Licht, 1983). Failure experiences are attributed more to insufficient ability and less to insufficient effort (Pearl, 1982; Pearl et al., 1980; Pearl et al., 1983). While these ascriptions are among the responses given in the present study, effort is the predominant response given across success, failure, and unexpected

success experiences. Effort is initially viewed by these learning disabled students as internal, moderately unstable, and somewhat within their control.

Attribution retraining paired with strategy training had an effect on the predominant responses offered at posttest. While effort attributions remained high, they were accompanied by strategy attributions. The effective use of the strategy was offered as the explanation for success in the task-specific situation. Of critical importance is the distinction in strategy attributions made in generalized achievement situations. The attribution retraining group was able to envision strategy use as an explanation for general academic outcomes. In contrast, the students receiving only the strategy dropped in strategy attributions. Effort and task ease were explanations given. These students may view academic tasks as easier given an effective strategy. What is important to note is that task ease is an attribution which may be considered external in locus, and somewhat unstable. There may be some degree of controllability perceived as these students do possess a strategy which they could apply at appropriate tasks.

Attribution retraining then has an impact on maintenance of strategy use, metacognitive awareness of the strategy use, and changes in task-specific and general attributions. Attribution retraining needs to be addressed in the cognitive and metacognitive remedial instructional packages established for learning disabled students.

Implications for Future Research

Key findings in the present investigation provide direction for future strategy and attribution research. The Strategies Intervention Model

selected for this study incorporates essential features of cognitive and metacognitive training. Further, it addresses the critical issue of generalization at all levels of instruction. As such, it offers a theoretically and instructionally sound base for the development of learning strategies. It provides the conceptual model used in the attribution retraining component of the study.

One of the merits of this study is that it addresses directly the impact of motivation on the maintenance of strategic behavior. Students receiving attribution retraining maintained strategic behavior following acquisition. Findings give clear direction as to the inclusion of a motivational component in strategy intervention. Hence, recommendations are made to the researchers involved with the Strategies Intervention Model (Schumaker et al., 1986). Motivational strategies must be incorporated into each strategy rather than taught separately (Ellis & Lenz, 1987). The BELIEFS mnemonic constructed in this investigation provides parallel cognitive and metacognitive features of the learning strategies model. It may be included as a feature of each strategy taught.

A second merit of the study rests with the inclusion of crucial instructional/task features built into the attribution retraining program. Prior research points to critical issues to be addressed in attribution retraining. First, the instructional framework for the teaching of new adaptive attributions is considered. The teaching methodology moves from direct to indirect instruction with the use of the BELIEFS framework. Instruction begins with describing and modeling adaptive attributions, and moves toward self-regulation of adaptive attributions in the latter phase of acquisition. The

issue of generalization is addressed in the antecedent and acquisition phases of newly acquired attributions. Second, newly acquired beliefs are tied to effective strategies. The new beliefs are born out of an awareness that the strategy has worked for them.

The type of feedback given and the delivery of this feedback is considered in the study. Prior research points to the acknowledgement of effort in strategy use as a socially reinforcing agent for the continued use of effort. This type of feedback can be used initially in the attribution retraining program. As the students acquire adaptive attributions, it is vital that they move toward self-reinforcing feedback. Statements such as "I can succeed with the help of a good strategy" allows them to tie positive self-statements with effective strategies. Again, the BELIEFS mnemonic may provide a frame for giving feedback. It is further recommended that researchers of attribution retraining programs consider the instructional framework used.

A third merit of this study lies with the free-choice approach used in the measurement tools. These instruments are constructed to alleviate measurement problems found in prior attribution research. Three critical concerns are addressed. First, free-response answers allow researchers in the learning disabilities field fuller understanding of the type of responses offered by adolescents and the meaning of these responses on the three-dimensional scale. Second, the use of a three-dimensional scale in addition to responses given provides greater depth in understanding of the way learning disabled adolescents perceive causes for success and failure at school-related tasks. Finally, both task-specific and general attributions are considered. Findings in this study point out differences perceived by the

students given the two distinct situations. While validation of the instruments used is clearly in order, it is recommended that the above concerns be addressed in the measurement tools used by researchers in the attribution field.

Limitations of the study are addressed as they provide further direction for future research. The first limitation of the study is its sample size. As the sample used is thirty-two participants, generalization of the results to the learning disabled adolescent population is limited. The type of responses offered by these students needs to be more fully explored with a generous sampling of learning disabled students. Expression of attributions may be difficult for these students. There is a distinct need in the learning disabilities field to examine attributional statements of learning disabled high school students in relation to causes for success and failure in academic tasks. Further, the interpretation of these responses in the dimensions of locus of causality, stability, and controllability is clearly lacking.

The second limitation of this study is the use of a single strategy. While the inclusion of the attribution retraining component results in maintenance of the strategy, and in changes in task-specific and general attributions, this component needs to be addressed over time. Given the development of a set of strategies for learning disabled students in the intermediate and high school levels, would the inclusion of an attribution retraining program result in maintenance and generalization of strategic behavior? A long-term study would be beneficial in order to examine the overall effects of attribution retraining.

A third limitation is present in the study. In the steps of the strategy used in this investigation, there is lack of opportunity to deal with failure experiences. While frustration with the strategy is dealt with by feedback given to persistence in strategy use, this may not be sufficient. These students realistically face failure in their content areas. Using the strategy in its complete form, from acquisition to generalization, would give further opportunity for instruction and self-instruction in adaptive attributions for failure.

The fourth limitation lies with the measuring tools to detect changes in attribution. In Weiner's model (see Figure 1 and 2), it is suggested that locus of causality mediates changes in self-esteem. Stability accounts for expectancy shifts in future outcomes. And finally, controllability has behavioral consequences in persistence with the task or learned helpless behavior. The measures used here indicate changes made in attributional statements given to general achievement situations. The learning disabled students receiving attribution retraining viewed success and failure in hypothetical academic situations as due to effort in strategy use. Expectancy shifts in outcomes are noted. Further behavioral consequences are noted through the maintenance of the strategy. What cannot be detected is changes in self-esteem along with the changes in locus of causality. The use of a self-esteem measure is recommended for future attribution retraining studies using this model. The recommendations made will serve to enhance attribution retraining research.

Implications for Practitioners

The attribution retraining model generates practical application in the special education field. As maladaptive causal beliefs of success and failure undermine the acquisition, maintenance, and transfer of new skills and strategies for learning disabled students, there is a need to address motivational aspects as a vital component of intervention. The instruction and the tasks used in intervention programs are critical if changes in effort expenditure are to be perceived as credible for these students. Learning disabled students may be re-taught to view their performance outcomes as under their control if the use of effort is paying off with successful outcomes and in coping with difficulty or failure. Thus, providing the students with effective strategies allow them to use effort in a purposeful manner. Licht and Kistner (1986) stress that if the goal of attribution retraining is to ensure long-term maintenance and generalization of new strategies and adaptive attributions, then intervention must take place on a variety of tasks, across settings, and on a long-term basis. For learning disabled students, effort and strategy feedback may serve as initial social reinforcement, whereas, active participation in effective strategy use--self-management--may initiate personal responsibility in academic behavior.

This chapter concludes with practical suggestions offered to secondary remedial instructors of learning disabled students:

- (1) Remedial instructors need to consider the most appropriate instructional model for their secondary students. Skills development for these students remains a concern. However, there is a critical need to consider how these learning disabled

students may be assisted in coping with the academic demands of the high school curriculum. A learning strategies model provides the students with "tools" with which they can learn content in a structured and systematic fashion.

- (2) Critical task/instructional variables in learning strategies should be considered in their selection. First, prior research points to direct instruction as a highly effective teaching method for learning disabled students. Direct instruction provides structured and systematic steps for the acquisition of the strategy. Describing and modeling these steps allows the students knowledge of the strategy. However, the primary goal for secondary students is independent and responsible behavior. A second critical variable is a self-instructional component. Students need to go beyond knowledge of the strategy to self-regulation of the strategy. The learning strategies model provides opportunity for practice and monitoring of the strategy in a controlled remedial environment. Finally, generalization is an issue to be considered at all levels of instruction. Students need to understand the benefits and appropriate use of the strategy outside the Learning Disabilities Resource Room.
- (3) Peer tutoring is utilized in many of the secondary Learning Disabilities Resource Centres in order to provide additional support for the learning disabled students. Learning strategies may be used effectively as an instructional framework for coaching these students. Peer tutoring may be viewed as an integral part of generalization phase of strategy use. Acquired strategies may be directly used or generated with the assistance of the tutor for coping with the required content of the curriculum.
- (4) Many learning disabled students develop motivational problems as a result of repeated failure in academic outcomes. Remedial instructors face resistance on the part of these students to learn

and achieve. Attribution retraining is an effective method for addressing the maladaptive beliefs that students hold. The BELIEFS mnemonic constructed in this thesis provides an instructional and self-instructional framework for altering beliefs for success and failure in school-related tasks.

- (5) Learning disabled students need to be assured that their negative feelings and thoughts are understood. The remedial centre may provide a secure environment for students to become aware of the beliefs that hamper school success and to express or acknowledge these beliefs. However, as the goal for secondary learning disabled students is responsible academic behavior, students learn through the BELIEFS mnemonic how to set aside these negative thoughts and feelings and replace them with adaptive beliefs. Learning disabled students need to deliberately attempt self-reinforcing statements that allow them to persist with strategic behavior. They need to believe that the strategies will pay off for them.
- (6) Remedial instructors need to become aware of the type of feedback given to learning disabled students. Indiscriminantly telling students to try harder may be undermining effort given to complete academic tasks. It is the acknowledgement of their effort in strategic behavior that allows these students fuller understanding of their role in responsible achievement behavior.
- (7) The way in which feedback is delivered is also an important consideration for remedial instructors. Initially, remedial programs can offer a consistent and secure environment through socially reinforcing statements such as the acknowledgement of effort. Students need to be aware of the role of purposeful effort in producing successful academic outcomes. As these students move toward independence, social reinforcement feedback must be interspersed with self-reinforcing statements.

(8) Learning disabled students need to become self-advocates for their learning process. They need to acquire effective learning strategies which enable them to cope within the school environment. Further, these students need to develop appropriate life skills for independent and responsible behavior following formal schooling. Remedial instructors may initiate self-advocacy by providing opportunity for the development of adaptive beliefs. Learning disabled students must believe that they are able to achieve and set realistic goals for themselves through responsible and independent behaviors.

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APPENDIX A

Provincial and School District Guidelines for the Identification and Placement of Learning Disabled Students

This appendix contains the guidelines for the identification and placement of the severely learning disabled set forth in the Manual of Policies, Procedures and Guidelines published by the Ministry of Education in the Province of British Columbia. School district criteria for services is established in accord with provincial guidelines. Included is a statement of the provision of services set forth by the school districts.



3.26 - SEVERE LEARNING DISABILITIES

3.26.1 DEFINITION

The Ministry of Education recognizes that 1-2% of students in the schools will be severely learning disabled. These students experience difficulties with learning that are so severe as to almost totally impede educational instruction by conventional methods. It is anticipated that the mild to moderately learning disabled will be supported at the school level by the Learning Assistance teacher.

The following definition is advanced by the Ministry of Education:

Learning disabilities is a processing disorder involved in understanding or using symbols or spoken language. These disorders result in a significant discrepancy between estimated learning potential and actual performance. Generally, a discrepancy of two or more years on grade equivalent scores or a similar discrepancy on standardized score comparisons is recognized as significant. This discrepancy is related to basic problems in attention, perception, symbolization and the understanding or use of spoken or written language. These may be manifested in extreme difficulties in thinking, listening, talking, reading, writing, spelling or computing.

The defined population is limited to children whose learning difficulty can be clearly identified as a communication disorder. This category does not include children with learning problems primarily resultant from factors such as:

1. Sensory or physical impairments;
2. Mental retardation;
3. Emotional disturbance;
4. Environmental or cultural disadvantage;
5. English as a Second Language;
6. Lack of opportunity to learn: due to irregular attendance or transiency

3.26.2 IDENTIFICATION/PLACEMENT

Students suspected of being severely learning disabled should be referred for an in-depth psychoeducational assessment. Health



and developmental information, including social adjustment data, should also be included in the assessment. Prior to this referral, however, it is essential that sufficient school based data collection be compiled and instructional intervention strategies attempted.

The district screening and placement procedure should be the vehicle to process referrals for the program to ensure consistency with regard to the student population being served.

Parental permission should be obtained prior to any data gathering and the parents should be involved in any program/placement decisions.

3.26.3 PROGRAM

An Individualized Educational Plan (IEP) should be carefully planned for the student with a severe learning disability. The program should include a statement of the student's present levels of educational performance, the long range goals and short term instructional objectives, the services to be provided, the evaluation procedure, the anticipated duration of services and a date for reviewing the program. The program should be developed by the learning disabilities teacher in conjunction with the classroom teacher, learning assistance teacher, other involved school personnel and parent/guardian.

Individualized planning should be provided on an intensive basis, with a view to maintaining the student in/or returning the student to the regular classroom as quickly as possible. Each student's program and placement should be reviewed regularly.

Duration of service will vary according to degree of disability and rate of learning. It is recognized that even when students with severe learning disabilities respond well to intensive short term instruction, they may still need ongoing support which is usually provided by the learning assistance teacher. Some students may require ongoing intensive long term service in a resource room or a self-contained class.

Student progress should be recorded regularly and stated in objective, as well as subjective, terms.

School Districts should establish program/placement criteria, develop specific program entrance and exit criteria and specify procedures for monitoring or reviewing individual placements.



3.26.4 SERVICE DELIVERY

School districts should examine the least restrictive alternative in planning services for the severely learning disabled student. It is recognized however, that a range of options is necessary in planning appropriate services for such a diverse group. Possible service delivery options include assessment and programming centres, resource rooms, self contained classes and itinerant services.

3.26.5 EVALUATION

School districts should provide for regular evaluation of programs for students with severe learning disabilities. Please consult the Ministry's Evaluation of Special Programs: Resource Materials for information on evaluation.

3.26.6 PROGRAM PERSONNEL

Teachers appointed to programs for the severely learning disabled should have the qualifications and competencies expected for learning assistance teachers, as well as, advanced course work in the following areas:

- (a) assessment and programming for learning disabilities;
- (b) language and communications;
- (c) diagnosis and remediation of mathematics and language arts;
- (d) social skills development and behaviour management;
- (e) curriculum modification;
- (f) cooperative planning and consultation.

3.26.7 RESOURCES

Severely learning disabled students who have difficulty in using print materials may obtain copies of audio books from the master tapes held by the Provincial Resource Centre for the Visually Impaired at minimal cost. Titles held by the Centre are listed in a catalogue which is available in all school districts.

To comply with copyright requirements users of this service must be certified by the school district as "print-handicapped". Forms are available from the Resource Centre and must be signed by the Superintendent of Schools or the Special Education Supervisor.



Inquiries and purchase orders should be addressed to:

Provincial Resource Centre for the Visually Impaired
4196 West 4th Avenue,
Vancouver, B.C.
V6R 4J5

3.26.8 FACILITIES

Please refer to the B.C. School Facilities Building Manual - Part 3 Design Guidelines.

3.26.9 CONSULTATION

The services of the Coordinator, Learning Assistance and Learning Disabilities are available to school districts to assist with learning disability programs. Further information may be obtained from:

Provincial Coordinator
Learning Assistance and Learning Disabilities
Division of Special Education
Ministry of Education
Parliament Buildings
Victoria, B.C.
V8V 2M4

Telephone: 387-4611 (Local 205)

A statement of the provision of services for the Severely Learning Disabled by the Coquitlam School District is provided as follows:

LEARNING RESOURCE PROGRAM GUIDELINES

Learning Resource Programs are school-based programs designed to serve the needs of the severely learning disabled population in their home school setting. These programs provide modified and individualized curriculum instruction in Language Arts and/or Arithmetic and thus allow severely learning disabled children to participate in their regular classes for the majority of the day.

The Learning Resource Program teachers will develop an Individualized Education Plan for each student in the core subjects, (Language Arts and/or Arithmetic), which will include diagnostic testing information, learning objectives, and instructional strategies to address each child's specific learning deficit. In addition, the Learning Resource Program teacher may work in consultation with the classroom teachers to provide support in other subject areas.

Candidates for the Learning Resource Program will be expected to meet district guidelines for the Severely Learning Disabilities: i.e.:

- (a) A psychoeducational assessment should be administered and should identify a processing disorder resulting in a significant discrepancy between estimated learning potential and actual performance. This discrepancy should not be primarily due to other factors such as sensory impairment, mental handicaps, behaviour disorder, or environmental or cultural disadvantage.
- (b) Specifically, the psychoeducational assessment should indicate that the child has average or better cognitive ability (within 1 1/2 standard deviations), a specific learning deficit, and a discrepancy of more than 1 standard deviation on a standardized achievement test. A general guideline would be a primary child who is one year behind in achievement, or an intermediate child who is two-three years behind age appropriate achievement.

Candidates for the Learning Resource Program will be presented to the District Screening Committee by the Area Counsellor for confirmation prior to placement. An up-to-date list of all Severely Learning Disabled Students

entering and exiting the Learning Resource Program will be kept by the District Screening Committee.

Placement of a child in the Learning Disabilities Program requires consent from the parent or guardian.

Identification procedures should conform to district policy. The suggested steps for placement follow:

The student is presented by his homeroom teacher for discussion at the School Based Team meeting:

The School Based Team may:

1. make suggestions for program modification in the regular class.
2. suggest further data gathering and consultation with the learning assistance teacher.
3. place the student in learning assistance or on the wait list.
4. recommend a psychoeducational assessment and discuss placement in the Learning Resource Program upon completion of assessment.
5. discuss a possible Learning Resource Program placement with parents and obtain their approval.
6. request that the Area Counsellor present name(s) to the District Screening Committee.
7. if placement is confirmed by the District Screening Committee, the student is placed in the Learning Resource Program or on the wait list.

ARA: kh

1988 05 09

A statement of the provision of services for the Severely Learning Disabled by the Delta School District is provided as follows:

**RESOURCE ROOM (LEARNING DISABILITIES):
JUNIOR SECONDARY**

Description

The Resource Room (Learning Disabilities) provides an intensive resource programme for a small group of junior secondary aged learning disabled pupils. The level of integration is based on the pupil's ability to take advantage of regular classroom programming. The students enrolled in the programme will receive from two to four blocks of remedial and compensatory instruction and support in the remainder of their programme.

Each pupil in the Resource Room (Learning Disabilities) programme will have an individually tailored education programme. The teacher of the programme will:

- (a) plan and articulate teaching strategies that will optimally meet the objectives set for each pupil;
- (b) design programmes that establish and enhance appropriate attitudes to learning and study skills;
- (c) instruct the pupil daily in targeted areas;
- (d) provide planning, consultation and support for appropriate instruction in the regular classroom;
- (e) record the effects of all instruction and monitor the pupil's progress in integrated courses;
- (f) communicate the results of all instruction to the pupil and his parents.

Referral Procedures

The Resource Room (Learning Disabilities) accepts pupils at the junior secondary level. Pupils accepted are experiencing significant learning problems as evidenced by:

- (a) a significant discrepancy between cognitive abilities on psycho-educational assessments;
- (b) a significant discrepancy between academic achievement and expectation;
- (c) academic performance is at least two years behind in reading / math;
- (d) the pupil has already received help from the learning assistance centre;
- (e) the pupil's difficulties are not primarily attributable to behavioural or emotional problems.

APPENDIX B

Review of Attribution Retraining Studies

Contained in this appendix is a review of the attribution retraining studies. These studies are classified into External-based Control Programs and Self-management Techniques. The External-based Control Programs are listed by: reinforcement training schedules; contingent social reinforcement with attribution retraining; and attributional feedback training. The Self-Management Techniques are listed by: participant modeling; self-instruction; and strategy training with attribution retraining.

APPENDIX B

A Review of Attribution Retraining Studies

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|--|--|--|---|--|
| EXTERNAL-BASED CONTROL PROGRAMS | | | | |
| <u>REINFORCEMENT TRAINING SCHEDULES</u> | | | | |
| Chapin & Dyck (1976) | * gr. 5-7 students with reading difficulties * n = 30 | * two levels of partial reinforce- ment were combined with/without attribution retraining A fifth group received success only. | * persistence (number of sentences attempted) * three words beyond their graded word reading level | * no measures for changes in attributions |
| Dweck (1975) | * ages 8-13 identified learned helpless students * n = 12 | * success-only treatment with attribution retraining and partial reinforcement treatment. | * persistence (number and latency) at arithmetic problems | * IAR scale * Test anxiety scale * E vs. A failure attributions |
| Fowler & Peterson (1981) | * gr. 4-6 students with reading difficulties * n = 28 | * N1, N3, N3AR, N3DAR (failure lengths with indirect and direct attribution retraining. | * persistence (number) at reading sent. three words beyond their graded word reading level | * IAR * E. vs. A. failure attribution scale (Dweck, 1975). |

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|---|--|--|--|---|
| <u>Contingent Social Reinforcement with Attribution Retraining</u> | | | | |
| Andrews & Debus (1978) | * 6th grade male students who least frequently attributed failure to lack of E in phase 1 of study * n = 42 | * control group, social reinforcement group, and token plus social reinforcement group. | * persistence at achievement tasks * changes in attributions to effort | * IAR scale * EAS subscale |
| Bugental, Whalen, and Henker (1977) | * ages 7-12, elementary aged hyper-active boys * n = 36 | * self-controlling speech group (internal source of control) and contingent social reinforcement (environmental source of control) | * perceived controllability of outcomes * error reduction task behavior * teacher ratings on two interventions | * PC-- perceptions of causality for good and bad grades * Conners Abbreviated Teacher Rating Scale * Porteus Maze |

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|---|--|--|--|---|
| <u>Attributional Feedback Training</u> | | | | |
| Chapin & Dyck (1976) | * gr. 5-7 students with reading difficulties * n = 30 | * two levels of partial reinforce- ment were combined with/without attribution retraining A fifth group received success only. | * persistence (number of sentences attempted) * three words beyond their graded word reading level | * no measures for changes in attributions |
| Dweck (1975) | * ages 8-13 identified learned helpless students * n = 12 | * success-only treatment with attribution retraining and partial reinforcement treatment. | * persistence (number and latency) at arithmetic problems | * IAR scale * Test anxiety scale * E vs. A failure attributions |
| Medway and Venino (1982) | * students from gr. 4-6 whose scores on Effort attribution subscale of IAR fell in 3rd of distribution * n = 40 | * attribution feedback type and pattern of of performance | * persistence on visual discrimination task was measured by: (a) time (sec.) spent on each task (b) number of problems completed | * IAR scale * Effort attribution subscale * Posttreat. attributions were measured by "cup" technique (Ames, Ames & Felker, /76) |

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|--|--|--|---|--|
| <u>Attributional Feedback Training</u> | | | | |
| Miller, Brickman, and Bolen (1975) | * grade twos from four classrooms * n = 96 | * attribution strategy with a persuasion strategy to in changing achievement behavior | * changes in math- related self-esteem and math achievement | * self- esteem pre and posttest |
| Schunk (1982) | * children ranging in age from 7.5 to 10.7 * n = 40 | * past attributions, future attributions, monitoring or training control | * mastering subtraction operations * changes in self- efficacy | * self- efficacy scale |

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|-------|-----------------------------|----------------------|-------------|-------------------------|
|-------|-----------------------------|----------------------|-------------|-------------------------|

SELF-MANAGING TECHNIQUES

Participant Modeling

| | | | | |
|------------------|---|--|---|---|
| Schunk (1981) | <ul style="list-style-type: none"> • children ranging in age from 9.2 - 11.3 years * n = 56 | <ul style="list-style-type: none"> • modeling & attributions, modeling & no attributions, didactic & attributions, didactic & no attributions, control group. | <ul style="list-style-type: none"> • changes in division persistence, accuracy, and perceived efficacy | <ul style="list-style-type: none"> * self-efficacy scale |
|------------------|---|--|---|---|

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|---|---|--|---|--|
| <u>Self-Instruction</u> | | | | |
| Bugental, Whalen, and Henker (1977) | * ages 7-12, elementary aged hyper- active boys * n = 36 | * self-controlling speech group (internal source of of control) and contingent social reinforcement (environmental source of control) | * perceived controllability of outcomes * error reduction task behavior * teacher ratings on two interventions | * PC-- perceptions of causality for good and bad grades * Connors Abbreviated Teacher Rating Scale * Porteus Maze |
| Fowler & Peterson (1981) | * gr. 4-6 students with reading difficulties * n = 28 | * N1, N3, N3AR, N3DAR (failure lengths with indirect and direct attribution retraining. | * persistence (number) at reading sent. three words beyond their graded word reading level | * IAR * E. vs. A. failure attribution scale (Dweck, 1975). |
| Reiher and Dembo (1984) | * students between the ages of 12.8 and 15.11 (gr. 7-8). * n = 90 | * self-instruction self-instruction with credibility training; and a control group | * persistence at spelling words | * IAR scale * attribution discs (Nicholls, 1975) |

| STUDY | SUBJECTS/ SAMPLE SIZE | COMPARISON GROUPS | PERFORMANCE | ATTRIBUTION MEASURES |
|-------------------------------------|--|---|---|--|
| <u>Strategy Training</u> | | | | |
| Reid, and Borkowski (1986) | <ul style="list-style-type: none"> * students from gr. 2 - 4; hyper-active under-achieving children | <ul style="list-style-type: none"> * strategy; strategy plus self-control; strategy, self-control, plus attribution retraining | <ul style="list-style-type: none"> * use of more complex strategies * higher personal causality scores * reduced impulsivity | <ul style="list-style-type: none"> * general personal causality question. * specific attribution measure |

APPENDIX C

Letters of Information and Consent

Included in this appendix are the letters of information and consent sent to personnel concerned with the study. Listed in order are the informational letter and the permission form for the school principals, the information sheet for the parent/guardian of prospective students, and the consent forms for the parent/guardian and the student.

Dorothy C. Sawatsky
Graduate Studies
Faculty of Education
Simon Fraser University
Burnaby, B.C. V5A 1S6

Sept 15, 1987

Dear Principal:

I am a Masters student in the Faculty of Education at Simon Fraser University under the direction of Dr. Bernice Wong and Dr. Ron Marx. For my thesis research, I plan to conduct a study on how to promote motivation in learning disabled students. I seek your permission to ask identified learning disabled students in the junior high grades to participate in this research. I need to obtain a total of about 30 to 35 students for this study.

Learning disabled students identified as needing skill development in memorizing and recalling information for test-taking will be trained in a specific FIRST-Letter Mnemonic strategy. This strategy was developed by Dr. Donald Deshler at the University of Kansas. The aim of this intervention study is twofold: (1) to gain a better understanding of the influence of strategy use for acquiring and maintaining skills needed for school related tasks; and (2) to examine the reasons students give for their success and failure in academic areas. To this end, each of the students who volunteer to participate will gain skills in how to categorize and remember information through the use of the FIRST-Letter Mnemonic strategy. Integrated with the development of retrieval skills will be a discussion of the reasons "why" students believe they succeed and fail in school assignments.

During the study, learning disabled students will be seen three days a week for 50 minutes each day, over a period of 4 weeks. Parental permission will be solicited with a letter sent home with the students. All sessions will be conducted by the researcher who has training in learning disabilities and holds a B.C. teaching certificate. Research sessions will be scheduled at your teachers' convenience.

Thank you for your attention to this letter. Enclosed is a copy of the parental and student permission forms. I have also attached a form which Simon Fraser University requires as acknowledgement of your consent.

Sincerely,

Dorothy C. Sawatsky

Faculty of Education
 Simon Fraser University
 Burnaby, B.C. V5A 1S6
 Tel: (604) 291-3395

**CONSENT FORM
 FOR
 SCHOOL PRINCIPALS**

I, _____ have read
 (principal's name)

the attached information sheet and am willing to have teachers and students in my school participate in the study on the effects of strategy training with attribution retraining.

I understand that all data collected during the study will remain private and confidential.

I also understand that I can withdraw my school's participation from the study at any time.

If I wish, I can receive a copy of the final report of the study by contacting Dorothy C. Sawatsky at the above address.

If I have any concerns about the study or any questions, either before or during the project, I can contact Dorothy Sawatsky at 421-0916 or Dr. Bernice Wong at 291-4115. Any complaint about the experiment may be directed to Dr. Jaap Tuinman, Dean of Education at Simon Fraser University. Dr. Tuinman's telephone number is 291-3148.

Signature: _____
 (Principal's name)

Date: _____

School: _____

Address: _____

District No.: _____

School Telephone No.: _____

Faculty of Education
Simon Fraser University
Burnaby, B.C. V5A 1S6
Tel: (604) 291-3395

INFORMATION SHEET FOR PARENTS

Title of Project: The effects of strategy training and attribution retraining on changes in attributions and maintenance of strategy use for a learning disabled population.

The aim of this study is twofold: (1) to provide an efficient way for students to improve in studying and taking tests; and (2) to examine the reasons that students give when they succeed or failure in school-content areas. To this end, each of the students asked to participate will gain skills in how they might better study and remember information for test-taking through the use of an effective strategy developed by Donald D. Deshler at the University of Kansas. Integrated with the development of these skills will be a discussion of the reasons "why" students believe they succeed and fail in school assignments. Teaching students how they might better direct their effort in school will be the second focus in the study.

All sessions will be conducted by the researcher who has training in learning disabilities and holds a B.C. Teaching Certificate. The sessions provided for your child will take place three days a week for 50 minutes over a four week period and will be held during the regular school hours.

You may contact Dorothy Sawatsky at 421-0916 with any questions you might have.

Initials: _____

**CONSENT FORM
FOR
PARENT OR GUARDIAN**

Please indicate whether or not you and your son/daughter agree to participate in the project described on the preceding page. Any questions regarding the project may be directed to me at 421-0916, or to my senior supervisor, Dr. Bernice Wong, at 291-4115. You may also obtain a copy of the results of this project upon its completion by contacting Dorothy Sawatsky at the address below.

Dorothy Sawatsky
Graduate Studies
Faculty of Education
Simon Fraser University
Burnaby, B.C. V5A 1S6

Please retain this part of the form for your information. Return the bottom portion to the school tomorrow.

----- (Cut here) -----

PLEASE CHECK ONE OF THE FOLLOWING:

- YES My son/daughter will participate.
NO My son/daughter will not participate.

My son/daughter and I have read the attached information sheet and understand the nature of the project. I understand that all data collected will be confidential and that it is possible to withdraw at any time. I may direct any questions or comments to Dorothy Sawatsky or to Dr. Bernice Wong (at the address above), and I may also obtain a copy of the results from D. Sawatsky.

| | |
|---|---------------------------------|
| Signature: _____ (Signature of parent of legal guardian) | _____ (Signature of Student) |
| _____ (Parent's or Guardian's full name) | _____ (Student's full name) |
| _____ (Today's date) | _____ (Student's Birthdate) |

Faculty of Education
Simon Fraser University
Burnaby, B.C. V5A 1S6
Tel: (604) 291-3395

STUDENT CONSENT FORM

I, _____ would like take part in
(your name)
this study.

In this study I will learn how I might better study for exams in Science or
Social Studies.

Signature: _____

Date: _____

Birthdate: _____

School: _____

Grade: _____

APPENDIX D

Strategy Training

This appendix contains the lesson plans, the training tasks, the pre/posttest measures, and the scoring procedures for the Strategy Training. These materials are taken from The FIRST-Letter Mnemonic Strategy manual (Nagel, Schumaker, and Deshler, 1986). The objectives and frame for each of the lessons plans, steps one through five, are outlined for the purpose of the study. Complete indepth procedures for the strategy are contained in the manual.

INSTRUCTIONAL METHODS:
The FIRST-Letter Mnemonic Strategy

STEP 1: PRETEST AND COMMITMENT TO LEARN

Objectives:

1. To measure the student's skill with regard to memorizing and recalling information in a list of information.
2. To obtain the student's commitment to learn the FIRST-Letter Mnemonic Strategy.

Lesson Plan:

1. Provide an advance organizer.
2. Distribute Materials for the Memorization Test.
3. Give instructions for the Memorization Test.
4. Instruct the students to begin, and supervise work.
5. Collect the Memorization Test Materials.
6. Distribute the Pretest: Students were given a ten-minute break between memorization study time and test on recall.
7. Inform students of test results to initiate Task-Specific Attribution Measure (given following day).
8. Reaffirmation of student commitment to learn.
9. Give a post-organizer.

STEP 1A: GENERAL ATTRIBUTION DISCUSSION

- Given only to Strategy plus Attribution Retraining Group

Objectives:

1. To provide a discussion regarding student pretest scores on the recall list-learning task, and the causes given for success or failure at this task.
2. To initiate discussion about performance at school-related tasks, and the beliefs they hold regarding the causes of success and failure.
3. To provide an activity in which each student must solicit one area in their life which is successful for them. To elicit beliefs held about the causes of that success.
4. Discussion of school success and its relationship to beliefs held.

Lesson Plan:

1. Provide an advance organizer.
2. Review the pretest scores and the causes given on the Task-Specific Attribution Measure for success or failure.
3. Discussion of School Performance and how they see themselves and their capabilities fitting into the structure.
4. Activity for successful outcomes and beliefs held.
5. Discussion on beliefs about school success and failure.

STEP 2: DESCRIBE (Two Sessions)**Objectives:**

1. To give students rationales for learning the FIRST-Letter Mnemonic Strategy.
2. To describe for students the general characteristics of situations where the strategy can be applied.
3. To provide examples of situations where the strategy can be applied.
4. To describe the benefits students can accrue by using the strategy.
5. To describe the steps for designing mnemonic devices.
6. To describe the steps for making and memorizing lists.

Lesson Plan:

1. Provide an advance organizer. Solicit responses for the definition of "mnemonic".
2. Discuss rationales for using the FIRST-Letter Mnemonic strategy.
3. Discuss examples of situations where the strategy can be used. Present Cue Card #1: Definition of List. "A list has a main idea heading and several items that are related to the heading. What is a main idea...What are the details that refer to it?"
4. Discuss concrete benefits for students.
5. Set goals for acquisition and mastery of strategy so that students are able to see progression of learning task.
6. Describe steps for designing mnemonic devices:
STEP 1: Form a word (Cue Cards #2 and #3).
STEP 2: Insert a letter or letters (Cue Cards #2 and #3).
STEP 3: Rearrange the letters (Cue Cards #2 and #3).
STEP 4: Shape a sentence (Cue Cards #2 and #3).

- STEP 5: Try combinations (Cue Cards #2 and #3).**
7. Describe steps for making and memorizing lists (Session 2):
- STEP 1: Look for clues (Cue Card #4 - #8).**
 - STEP 2: Investigate the items (Cue Card #4, #9, and #10).**
 - STEP 3: Select a mnemonic using FIRST (Cue Card #4).**
 - STEP 4: Transfer the information to a card or paper.**
 - STEP 5: Self-Test.**
8. Compare the new strategy to the students' previous study habits.
9. BELIEFS mnemonic taught to S.A. group only.
10. Give a post-organizer.

STEP 3: MODEL (Two Sessions)**Objectives:**

1. To demonstrate to the students how to make lists, design mnemonic devices, and memorize information in lists.

Lesson Plan:

1. Review the strategy.
2. Give an advance organizer.
3. Give a copy of the Model Chapter to each student. Orally read out the passage.
4. Demonstrate the FIRST-letter Mnemonic strategy.
 - (a) LISTS
 - (b) FIRST
5. Include the students in the list-making activities.
6. Demonstrate checking the study questions in the chapter.
7. Demonstrate the final self-test.
8. For those students included in the S.A. group, adaptive attributions were modelled for both successful outcomes and for opportunities where persistence in strategic behavior was required. An example is as follows: "This is one time where I feel frustrated. This is hard. I know that if I persist in trying combinations of the strategy, this will work. Great! I got it by focusing on the steps of the strategy".

STEP 4: VERBAL REHEARSAL

Objectives:

1. To ensure that students can instruct themselves to follow the steps of the FIRST-Letter Mnemonic Strategy.

Lesson Plan:

1. Review the steps for making and memorizing lists and the steps for designing mnemonic devices.
2. Provide an advance organizer.
3. Introduce rapid-fire verbal rehearsal for FIRST and LISTS.
4. Structure time for individual review.
5. Administer an individual oral quiz:
QUESTION #1: List the steps for selecting a mnemonic device for a list.
QUESTION #2: List the steps for making and memorizing lists.
QUESTION #3: Name five word clues and five other clues for recognizing that a list exists.
QUESTION #4: List the seven steps for examining beliefs that we hold as we enter a learning task.
(Given only to the S.A. group.)
6. Give individual feedback. In order to proceed to Step 5, 100% mastery is required. Students are then required to verbally rehearse these three (four) questions over a three-day period.

STEP 5: CONTROLLED PRACTICE AND FEEDBACK

Objectives:

1. To teach students to perform the five steps for making mnemonic devices and four of the five steps for making and memorizing lists at mastery levels with controlled stimuli.

Lesson Plan:

1. Review the strategy steps (individual verbal rehearsal).
2. Give an advance organizer.
3. Five kinds of lessons:
 - Day 1: Lesson on the **F** step.
 - Day 2: Lesson on the **I** step.
 - Day 3: Lesson on the **R** step.
 - Day 4: Lesson on the **S** step.
 - Day 5: Lesson on the **T** step.
4. Monitor individual practice for appropriateness of strategy.
5. Administer quiz:
 - Quiz 1: Oral Quiz
 - Quiz 2: Written Quiz
6. Individual Feedback:
 - (a) Provide positive feedback.
 - (b) Provide corrective feedback.
 - (c) Provide feedback regarding attributions--"Why have I succeeded at this task?"--Reinforce attributions made for directing effort in strategy use for both success and failure. Discuss any discouragements the students may be experiencing. (Given only to the S.A. group).

LESSON 1**Form a Word****FIRST LESSON 1A**

Be sure to know this
information for the next test:

Common Human Fears

Heights
Insects
Death
Elevators
Snakes

FIRST QUIZ 1A

Name: _____

Date: _____

1. List five fears that humans have.

LESSON 2

Insert a Letter

FIRST LESSON 2A

This information will be covered on the exam:

**Americans who are
Part Indian**

Charles Stevens
Cher
Burt Reynolds
Redd Foxx

FIRST QUIZ 2A

Name: _____

Date: _____

1. Name four famous Americans who have Indian ancestors.

LESSON 3

Rearrange the Letters

FIRST LESSON 3A

Be sure to know this list:

Gemstones

Diamond
Amethyst
Topaz
Sapphire
Emerald

FIRST QUIZ 3A

Name: _____

Date: _____

1. Name the five gemstones we've studied.

LESSON 4**Shape a Sentence****FIRST LESSON 4A****Know the following:****Assassinated Leaders**

**Julius Caesar
Mahatma Gandhi
Martin Luther King
John F. Kennedy
Abraham Lincoln**

FIRST QUIZ 4A**Name:** _____**Date:** _____

1. Name famous leaders who were assassinated.

LESSON 5**Try Combinations****FIRST LESSON 5A**

Be sure to know this information for the final exam:

**Examples of
Arthropods**

Spiders
Crabs
Insects
Lobsters
Shrimp

**Soybean
Uses**

Rubber
Soap
Food
Explosives

**Elements
of Learning**

Thinking
Judgment
Decision-making
Imitation
Memory

FIRST QUIZ 5A

Name: _____ Score: _____

Date: _____

Answer the following questions:

1. Three examples of arthropods are:

a. _____ c. _____

b. _____

2. A fly is an arthropod. (Circle one.)

True

False

3. Tires can be made out of soybeans. (Circle one.)

True

False

4. Which of the following is an arthropod? (Circle one.)

a. painted horse

c. catfish

b. black widow spider

d. sand dollar

5. List four uses for soybeans:

a. _____ c. _____

b. _____ d. _____

6. When you do the FIRST Strategy, what are two elements of learning that you use?

a. _____ b. _____

7. Which of the following is *not* an element of learning? (Circle one.)

a. decision-making

c. imagination

b. thinking

d. judgment

8. Which of the following is a use for soybeans? (Circle one.)

a. paper

c. electronics

b. explosives

d. plastics

9. You might be using soybeans when you read a book. (Circle one.)

True

False

10. You might be using soybeans when you take a bath. (Circle one.)

True

False

Pretest Lists Sheet**PROTISTS**

(Living things that are not plants or animals)

**Groups in the
Protist Kingdom**

Bacteria
Algae
Fungi
Protozoa
Viruses

**Ways to control
Bacterial Growth**

Heating
Canning
Pasteurizing
Freezing
Cooling
Dehydrating

**Problems caused
by Protozoa**

Malaria
Sleeping sickness
Fever
Cramps
Bleeding gums

Name: _____

Date: _____

Answer the following questions:

1. One way the growth of bacteria can be stopped is: (Circle one.)

- a. spraying
- b. stamping
- c. dehydrating
- d. hydrating

2. A sickness that is caused by a protist is: (Circle one.)

- a. Parkinson's disease
- b. malaria
- c. polio
- d. measles

3. One protist can make your gums bleed. (Circle one.)

- True
- False

4. One way bacterial growth is controlled in milk is through pasteurization. (Circle one.)

- True
- False

5. Protozoa and arachnids are groups in the Protist Kingdom. (Circle one.)

- True
- False

6. Two ways high temperatures are used to control bacterial growth are:

_____ and _____

7. Two ways low temperatures are used to control bacterial growth are:

_____ and _____

8. Name four problems caused by protozoa:

- a. _____
- b. _____
- c. _____
- d. _____

9. Name four groups in the Protist Kingdom.

- a. _____
- b. _____
- c. _____
- d. _____

10. Which of the following is a protist that causes cramps? (Circle one.)

- a. parasite
- b. fungi
- c. partizoid
- d. protozoa

Posttest Lists Sheet I**DIGESTION****Parts of the
Digestive System**

Mouth
Esophagus
Stomach
Small Intestine
Large intestine
Anus

**Basic Food
Needs**

Proteins
Carbohydrates
Fats
Minerals
Vitamins
Water

**Results of
Digestion**

Sugars
Amino acids
Glycerol
Fatty acids

Name: _____

Date: _____

Answer the following questions:

1. There are how many basic food needs? (Circle one.)

- a. five
- b. six
- c. four
- d. seven

2. The digestive process begins in the _____.

3. There are several results of digestion. They are:

- a. _____
- b. _____
- c. _____
- d. _____

4. What drink constitutes one basic food need? _____

5. The large intestine and small intestine are parts of the _____.

6. Which of the following is one of the basic food needs? (Circle one.)

- a. carbon
- b. minerals
- c. carbonite
- d. vitriol

7. Which of the following is a result of digestion? (Circle one.)

- a. gartrin
- b. glycogen
- c. glycerol
- d. gastroids

8. Carbohydrates and fatty acids are basic food needs. (Circle one.)

True False

9. Name four basic food needs:

- a. _____
- b. _____
- c. _____
- d. _____

10. Which of the following is a result of digestion? (Circle one.)

- a. salts
- b. honey
- c. saline
- d. sugars

Posttest Lists Sheet II**MAMMALS****Characteristics
of Mammals**

Seven vertebrae in neck
Hair
Developed brain
Nurse young
Care for young

**Adaptations in
Mammals**

Hair
Antlers/horns/scales
Teeth
Hibernation
Thick skin

**Placental
Mammals**

Fliers
Insectivores
Rodents
Carnivores
Primates

Name: _____

Date: _____

Answer the following questions:

1. Two characteristics of mammals relate to how they deal with their children. What are they? (Fill in the blanks.)

They _____ their young and _____ their young.

2. Which of the following is a group of placental mammals? (Circle one.)

- a. insects
- b. arachnids
- c. insectivores
- d. conifers

3. Which two adaptations in mammals allow them to live in colder climates?

a. _____ b. _____

4. The fliers are one group of placental mammals. (Circle one.)

True False

5. Which of the following is not a mammal? (Circle one.)

- a. human
- b. rat
- c. cat
- d. bird

6. Name four adaptations in mammals.

a. _____ c. _____
b. _____ d. _____

7. Which adaptation in mammals allows them to eat tough foods like meat?

8. Name four groups of placental mammals.

a. _____ c. _____
b. _____ d. _____

9. Which of the following is a characteristic of all mammals? (Circle one.)

- a. four legs
- b. developed brain
- c. two ears
- d. nose

10. Name four characteristics of mammals.

a. _____ c. _____
b. _____ d. _____

Posttest Lists Sheet III**PLANTS****Plant Uses**

Cardboard
Oxygen
Paper
Wood

Vascular Plants

Club mosses
Ferns
Conifers
Flowering plants

**Characteristics
of Conifers**

Cones
Needle-shaped leaves
Green all year
Woody stems

SCORING PROCEDURES

Scoring Procedures for the Strategy Training

1. Provide positive feedback. Examples include:

"Good for you!"

"I see that you are attempting to focus on the steps of the strategy."

2. Provide corrective feedback (scoring procedures, p. 91).

TYPES OF ERRORS MADE:

(a) The list on the card was poorly copied from the original.

(b) An answer(s) on the test was so poorly spelled that it would not be accepted by a regular class teacher.

(c) The student reports that he or she could not remember the mnemonic device.

(d) The student reports that he or she could not remember the items that corresponded to the letters.

(e) The student reports that he or she did not have enough time

(f) The student designed the wrong kind of mnemonic device or did not design a mnemonic device.

(g) The student is incorrectly answering particular kinds of questions on the #5 Series Quizzes.

3. Provide feedback regarding attributions.

(a) Have students ask themselves the following questions:

"Why have I succeeded at this task?"

"Why have I failed at this task?"

(b) Have students rehearse the steps to the BELIEFS mnemonic.

(c) Pinpoint which of the steps they are finding hard to cope with.

(d) Reinforce attributions made for directing effort in strategy use for both success and failure.

(e) Discuss any discouragements the students may be experiencing. (Given only to the S.A. group)

Scoring Procedures for Quizzes and Pre/posttest measures

Scoring procedures for quizzes in Lessons 1 through 5 may be obtained on page 91 of manual. The answer key for all assessments is found on pages 143 - 144 of manual.

APPENDIX E

Metacognitive Awareness of Strategy Use

Contained in this appendix are the operational definitions for each question eliciting metacognitive awareness of strategy use in study behavior. The scoring procedure for the structured interview is outlined.

Metacognitive Awareness of Strategy Use:
Operational Definition for Questions

1. When and how long would you study for this test?

APPORTION OF STUDY TIME

- * Scheduled Time - amount of time needed to study
- * Priority - where does it fit in a list of activities

2. How would you study for this test? Show me the way you would go about studying for a test on this chapter?

STRATEGY EMPLOYMENT OF STUDY SKILLS

- * Reading of chapters assigned
- * Taking notes/Additional research for the test
- * Answering questions at the end of a passage
- * Writing out of definitions or questions
- * Rechecking their answers to the passage
- * Underlining main ideas and supporting details
- * External assistance - formatting study questions

3. What information do you think is important in this paragraph? What is the main idea of this paragraph? What details support the main idea?

KNOWLEDGE OF MAIN IDEA / DETAILS

- * Identification of main idea and supporting details in a paragraph
- * Definition: "The main idea is the most general statement in the paragraph. It explicitly explains the general topic. Most of the sentences should refer to it. Most of the other sentences should elaborate or qualify this statement" (Aulls, 1978, p. 102, as quoted by Wong, Wong, Perry, and Sawatsky, 1986).

4. How do you pick out the important information in this paragraph? How do you choose the main idea and the supporting details?

STRATEGY FOR SELECTING MAIN IDEA / DETAILS

- * Any referral made to the above definition
- * Headings / Items in a list
- * Bold-faced print
- * Italics
- * Diagrams

5. How do you attempt to remember this information?

STRATEGIES FOR RECALL

- * Organization of ideas into headings / items
- * Creating questions for details
- * Practice writing out the information
- * Covering and spelling out/recalling (visualization)
- * Mnemonics (FIRST-Letter Mnemonic)

Scoring Procedures

A score for the structured interview was arrived at by summing the responses to the individual questions, for a total possible score of five. One mark was given per question for any of the appropriate responses listed above. The interrater reliability was 88%.

APPENDIX F

Attribution Measures

This appendix contains the General Achievement Causality Measure and the Task Specific Attribution Measure. Procedures for encoding and classifying student responses are outlined. The operational definitions for the nine attributional categories are presented.

GENERAL ACHIEVEMENT CAUSALITY MEASURE

NAME:
GRADE:
AGE:
SCHOOL:

GROUP:
IDENTITY NUMBER:
MALE: FEMALE:

HYPOTHETICAL SITUATIONS

Practice Question: Do you play volleyball? Imagine that you were playing in a volleyball tournament. The score was tied 20/20. It was your serve and it was an excellent serve, hitting the floor. You gained the winning point for your team. Give me a reason or some reasons why this might happen.

SUCCESS EXPERIENCE

1. Imagine that you have two midterms that fall on the same day, one in Science and the other in Socials. You are required to read two chapters for Science and one for Socials. In total, you have to read three chapters for the two tests that fall on the same day. Imagine that you have passed both of the exams. When this situation happens to you, that is, you have tests that fall on the same day and are required to do a great deal of reading, and yet still pass the tests, why might this happen? Give me a reason or some reasons why this might happen for you.

Can you tell me more about that?

FAILURE EXPERIENCE

2. Imagine that the same situation has happened to you. You have two midterms that fall on the same day, one in Socials and the other in Science. Again, you are required to read two chapters in Science and one in Socials. In total, you have to read three chapters for the two tests that fall on the same day. This time, however, you have failed both of the exams. When this situation happens to you, that is, you have tests that fall on the same day and are required to do a great deal of reading, and find that you have failed both of the tests, why might this happen?

Can you tell me more about that?

UNEXPECTED EXPERIENCE

3. What is the subject area that you find the most difficult in school?

Why do you find it so hard?

Imagine that you had to take a test in _____. In spite of it being difficult for you because of _____, imagine that you passed the test. Give me a reason or some reasons why this might happen for you.

Can you tell me more about that?

TASK SPECIFIC ATTRIBUTION MEASURE

" NAME , on the recall task you have taken you received a score of ___ out of 10 possible marks or ___ % (show test results).

Is this a good or bad mark for you?

Give me a reason or some reasons why you received this mark.

Can you tell me any more about your_____.

Procedures for Encoding and Classifying Responses

1. Each students had an individual tape which held the pre/posttest measures for the general achievement causality measure and the task specific causality measure.
2. All tapes were transcribed verbatim.
3. The researcher classified each response according to the operational definition outlined.
4. A second encoder classified 60% of the responses from each group, the attribution plus strategy training group, the strategy group, and the control group.
5. Comparisons were sought and discussed. The interrater reliability for the general achievement causality measure is 86%. The interrater reliability for the task-specific causality measure is 82%.

Encoding of Responses

(Operational Definitions)

A. Effort

- * Effort for studying.
- * Effort during a test.
- * Test preparation.
- * Concentration during study.
- * Attention to instruction.
- * Attentive reading ("reading carefully").

B. Strategy Employment

- "How" they are studying for a test.
- "How" they are taking a test.
- * Organization in study behavior.
- Organization and strategies for test-taking.
- Use of strategies (eg., mnemonic).

C. Characteristics of the task - difficulty / ease

- * Studing load (time / amount).
- Subject matter difficulty.
- * Test difficulty.
- * Cheating to ease the task.
- Understanding of the material.

D. Luck

E. Ability

- * "I'm not good at..."
- * "I'm slow; I get so confused."
- Memory ("I don't have a good memory").

F. External Assistance

- Parental help.
- * Teacher assistance.
- Teacher's instructional ability.
- Liking the teacher and accessing help.

G. Physiological Factors

- Fatigue
- * Mood
- Health
- * Stress or anxiety

H. Learning Conditions

- * Noise at home or in the classroom.
- Crisis at home.

I. Will to Succeed (Motivation)

- Determination.
- Interest in subject matter.

APPENDIX G

The Final Causal Dimension Scale

The Final Causal Dimension Scale as developed by Russell (1983) is presented with its modified scale. Listed in order are: administration format for learning disabled adolescents; modifications of wording structure in the scale, items by causal dimension, and scoring procedures.

THE FINAL CAUSAL DIMENSION SCALE

(DESIGNED AND VALIDATED BY DAN RUSSELL, 1983)

INSTRUCTIONS: Think about the reason or reasons you have given. The items below concern your impressions or opinions of this cause or causes of your outcome. Circle one number for each of the following scales.

1. Is the cause(s) something that:

| | | | | | | |
|---|---|---|---|---|---|---|
| Reflects an aspect of yourself or others | 5 | 4 | 3 | 2 | 1 | Reflects an aspect of the situation. |
|---|---|---|---|---|---|---|

2. Is the cause(s):

| | | | | | | |
|--|---|---|---|---|---|---|
| Controllable by you or other people | 5 | 4 | 3 | 2 | 1 | Uncontrollable by you or other people. |
|--|---|---|---|---|---|---|

3. Is the cause(s) something that is:

| | | | | | | |
|-----------|---|---|---|---|---|-----------|
| Permanent | 5 | 4 | 3 | 2 | 1 | Temporary |
|-----------|---|---|---|---|---|-----------|

4. Is the cause(s) something:

| | | | | | | |
|------------------------------------|---|---|---|---|---|---------------------------------------|
| Intended by you or other people | 5 | 4 | 3 | 2 | 1 | Unintended by you or other people. |
|------------------------------------|---|---|---|---|---|---------------------------------------|

5. Is the cause(s) something that is:

| | | | | | | |
|----------------|---|---|---|---|---|----------------|
| Outside of you | 1 | 2 | 3 | 4 | 5 | Inside of you. |
|----------------|---|---|---|---|---|----------------|

6. Is the cause(s) something that is:

| | | | | | | |
|--------------------|---|---|---|---|---|-------------------|
| Variable over time | 1 | 2 | 3 | 4 | 5 | Stable over time. |
|--------------------|---|---|---|---|---|-------------------|

7. Is the cause(s):

| | | | | | | |
|---------------------|---|---|---|---|---|----------------------------|
| Something about you | 5 | 4 | 3 | 2 | 1 | Something about others. |
|---------------------|---|---|---|---|---|----------------------------|

8. Is the cause(s) something that is:

| | | | | | | |
|------------|---|---|---|---|---|------------|
| Changeable | 1 | 2 | 3 | 4 | 5 | Unchanging |
|------------|---|---|---|---|---|------------|

9. Is the cause something for which:

| | | | | | | |
|--------------------------|---|---|---|---|---|---------------------------|
| No one is responsible | 1 | 2 | 3 | 4 | 5 | Someone is responsible |
|--------------------------|---|---|---|---|---|---------------------------|

Administration Format for Learning Disabled Adolescents: The Final Causal Dimension Scale

Protocol

I want you to think of the reasons you have given for success or failure in these hypothetical situations. I am going to ask you to place your answer on a scale. This scale allows me to know more about what you are thinking and feeling inside.

This scale has a statement on either side of it. The scale has numbers from 1 to 5. If the statement on the left of the scale reflects your given response, you might choose a 4 or a 5. Similarly, if the statement on the right of the scale reflects your response, you might choose a 2 or a 1. The 1 and the 5 would tell me that you think clearly and strongly about your response. Sometimes your response(s) might include both statements. If that is the case, then you would choose a 3. Are there any questions?

Let us try an example together. I might have said, "I won the winning point for my team in volleyball because I am very good in this sport". Item number 1 has two statements: (1) reflects an aspect of yourself or others; (2) reflects an aspect of the situation. I would choose a 4 or 5 as it is saying something about my ability. Let us try this scale with your response.

Procedures

- Step 1: All students were presented with the same protocol.
- Step 2: All students worked through a practice example.
- Step 3: Questions raised were answered.
- Step 4: The researcher verbally repeated the student response for each of the nine items in the scale.
- Step 5: The researcher used the exact wording in the scale and provided alternate words to ensure comprehension (alternate words are presented below).

Modifications in Wording Structure: The Final Causal Dimension Scale

- | | | |
|----|--|--|
| 1. | Is the cause(s) something that: Reflects an aspect of yourself or others | Reflects an aspect situation |
| | <ul style="list-style-type: none"> • Says something about... | |
| 2. | Is the cause(s): Controllable by you or other people | Uncontrollable by you or other people |
| | <ul style="list-style-type: none"> • Something that you can control or regulate... | |
| 3. | Is the cause(s) something that is: Permanent | Temporary |
| | <ul style="list-style-type: none"> • Lasting | <ul style="list-style-type: none"> • Limited or for a short period of time |
| 4. | Is the cause(s) something Intended by you or other people | Unintended by you or other people |
| | <ul style="list-style-type: none"> • Plan for | |
| 5. | Is the cause(s) something that is: Outside of you | Inside of you |
| | <ul style="list-style-type: none"> • No alterations | |
| 6. | Is the cause(s) something that is: Variable over time | Stable |
| | <ul style="list-style-type: none"> • Does not/does last over time | |
| 7. | Is the cause(s): Something about you | Something about others |
| | <ul style="list-style-type: none"> • No alterations | |
| 8. | Is the cause(s) something that is: Changeable | Unchanging |
| | <ul style="list-style-type: none"> • No alterations | |
| 9. | Is the cause(s) something for which: No one is responsible | Someone is responsible |
| | <ul style="list-style-type: none"> • No alterations | |

Scoring Procedures

Items by Causal Dimension

Items by causal dimension follow that of the Final Causal Dimension Scale (Russell, 1983). They are as follows:

(1) Locus of Causality

Items 1, 5, and 7

(2) Stability

Items 3, 6, and 8

(3) Controllability

Items 2, 4, and 9

Scoring Procedures

A score for each of the three subscales is arrived at by summing the responses to the individual items, for a total possible score of 15. High scores on these subscales indicate that the cause is perceived by the student as internal, stable, and controllable.

APPENDIX H

Attribution Retraining

This appendix contains instructional procedures for the attribution retraining group. The lesson plan for the antecedent general attribution discussion is presented. The BELIEFS mnemonic provides the instructional and self-instructional framework. A theoretically based rationale is provided for each of the steps used.

Lesson Plan for the Antecedent Attribution Discussion

Objectives:

1. To provide a discussion regarding student pretest scores on the recall list-learning task, and the causes given for success or failure at this task.
2. To initiate discussion about performance at school-related tasks, and the beliefs they hold regarding the causes of success and failure.
3. To provide an activity in which each student must solicit one area in their life which is successful for them. To elicit beliefs held about the causes of that success.
4. Discussion of school success and its relationship to beliefs held.

Lesson Plan:

1. Provide an advance organizer.
2. Review the pretest scores and the causes given on the Task-Specific Attribution Measure for success or failure.
3. Discussion of School Performance and how they see themselves and their capabilities fitting into the structure.
4. Activity for successful outcomes and beliefs held.
5. Discussion on beliefs about school success and failure.

The Mnemonic Frame BELIEFS

- B** **Be aware** of your present thinking.
How am I feeling about approaching this task?

- E** **Express** these thoughts and feelings to yourself. Distinguish between the positive and negative statements.

- L** **Leave aside** the negative statements.
Put any self-statements aside which inhibit you from using the steps of the strategy.

- I** **I can succeed!**
Use a self-directing statement which is positive.

- E** **Excellent thinking!**
Use self-reinforcing statements.

- F** **Focus on "how" to succeed.**
Use the steps of an effective strategy.

- S** **Steps of the Strategy.**
Verbally rehearse the steps to the strategy.

Rationale for the Steps to the BELIEFS Mnemonic

1. **B Be aware** of your present thinking.

How am I feeling about approaching this task?

The first step in the mnemonic is a self-questioning technique. It is a verbal mediation process where the internal dialogue helps to organize new behavior. Meichenbaum (1977) stresses that in order for behavior to change, students must first be observers of their thoughts, feelings, and behavior.

2. **E Express** these thoughts and feelings to yourself. Distinguish between the positive and negative statements.

The second step of the mnemonic focuses on the behavior which is to be modified. Students are required to both acknowledge their present thoughts and feelings and organize them into two camps. In the first phase of instruction these feelings are expressed verbally. As the students move toward self-instruction, they express their feelings in covert speech, and finally with non-verbal self-cues (Meichenbaum, 1977).

3. **L Leave aside** the negative statements. Put any self-statements aside which inhibit you from using the steps of the strategy.

Step three in the mnemonic requires the students to predict and monitor their beliefs. The students need to predict how beliefs, expressed through thoughts and feelings, will affect their performance. They are directed taught how to leave aside the negative self-statements that inhibit persistence at a task.

4. **I I can succeed!** Use a self-directing statement which is positive.

These negative self-statements are replaced with positive, self-reinforcing statements. These positive statements direct them in attempting the academic tasks. The awareness gained as an self-observer of thoughts, feelings, and behavior allow for the substitution of new adaptive attributions (Meichenbaum, 1977).

5. **E Excellent thinking!** Use self-reinforcing statements.

The students move in step five to self-regulation in reinforcement. These self-reinforcing statements are strengthened as students experience benefits from effort in effective strategy use.

6. **F Focus on "how" to succeed.** Use the steps of an effective strategy.

Students need opportunity for practice with their newly acquired attributions. Step six of the mnemonic provide the direction for their effort. Effort is extricately woven with effective strategies.

7. **S Steps of the Strategy.** Verbally rehearse the steps to the strategy.

The last step in the mnemonic provides opportunity for rehearsal of the steps of the strategy to be used.