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A study of the effects of attribution retraining and cognitive self-instruction upon the academic and attentional skills, and cognitive-behavioral trends of elementary-age children served in self-contained learning disabilities programs

Arthur Vance Morgan IV
College of William & Mary - School of Education

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A study of the effects of attribution retraining and cognitive self-instruction upon the academic and attentional skills, and cognitive-behavioral trends of elementary-age children served in self-contained learning disabilities programs

Morgan, Arthur Vance, IV, Ed.D.
The College of William and Mary, 1990

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A STUDY OF THE EFFECTS OF ATTRIBUTION RETRAINING AND COGNITIVE SELF-INSTRUCTION UPON THE ACADEMIC AND ATTENTIONAL SKILLS, AND COGNITIVE-BEHAVIORAL TRENDS OF ELEMENTARY-AGE CHILDREN SERVED IN SELF-CONTAINED LEARNING DISABILITIES PROGRAMS

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

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

by
Arthur Vance Morgan IV
August 1990
A STUDY OF THE EFFECTS OF ATTRIBUTION RETRAINING
AND COGNITIVE SELF-INSTRUCTION
UPON THE ACADEMIC AND ATTENTIONAL SKILLS,
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OF ELEMENTARY-AGE CHILDREN SERVED IN
SELF-CONTAINED LEARNING DISABILITIES PROGRAMS

by

Arthur Vance Morgan IV

Approved August 1990 by

Roger R. Ries, Ph.D.
Chair of Doctoral Committee

Virginia K. Laycock, Ed.D.

Lori A. Korinek, Ph.D.
To a beautiful family,
my wife, Holly,
and children, Vance and Laura,
whose love and support
meant more than I could ever express;

the memory of my father,
Arthur Vance Morgan III,
and the indomitable spirit of my mother,
Isabel Morgan
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The purpose of this study was to investigate the integration of an attribution retraining program and a cognitive self-instruction procedure as a means of improving the academic performance and component attentional skills and modifying the cognitive-behavioral beliefs and behaviors of elementary-age children served in self-contained learning disabilities programs.

Subjects were 77 children, 10-13 years of age, served in Chesapeake, Virginia Public Schools self-contained learning disabilities programs. A primary group (n=27) received attributional retraining and cognitive self-instruction, a secondary group (n=25) cognitive self-instruction alone, and a control group (n=25) traditional instruction. Instruction and intervention in the treatment conditions were presented over a 10-week period in three phases: (a) Controlled Instruction, (b) Transition, and (c) Direct Instruction.

Assessment was conducted in reading, mathematics, and written language on a standardized instrument (Woodcock-Johnson Tests of Achievement) and teacher-administered probe sheets, locus of control (Children's Nowicki-Strickland Internal-External control scale),
cognitive-behavioral trends (Burks' Behavior Rating Scales), general memory and attention (Visual-Aural Digit Span Test), and attentional style (Matching Familiar Figures Test).

Analysis of covariance and post hoc least squares means analysis (.05 confidence level) revealed significant primary treatment growth in three cognitive-behavioral outcomes (poor attention, poor ego strength, and excessive dependency) and probe sheet mathematics; significant primary treatment growth versus either secondary treatment or control conditions was noted in cognitive-behavioral areas (poor academics and poor impulse control) and standardized reading. A near significant outcome was noted in latency rate. No significant differences were noted in mathematics or written language on the standardized instrument, reading or written language on probe sheets, trends toward internality, general attention/memory, and latency or error rate.

Recommendations include longer term investigations of antecedent attributions, clarification of the role of attribution in cognitive-behavioral change, and a diverse application of attribution retraining in education.

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SCHOOL OF EDUCATION
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CHAPTER 1

Introduction

Justification for the Study

The needs of special education children range broadly within and across the various exceptionalities. Children regarded as possessing the most severe examples of specific exceptionalities are often served in self-contained settings in which the majority of services are provided within the special education classroom. Children classified as severely learning disabled demonstrate inadequacies in attentional skills (Hallahan & Lloyd, 1987), processing and integrating information (Brown & Alford, 1984; Cermak, 1983), and cognitive-motivational variables (Licht, 1983; Torgensen, 1982) which inhibit academic growth and school progress. Such children often receive total language arts instruction as well as instruction in math, science, and social studies in the self-contained learning disabilities classroom. Given the consequent weight of instructional responsibility placed upon special education personnel, the identification of intervention methods which increase the probability of academic growth and of auxiliary development in strategy generalization and cognitive-behavioral beliefs and actions will serve to expand
available methodological choices and ideally contribute to a more efficiently and confidently implemented instructional process. This need is particularly applicable to the self-contained learning disabilities setting where there has been unconvincing evidence supporting the presence of academic gains as a result of such placement.

Meichenbaum (1980) and Kendall and Braswell (1985) have elucidated the appropriateness of cognitive and/or cognitive self-instruction procedures for overcoming inadequate cognitive-behavioral skills pertinent to the learning process. Yet, the insistence by Campione and Brown (1977) that the ultimate criterion of effective cognitive self-instruction training is generalization of trained skills is telling in light of the dearth of supporting evidence to this effect (Wong, 1985).

Attribution theory and specifically the tenets of the attributional theory of achievement motivation (Weiner, 1974, 1979, 1980, 1985) provide an avenue of exploration pertinent to the issue of skill generalization (Borkowski, Weyhing, & Turner, 1988; Chapman, 1988; Kistner, Osborne, & LeVerrier, 1988). As learning disabled children have been found to perceive themselves as possessing little or no control over achievement outcomes and to view their efforts as valueless (Licht, 1983; Licht, Kistner, Ozkaragoz,
Shapiro, & Clausen, 1985; Pearl, 1982), the inclusion of attribution retraining methods in instructional programming warrants consideration. Birthed originally for low-achieving and learned helpless children (DeCharms, 1972; Dweck, 1975) with belief symptomatology similar to learning disabled children, attribution retraining has been reported as successful in "teaching participants that their failures are due to lack of effort, an internal, unstable, and controllable attribute" (Forsterling, 1985, p. 509). The added dimension of attributional shift may impact upon the effective generalization of trained cognitive self-instruction skills, the acquisition of academic skills, perceptions of personal control, and the development of related cognitive-behavioral skills.

While there is substantial literature addressing cognitive self-instruction approaches and attribution retraining as separate entities, there are none known to this researcher that have attempted to integrate the two approaches with normal or disabled school-age populations. The current study adapted a superordinate, multi-faceted attribution retraining framework within which a subordinate cognitive self-instruction procedure was employed to reinforce component attentional skills in the self-contained learning disabilities classroom. The generalization of cognitive-behavioral effects to the
general educational setting was assessed as was the significance of a locus of control variable.
Statement of the Problem

This study investigated the integration of a superordinate, multi-faceted attribution retraining program and subordinate cognitive self-instruction procedure as a means of improving the component attentional skills and academic performance and modifying the cognitive-behavioral beliefs and behaviors of elementary-age children who are served in self-contained learning disabilities programs.
Theoretical Rationale

Cognitive self-instruction methods as developed by Meichenbaum (1974, 1977) evolved from the preliminary observations of Piaget (1955), Vygotsky (1962), and Luria (1961) in the study of children's private speech. Adapting these ideas and those of others such as Mead (1934), Reese (1962), and Flavell, Beach, and Chinsky (1966), Meichenbaum speculated that the elicitation of productive self-talk noted in schizophrenic patients may also be conditioned in nonclinical individuals deficient in self-regulatory speech. Meichenbaum and Goodman (1969, 1971) devised a self-instruction program for impulsive children that incorporated the principles set forth by Vygotsky, and particularly Luria in respect to the provision of a sequential series of initially adult-modeled overt self-statements gradually fading to child-based covert self-statements. Since the early stages of experimental applications, cognitive self-instruction methods have been broadly and successfully employed to improve academic performance (Wiesner, 1986), facilitate attention (Egeland, 1974), and inhibit aggressive behavior (MacPherson, Candee, & Hohman, 1974), among numerous other applications, in both normal and disabled populations. Despite extensive research efforts, a persistent and overriding concern regarding the utility of cognitive self-instruction has been the dearth of
evidence asserting effective strategy generalization. Additionally, there are limited studies addressing the application of cognitive self-instruction methods to severely learning disabled populations. The general tenets of attribution theory and specifically those of the attributional model of achievement motivation are viewed as providing a perspective within which to speak to these limitations, and a superordinate method by which to enhance the inherent power of cognitive self-instruction methods with children identified as severely learning disabled.

Based upon research in locus of control by Rotter (1966) and the seminal ideas on attribution by Heider (1958), the attributional model of achievement motivation (Weiner, 1969, 1971, 1979) provides a theoretical perspective through which to explore the link between causal attributions and future achievement in children identified as learning disabled. Rotter disclosed the behavioral effects of individual differences in perceived internal versus external control of reinforcements, and identified differential effects of ability and happenstance causal attributions upon expectancy, aspiration, and information seeking. The development of an external locus of control was proposed by Rotter as substantially a defensive response to failure: after an individual had continually experienced failure and
negative feedback, he would capitulate to what were perceived as superior external forces, having been increasingly led to believe that he lacked competence and control over the environment. Heider first proposed that attribution involves the connecting of events with underlying conditions through an examination of personal and environmental forces. Through attribution, the individual can predict and regulate his relationships with the world; this process mediates the senses of competence and self-determination.

In adapting these notions, Weiner (1974, 1979, 1980, 1985) postulated a taxonomy of causes for success and failure that a student would use for explanatory purposes. Originally, these attributions were separated into two distinct bipolar dimensions: locus (internal\external) and stability (stable\unstable). More recently, the dimension of controllability has been proposed (Weiner, 1979) as a means of delineating more specifically between the specific causes falling within the stability dimension. In clarifying a model of achievement motivation, Weiner (1971) states that "individuals utilize four elements of ascription both to postdict (interpret) and to predict the outcome (O) of an achievement-related event[:] these four causal elements are ability (A), effort (E), task difficulty (T), and luck (L)" (p. 2).
dimension, ability and effort are internal (describing qualities of the person undertaking the task) while task difficulty and luck are external (describing environmental features). Ability and task difficulty are stable (enduring across similar task presentations) and effort and luck unstable (variable and unlikely to persist over time). Weiner proposes that each attributional dimension is related to specific psychological functions: internal features are specific to self-esteem and external features to the magnitude of expectancy change following success or failure (Metalsky & Abramson, 1981). Student attribution of failure to internal, stable factors but not to external, unstable factors will contribute to lowered self-esteem and future achievement expectancy; attribution of success to stable factors rather than unstable factors results in greater expectancy shifts (Marsh, Cairns, Relich, Barnes, & Debus, 1984; Wiener, Nirenberg, & Goldstein, 1976). While typically focused upon the locus dimension (Weiner 1979, 1980), achievement-related affect is most recently divided into three conceptual sets: "(a) those emotions tied directly to outcome regardless of attribution, such as happiness/unhappiness; (b) distinct emotions related to particular causal ascriptions, such as anger when a failure is attributed to a teacher's bias; and (c) affects related to self-esteem (e.g., pride, shame,
feelings of competence), which are mediated by the locus dimension" (Platt, 1988, p. 570).

The 8-celled classification model is depicted as follows (adapted from Weiner, 1971, p.2):

<table>
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<th>Controllability</th>
<th>Locus of Control</th>
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<td>Controllable</td>
<td>Ability Task Difficulty</td>
</tr>
<tr>
<td>Unstable</td>
<td>Uncontrollable</td>
<td>Effort Luck</td>
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The fundamental assumptions, then, are that a relation exists between the causal attributions for academic success and failure and achievement, and that individuals continually seek to identify these relations.

To extrapolate to children who are learning disabled, given the chronicity of academic failures, numerous studies have demonstrated that these students develop causation beliefs whereby learning problems are attributed to uncontrollable variables such as lack of ability or external factors such as task difficulty or happenstance (Diener & Dweck, 1978; Licht, Kistner, Ozkaragoz, Shapiro, & Clausen, 1985), and that they are less likely than nondisabled peers to view their efforts as controllable determinants of achievement outcomes (Butkowsky & Willows, 1980; Pearl, Bryan, & Donahue, 1980). While ongoing controversy exists in the field of learning disabilities regarding elements as fundamental as etiology and assessment and as pragmatic as
remediation (Tarver, 1986; Wade & Kass, 1986), one truism remains implicit in the understanding of children who are learning disabled: chronic, repetitive experiences of school failure have impacted upon their young lives. Such protracted struggle through the educational system contributes to a perception of limited or no control over achievement outcomes and exertion of effort as valueless (Butowsky & Willows, 1980; Licht, 1983; Pearl, Bryan, & Donahue, 1980) as compared to nondisabled peers. The learning disabled child's long-standing beliefs regarding personal causation for success and failure in the school setting are key determinants of subsequent achievement (Cecil & Medway, 1986) and may result in "less persistence in mastering schoolwork, which in turn increases the likelihood of continued failures and reinforces the children's perceptions of lack of control" (Kistner, Osborne, & LeVerrier, 1988, p. 82). Signs of "learned helplessness" (Fincham & Barling, 1978; Torgensen & Licht, 1983) emerge as children who are learning disabled assign responsibility for school failure to factors beyond direct, personal control, seeking ineffectively to distance themselves from corresponding emotional and cognitive insult. Such failure-prone children may experience diminished self-esteem (Licht, 1983), task persistence (Kennelly, Dietz, & Benson, 1985), academic self-concept (Chapman, 1987),

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and expectations for future achievement outcomes (Hiebert, Wong, & Hunter, 1982; Rogers & Saklofiski, 1985). Negative perceptions and expectations may prove enduring (Chapman, 1988).

As Weiner proposes a clear link between achievement motives and behavior, and that the sustained presence of counterproductive causal attributions contributes to auxiliary manifestations such as learned helplessness and lowered self-esteem, researchers have developed attribution retraining programs designed primarily to modify children's beliefs as a means of enhancing achievement behavior, and secondarily and auspiciously to support more productive achievement-related affective development (Borkowski, Weyhing, & Carr, 1988; Fowler & Peterson, 1981; Thomas & Pashley, 1982). Attribution retraining ordinarily "involves methods to induce children to ascribe prior or present achievement outcomes to effort... [and] presents them with a perception of increased control over their academic work" (Cecil & Medway, 1986, p. 174), although parallel research has addressed metacognition (Reid & Borkowski, 1985; Weyhing, 1986) and self-efficacy (Schunk, 1982, 1989).

While increasing attention has been directed specifically to the association between attributions and achievement in children who are learning disabled (Chapman, 1988; Kistner, Osborne, & LeVerrier, 1988;
Licht, 1983), there are few studies adapting attribution retraining to school age learning disabled populations (Borkowski, Weyhing, & Carr, 1988; Thomas & Pashley, 1982) and none known to this researcher that (a) focus on an elementary school age self-contained learning disabled population, (b) adapt cognitive self-instruction procedures (Meichenbaum & Goodman, 1969, 1971) as a subordinate tool for improving attentional skills and academic achievement, (c) measure classroom behavioral and academic generalization effects, (d) present a composite attribution retraining framework incorporating efficacious features from a broad sampling of recent research, and (e) utilize a weekly group processing session as a means of enhancing internalization and generalization of attribution shifts.
Definition of Terms

**Attribution retraining:** Methods to enhance behavior, ordinarily achievement-oriented, by changing children's causal beliefs through the systematic application of principles emanating from attribution theory.


**Cognitive self-instruction:** A method designed by Meichenbaum and Goodman (1969, 1971) to teach children lacking in impulse control and other performance inhibiting behaviors to acquire control through a progressive series of overt and covert self-statements.

**Component attentional training:** Methods intended to remediate apparent underlying processing deficits such as auditory memory or visual attention in children with learning disabilities.

**Students served in programs for the learning disabled:** Students identified as learning disabled according to locality standards that adhere to Federal and State regulations as dictated by Public Law 94-142. Locality guidelines establish the following general placement criterion: (a) low average or higher assessed
or potential ability, (b) significant delay in achievement in at least one area based upon standard scores differences, and (c) processing delay(s).

**Locus of control:** A general expectancy regarding ownership over behavioral outcomes that distinguishes between perceived control of either an internal (self) or external (environmental forces) orientation.

**Metacognition:** Self-knowledge about cognitive states and processes; metamemory is specific self-knowledge about factors that influence memory activity.

**Probe sheets:** Teacher-administered worksheets designed to pinpoint select reading, mathematics, and written language skills.

**Self-contained learning disabilities classroom:** Classrooms in the locality identified for participation in this study in which children with the most severe learning disabilities are provided services in an individualized setting by a state certified teacher for 3 to 6 hours daily.
Research Hypotheses

This study investigated the validity of the merger of attribution retraining and cognitive self-instruction methods as an instructional procedure as applied by special education teachers with elementary-age children with learning disabilities served in self-contained learning disabilities programs. If the proposed integrative model is functional and the assessed skills and tendencies of the children are changed in the desired direction, then these changes should be measurable by differences on pertinent pretest and posttest measures. Accordingly, the following general hypotheses are offered:

Compared to similar children in a cognitive self-instruction condition or control condition, elementary-age children with learning disabilities served in self-contained learning disabilities programs who have completed a program of component attentional training in an attribution retraining-cognitive self-instruction condition will demonstrate more significant improvement on:

1. Standardized measures of academic achievement,
2. Probe sheet measures of academic achievement,
3. Selected cognitive-behavioral trends (poor
investigating impulse control, poor attention, poor academics, poor ego strength, excessive dependency),
4. A measure of reflectivity-impulsivity,
5. A measure of general attention and memory, and
6. A more significant trend toward internal than external locus of control beliefs.
Sample Description and Data Gathering

The target population is children with severe learning disabilities served in self-contained learning disabilities (SCLD) programs in elementary school settings. The sample consisted of 77 students currently placed in nine self-contained learning disabilities programs in Chesapeake, Virginia. Students were served in programs at the upper elementary school level (grades 4-6) and ranged from approximately 10 years to approximately 13 years of age. Students received 3 to 6 hours of daily instruction in the SCLD classroom. Students were placed in SCLD classrooms after review of psychological, educational, sociocultural, medical, and other pertinent documentation by a city Special Education Eligibility Committee that adhered to local, state, and federal placement guidelines.

Each student experienced the following pretest assessment sequence:

After securing parent permission and fulfilling all related ethical safeguards, an individual assessment session was held with each student within three weeks of the initiation of the first intervention session. Three weeks was viewed as a reasonable time frame for these assessments given the restraints of time and other obligations upon the researcher and other support personnel assisting in the assessment process.
Assessment sessions were held during the school day (8am–3pm) to allow for flexibility in scheduling.

Individually administered pretesting consisted of the following measures in the stated sequence:

1. Visual-Aural Digit Span Test to obtain a measure of general attention and memory.

2. Children’s Nowicki-Strickland Internal-External control scale to obtain a measure of internal versus external locus of control.

3. Matching Familiar Figures Test to obtain a measure of reflective versus impulsive attentional responding styles.

4. Woodcock-Johnson Tests of Achievement from the Woodcock-Johnson Psycho-Educational Battery to obtain measures of reading, mathematics, and written language.

The respective learning disabilities teacher completed the full Burks’ Behavior Rating Scales so as to mask specific attention to the dimensions of interest: poor impulse control, poor attention, poor academics, poor ego strength, and excessive dependency. Each teacher administered academic probe sheets at the onset of Phase 2 and at the conclusion of Phase 3. Probe sheets assessed select reading, math, and written language skills (see Instrumentation for a complete description of the probe sheet procedure).
Posttest measures observed the sequence stated in the pretest assessment. Posttesting was initiated the week following completion of the intervention sequence and concluded for all students within three weeks of the initiation of the first posttest measurements.
Limitations of the Study

One limitation of this study is the continued controversy that surrounds the definition and etiology of learning disabilities. However, the locality providing the sample population for this study adheres to local, state, and federal guidelines as dictated in Public Law 94-142. Hence, the identified subjects should approximate those students similarly placed in other learning disabilities settings.

A second limitation was the use of intact classroom groups rather than random selection and placement of students in the two treatment groups and one control group. In this study, randomization was restricted by the need to examine intervention effects in an in vivo educational environment not sanctioning random student assignment; again, adherence to local, state, and federal standards for placement should allow for generalization between selected classroom groups and those groups distributed throughout the locality.

A third limitation is the presence of uncontrollable teacher personality and teaching style variables. The use of different teachers in both treatment and control settings serves to partially control for these variables as does the introduction of researcher (and/or assistant) observation and documentation of teacher accuracy in design implementation. In the latter case, an effort was
made through modeling, discussion, and reinforcement to assure the consistency and reliability of strategy and training techniques.

A fourth limitation was the immediate rather than delayed posttest assessment of results. Research in attribution retraining suggests that attribution shifts may require a prolonged period of sustained internalization before such shifts may emerge in a measurable form. Such a delayed follow-up, while not practical for this study because of scheduling and personnel restrictions, is under consideration for an undetermined period after the first data collection.
Ethical Safeguards

The principles of the APA document Ethical Principles of Psychologists were adhered to in this study. The 10 subprinciples of principle nine dealing specifically with human participants in research were honored. The study was submitted to and approved by the dissertation chairman and committee members, the Director of Research, Testing, and Student Activities for the Chesapeake Public Schools, and the Human Subjects Research Committee of the College of William and Mary. Appropriate informed consent was obtained. All test scores were confidential and recorded by procedures that guaranteed anonymity. Information obtained was and will not be made available to school personnel or others in a format by which an individual can be identified. No information gathered was or will be included in the records of teacher or student participants. Participants were offered post-study debriefing, feedback, instruction, and opportunity for personal observations and skill review. Control participants were provided opportunity for intervention training.
CHAPTER 2

Review of Literature

Historical and Theoretical Overview

The underlying principles of children's private speech that served as theoretical guideposts for the cognitive self-instruction methods of Meichenbaum and Goodman (1969, 1971) are based upon the seminal work of Piaget (1955), Vygotsky (1962), and Luria (1961) in delineating the functional relationship between children’s language and behavior. Piaget described children's talking aloud as a sign of egocentricity and a phenomenon that diminishes as children develop the capacity to adopt the roles of others. Vygotsky reported that private speech simultaneously becomes increasingly internalized as children grow through the elementary years while adopting a more self-regulating function as it progresses toward preceding rather than following behavior. In broadening Vygotsky’s findings, Luria asserted that for the young child the motor act of saying words was more powerful than the actual meaning of the words; given this assumption, verbal behavior was regarded as capable of and oriented toward controlling nonverbal behavior.

Additional influences in clarifying the development
and conduct of language in children include that of Mead (1934), Reese (1962), and Flavell, Beach, and Chinsky (1966). Mead suggested that children gain knowledge of their behavior as a result of talking about it, that speech and thought are in the form of and serve the function of a dialogue, and that children gravitate toward overt speech which serves a self-guiding role, a view consistent with that of Vygotsky and Luria. Reese and Flavell, Beach, and Chinsky examined the role of verbal mediation whereby the child moderates cognitions by accompanying or preceding behaviors with self-regulatory private speech.

The general historical antecedents of cognitive self-instruction issue from two sources, that of the development of behavioristic interest in self-control and the emergence of cognitive learning theories of psychotherapy (Kendall & Braswell, 1985). In the first case, the work of Skinner (1953) preceded the gradual acceptance of the presence of cognitive influences upon behavioral outcomes with Bandura (1969) an early proponent of this position. In the second case, the models of therapists such as Ellis (1962) and Beck (1976) proposed that thinking and emotion are intractably intertwined and unable to be completely separated from each other; given such a position, the modification of the individuals thoughts or beliefs was viewed as a
Meichenbaum integrated these influences in the process of understanding and generalizing the conditioned effects of positive self-talk approaches that had been adapted with schizophrenic patients. It was reasoned that such conditioning methods could be applied to nonclinical populations. Cognitive self-instruction methods used with children were distinguished from those adapted for adult therapies by concentration upon cognitive absences or deficiencies rather than upon cognitive distortions. Early approaches developed by Meichenbaum and Goodman (1969, 1971) focused upon the treatment of impulsive children with an implicit assumption that identification of cognitive absences and teaching of the respective cognitive skill would impact upon impulsive-reflective behavioral patterns. Voluminous research with a broad range of normal and special needs populations has since been conducted in order to explore the theoretical and methodological soundness and applied utility of cognitive self-instruction methods. As Wong (1985) reports, cognitive behavior modification interventions received increased attention by special education professionals, but that inadequate evidence of generalization of trained skills has remained a persistent rebuttal to procedural efficacy. In this study, the merger of attributional theory and resultant retraining methods with cognitive
self-instruction was hypothesized as an effective means by which generalization may be enhanced and gains in achievement spurred.

The basic contention of attribution theory is that perceived causality may affect behavior, that of the individual and of others. These views were first proposed by Heider (1958) and have been most clearly espoused in recent literature by Weiner (1974, 1979, 1980, 1985). The cognitive approach to human learning and behavior which serves as the underpinning to attribution theory was advanced by Tolman (1959) and Lewin (1935, 1936).

Tolman spoke of cognitive influences upon learning phenomena and Lewin upon social behavior. According to Tolman, "the organism utilizes environmental objects and develops means-end readiness with regard to them and their relation to his behavior....[while means-end readiness] endures independently of the present motivational state of the organism" (Marx & Hillix, 1973, p. 339-340). 'Drive stimulation' (loosely perceived as needs) serve as energy sources leading to the establishment of goals with both positive and negative goal descriptions (given inherent value-laden properties). With goals established, the individual engages in goal-directive behaviors oriented toward reducing drive stimulation. Lewin also isolated an
energy source subsumed under the auspices of a tension system; again, goal-establishment occurs with the 'valence' of an end state determining to which regions in an individual's 'life space' one will proceed. Here, tension reduction is achieved. Yet, Weiner et al. (1971) assert that "the ... cognitive conceptions of motivation [were] little concerned with mental events... [tending to] disregard cognitive operations such as information processing, formulations of beliefs concerning the cause of events, and the influenced appraisal of effect and action" (p. 1). These concepts of cognitively-mediated goals and behaviors emerge in a more complete form in Heider's (1958) discussion of attribution.

Heider introduced the notion that through a process of considering personal and environmental forces, an event is associated with the related underlying conditions; hence, one comes to 'attribute' causality and persists at doing so in an effort to organize and systematize one's world. The effectiveness in moving beyond mere existing within, to understanding of, and finally to prediction and control of one's world may be directly tied to the accuracy with which causal attributions are proffered. The individual arrives at these causal conclusions through an ongoing experimentation process: "people assess the degree to which observed behaviors or events occur in the presence
but not in the absence of each potential causal factor under consideration" (Metalsky & Abramson, 1981, p. 17). Personal causation, Heider concludes, begins with an analysis of an observed event with the critical elements of 'intention' and 'effect' mediating the assumption of causation, i.e. intention and causation will be accepted if the desired effect of a behavior is achieved and rejected if an undesired effect is realized. The influence of 'trying' and 'power' are synonymous with intention and effort in the first case and with ability in the second, and the interaction of environmental forces judged to exist beyond the individual's immediate or potential control and the presence of 'trying' and 'power' further serve to mediate placement of causality. Heider asserts that "different attributions for any success or failure will have distinct consequences for the individual's affective reaction, expectancy of future success, and subsequent behaviors" (Platt, 1988, pp. 569-570). It is toward a clarification of this specific assumption as well as the general notions of Heider that Weiner and his associates were notably directed.

Kelley (1971) expanded upon Weiner's notion of the 'covariance' between causal factors and related behavior or events, proposing that individuals attribute outcomes to aspects of the person, environment, or situation based upon situationally apparent features such as
'consistency' and 'consensus'. That outcome identified as most plausible is a product of the interactive analysis of these elements and features; yet, in that individuals may engage in an incomplete analysis, and information is not attended to or selectively ignored, the general application of a mechanical 'covariance principle' may be misleading and attribution wrongly assumed. Kelly developed the 'discounting principle' as a means of correcting for the presence of incomplete data: here, "when behavior occurs in the presence of multiple plausible causes, the attribution will be discounted... [and] the observer [will] attribute the effect less to any one cause than he would if only that cause were plausible" (Deci, 1976, p. 247). The consequent attribution will be less definitive given the loss of confidence in the validity of the attribution. The presence of 'causal schemas', referring to predisposing assumptions about operations and interactions in assessing causality, impact further when insufficient information is provided by imploring the individual to rely upon an understandable and settling rather than unique and potentially dissonant hypothesis. Thus, in respect to academic performance, the child with learning disabilities whom historically has ascribed personal school failure to a lack of aptitude or ability, and has been convinced of such beliefs by external others
(teachers or parents) and events (repeated grades and poor report cards), assumes in a slanted world view that the occasional, unexplained success is a tribute to factors beyond personal ownership, any other explanation 'not making sense' in a school specific causal schema.

Personal causality was determined by the desirability of an effect in the model proposed by Jones and Davis (1965). The individual acting as observer of events will select as explanation for action of the self or the agent of the action that effect perceived as most desirable, and will then infer the actors disposition. An observer must always conclude and describe intent before attributing an action to the disposition of the individual; thus, the focus is upon predicting the personal cause to which attribution will be assigned, while not necessitating the multiple sources of information referred to by Kelley. Within this framework, a child who is learning disabled might attribute personal failure to external factors such as teachers, parents, climate, task difficulty, or physical condition as a means of achieving a most desirable, indulgent end, that of establishing a distance between one's failure (action) and one's global self-esteem (disposition).

Rotter (1966) formulated a view from social learning theory that individuals differed in beliefs about
personal control over environmental events and rewards. The 'internally' controlled individual perceives rewards following from their own behaviors or attributes while the 'externally' controlled individual does not perceive such a relationship, believing themselves at the mercy of environmental events and happenstance. The internally directed individual foresees that change can and will occur as a result of one's own action; the externally directed individual assumes that change is not associated with their behaviors. The one-dimensional locus of control construct provided an early impetus for study by Weiner and his associates in the area of differential expectancy shifts based upon perception of reinforcements as externally or internally controlled. Weiner and others (Deci, 1976) have since clarified the distinction between locus of control and locus of causality: Weiner (1979) states that locus "is conceived as a backward-looking belief... [and] that the concepts of locus and control must be separated" (p. 6). Yet, Rotter's work suggested that repeated negative encounters with the environment would tend to make individuals less intrinsically motivated, and that those who experienced repeated failure would move toward low achievement and in an external direction; such assumptions have seemingly proved evident in research with children identified as learning disabled (Kistner, Osborne, & LeVerrier, 1988;
Li~ht, 1983; Licht, et al., 1985) and Rotter remains among the first to accurately relate the structure of perceived causality to expectancy change.

Atkinson's (1957, 1964) model of achievement oriented behavior bears the influence of Lewin and Tolman in the development of an expectancy regarding the likelihood of success. The model asserts that one is engaged in an approach-avoidance conflict when facing an achievement-oriented situation. The tendency to approach success is a function of the motive for success, and the incentive value for success; the success motive is a relatively stable personality characteristic that is defined as one's need for achievement. The probability of success is one's expectancy of achieving the goal and the estimate of success probability is based on any available information including experience in similar past situations. The incentive value of success relates to the pride a person will feel in achieving a goal and in Atkinson's mathematical model the psychological value of a goal is a function of the probability of success, thus emphasizing the element of achievement in this model. The corollary of the tendency to approach success is the tendency to avoid failure, again with three operative factors: (a) the motive to avoid failure, (b) expectancy about failure, and (c) the incentive value of failure. The tendency to avoid failure is one's tendency
not to perform the activity, so as not to risk failure. The tendency to achieve is then an admixture of the two more stable factors, motive to succeed and motive to avoid failure, and the less stable factor of probability of success which is directly related to one's ability and task difficulty. Weiner (1971) cites "evidence that individuals high in achievement motivation are more likely to undertake achievement activities, select tasks of intermediate difficulty, work harder, and persist longer in the face of failure than individuals low in achievement motivation" (pp. 9-10) as support for the essential formulations of Atkinson's model, and review of the attributional model of achievement motivation proposed by Weiner and his colleagues confirms the application of certain of these principles.

The attributional model of achievement motivation (Weiner, 1979, 1985) is one of three models of action described by Forsterling (1985) as contributing to research in attribution retraining (the others being self-efficacy theory as proposed by Bandura (1977) and examined by Schunk (1982, 1989), and the model of learned helplessness developed by Seligman (1975) and furthered by Abramson, Seligman, and Teasdale (1978)). In Weiner's model, individuals constantly seek to identify the causes for achievement-based successes and failures. The types of attributions individuals propose for successes and
failures have important and differential consequences for behavior, cognition, and affect. In summarizing Weiner et al. (1971), Forsterling (1985) reported that:

...ascriptions of failure to stable (uncontrollable) causes (e.g., lack of ability or task difficulty) decrease subsequent expectancies of success, whereas attributions of failure to internal causes (lack of ability or effort) maximize negative esteem-related affects following the outcome. In contrast, success attributed to stable causes increases subsequent expectancies for future success more than do attributions to variable factors (e.g., luck), and esteem-related emotions following success (e.g., pride) are maximized when internal attributions are made. (p. 501)

The perceived causes of success and failure share the properties of locus, stability, and controllability, with intentionality (Weiner, 1979) and globality (Abramson, et al., 1978) as other possible causal structures. The locus dimension (internal/external) has been tentatively identified as a determinant of certain important affective reactions and the stability dimension (stable/unstable) as related to expectancy levels (Platt, 1988). Internal attributions are made to the extent that outcome is attributed to oneself whereas external attributions are made to the extent that outcome is
attributed to environmental or uncontrollable variables. Stable factors are unchanging and persist over time while unstable factors deviate across time and situation. Ability and task difficulty are stable while effort and luck are variable. The magnitude of expectancy shift will tend to be greater when attributed to stable factors (the Expectancy Principle). The location of any specific cause is variable while the underlying dimensions on which causes are given meaning are constant.

Weiner (1985) advanced the idea that "causal ascriptions influence emotions, and that emotional reactions play a role in motivated behavior" (p. 562). Pride and feelings of self-esteem are 'self-reflective' emotions related to the locus dimension, within which is described the 'hedonic bias', a tendency to ascribe success to internal factors and failure to external factors. Anger, pity, gratitude, guilt, and shame are associated with the controllability dimension, e.g. "the attributional antecedent for anger is an ascription of a negative, self-related outcome or event to factors controllable by others.... [while] guilt and anger ... are elicited by controllable causes, but guilt is directed inward, whereas anger is typically (but not necessarily) directed outward" (Weiner, 1985, pp. 563-564). Feelings of hopelessness are related to causal stability as Weiner et al. (1978, 1979) found that
hopelessness and resignation emerge when attribution for a negative outcome is given to a stable cause. Weiner (1985) cautions that the dimension-affect relationships are culture-prevalent but not culture-invariant, and that attributions and emotions may be experienced absent the speculated linkage.

Weiner's central assertion that a relation exists between achievement and a child's success and failure attributions appears to have been borne out in the literature, albeit one complex and open to scrutiny. Non-disabled children low in achievement and with failure expectations initially served as subjects for the investigation of Weiner's precepts (Diener & Dweck, 1978; Dweck, 1975) as did studies proceeding on a parallel course (DeCharms, 1972) that sought to examine attributional causations for achievement. Increasingly within the expanding body of research that is examining these notions, the learning disabled population has been identified as one whose characteristic pattern of school failure and performance deficits may be more clearly understood, explained, and counteracted through the attribution model. Kistner, Osborne, and LeVerrier (1988) report that:

Research with both LD and nondisabled children has clearly demonstrated that children who attribute their failures to variables over which they have
... control (e.g., their efforts) are more likely to persist ... and are less debilitated by failures than are children who attribute their learning problems to uncontrollable causes such as lack of ability or external factors [while] learning disabled children tend to be less likely than nondisabled peers to view their efforts as determinants of achievement outcomes. (p. 82)

Kistner et al. (1988) note that the achievement attributions of children with learning disabilities are predictive of their academic progress as well as of classroom behavior. In a longitudinal study of children with learning disabilities, the developmental changes of achievement attributions were delayed compared to nondisabled peers in the gradual and paralleling move of both groups toward increasing emphasis upon effort as a determinant of achievement difficulties.

Chapman (1988) found in a second longitudinal study that children with learning disabilities have relatively external control orientations for achievement outcomes in school with a clear external trend for failures, but a less distinct formulation for successes. In portraying the affective dilemma of the child identified as learning disabled, Chapman states:

These characteristics are marked by low self-perceptions of ability, reflecting relatively
negative academic self-concept, along with tendencies toward learned helplessness and lower expectations for future success in school... [they] have relatively little confidence in their ability and expect to achieve at lower levels, but when success does occur, they see it as being caused by a teacher’s assistance or easy work. (p. 363)

With the principles of attribution theory apparently operative for children with learning disabilities, the application of attribution retraining programs with this population appears justified. Forsterling (1985) characterized attribution retraining as being "consistently successful in increasing persistence and performance" (p. 509) in nondisabled but low achieving and learned helpless children; similar characteristics are pertinent to and describe the child with learning disabilities. Weiner states that such programs have primarily demonstrated "that persistence in the face of failure is enhanced when attributions for failure are changed from low ability to lack of effort, to poor strategy, or to temporary external barriers" (p. 567).

Borkowkski (1988) suggests that "motivational training in combination with skill training, designed to reshape attributional beliefs about the causes of ... successes and failures, may be the key to resolving some of the dilemmas encountered in strategy transfer research..."
with LD students" (p. 51).

While attribution retraining studies proliferate in the literature, there are few known to this researcher that are directed toward the learning disabled population. In this study, a multi-faceted attribution retraining approach was developed as a superordinate strategy with the intent of creating an efficacious climate for implementation of a cognitive self-instruction program designed to improve and generalize the cognitive processing skills and academic performance of children served in SCLD programs. Adhering to the notion of a broadly based approach, attribution retraining assumptions and concepts are culled primarily from the work of Weiner (1974, 1979, 1980, 1985) but also that of Schunk (1989) in self-efficacy, Seligman (1975) in learned helplessness, and Borkowski (1988) in metacognition, consonant with research findings in identifying the maladaptive characteristics of children with learning disabilities and with Borkowski's (1988) observation that "relations among strategies, metacognition, and attributions are multidirectional" (p. 47).

Critique

Kendall (1984) recommends that an organismic position be adopted in applying cognitive self-instruction methods and that interventions should be
structured to take advantage of the strengths of the child rather than to focus specifically or primarily upon the weaknesses.

Kendall (1984) and Abikoff (1979) conclude that despite a lack of convincing applications to school-age populations, cognitive self-instruction methods appear to possess substantial potential for use with special needs children and that support for further research is compelling.

Forsterling (1985) reports that "because Weiner's model of achievement behavior does not postulate a direct link between causal attributions and behavioral consequences (persistence, performance), but includes other intervening variables (affects and expectancies), the conclusions from the model for attributional change programs are somewhat unclear" (p. 502). Further, he relates that the three conceptual systems underlying most attribution retraining programs (attributional model of achievement motivation, self-efficacy, and learned helplessness) fail to differentiate themselves from one another in research by examining the deductions that are dissimilar, instead tending to gravitate toward investigating similar principles. Both conceptual and methodological difficulties are present in attempts to assess the speculated links between expectancy and affective states, i.e. specific vs. global indicators and
immediate vs. delayed assessment of emotion. Yet, Forsterling reports that empirical support for the effectiveness of attribution retraining is generally favorable. He further states that:

Because there are many similarities between cognitive behavior modification and attributional approaches to psychopathology, attributional concepts and techniques for attributional change could easily be implemented in the practice of cognitive therapy. Especially for maladaptive behaviors in the achievement domain (e.g., underachievement or lack of persistence), attributional intervention ... may be useful. (p. 510)

The a priori assumption by the attributional theorist and retrainer that there exists a predetermined value or utility of attributions in the global case does not adhere purely to the concept inherent in cognitive therapy literature (Ellis, 1962; Beck, 1976) that the individual should be taught to modify cognitions in a realistic direction as maladaptive functioning is related to unscientific or unrealistic thinking: what may be realistic for one subject regarding intrinsic ability, for example, may not be for another.

Metalsky and Abramson (1981) offer that attributional theory must distinguish between
attributional content and attributional styles in order to both understand and impact upon maladjustment: attributional content is the particular attribution such as ability or luck that one makes while attributional style refers to "the extent that [one] relies on and utilizes the same or similar information to resolve causal ambiguity across different situations and across time" (p. 39). They hypothesize that belief-based and evidence-based attributional styles may mediate the resolution of causal ambiguity, and this approach may serve eventually to modify the incongruity between the attribution retrainer's predetermined assumptions and those operative within the subject.

Borkowksi, Weyhing, and Carr (1988) assert that students' program-specific attributions (those specific to the training tasks) are generally alterable: antecedent attributions (those long-standing, entrenched, and 'global') are more resistant to change but "may be altered by a combination of strategy training with program-specific attributional retraining... focusing on improving specific strategy knowledge, fostering the use of executive or coordinating routines, and reshaping attributional beliefs in order to alter academic skills ..." (p. 46-47).

Reid and Borkowski (1987) report that an increase in student awareness of the negative impact of
maladaptive attributions on task performance enhances strategy generalization and maintenance.

Cecil and Medway (1986) confirm that attribution retraining "is a practical and easy-to-carry-out procedure for school personnel who work with children whose problems result from motivational deficits" (p. 179). Cecil and Medway further assert that related research has verified "the importance of cognitive interventions designed to teach children to understand the nature of success and failure, to view the former to result from ability and effort, and to view the latter to result from lack of effort" (p. 179).

Reiher and Dembo (1984) specify "that comparison studies in reattribution training methods are needed to determine whether cognitive modification approaches produce more generalized and desirable effects that other approaches" (p. 93) and report that training conducted in groups may contribute the advantages of group process to instructional generalization.

Borkowski, Weyhing, and Turner (1986) contend that the motivational deficits in academic situations experienced by many educationally handicapped children are directly linked to poor learning histories, cognitive deficits, and negative attributional states and that research which examines the interplay of attribution and metacognition in the educational development and progress
of special needs children will be broadly contributory.

The generalization of attribution retraining effects upon cognitive-behavioral trends outside of the intervention setting has not been investigated to this researcher's knowledge with either a nondisabled or learning disabled school age population, and in no instances have investigators attempted to incorporate a superordinate-subordinate strategy of attribution retraining-cognitive self-instruction as a means of developing cognitive processing skills and academic performance. The intent of this study was to broaden the understanding of causal attributions in the achievement setting, both separate from and in conjunction with cognitive self-instruction approaches by addressing these unexamined issues.
Attribution Retraining

Introduction

Attribution may be distinguished from expectancy along a temporal dimension: expectancies precede a behavioral event or situation and attributions follow the event and attempt to specify and account for its cause (Kendall & Braswell, 1982). Children who attribute their academic or behavioral improvement to personal effort or ability may be more likely to generalize effects than children who attribute change to luck, fate, chance, or anything external to themselves (Kendall & Braswell, 1985, pp. 105). Borkowski, Weyhing, and Turner (1986) suggest that children with positive beliefs about their own instrumentality should profit from strategy instruction and that a narrow focus upon the conditions of strategy training will not contribute to a durable strategy generalization.

Research

Carr and Borkowski (in press) examined the effectiveness of an attribution retraining/strategy training procedure on reading comprehension with 52 underachieving third- through fifth-grade students. Underachievers were divided into three treatment conditions: strategy-plus-attribution, strategy-only, and control. Strategy training in the treatment conditions consisted of three reading comprehension
strategies—topic sentence, summarization, and questioning; the direct instruction method was implemented for both strategy and attribution training. Attribution training consisted of cartoon supported discussion regarding the importance of effort in the production and use of strategies. Metacognitive knowledge was provided so that children gained an opportunity to understand the purpose of a strategy before advancing to the next step. Underachievers given attribution retraining and strategic training were hypothesized to respond with greater growth in reading comprehension. Significant group differences were found in strategy use, prose recall, reading awareness, and attributional beliefs. Importantly, children in the strategy-plus-attribution condition were more likely to modify self-attributions about effort than children in the strategy-only or control conditions. One year follow-up indicated that reading grades were significantly higher in the strategy-plus-attribution condition than either the strategy-only or control conditions. The integration of attribution and strategy training appeared a key to effective instruction with this at risk population: separation of the two elements or a failure to integrate them wisely were regarded as critical instructional errors.

Dweck (1975) conducted a seminal study on
attribution retraining with 12 school-age children identified as exhibiting characteristics of learned helplessness. These children responded to failure with an impaired performance and were less likely than mastery oriented children to attribute achievement outcomes to effort or to prefer tasks in which failure was a possibility. One group of children was given progressively more difficult arithmetic problems with all failures ignored and all successes reinforced. In the second group, failure was guaranteed on approximately 20% of the tasks by presentation of problems beyond their skill level: each child was provided with an effort attribution after each failure, specifically the admonition "You should have tried harder". Children in both conditions were trained for 25 days with posttest consisting of presentation of puzzles which were selected to induce failure and elicit coping mechanisms, such as helplessness and decreased persistence. Children given attribution retraining exhibited important decreases in counterproductive responses in the failure condition, while the children not receiving such training exhibited continued performance deficits. Attribution retraining also contributed to an increase of attribution of failure to a lack of effort rather than a lack of ability.

A study by Medway and Venino (1982) hypothesized that children who received effort feedback would make
greater effort attributions and persist at a subsequent task longer than children who did not receive such feedback. A secondary hypothesis asserted that performance patterns and effort attribution feedback may interact: children may differentially respond to beliefs that performance improved over time rather than at random. After having been identified as displaying tendencies not to perceive effort as a cause of their school-related performance, 40 children were given a series of visual discrimination tasks with effort feedback versus no feedback and ascending versus random patterns of success over trials presented in a 2x2 factorial design. Effort feedback enhanced task persistence, although this effect was not mediated by children's attributions; a failure to allow for a sustained period of internalization of modified attributions may have inhibited measure of related change. No significant influences upon attributions or task persistence were noted due to ascending or random performance patterns.

Kistner, Osborne, and LeVannier (1988) evaluated the developmental patterns of attributional styles in children with learning disabilities and the relation of their achievement attributions to academic progress. A longitudinal design was incorporated with pretests and posttests of attributions, academic progress, and teacher
ratings of success and classroom behavior assessed over a 2-year span. The hypothesis that children identified as learning disabled enter a self-perpetuating failure cycle was not supported based upon developmental patterns of attribution; however, in accordance with expectations, children with learning disabilities who attributed failures to manageable causes made the more significant achievement gains and received the more socially appropriate classroom ratings.

The dimensions of locus of control, stability, and controllability assessed by the attributional measures are regarded as key elements to be embedded in an attribution retraining program.

Seventh- and eighth-grade students classified as learning disabled were taught goal setting and self-regulatory skills in a resource room setting based upon a model developed by Tollefson, Tracy, Johnson, and Chatman (1986). The training program was designed to help establish realistic goals, develop plans to achieve these goals, monitor and evaluate their own behavior, and accept responsibility for the outcome of goal-directed activities. Children attributed success to effort and failure to effort, luck, and task difficulty following program completion; the rate of assignment completion improved for a subgroup of the children in both the regular and resource classrooms. Tollefson et al. (1986)
suggested that attribution retraining should include activities that demonstrate to children the 'unstable' and significant influence effort can have upon achievement. Here, effort would be regarded as unstable because of its variable nature; hence, one informs the child that the degree of effort expended is controllable and importantly that the capability to exert personal control over the degree of effort is one of the child's implicit competencies.

In two studies, Jacobsen, Lowery, and DuCette (1986) compared the attributional patterns of success and failure in achievement and in social situations in children identified as learning disabled and normally achieving children. In the first study, 94 seventh- and eighth-graders were interviewed about attributions for hypothetical success-failure situations; 105 students 9-17 years of age were interviewed in the second study about attributions for real life ratings of success. Children with learning disabilities attributed success to internal factors as did normally achieving children, but tended to externalize success more than the nondisabled children.

Cooley and Ayres (1988) examined self-concept and attributions made about academic success and failure in 46 children classified as learning disabled and 47 normally achieving children. No differentiation between
the groups was noted in attributions regarding internal versus external causes for successes and failures and ability versus effort causes for failure.

The Cooley and Ayres study underlines the evolving understanding of the attributional characteristics of children with learning disabilities by presenting an outcome counter to that typically noted in attributional literature: for example, Snyder (1982) among others suggests that children classified as learning disabled focus attribution more upon external than internal dimensions. However, the finding that attribution did not differentiate at the mean chronological age of the sample (12 years) dovetails with evidence that attribution generally tends to be less externally directed as children grow older.

Friedman and Medway (1987) investigated the effects of varying performance sets and outcomes on the expectations, attributions, and persistence of 48 boys classified as learning disabled and 48 nondisabled fourth- and fifth-grade boys. Children were given a task and told that they had either succeeded or failed. Commensurate with expectations, boys identified as learning disabled attributed outcome to external factors; contrary to expectations, they showed greater persistence, and did not exhibit lower performance expectations nor show greater expectancy shifts after
outcome information than nondisabled peers. The greater persistence of the boys with learning disabilities may speculatively be associated with perseverative tendencies characteristic of children classified as learning disabled, or metamemorial deficiencies inhibiting the identification or application of variable, equally, or more suitable strategies.

Results of the Friedman and Medway study suggest that the internal-external attribution dimension may be a key in differentiating the successfully achieving nondisabled and academically compromised child with learning disabilities.

Reimer and Dembo (1984) placed 66 seventh- and eighth-grade students with low effort attributions in two treatment conditions: the first consisted of an experiential self-instruction training method designed to alter task persistence and effort attributions for success and failure; the second consisted of formal teacher presentation. Compared to controls, both treatment groups at posttest showed greater task persistence and were more likely to attribute performance to effort but not to ability, luck, or task difficulty.

These findings appear to support the assertion that attributional change can be induced through self-instruction methods and specifically that change in persistence reflects a belief that effort is critical to
achievement.

Critique

Pearl (1985) indicates that caution must be taken in the application of attribution retraining. While ordinarily identifying children who may benefit from retraining, selection procedures may arbitrarily include children who may not benefit or may be considered at risk for a stressful response. Children who are lower in ability and whose performance and progress are compromised may not be helped by exhortations to exert more effort; maximal effort may be elicited and success or progress may not be forthcoming, thus confirming the perception of inadequate ability and affirming cause for related self-esteem complications. Pearl further advises that research is necessary to determine whether positive effects generalize to all academic areas or simply to content areas specifically addressed in training. Global academic achievement was assessed through two different sources and at two separate time periods in this study.

Elig and Frieze (1979) assert that measures of children's attributions are presented in multiple formats and do not necessarily present a cohesive or generalizable interpretation of the concept and by implication of the results of retraining. Locus of control was selected for the purposes of this study because of the documented relationship with attribution.
and the considerable empirical base for the validity and use of the selected locus of control measure.

The effectiveness of attributional feedback is closely associated with the issue of timing and clarity of the relationship between the child's performance and the adult attribution statement or child self-statement. Effort was made in the design of this study to integrate the general trends of current research in presenting to teachers an understanding of timing and situational variables.

Wilson and Linville (1982) suggest that variant attribution retraining procedures will impact differentially on outcome measures. Self-attribution statements may be effective in one and behavioral responses in another. An effort was made here to incorporate both self-attribution and behavioral measures to more clearly define the integrated nature of this relationship.

A refinement to attribution theory and retraining proposed by Harter and Connell (in press) is that the critical dimension in understanding children's attributions is the degree to which they are aware of the relevant factors operating in a given situation. Given this proposition, as children classified as learning disabled appear less aware of relevant factors influencing their test performance, they will be less
likely to use task relevant factors regardless of the internal or external nature of the task requirement. If this is the case, then attribution retraining with children identified as learning disabled should encourage examination of the link between attributions and metamemorial factors. In this study, children with learning disabilities were required to participate in a weekly processing session in which the specific indices and characteristics of different educational applications of a training strategy are discussed.
Cognitive Self-Instruction

Introduction

The seminal work of Meichenbaum and Goodman (1971) punctuated the role of cognitive self-instruction (CSI) in the performance of nonverbal tasks. CSI training as defined in the Meichenbaum and Goodman model has been broadly employed in research, and multiple educational applications have been derived. Variants of the original model have been developed while retaining the fundamental principles of enhancing the internal control function of language.

Research

A study by Robin, Armel, and O'Leary (1975) assessed the effects of CSI training on written language skills in 30 kindergarten children. CSI training was compared to a direct training procedure and a control condition while the effect of training was assessed on both trained and untrained letters in order to determine generalization effects. Significant gains were noted in both treatment conditions over the control group; the CSI group made gains significantly above that of the direct training group.

Barling (1980) assigned school age children to conditions in which the relative effectiveness and interaction of task-oriented self-instruction, self-reinforcement, self-monitoring, and external feedback
upon math and verbal tasks were assessed. Children were contrasted on an internal-external dimension: those with an internal locus of control tended to use self-instruction on the verbal tasks more readily than externals. Those children who received both self-monitoring and self-reinforcement were superior in terms of persistence and accuracy on math tasks; no training differences for accuracy or persistence emerged for verbal tasks. Children in the task-oriented self-instruction group demonstrated the least significant change in math. Barling concluded that the omission of the ordinarily present self-monitoring and self-reinforcement elements from the self-instruction procedure contributed to its ineffectiveness, and confirmed the importance of these two procedural components.

Cognitive self-instruction training was adapted by Fish and Mendola (1986) for use with 3 school-age (8-9 years) emotionally disturbed children with homework completion rates judged as lowest in the class. Individual sessions were held with each child for 2 weeks, totaling 8 sessions of 30 minutes duration; children were taught to instruct themselves in evaluating homework demands, cognitively rehearsing a plan, guiding performance through self-talk per Meichenbaum and Goodman (1969), and incorporating self-reinforcement. Tasks in
mathematics, reading, and language arts that were structured by specific hierarchical sequence were used during training. Task format was identical to that of homework assignments, but task content varied daily and was different from homework content. Children were informed before each session that use of the procedural steps would help them to remember to do their homework assignments. With percentage of completed homework assignments handed in each week used as the dependent measure, increases in homework completion were reported during CSI training and at follow-up 13 weeks later.

Fish and Mendola recommended pretest and posttest teacher evaluations and student attitude measures in order to assess the broader generalization effects of the intervention.

Leon and Pepe (1983) studied the effects of CSI training upon the arithmetic skills of 24 9-12 year old children classified as educable retarded and 13 9-12 year old children classified as learning disabled who were assigned to CSI or control conditions. Daily 15-minute sessions were held throughout a 7-week treatment period. The Meichenbaum and Goodman (1971) model was incorporated in the form of a CSI dialogue that contained a set of statements corresponding to the task sequence involved in computation of a type of arithmetic problem; only the insertion of specific facts in the dialogue was required.
Significant posttest differences were noted for the CSI group on arithmetic operations skills and in favor of the children classified as learning disabled. A trend was noted for CSI training for specific types of computational skills to enhance generalization of that skill to problems with similar computational elements.

Leon and Pepe emphasized the critical aspect of establishing procedures and techniques which will maximize the generalization effects of CSI: a need to transfer strategy use and responsibility from teacher to student is crucial.

CSI training was compared with training using a scanning strategy by Parrish and Erickson (1981) with 24 children identified as impulsive on the Matching Familiar Figures Test (MFFT). Children were assigned to a control and three treatments: (a) a scanning strategy, (b) verbal self-instruction, and (c) a scanning strategy and verbal self-instruction. Standard reading, spelling, and math materials were used as educational stimuli. A significant decrease in MFFT errors but not an increase in time taken to reflect was noted for both cognitive training components. The assumption that the combined treatment would produce more significant gains than the two components alone was not supported. Classroom task performance as assessed by decreases in total quiz errors improved significantly but not classroom behavior, an
equivocal finding given the lack of attention directed toward the interpersonal or motivational dimensions of performance. The failure of the combined treatment to differentially impact upon performance on reflective-impulsive reassessment tasks or general classroom behavior may be due to this inattention to metamemorial issues or generalization cues.

Short and Ryan (1984) explored the relationship between the learned helplessness attributions and passive learning style of poor readers. Fourth-grade poor readers were instructed to ask themselves wh__ questions derived from the grammar within a story as a recall aid. Children were divided into a control condition and two treatments: in the first treatment, attribution retraining focused upon the relationship between strategic effort and outcome performance; in the second, no specific information was provided regarding the association between effort and outcome. The first control condition provided attribution retraining but no task-specific strategy instruction to skilled readers and the second, no specific training or instruction to skilled readers. While benefits were not enhanced by attribution retraining, posttesting revealed that both strategy trained groups recalled the story in a maintenance test as well as the skilled readers. A significant increase over their pretest performance and
that of the control group resulted while trained groups also exhibited greater meta-reading awareness than the control samples.

A limited focus upon the effort-outcome attributional dimension may have inhibited the influence of attribution retraining, while there was no evidence of examination of pre-existing locus of control or belief characteristics.

Harris (1986) sought to assess two fundamental issues inherent in CSI training, that of the natural occurrence of regulatory private speech among children with learning disabilities and normally achieving children during problem solving, and the effects of CSI on private speech and task performance. The study adapted the self-instructional training approach presented by Meichenbaum (1977) for use with 30 children classified as learning disabled and 30 normally achieving children, mean age of 8 years. A puzzle solving task was completed on video tape by a same age peer who modeled the CSI steps as adapted by Harris: problem definition, strategy, self-reinforcement, and self-evaluative. The CSI training approach consisted of several steps with the children actively encouraged to attend to the model's usage of CSI steps, to apply the techniques the model had used in their own efforts at puzzle solving, and to think aloud. The control children were given no specific
training and asked to spontaneously respond to the puzzle solving task. Harris confirmed a significantly lower proportion of task relevant statements (private speech) by children with learning disabilities than normally achieving children. CSI training resulted in a significantly higher proportion of task relevant speech for children with learning disabilities and normally achieving children while children exposed to CSI training had a significantly higher rate of private speech and significantly longer persistence times. The proportion of task relevant private speech for children with learning disabilities in the CSI training condition was equal to the proportion of task relevant private speech for the normally achieving children in the spontaneous response condition: this marked improvement appeared to confirm the impact of CSI training upon the development of prerequisite, strategic learning behaviors in children with learning disabilities while the existence of absolute deficiencies in task relevant private speech further alludes to the presence of deficits in self-regulation of organized, strategic behaviors rather than merely structural or ability deficits in accounting for performance delays among children with learning disabilities.

Copeland, Reiner, and Jirkovsky (1984) sought to establish the presence of patterns in the use of private
speech in 20 school-age children with learning disabilities (6 to 9 years). The children were videotaped in solitary play and the tapes analyzed for activity level and types and amounts of private speech. Children classified as learning disabled used more fantasy/role-playing speech than regulatory or affective speech; highly active or impulsive children with learning disabilities demonstrated consistent differences in the use of private speech when contrasted with less active or impulsive children and were viewed as potentially responsive to techniques oriented toward modification of self-directed speech.

Pre-school children were presented with a match-to-sample task designed to be too difficult for them to perform correctly without some task analysis (Fjellstorm, Born, & Bear, 1988). Five children were identified by teachers as attentive and possessing age-appropriate language skills. Self-instruction training stressed self-questioning components, i.e. the children were to ask what components the sample stimuli had in common, and then to decide whether each subsequent stimulus had the same components. All five children made fewer errors after being taught to self-question and answer overtly in a developmental adaptation of Meichenbaum’s (1971) model. Instructor cuing to actively use self-instruction methods was vital to maintenance; children dropped close
to baseline error levels when instructed not to self-question, while instructions to self-question exerted strong experimental control over accurate problem solutions.

Critique

The research cited here illustrates the broad range of problem and population coverage attributed to cognitive self-instruction methods and appears to affirm the fundamental principle that unifies these studies; that is, the internal control function of language in children assumed or measured as deficient in such control is not imperiously resistant to change but is in fact transmutable. Yet, there are elements of cognitive self-instructional procedures and applications which remain problematic.

Whalen, Henker, and Hinshaw (1985) detail prospective difficulties or pitfalls in arbitrarily applying CSI techniques with children. Children prone to a low frustration tolerance or self-esteem may experience inordinate guilt when procedural application does not prove fruitful because of the inherent personal responsibility message of CSI. Overt self-talk may provide distracting and negatively attention-seeking in group or classroom settings. Children may began to feel separated or different from peers because of the reliance upon an 'artificial' strategy, one not necessary for
others in order to succeed or progress. CSI procedures may divert energy and attention from the given task or interfere with optimal performance on tasks that either are speed based or have already been mastered. Children who tend toward anxiety or obsessional thought patterns may find CSI procedures with reliance upon systematic, reflective strategies to entwine them further within dysfunctional pre-existing thought patterns.

An inadequate demonstration of substantial short or long term generalization of CSI procedures to the classroom environment is repeatedly stressed in the literature, either in respect to academic or behavioral parameters, or any processing component. Transfer of training is a distinct need in CSI procedures, and children may benefit from specific lessons in assessing the demand characteristics of varying learning situations and their similarities and differences to CSI presented strategies. Wong (1985) points out that a deficiency in CSI work is the limited understanding of how children or others exposed to such training may modify and internalize the strategy over time. Generalization and intervention effects will be more clearly assessed and understood if research confirms the ongoing presence of strategy adoption and implementation in either idiosyncratic or global forms. Conversely, studies which reveal the final metamorphosized pattern across
individuals and groups may contribute to effective modification of existent CSI training and discovery of entry procedures not otherwise proposed.

This study sought to investigate the role of locus of control in predicting the efficacy of cognitive self-instruction strategies as well as to assess generalization effects via teacher assessed behavioral variables congruent with the impulse reduction-reflective enhancement theme of cognitive self-instruction. Through provision of a distinctly stimulating, achievement-oriented learning climate, attribution retraining is perceived as a provocative complement to the extraordinary potential of cognitive self-instruction in effecting change with this group of elementary-age children served in SCLD programs.

CSI research has been limited by overfocus on singular dependent measures such as those used for stimulus training or paper and pencil measures. A need to expand the exploratory range has been recommended and inclusion of measures of metacognitive improvements, changes in attributional patterns, and emergent self-efficacy seen as valuable (Wong, 1985): this study sought to actively address metacognitive and attributional concerns.

Dismantling procedures appear called for due to an apparent shortage of studies addressing the component
parts of the traditional Meichenbaum and Goodman (1971) strategy sequence. It is conceivable that each step is not vital or as vital as the others to procedural effectiveness, or that step inclusion may be differently applied across groups dependent on pertinent characteristics. The converse extension of dismantling the basic procedural steps outlined by Meichenbaum and Goodman is to consider whether lack of generalization effects is accountable for by a missing element, and in this study the inclusion of an attributional focus was investigated as a potential extension of traditional cognitive self-instructional methods.

Evidence accrued by Brown (1983), Brown and Palinscar (1982), and Leon and Pepe (1983), among others, suggests that effectiveness of CSI training is mediated by the presence of information provided to children regarding the rationale or value of the procedure. This study directly attended to such a need through repeated teacher reinforcement of strategy worth and utility.
Component Attentional Training

Introduction

Research has been equivocal in establishing the presence of component deficits in children classified as learning disabled (Arter & Jenkins, 1979; Hallahan & Kaufman, 1976; Hammill & Larson, 1974; Ross & Ross, 1976). Yet, component oriented remediation, instruction, and research persists in the field of learning disabilities (Kirk, Berry, & Senf, 1979). This medical model assumes learning problems are overt manifestations or symptoms of an underlying pathology (Treiber & Lahey, 1983). The Theory of Deviance as reported by Kass (1977, 1986) establishes a developmentally oriented view of component deficits hypothesized as characteristic of children with learning disabilities: (a) sensory orientation, birth to 18 months, (b) memory, 18 months to eight years, (c) re-cognition, eight years through 11 years, (d) synthesis, 12 years to 14 years, and (e) communication, 14 years and up. While focus has been placed increasingly upon areas such as direct academic (Clark & Walberg, 1979; Lahey, Busemeyer, O'Hara, & Beggs, 1977) and strategy instruction (Brown, 1975; Gibson & Levin, 1975; Smith, 1983; Torgesen, 1977), the issue of component deficits has not been conclusively resolved and many researchers assert that children identified as learning disabled are characterized by
specific process disorders which are amenable to training (Lahey, 1979; Velutino, Steger, Moyer, Harding, & Niles, 1977; Wong, 1979).

Research

Wade and Kass (1986) studied the differential effects of component deficit remediation and academic deficit remediation upon development of reading skills in 76 third- through sixth-grade children with learning disabilities. Based upon the developmental orientation of the Theory of Deviance (Kass, 1977), component deficits for the re-cognition function were identified as haptic discrimination, visualization, and figure-ground; tasks in the component deficit condition were academic in nature but presented as stimuli for isolate component remediation. Academic deficit remediation was designed to meet individual students needs with specific instructional objectives developed on the basis of the recommendations for a diagnostic-prescriptive program. Children were placed in two treatment conditions: in the first, 3 weeks of component deficit remediation preceded 6 weeks of academic deficit remediation; in the second, 9 weeks of academic deficit remediation alone were provided. Analyses of effect sizes led Wade and Kass to conclude that children with learning disabilities having component deficit remediation plus academic deficit remediation scored higher on posttest reading scores than
similar children having academic deficit remediation alone. Further, reading scores appear to have improved immediately after component deficit remediation. A procedural weakness was the limited time provided for component deficit remediation while no evidence was presented regarding the actual response of the assumed component deficits themselves to remediation, i.e. the actual gains in haptic, discrimination, visualization, and figure-ground skills.

The effectiveness of cognitive self-instruction (CSI) procedures in minimizing the attentional deficits of 9 children served in SCLD programs were investigated by Brown and Alford (1984). Children included in the sample demonstrated attention-concentration delays on the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1974). Cognitive functioning did not fall below an 85 WISC-R IQ while reading recognition skills were delayed by two or more grades below expected grade placement. Children were further assessed on the Detroit Tests of Learning Aptitude (Baker & Leland, 1967) for measures of visual attention span and on the Matching Familiar Figures Test for measures of reflection-impulsivity. Based upon the training materials and exercises formulated by Egeland (1974), children were trained individually over a two-month period for a total of 16 sessions to process information and selectively
attend to visual discrimination problems more effectively. The cognitive self-instruction (CSI) procedures of Meichenbaum and Goodman (1971) were integrated into the training module. Sustained improvement was found in reading, attention, and both error and latency factors of the reflection-impulsivity measure. Brown and Alford suggest that generalized improvement in reading may follow naturally the more skillful the attention to relevant attributes of a stimulus; failure to improve in spelling or arithmetic skills was regarded as an artifice of the small number of test items and the relative brevity of the pretest-posttest time lapse.

Limitations included the lack of an attention-control group which may confound interpretation of results and a failure to objectively assess classroom behavioral effects. Further, instruction did not incorporate generalization or strategy application cues, encouragement, or rewards, nor direct teacher involvement.

Zakay, Bar-El, and Kreitler (1984) sought to demonstrate that changing cognitive contents for children rated as impulsive would bring about a reduction in the level of their impulsiveness. Cognitive Orientation Theory (Kreitler & Kreitler, 1972) formed the underpinnings of an approach designed to alter the belief
clusters and impact upon the reflective-impulsivity dimensions of 74 children defined as impulsive by teachers. Children were pretested and posttested on the Pre-School Interpersonal Problem-Solving Test (Spivak & Shure, 1974), adapted for Israeli children (Snir, 1977), the CO Questionnaire of Impulsiveness-Reflectiveness (Zakay, Bar-El, & Kreitler, 1984), the Behavioural Measures of Adjustment (Spivak & Shure, 1974), adapted for Israeli children (Snir, 1977), and the Matching Familiar Figures Test. Assignment to four treatment groups eventuated: (a) belief treatment, (b) plan training, (c) combined treatment, and (d) control. Belief treatment emphasis was placed on discussing the belief system of a hypothetical reflective child and personal application; plan training focused upon a problem-solving technique based on following a multi-stage procedure geared to the characteristics of reflectiveness; and combined treatment adhered to the same conceptual elements but provided fewer idiosyncratic applications. The three treatments proved equally effective in bringing about a change in cognitive orientation clusters, while a strong relationship between a positive change in cognitive orientation scores and significant improvement in reflective behaviors was clearly demonstrated. The behavioral and cognitive changes occurred in a broad range of measures and endured
until 8 weeks after termination of training.

Douglas, Parry, Marton, and Garson (1976) trained hyperactive elementary-age boys on cognitive, academic, and social tasks using specific attentional strategies, general problem-solving strategies, and social interaction strategies. Twenty-four sessions were conducted with 12 sessions specifically with the teacher and 6 sessions with the parents: instructions to teachers and parents in supplemental sessions focused upon cognitive strategies and design of behavior modification techniques intended to encourage student use of self-instruction and self-monitoring methods. The treatment group recorded improvement on reading scores, time on the Bender-Gestalt Test (Koppitz, 1975), and error and latency scores on the Matching Familiar Figures Test. Differences were not noted on math scores, teacher ratings of hyperactivity, memory tests, or Bender-Gestalt scores.

Arnold and Forehand (1978) compared the effectiveness of cognitive self-control training and response-cost procedures in improving the impulsive response style of 32 impulsive pre-school children. Four treatment conditions were defined: (a) cognitive training, (b) response-cost, (c) cognitive training and response-cost, and (d) attention control. Training consisted of four 20-30 minute sessions extended over a
2-week period. On a test of reflection-impulsivity, all four groups showed improvement, but only the two cognitive training groups showed significant improvement on the group-administered classroom matching test.

Arnold and Forehand failed to utilize response-cost procedure during each of the four sessions, instead incorporating them only during the pretest and posttest sessions, while the limited duration of training exposure reduces the probability of longer term generalization. The lack of pretest and posttest teacher behavioral ratings does not adequately speak to the issue of concomitant impact upon classroom behavior.

Harris (1986) studied the differential effects of self-monitoring of attentional behavior and self-monitoring of productivity on on-task behavior and academic response rate in four elementary-age boys served in SCLD classes and nominated by the classroom teacher as having significant attentional and productivity problems. A counter-balanced multiple baseline design was adapted; treatment procedures were implemented during a daily spelling seatwork activity. Each student was instructed in both self-monitoring methods while the teacher required and monitored daily compliance. The self-monitoring of attention procedure used a softly audible tape recorded tone to cue recording of attention behavior; the self-monitoring of productivity procedure
required the students recording and filing of spelling words at the end of each spelling activity. An increase in on-task behavior was indicated during both self-monitoring conditions; however, trends regarding levels of academic response rate were not clear. All four students were more attentive to task and verified the social validity and practicality of the procedures in post-study interview. Harris notes the limitations of no spelling achievement data to determine the generalized effect of improved attention.

Bolster, Marshall, Bow, and Chalmers (1986) assessed the visual selective attention capabilities of 20 elementary-age children classified as learning disabled and 20 nondisabled control children on a computer-generated visual-target-identification task. The children were asked to locate colored form targets in an array of distractor stimuli. Arrays were presented in disjunctive and conjunctive formatives, the former sharing no features with the target and the latter sharing one feature with the target. As identified through performance on the Matching Familiar Figures Test, impulsive children were significantly overrepresented among the learning disabled group and were less accurate than reflectives at target identification for both array types. While children with learning disabilities were faster in responding to
targets, between groups accuracy differences were not noted.

The Bolster, et al. study reflects the trend of studies on children with learning disabilities to suggest compromised visual selective attention as a distinguishing component characteristic.

The effects of self-instruction and progressive muscle relaxation in reducing impulsive and inattentive behavior on 28 elementary-age children with learning disabilities were reported by Zieffle and Romney (1985). Pretesting and posttesting consisted of the Porteus Maze Test (Porteus, 1955) and the Matching Familiar Figures Test for assessment of cognitive deliberation and reflection-impulsivity, and of the Coding and Digit Span subtests of the Wechsler Intelligence Scale for Children-Revised (WISC-R) (Wechsler, 1975) for assessment of concentration. Treatment occurred during a 4-week span involving ten 30-minute sessions. While neither treatment condition reflected a differential superiority over the other, only the treatment conditions resulted in a significant overall improvement on cognitive deliberation, reflection-impulsivity, and concentration tasks.

Wiesner (1986) investigated the impact of a package of cognitive training procedures (entitled "Stop-Think-Act") per Meichenbaum and Goodman's (1971) model upon the
academic skills and attention/memory skills of 36 elementary-age children served in SCLD programs. Both the training and control groups consisted of 18 children, mean age approximately 10 years. Sessions were held twice weekly, one hour per session, with materials and exercises adapted from those presented by Egeland (1974). Assessment consisted of the reading, mathematics, and written language sections of the Woodcock-Johnson Psycho-Educational Battery (WJPB) (Woodcock, 1978), selected subtests of the Detroit Tests of Learning Aptitude (DTLA) (Baker & Leland, 1967), and the Matching Familiar Figures Test (MFFT). Significant improvement occurred in reading and mathematics on the WJPB, the latency but not the error score on the MFFT, and the auditory but not the visual memory scores of the DTLA. Weisner confirms that self-instruction methods developed by Meichenbaum can be effectively applied by self-contained learning disabilities teachers within the special education classrooms with potential impact upon component attentional skills.

It is important to note that among the caveats and recommendations presented by Wiesner are more active teacher involvement in encouraging strategy generalization, use of standardized behavioral measures, increases in the number of sessions, and decrease in session length.
Critique

Research is equivocal in determining the effectiveness of component attentional skills training on durable, generalized achievement gains and amelioration of underlying processing deficits. Strategies to develop sustained, accurate attention have impacted upon attention-to-task, response accuracy, and academic gains (Heins, 1980; Lloyd, Hallahan, Kosiewica, & Kneedler, 1980; Rooney, Polloway, & Hallahan, 1985), but there remain questions regarding the influence of factors such as ability, motivation, class size, response set, strategic cues, time-delay of prompts, metacognition, and efficacy, among others, in mediating efficacious component attentional skills training.

As the child with learning disabilities has been characterized as an "inactive learner" (Torgensen, 1977), as externally cued and controlled (Pearl, Bryan, & Donahue, 1980), and as being a candidate for "learned helplessness" (Seligman, 1975), then component attentional skills training with a focus upon involved, internal, and competency oriented strategies appears explicitly applicable to elementary-age children served in SCLD programs either separate from or in conjunction with pertinent other educational methods. In this study, partially to clarify the conditions under which component attentional skills may prove most beneficial, such
training was incorporated with elementary-age children placed in SCLD programs in a unique superordinate-subordinate integration of attribution retraining and cognitive self-instruction hypothesized to enhance the growth and behavioral generalization of pertinent attentional skills. In answering Weisner's (1986) recommendations, component attentional skills training was presented in a scheduling package that featured a compression of session length and an extension of number of weekly sessions unlike any previous approach noted in the literature, thus providing a further understanding of the functions of these dimensions upon training efficaciousness.
Learning Disabilities

Introduction

A revolution in the field of special education occurred with Kirk's (1963) coining of the then relatively temperate but clearly invigorating term 'learning disabilities' to describe a broad category of educationally impaired children. Subtly simplistic in assembling heterogeneous, divergent speculations and research under an 'acceptably' labeled umbrella, the new term emphatically began to lift a cloud of stigmatization and misunderstanding from the lives of these children, and served to dramatically facilitate the call for and development of specific public education regulations and laws governing and assuring corrective educational services. In the years since the term learning disabilities initially gained acceptance the definitions and construct of learning disabilities have been closely scrutinized with diverse results and opinions signaling the still evolutionary stage of research in the field.

Regulations and Definitions

The Education for All Handicapped Children Act (1975), or Public Law 94-142, and the Reauthorization of the Education of the Handicapped Act (1986) provide the federal definition of learning disabilities that has served as the model for many state definitions, including the Commonwealth of Virginia (see Learning Disabilities
Definitions). The present federal and Commonwealth of Virginia definition states:

"Specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language spoken or written, which may manifest itself in an imperfect ability to listen, think, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (Regulations Governing Special Education Programs for Handicapped Children and Youth in Virginia)

The federal and Commonwealth of Virginia definitions, then, accept certain fundamental principles: (a) a disorder exists in at least one psychological processing area, (b) the efficiency of learning has been impacted, and (c) the condition is exclusionary.

A second component of the federal definition (P.L. 94-142, 121a.541) proposes a requisite discrepancy of significance between assessed ability and current
achievement in one or more of the following areas: (a) oral expression, (b) listening comprehension, (c) written expression, (d) basic reading skill, (e) reading comprehension, (f) mathematics calculation, and (g) mathematics reasoning.

While the Commonwealth of Virginia has adopted the federal definition as a working model, on October 29, 1987 the Position Paper on the Identification of Students with Specific Learning Disabilities in Virginia was released by the Department of Education. Proposing an alternative to the federal definition, the Position Paper presented a response to a perception of evidence that localities were misidentifying children as learning disabled because of a dearth of regular education or remedial service programs. In asserting this position, the Department of Education cited a study by Weller and Strawser (1987) that maintained an estimated 25% to 38% of children placed in learning disabilities programs are in fact children who primarily suffer from or display the influence of other handicapping or nonhandicapping conditions.

The proposed Commonwealth of Virginia definition reads:

Specific Learning Disabilities. Specific learning disability is an inclusive term used to denote various processing disorders presumed to be
intrinsic to an individual (e.g., acquisition, organization, retrieval, or expression of information; effective problem-solving behaviors). For the purpose of special education services, a student classified as learning disabled is one who, after receiving instructional intervention in the regular education setting, has a substantial discrepancy between ability and achievement. The disability is manifested by substantial difficulties in the acquisition and use of skills in listening comprehension, oral expression, written expression, reading, and/or mathematics. Even though specific learning disabilities may occur concomitantly with other handicapping conditions, specific learning disabilities are not the direct result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, of environmental, cultural, or economic disadvantage, nor the result of instruction which was inappropriate to the child's age or ability level (Superintendents' Memo #271, December 16, 1988, p.7).

In accordance with the overt goal of increasing the accuracy of the classification process, the revised definition addresses the latest research trends and reflects a cognizance of definitions similarly evolving within the special education community. As of May, 1990,
this revised definition had not yet been implemented in this or any modified form and the previously cited federal and Commonwealth of Virginia definition that remains in force is adhered to in the city of Chesapeake.

Farnham-Diggory (1986) identified 14 different definitions of learning disabilities in a literature review. Foremost among currently advocated alternative definitions are those proposed by the National Joint Committee on Learning Disabilities (NJCLD) (1987), the Interagency Committee on Learning Disabilities (1987), the Association for Children and Adults with Learning Disabilities (1985), and the National Association of School Psychologists (1989) (a modified version of the NJCLD definition) (see Appendices for Definitions of Learning Disabilities). That a consensus cannot be reached articulates both the complexities of the construct learning disabilities and the multifold needs of interest groups that dictate an idiosyncratic and parsimonious perspective. Lerner (1988) suggests that "the goal of finding a single definition of learning disabilities acceptable to all may be unfeasible" (p. 9). Keough (1987, 1988) recommends that one should view learning disabilities as less of a singular entity that may be tidily packaged and more as a network of conditions which share certain common characteristics and causalities.
In section 2.1 of the Virginia code detailing procedures for Child Find: Identification of the LD Student, presentation of a list of general characteristics said not to be assumed true to all learning disabled children but clustering differentially within learning disabled children asserts an implicit adherence to Keough's view. Other than the academic (oral and written expression, listening and reading comprehension, basic reading skill, and math calculation and reasoning) and processing areas (perceptual-motor, attentional, memory, time and space orientation skills) traditionally cited, the guideline acknowledges the presence of cognitive factors (organizational and thinking skills), social factors (compromised abilities to interpret the signs of social interaction that may lead to inappropriate behavior and poor emotional control), and emotional factors (concomitant with chronic academic stress and failure). The complexities and multiplicities of interactional possibilities within this broad array of characteristics prove a telling argument for the positions of Lerner and Keough advocating a less rigid stance on definition and classification.

Lerner (1988) concludes that there are certain common elements within the currently available definitions: "(1) neurological dysfunction, (2) uneven growth pattern, (3) difficulty in academic and learning
tasks, (4) discrepancy between achievement and potential, and (5) exclusion of other causes" (p. 9). There is controversy within the field of learning disabilities regarding each of these fundamental components:

1. While a general acknowledgement exists that there is a neurological basis for a learning disability, the presence of such a physical influence is more often assumed given the results of psychometric tests or the behavioral manifestations of the condition itself than proven conclusively through direct medical examination and documentation.

2. Issues within the field regarding the unevenness of growth center around assumptions originating with the developmental and maturational theorists and those emerging from cognitive psychology. The seminal work of Piaget (1963) revealed an expected and predictable pattern of human development through childhood that if inhibited or slowed by an a child's individual 'biological time clock' or factors external to the child may be manifested in an apparent inability to learn at an expected rate; the probable explanation for a delay in learning manifested within the educational setting as an apparent learning disability would then be a mismatch between the premature introduction of academic concepts and the child's maturational preparation.

One of the early tenets of cognitive psychology that
entered the lexicon of learning disabilities is the notion of a delay or disorder in psychological processing areas. The presence of such a delay in an area presumed active and essential to the effectiveness of the learning process would be assumed to disrupt the acquisition and integration of concepts and knowledge in the child with learning disabilities. For example, if as Cherry and Kruger (1983) claim the child with learning disabilities has a deficiency in focusing selectively on auditory tasks and a compounding delay in accurate visualization (of symbolic material) as Wade and Kass (1986) would assert, then this child would tend to be impeded in the use of phonetic analysis in reading, finding her/himself unable to effectively link the two fundamental but otherwise disparate processes. With respect to differentiating children with learning disabilities from nondisabled children, while there is a reassuring face validity to this approach, the literature has not tended to consistently support the existence of such delays (Shepard & Smith, 1983; Ysseldyke, Algozzine, Shinn, & McGue, 1982), the utility of allied intervention methods (Tarver & Dawson, 1978; Vellutino, Steger, Moyer, Harding, & Niles, 1977), or the reliability and validity of psychometric instruments designed to identify their presence (Salvia & Ysseldyke, 1988). Increasingly, new developments in cognitive processing have focused
awareness upon the delimiting nature of such a view.

The advances in cognitive processing have generated an even more complex picture of the child with learning disabilities: cumulatively, the child as learner may be seen as a product of experientially impaired cognitive structures, fallible memory functions, and an information processing system within which exists a faulty sequential progression in the acquisition, interpretation, organization, storage, retrieval, and employment of information for learning. The cognitive processing model furnishes the theoretical base for methods and issues such as attribution, metacognition, cognitive self-instruction, and reflective and impulsive learning styles examined in this study.

3. As with the assumed presence of neurological dysfunction, the issue of difficulty in academic and learning tasks is presumed a given as it is manifest within both the referral and classification process that the child with learning disabilities is (a) disabled by a condition that impacts (b) upon the adequacy of learning.

4. While the acceptance of a delay in academic achievement may be moot, the methods and standards by which the determination of a specific and severe discrepancy between the child's assessed ability and actual achievement are variable. Kavale (1987) asserts
that "the concept of LD was never meant to be solely or primarily underachievement... discrepancy alone does not capture the complexity of the LD phenomenon" (p. 19). Yet, classification and service decisions continue to be based to an extensive degree upon the presence of a severe discrepancy and as Parrill (1987) points out, "it is not unusual for the boundaries designating severe discrepancy to reflect monies allocated or numbers of children state departments are willing to serve" (p. 40). The federal government originally provided a formula which was rejected; the states and localities have since developed guidelines which are tied closely to psychometric formulas which vary in defensibility and soundness. Typically, either age- and grade-based differences, standard scores, or regression to the mean adjustments are incorporated in the determination of severe academic discrepancy (refer to the Winter, 1987 issue of Learning Disabilities Research for an extensive review of severe discrepancy issues).

In adhering to the potential problems outlined in the federal Regulations for Evaluating Specific Learning Disabilities (1977), a task force representing the Commonwealth of Virginia recommended caution and flexibility in the application of any guideline or formula advocated by an individual locality and emphasized the invaluability of the 'human factor' in
classification and placement decisions. The task force presented a guide dependent upon a discrepancy between ability and achievement using an age- and grade-based formula differentially applied for three grade level groupings (kindergarten - third, fourth - eighth, and ninth - twelfth). A guideline was developed in 1982 by an interdisciplinary team representing City of Chesapeake Pupil Personnel Services departments which reflected the tenets of the state task force: while age- and grade-based discrepancies were outlined, the use of optional standard score based discrepancies were encouraged and the 'formula' emphasized as available for guiding, not monopolizing the decision making process. Currently, this guideline is not actively in use; regarding the discrepancy issue, classification and placement decisions are generally based upon standard score differences between assessed and/or potential ability of approximately 1 1/2 standard deviations when such scores are available, estimated grade or age level differences when standardized scores are not available, available documentation reflecting classroom performance and placements, and the clinical judgment of the individuals involved in the assessment and classification process.

The City of Chesapeake experienced a recent (February-March, 1989) state general and special education review of adherence to state and federal
regulations and guidelines and the procedures adopted for special education classification purposes were not faulted.

5. The issue of a learning disability existent within a child only to the exclusion of any other influence has been gradually reconceptualized within or winnowed out of recent definitions as researchers, practionners, and educators have found such a precise discrimination to be difficult to ascertain and, furthermore, a crude and inaccurate process. While a neurological bases is assumed, the child with learning disabilities may be said to be inalterably a part of a grand, enveloping ecological system, and a microcosmic system her/himself, and the core neurological elements which may originally constitute the condition of the child with learning disabilities are interactive with all the other elements which define those systems. Thus, for example, emotional and social components that emerge as significant as the child reacts to the impact of her/his neurologically based learning difficulties upon the world should not serve absolutely to exclude from classification, but instead to flesh out a more holistic view of the child for informed, effective decision-making, possibly defining a critical extension of the child's condition.
Critique

To a degree, the presence of multiple definitions of learning disabilities articulates the give and take inherent in any field or endeavor in which divergent bodies maintain vested interests in the definitional parameters. Yet, the variance in definition and acceptance of the construct itself speaks primarily to an investiture of a more noble sort, that being the rigorous, unambiguous search for meaning and clarity in a field that is fraught with uncertainty, abundant in needs, and vast in impact upon the welfare of children: ironically, such a grand quest conducted by individuals is both burdened with and energized by the diversity and uniqueness of individual valuations and visions. Keough's (1987) moderate counsel that "the definitional task is to identify and describe systematic covariations within the symptom pool and to order these groupings into a coherent and logical taxonomy of conditions" (p. 7) is a call for a Piagetian assimilation and accommodation of findings from disparate research and theoretical sources with the implicit goal an advancement of the understanding brought to the field of learning disabilities, and an equally demanding but less visible goal the demystification of the construct.

For the purposes of this study, the current federal and Commonwealth of Virginia definitions of learning
disabilities served as guidelines for classification of children identified as subjects. By implication and standards established by the locality, children in this study who have been identified for placement in self-contained settings exhibit the broad range of characteristics previously described, and do so to a more significant degree than similar children served in resource settings. Of particular note is that these children served in SCLD programs are hypothesized to exhibit deficits in component attentional skills (Wade & Kass, 1986), and metacognitive components (Simmons, Kameenui, & Darch, 1988; Sternberg & Wagner, 1982), attributional beliefs (Licht, Kistner, Ozkaragoz, Shapiro, and Clausen, 1985) such as locus of control (Lewis & Lawrence-Patterson, 1989), and reflectivity-impulsivity (Cullinan, Epstein, Lloyd, & Noel, 1980; Hallahan & Reeve, 1980) as reflected in recent cognitive psychology literature. This study presented a model of intervention with children served in SCLD programs that incorporated an integrated superordinate attribution retraining-subordinate cognitive self-instruction strategy in an effort to modify component attentional responses, locus of control beliefs, and behavioral patterns, increase achievement, and generalize training effects outside the immediate intervention setting.
Locus of Control

Introduction

Children cast the shadows of an array of attributes and beliefs upon enterprises and events; the child who assumes that controls over experiential reinforcements are primarily internally formed may interpret and learn differently than the child whose conviction is one of externally directed rewards. Rotter (1966) defines an internal locus of control as belief that what has happened, is happening, or will happen is related to what they themselves have done, are doing, or will do; an external locus of control is the belief that what happens is unrelated to one’s acts or influence. The internally oriented child establishes that positive outcomes are related to personal skill and effort, while negative outcomes are due to a lack of effort, or inadequate strategy in skillfully applying effort. The externally oriented child asserts that luck, fate, happenstance, or the influence of others are the coordinators of positive and negative outcomes.

Research

In investigating the perceptions of parents and teachers of 24 children served in SCLD programs and 26 nondisabled children regarding the students’ locus of control orientation in relation to that orientation held by the students, Lewis and Lawrence-Patterson (1999)
found that children with learning disabilities tend to be more external than nondisabled peers of similar ages in total locus of control and perceived responsibility for success experiences (on the Intellectual Achievement Responsibility instrument). This finding concurs with indications that children with learning disabilities do not appear to follow the typical pattern of progression from a primarily external orientation at ages 4 to 5 to a primarily internal orientation at ages 10 to 11 as proposed by Lawrence and Winschel (1975).

In the SCLD group, while there was no significant difference between parents and children’s perceptions of locus of control orientation, such a difference did exist when considering teachers’ perceptions and those of their students. Teachers perceived students as possessing a greater trend toward internal orientation for success experiences than the children identified for themselves. Lewis and Lawrence-Patterson conclude that teacher awareness of the locus of control orientation of children with learning disabilities is a crucial element in assuring an individualized educational environment: the teacher’s knowledge of the internal-external trend of the individual’s locus of control orientation will provide a gauge of the differential quantity or frequency of success experiences and of the need to implement strategies to attribute success experiences to the
students own devices and competencies.

Tarnowski and Nay (1989) studied the locus of control beliefs of 51 elementary-age boys who were variously diagnosed as experiencing learning disabilities (LD), attention deficit disorder with hyperactivity (ADDH), learning disabilities and attention deficit disorder with hyperactivity, and no disabling condition. Based upon the Nowicki-Strickland Locus of Control Scale, children in the LD and LD/ADDH groups differed significantly from controls on the locus of control dimension, tending toward heightened externality. Children in the LD/ADDH condition had the most pronounced externality trend, illustrating the dual impact of learning problems and attention/behavioral difficulties upon the presumption of the student with learning disabilities that success and failure are elements over which personal controls are ineffectual. A significant correlation existing between locus of control beliefs and ability/achievement discrepancies confirms others' observations (Stipek & Weisz, 1981) that a relation is present between externality and academic achievement.

Keough, Whitman, and Maxwell (1988) examined the effects of self-instruction and external instruction programs on the math performance of 38 nonretarded first-graders from regular classrooms and 16 mildly retarded children from special education classrooms enrolled in
public school settings. Specific assessments were conducted of the math knowledge base, linguistic skills, and personal attributions regarding locus of control. Self-instruction training consisted of a series of questions and answers that provided information concerning how to solve addition-regrouping problems in a format similar to that proposed by Meichenbaum and Goodman (1971). External-instruction training differed from internally directed training through an adjustment of instruction to the second person and elimination of instruction verbalization by the children. No specific prediction was presented regarding attributional orientation and performance under the two training formats; however, it was expected that the two populations would differ in individual characteristics. Mentally retarded children were projected to have a more external locus of control and to derive greater benefit from the self-instruction than from the external instruction training relative to nonretarded children. No significant differences in attributional style were found between the two ability groups. Keough, Whitman, and Maxwell assert that the 3 year chronological age gap between the younger nonretarded (average age 7.23 years) and older retarded children (average age 10.58 years) accounts for this failure to differentiate: research has generally indicated an external orientation for primary
school-age children. As hypothesized, more accurate performance for mentally retarded children was found under the self-instruction than under the external-instruction program while no such performance difference was observed in the nonretarded children.

The generalization effects of the internal and external conditions did not differ within or across groups; metacognitive cues orienting children to situational applicability of strategy were not available, while treatment duration was brief (7 days) and consequently lacking intensity. Inability to differentiate the role of locus of control was hampered by the failure to identify similarly aged and/or developmentally positioned children.

The relationship between the locus of control and responsiveness to three incentive conditions in a population of fourth- through sixth-grade French-Canadian children was investigated by Coady and Bastien (1984). Children were tested on a number cancellation task designed to be neutral in incentive value. Three incentive conditions were provided: in the first, a social incentive stating that most children perform well on the task; in the second, the material incentive of a prospective prize; and in the third, no incentive with no remark presented. Internally directed children were hypothesized to be less susceptible to the influence of
incentives with performance unchanged across conditions. External children were assumed to be more susceptible to the presence of incentives, and to lower performance in the no incentive condition. Variations dependent on preference and locus of control orientations were assumed to exist, and to interact and be dependent upon the sex of the child. Coady and Bastien found that internally directed children globally produced significantly higher scores than externally directed children, and that externals performed less capably in the no incentive condition. Girls who demonstrated an internal locus of control tended to express a higher achievement motivation; further, as the extremes of scores between internally directed and externally directed girls were dramatic, girls of this age group were viewed as possessing a more established and consistent locus of control than same age boys.

While random sampling occurred, there were no indications that the issue of ability differences was considered as a source of variation between groups; further, the mundane and repetitive nature of the tasks may have impacted upon response motivation.

Lakey (1988) examined the prediction of risk for depression dependent upon external control beliefs, low self-esteem, and low social problem-solving skill. While concurrent relationships had been found, few studies
explored these relationships from a longitudinal perspective; those available studies suffered from a lack of specificity in the conditions under which the depressive effect would occur. Vulnerability to subsequent negative life events, thus increasing the likelihood of depression, had not been adequately documented. Lakey assessed the dimensions of control beliefs, dysphoria, self-esteem, cognitive problem-solving ability, and advice seeking of 99 college undergraduates; pretests and posttests were separated by 10 week intervals. Results suggested partial support to the hypothesis that external control beliefs and low problem-solving ability may act as risk factors for subsequent depression. Internally controlled individuals and those with medium to external beliefs were found to be resistant to the effects of negative life events. Sustained internal personal control beliefs were viewed as a potential source of advanced, effective employment of coping behaviors, while the presence of such internal beliefs may serve as an understating mechanism, minimizing the direct threat to the opinions one holds of oneself in situations challenging a normative sense of mastery.

The implications of this study are compromised by the use of subclinical normals who may not be representative of the community at large.
Hallahan, Gajar, Cohen, and Tarver (1978) studied matched groups of 28 students with learning disabilities and 28 nondisabled seventh-, eighth-, and tenth-grade students with respect to the influence of locus of control and selective attention upon motivation and learning. Selective attention was evaluated by performance on measures of central recall and incidental recall. Locus of control was assessed by the Nowicki-Strickland Locus of Control Scale and the Intellectual Achievement Responsibility questionnaire (Crandall, Katkovsky, & Crandall, 1965). Significant differences were found between more internally directed nondisabled and more externally directed children with learning disabilities, and confirmed previous findings of a relationship between underachievement and external locus of control. Children identified as learning disabled appeared to harbor a sustained, restrictive leaning toward an external locus belief that sought to understate or make incongruous their ownership of poor achievement. Both locus of control measures differentiated significantly between nondisabled children and children with learning disabilities; that there was not a significant correlation between the two measures suggested that each assessed different aspects of locus of control and consequently affirms the pervasiveness of the external belief system of children with learning.
disabilities.
The effects of rational-emotive education group counseling upon locus of control and self-concept in 60 8-11 year old children identified as learning disabled was investigated by Omizo, Cubberly, and Omizo (1985). Children were assigned to either a treatment condition with a group leader experienced in rational-emotive education or a control condition; focus in the treatment condition was upon acquisition of problem-solving skills and the development of rational coping strategies. The Nowicki-Strickland Locus of Control Scale for Children and the Dimensions of Self-Concept were administered as pretest and posttest indices. Posttest differences of significance were noted between the treatment and control groups; the locus of control measure proved to be a valid discriminator. Rational-emotive education was concluded to encourage a more internal locus of control orientation in students with learning disabilities and to enhance several dimensions of self-control.

A focus of the current study was the differential effect of attribution retraining coupled with cognitive self-instruction training upon speculated external locus of control in the sampled learning disabled population.

Omizo and Cubberly (1983) examined the effects of reality therapy class meetings on locus of control and self-concept in 60 12-14 year old children with learning
disabilities. Teachers in the treatment condition were trained to conduct classroom meetings based upon the tenets of reality therapy. Pretests and posttests consisted of the Nowicki-Strickland Locus of Control Scale for Children and the Dimensions of Self-Concept. While self-concept improved significantly in the treatment group, and several dimensions of self-concept proved to be valid discriminators, a similar contention could not be stated regarding locus of control.

Critique

In interpreting research results, assumptions regarding the capacity for children to alter locus of control beliefs and the degree to which they may be changed must be mediated by cognitive and developmental considerations: for example, Harter (1982) indicates that primary school-age children generally perceive themselves as being externally controlled, while sex may be a factor between grades 6 and 12 but not in younger children (Coady & Bastien, 1984).

In examining the relationship between locus of control and achievement in boys identified as learning disabled and nondisabled boys, Loper and Reeve (1983) questioned the presence of a response bias on a locus of control measure (Intellectual Achievement Responsibility questionnaire) which may mistakenly misidentify children with learning disabilities as less internally oriented
than normals. In four experiments, boys identified as learning disabled and low-achieving boys tended to choose second response alternatives. While implications specifically for the use of the Intellectual Achievement Responsibility questionnaire are important, a more general implication regarding the use of self-report measures with children with learning disabilities is presented: the cognitive problems of children identified as learning disabled that relate to information processing may influence their self-report performance. The need to choose between alternatives may be affected by impulsivity, impaired attention/concentration, and/or short-term memory deficits characteristic of this population.

Research has not consistently found that presentation of instruction or interventions assumed to impact upon locus of control has effectively done so (Correa, 1987; Omizo & Michael, 1983). Design limitations appear contributory through lack of sustained exposure to training or insufficient successful experiences with perceptions of self-control.

The speculative external orientation of children with learning disabilities is consistent with the notion of the "inactive learner" (Torgensen, 1977) but is and of itself not regarded as the solitary variable accounting for this detached learning tendency (Bender,
Locus of control is viewed as one of a cluster of affective and cognitive variables which are associated with the inactive learner concept of learning disabilities, including temperament (Bender, 1987), self-concept (Hiebert, Wong, & Hunter, 1982), and task orientation (Pullis, 1985).

The research and prior critique indicate that locus of control is a variable pertinent to the study of children with learning disabilities who may tend more than nondisabled peers toward an external locus, thus perceiving themselves as distanced from responsibility for academic success or failure. Additional research is needed to clarify the generalization of assumptions regarding locus of control tendencies to variant age and placement groups. This study assessed this variable with elementary-age children served in SCLD programs, a group not known by this researcher to have been previously studied.

Further, it was felt to be of interest to observe the responsiveness of locus of control to interventions which aspire indirectly (cognitive self-instruction) and directly (attribution retraining) to shifting of locus of control to a hypothesized more achievement conducive internal direction.

This study adapted active teacher attributional cuing in order to provide a climate that acknowledges and
encourages shifting of locus of control, an approach not noted in prior studies adapting this variable as a dependent measure with children identified as learning disabled.

The current study additionally provided a sustained, intensive program rather than a periodic one, a design modification which is not noted in prior studies with children with learning disabilities and may contribute to a more ready internalization of locus shifts. While locus of control is a variable which stood alone in this study because of the selected measurement tool, it is important to iterate that locus of control is a variable designed here to represent or suggest a more global issue, that of attributional shift hypothesized to occur more readily and significantly under the primary treatment condition incorporating the networking of cognitive self-instruction and attribution retraining than in the secondary treatment condition utilizing cognitive self-instruction alone or control condition.
Metacognition

Introduction

The relationship between strategic learning and academic performance is not understood by many children with troubled educational histories (Johnston & Winograd, 1985). This lack of awareness of the person, task, and strategy variables affecting cognitive performance (Ryan, Short, & Weed, 1986) represents a metacognitive deficit; learning is compromised by the belief that effective strategies for controlling one's behavior, possessing the knowledge to plan, monitor, and regulate performance (Brown, Bransford, Ferrara, & Campione, 1983), and to apply known skills in novel situations (Schneider, 1985) are not available or situationally applicable. Metacognition thus includes a complex set of person (i.e., self-appraisal of abilities, attribution of outcome), task (perception of task difficulty and purpose), and strategy (strategy knowledge and recognition of the need to apply strategies) variables (Butler & Meichenbaum, 1981, pp. 219). Effective problem solving and motivation may be mediated by metacognition by focusing awareness upon the value and benefits of strategies (Paris & Oka, 1986).

Research

Borkowski, Peck, Reid, and Kurtz (1983) studied the acquisition, maintenance, and generalization of
organizational strategies as a function of reflectivity-impulsivity and metamemory. In one experiment, 64 second- and third-grade children classified as reflective or impulsive were assigned to a treatment condition in which strategy training and transfer sessions were provided; 25 children were assigned to a control condition providing no strategy or transfer training. Children in the treatment condition were taught a clustering strategy for use on a sort/recall task and an exhaustive-search strategy for an alphabet search task. Strategy maintenance was assessed following two training sessions. For both reflective and impulsive children, significant effects of strategy training, in terms of strategy use, were noted on the sort/recall readiness and alphabet search tasks. Metamemory was significantly related to strategic behavior when impulsivity and vocabulary scores were partialed out; further, children who maintained and generalized strategy training had higher levels of metamemory. Metamemorial awareness was significantly related to strategic behavior but also to cognitive tempo.

Borkowski, Peck, Reid, and Kurtz (1983) conducted a second experiment designed to elaborate upon the aforementioned findings. Here, 80 first- and third-grade children classified as reflective or impulsive were assigned to treatment and control groups: children in
the treatment condition were trained to use a clustering strategy and instructed to transfer the strategy to similar tasks. A stipulation in treatment design was that the two groups not differ significantly in entry metamemory scores. Assessment and strategy training sessions were spaced over a 7-month span. On tests of strategy transfer, greater ability to benefit from strategy training was noted in reflective than impulsive children, particularly at the first grade level. However, strategy scores were higher for reflective children during transfer but not training, implying a relationship between cognitive tempo and the ability to use strategies in new contexts. Metamemorial processes were borne out as significant mediators of strategy maintenance and generalization for both reflective and impulsive children when measures of reflectivity-impulsivity were statistically controlled.

Loper, Hallahan, and Sanna (1980) hypothesized that enrolling children identified as learning disabled in a corrective reading program would heighten metacognitive awareness and lead to gains in achievement. A pretest indicated no relationship between achievement and metaattention but a positive correlation between reading achievement and an interest variable; a negative correlation was found between reading achievement and a reward variable. The children were divided into high-
gain and low-gain groups based on reading improvement. Pretest relation did not exist between achievement and metaattention. Posttest results indicate for the high-gain children a positive interest-negative reward correlational pattern; no consistent pattern was noted for low-gain children between achievement and knowledge about attentional processes. The presence, then, of beliefs about and attention to strategy presentation and implementation mediated academic gains.

Strategies for semantically sorting pictures in preparation for future recall were presented to first-, third-, and fifth-grade children by Ringel and Springer (1980). Two of three treatment conditions featured strategy training and feedback regarding improved recall performance; one of these groups was directly informed of the cause-and-effect relationship between strategy use and effective recall. Feedback about strategy value increased the likelihood of strategy transfer for third- and fifth-grade children; transfer was particularly significant in the causal feedback condition. Feedback was hypothesized to effect transfer through metamemorial enhancement.

Kurtz and Borkowski (1987) reported a longitudinal study of metacognition and development of strategic behavior in reflective and impulsive children. The first part of the study used 135 children and the second part
130 children of which 77 were included in the original study. Children were pretested on metamemory, cognitive tempo, summarization skills, and teacher ratings of classroom impulsivity and assigned to one of three groups, two treatment and one control. Groups were approximately similar on metamemory, cognitive tempo, and summarization after random assignment. Participants in the earlier study were assigned to one of the treatment conditions to maximize analyses of causal modeling; as strategy training and procedures were dissimilar in the second study, prior experience was not viewed as influential. The treatment conditions consisted of a strategy condition containing a learning strategies curriculum-based summarization instruction and an executive condition presenting similar summarization instruction supplemented by metacognitive information about the benefits of performance monitoring, deliberate strategy selection and modification, and working slowly and carefully. A practice control group summarized paragraphs but received neither strategy nor metacognitive instructions. Executive training was hypothesized to facilitate strategy acquisition and influence cognitive style, leading to more reflective responding in impulsive children. Analyses indicated superior performance for children assigned to the executive condition while early metamemory was identified
as an antecedent of later strategy acquisition.

Kurtz and Borkowski relate that tempo and metamemory were related in the early elementary years but not in the later elementary years. While early metacognitive knowledge is formed through indirect parental training and dispositional characteristics, the influence of teacher instruction style in conjunction with first-hand, individualized, metacognitive experiences in a variety of learning and problem-solving situations becomes increasingly cogent. The teacher is implied as a potentially constructive and corrective source of new metacognitive knowledge for both academic and nonacademic purposes.

Critique

The developmental progression of metacognitive components and the critical periods that define important interactions require clarification (Kurtz & Borkowski, 1987) as a direct link between metacognitive preparation and academic instruction may define the nature and content of the instructional method to which a child or group is best suited. Kurtz and Borkowski envision the delivery of multistage training packages that integrate the essential components of metacognition and make more probable and predictable sustained academic gains. Research has increasingly suggested that children identified as learning disabled are deficient in
knowledge about, and understanding of, their own cognitive processes (Borkowski, Weyhing, & Turner, 1986; Slife, Weiss, & Bell, 1985) and that metacognitive components are influential in strategy acquisition and transfer in the learning disabled population (Ellis, Deshler, & Schumaker, 1989; Weyhing, 1986). Yet, Swanson (1984) observed that strategy and metacognitive instruction infrequently occurs in special education settings. Palinscar and Brown (1987) assert that sufficient evidence exists to justify adoption of metacognitive assessment and instruction methods with special education populations.

Given these research findings, there is ample reason to consider the integration of metacognitive themes in an attribution retraining program with elementary-age children served in SCLD programs. No studies known to this researcher have sought with this population to weave metacognitive strands into a similarly broad based attributional format. In this study, cognitive self-instruction served as a strategy condition with metacognitive information regarding the value and utility of a reflective approach to learning actively communicated to the children by their respective teachers. Further, metacognitive feedback was actively provided relevant to desired attributional shifts.
Population

Children classified as learning disabled are reported to be deficient in cognitive and attentional areas, and studies pertinent to this population have been conducted in the areas of attribution retraining, cognitive self-instruction, component attentional training, locus of control, and metacognition.

Attribution Retraining

Borkowski, Weyhing, and Carr (1988) examined the effects of attribution retraining with 75 upper-elementary children with learning disabilities. Four treatment conditions incorporated varying levels of attribution and strategy exposure. The primary treatment condition received attribution retraining on paired associate and sort recall tasks, instructions on the use of a summarization strategy, and attributional statements about the instructed strategy. The secondary treatment condition received an identical treatment package without prior attribution retraining on associate and recall tasks, but with attributional statements explicit in the summarization strategy. Controls received summarization strategy without attribution retraining or neither strategy nor attribution training. Results suggested that long standing, antecedent attributional beliefs were not altered by program specific attribution retraining; however, attribution retraining enhanced the maintenance
of the summarization strategy and selectively facilitated generalization.

Borkowski, Wehying, and Carr concluded that goal directed, strategic processing was enhanced in children classified as learning disabled through attributional beliefs that encouraged essential orientation and perseveration to task. The study is delimiting in the reliance upon a solitary measure of academic achievement and a failure to generalize attribution beyond the strategy related conditions.

Cognitive Self-Instruction

Graybill, Jamison, and Swerdlik (1984) applied a Verbal Self-Instruction (VSI) training method with 16 second- to sixth-grade children served in resource learning disabilities programs who had been characterized as impulsive by performance on the Matching Familiar Figures Test (MFFT) and 'impatient' on a teacher rating scale completed by regular classroom teachers. VSI training mimics the model of Meichenbaum and Goodman (1971) in proceeding through a graduated series of steps increasingly relying upon silent or covert verbalizations. Visually presented problems were used as the training stimuli and pictorial cards cuing both the child and teacher to the VSI steps were provided the treatment group. After 4 weeks of VSI training, the impulsive children with learning disabilities improved
performance on the MFFT but not in ratings by regular classroom teachers; hence, generalization was regarded as ineffectively established using the VSI model.

The 4-week training period may have been an inadequate sustained exposure to VSI methods to promote generalization to the regular classroom; additionally, no regular classroom reminders or reinforcements were adapted to enhance generalization. The Burks' Behavior Rating Scale was administered as a posttest measure only, with focus upon the category of 'poor impulse control', seriously weakening the value of the assessment.

Component Attentional Training

Lochner (1985) examined the effects of an haptic training program upon the impulse and attentional control capabilities of 12 school-age boys with learning disabilities diagnosed as communications handicapped with a secondary classification of neurologically impaired. Children classified as learning disabled were hypothesized to be able to modify their scanning activity and performance on haptic discrimination tasks, thus moving toward increased reflectivity. Direct instruction and modeling were adapted to teach more effective encoding strategies: (a) attention deployment, (b) scanning and search strategies, and (c) consequent inhibitory control and efficient attending behaviors. Positive verbal reinforcement was used in each session.
Children were first observed and then trained in gradually more complex puzzle assembly and discrimination tasks. Dependent measures were the Matching Familiar Figures Test (MFFT) and a videotape analysis of the child’s visual scanning behavior. Lochner reported significant improvements in impulse control, attention deployment, processing time, and error rates on the dependent measures, and apparent enhanced reflectivity given MFFT results. Importantly, results of training were observed both at posttest and follow up, 4 months later. Cross-modal transfer effects occurred which suggested a general change in cognitive style extending beyond modality specific responses.

Locus of Control

Bendell, Tollefson, and Fine (1980) investigated the interaction of locus of control orientation and methods of learning with a population of 50 adolescent boys with learning disabilities. Groupings were determined by identification of internal versus external locus of control on the Intellectual Achievement Responsibility questionnaire (IAR). Each group was exposed to a 'lowly structured reinforcement' and 'highly structured reinforcement' treatment condition. Each condition consisted of the presentation of 15 spelling words on a pretest and posttest basis. No study methods were presented and a minimal reward offered in the 'lowly
structured reinforcement' condition, while specific study methods with a similar reward were introduced in the 'highly structured reinforcement' condition. Bendell, Tollefson, and Fine reported that locus of control interacted with both highly and lowly structured methods. As hypothesized, students classified as learning disabled who were external in locus of control orientation benefited most from a structured learning environment, while internally oriented students performed significantly better under the lowly structured learning method than under the highly structured learning method. Implications for educational practice are commensurate with these findings: students with learning disabilities and internal trends should be provided increased opportunities to structure their learning methods while students with learning disabilities and external trends may best realize increases in achievement in highly structured situations providing immediate and consistent reinforcements.

**Metacognition**

Children classified as learning disabled and normal children were compared by Trepanier (1981) on knowledge of memory abilities, the ease of immediate versus delayed recall, memory estimation skill, and the allocation of study time. Developmental differences were examined by dividing children into younger (6-10 years) and older
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(10-15 years) subgroups. Memory estimation tasks represented the one area that differentiated the children with learning disabilities from nondisabled children: children in the younger group were inaccurate in estimating their own memory ability, while children identified as learning disabled in general were more inaccurate than normals in judging the memory skills of their friends. Trepanier speculated that inadequate metamemory development may contribute to a different 'mneumonic self-concept' in children with learning disabilities.

Critique

The reviewed research appears to confirm the relevance of the stated interventions and descriptive variables focused upon in this study to a sample of children with learning disabilities. Children classified as learning disabled as compared to nondisabled children appear to display deficiencies in attentional components. Similarly, such children tend toward apparent deficiencies in the availability and/or application of metamemorial strategies. Locus of control and attributional convictions converge as factors holding sway over the capacity of the child with learning disabilities to benefit from available instruction; such children tend to believe that they are relatively powerless in effecting academic progress. Cognitive
self-instruction methods have been effectively applied with learning disabled and nondisabled populations, but a pressing question remains of the effectiveness of generalization of trained skills. Attribution retraining has impacted upon the development of specific academic skills in children with learning disabilities.

The purpose of this study was to employ a superordinate-subordinate attributional retraining-cognitive self-instruction approach with elementary-age children served in SCLD programs; these children were specifically engaged in component attentional training and assessed on academic progress, behavioral indices, attention skills, and attributional shift (locus of control). A fundamental assumption of this study was that the marriage of attribution retraining and cognitive self-instruction would serve to dramatically enhance the utility of cognitive self-instruction methods and the generalization of trained skills.
Research Summary

The previous review of research in cognitive self-instruction and attribution retraining summarizes current methodological applications emanating from compelling theoretical positions.

While the work of Meichenbaum (1969, 1971) as extended by others to the educational setting has found that cognitive self-instruction methods have multiple potential uses with special needs children and may mediate impulsive response styles and result in academic gains, the inability to demonstrate generalization of training effects has presented a persistent rebuttal to procedural efficacy.

The attributional model of achievement motivation (Weiner, 1979, 1980, 1985) proposes that individuals seek to identify the causes for achievement-based successes and failures. This model is one of three described by Forsterling (1985) as providing the bases for attribution retraining methods which been effective in shifting children's achievement-oriented attributions toward those potentially more conducive to sustained academic effort and growth. Attribution retraining methods have generally been applied to nondisabled children low in achievement, self-perceptions of ability, and expectations for future school success, characteristics that are pertinent to the child who is learning disabled.
(Chapman, 1988). Consistent with Weiner's view, "learning disabled children tend to view themselves as having little or no control over achievement outcomes and their efforts as fruitless" (Kistner, Osborne, & LeVerrier, 1988, p. 82). A limited number of recent studies have examined attribution retraining with children who are learning disabled and confirmed that an attributional focus may impact upon gains in achievement. There are no such studies which have involved children served in self-contained learned disabilities programs.

This study was merited by advancing the understanding of both cognitive self-instruction and attribution retraining through the incorporation of a superordinate-subordinate attribution retraining-cognitive self-instruction approach not previously considered either with children who are learning disabled or nondisabled children. The intent was to examine the differential utility of such an interactive, multifaceted program with a self-contained learning disabled population and to lend clarity to issues surrounding locus of attributional control, and the academic and behavioral generalization of trained cognitive self-instruction skills.
CHAPTER 3

Methodology

Population

The target population in this study is elementary-age children with learning disabilities served in self-contained learning disabilities (SCLD) programs. The sample selected for study consisted of elementary-age children with learning disabilities served in SCLD programs in elementary schools in a Virginia locality of approximately 150,000 residents. The locality serves families ranging broadly in socioeconomic, educational, and vocational status, and is predominantly rural-suburban with developing light and medium industry. The locality serves approximately 29,000 students.

The students included in the sample were placed in SCLD classes after comprehensive psychological, educational, medical, and sociocultural evaluations were reviewed by a Special Education Eligibility Committee from the locality. Students were placed according to Virginia guidelines for learning disabilities; local guidelines parallel the federal definition (see Definition of Terms).

Children from six schools with nine self-contained learning disabilities classrooms served as subjects. A
total of 77 children approximately 10 years to approximately 13 years of age from grades four through six were selected for inclusion. There were 21 female and 56 male subjects. The primary treatment procedure was received by three classrooms (n=27), the secondary treatment procedure by three classrooms (n=25), and continued standard classroom instruction by three classrooms (n=25).

No exclusions were made based upon age, intelligence or academic scores. No statistically significant pre-experimental differences existed between the mean chronological ages or mean IQ scores of the three groups (see Table 4.1).

The Full Scale Wechsler Intelligence Scale for Children-Revised scores (or other standardized global cognitive measure) exceeded 80 for 64 students and did not exceed 80 for 17 students.

The primary treatment group consisted of 7 females and 20 males with a mean age of 11.9 years and a mean IQ score of 86.93. The mean age of female subjects was 11.65 years while the mean IQ score was 84.14; the mean age of male subjects was 11.99 years while the mean IQ score was 87.71.

The secondary treatment group consisted of 6 females and 23 males with a mean age of 12.13 years and a mean IQ score of 86.08. The mean age of female subjects was
12.38 years while the mean IQ score was 86.28; the mean age of male subjects was 12.87 years while the mean IQ score was 86.31.

The control group consisted of 9 females and 16 males with a mean age of 11.82 years and a mean IQ score of 85.6. The mean age of female subjects was 11.91 years while the mean IQ score was 88.22; the mean age of male subjects was 11.77 years while the mean IQ score was 84.13.
Treatment Procedures

Student Training

Introduction.

The treatment strategy integrated a 3-Phase adaptation of the specific steps of the self-instructional model of Meichenbaum and Goodman (1969, 1971) as recently reported by Wiesner (1986) with an adaptation of the attribution retraining model of Borkowski, Weyhing, and Turner (1986) and other relevant findings in attribution research. The modified self-instructional model labeled "Stop-Think-Act" by Wiesner is extended in this study to include two additional and conceptually true components—"Review-Success"—and retooled and retitled as "STARS", an acronym for "Stop-Think-Act-Review-Success". The attribution retraining model incorporated general attribution research trends and is entitled "Cool CATSS", an acronym representing the sequence "Can do-Ability-Try hard-Strategy-Success". The 3-Phase approach developed for this study incorporates a Phase 1 that addresses Controlled Instruction with Component Attentional Materials within a superordinate attribution retraining and subordinate cognitive self-instruction framework in the primary treatment and a cognitive self-instruction framework in the secondary treatment, a Phase 2 that specifies a Transition from Controlled Instruction to Standard Curricular Materials.
and a Phase 3 that directs active application of attributional and/or cognitive self-instruction ideas and skills from the "Cool CATSS" are "STARS" and/or "STARS" programs to standard curricular materials as defined by current IEP's. The procedural model responds to recommendations for future study proposed by Wiesner regarding active teacher provision of generalization cues, standardized behavioral assessment, session number extension, and session length compression.

Cognitive Self-Instruction Training.

Meichenbaum and Goodman (1969, 1971) suggested that impulsive children employed less mature, self-controlling speech than reflective children who incorporated more mature, self-guiding speech. Guided self-instruction reportedly encouraged an assumed natural transitory development of self-regulatory speech from overt to covert with resultant improvement on measures of cognitive problem-solving in children classified as learning disabled. The sequence of self-instruction procedures described by Meichenbaum and Goodman includes:

1. Cognitive modeling- the trainer models task performance and talks aloud while the child observes.

2. Overt guidance- the child performs the task, instructing herself/himself aloud under trainer observation and guided instruction.
3. Overt self-guidance— the child performs the task while instructing herself/himself aloud.

4. Faded, overt self-guidance— the child whispers the instructions to herself/himself as she/he proceeds through the task.

5. Covert self-instruction— the child performs the task while guiding her/his performance via inaudible or private speech or non-verbal self-instruction.

The content of self-instruction procedures and trainer/child statements invokes that proposed by Kendall (1985):

1. Problem definition: "Let's see, what am I suppose to do?"

2. Problem approach: "I have to look at all the possibilities."

3. Focusing attention: "I better concentrate and focus in, and think only of what I'm doing now."

4. Choosing an answer: "I think it's this one ..."

5. Self-reinforcement: "Hey, not bad. I really did a good job."
   or
   Coping statement: "Oh, I made a mistake. Next time I'll try and go slower and concentrate more and maybe I'll get the right answer."

The "STARS" acronym abbreviates the strategm in
which cognitive self-instruction steps are presented: the "STARS" modification of the "Stop-Think-Act" sequence implemented by Wiesner (1986) encourages the student to—
1. "Stop": pause and prepare for consideration of the task,
2. "Think": carefully consider all the available options,
3. "Act": identify, present, or record the answer,
4. "Review": carefully check the accuracy of the answer,
5. "Success": realistically reward oneself for accurate responses and effective strategy use.

Attribution Retraining.

An 'executive plus attribution' condition (Borkowski, Weyhing, & Turner, 1986; Kurtz & Borkowski, 1987) served as an overriding umbrella of metacognitive instructions and expectations under which the self-instruction model (Meichenbaum & Goodman, 1969, 1971) was presented to the primary treatment group. Kurtz and Borkowski (1987) found that integration of a strategy condition with metacognitive information about the importance and practical application and rewards of a reflective approach to learning effectively enhanced strategy acquisition and transfer and led to a more reflective responding style. Further research in attribution retraining (Dweck, 1975; Forsterling, 1985;
Jacobsen, Lowery, & DuCette, 1986; Medway & Venino, 1982) provided the impetus for inclusion of effort and ability attributional feedback for success and failure in this condition in endeavoring to create a clearly attribution oriented instructional climate. In this study, metacognitive review in the primary 'executive plus attribution' treatment condition focused upon the importance of:

1. Deliberate strategy selection and modification.
3. Working slowly and carefully.
4. Articulating coping and mastery classroom experiences.
5. Generally attributing task and strategy success to internal rather than external factors.
6. Attributing prior successful achievement to sustained effort and/or ability.
7. Attributing task failure to the use of ineffective strategy application, or to inadequate effort.
8. Applying strategy training to the classroom setting.
9. Active involvement in the acquisition and transfer process.
10. Believing in the value of strategy acquisition and application.
Teachers presented an attributional framework and efficacious environment via provision of:

1. Positive, credible expectations for students: "I know you’ll learn this." (Brophy, 1983)

2. Judicious social comparative information: "See how well Laura is doing? I’m sure that you can do just as well." (Schunk, 1989)

3. Discussions regarding beliefs about the causes of failure: "The problem was that I did not try to use the self-instruction steps." (Borkowski, Weyhing, & Turner, 1986)

4. Performance feedback emphasizing performance outcomes and patterns: "That’s correct... you’re doing much better." (Schunk, 1984)

5. Ability attributional feedback for prior achievement: "You’re good at this." (Schunk, 1983)

6. Effort feedback for prior achievement: "You’ve been working hard." (Schunk, 1983)

7. Deemphasizing effort feedback for future achievement: "You need to work hard." (Schunk, 1982)

8. Modeling of internal success attributions: "I tried hard and used the self-instruction steps. It is the most important reason because I have control over myself." (Borkowski, Weyhing, &
9. Stress upon sustained effort in incorporating a strategy: "To use a strategy requires effort. We must try hard to use a strategy or we won't remember what it is we are trying to remember."

10. Response sets encouraging generalization from the training setting to the classroom: "I would like you to use the self-instruction steps on your math test today, and describe the experience to the group tomorrow."

11. Strategy value statements: "As you learn the self-instruction strategy, you will find that you can attend to your work more easily and complete more work accurately than before."

(Brown, Bransford, Ferrara, & Campione, 1983)


14. Presenting conditional knowledge regarding strategy value: "You will find that the self-instruction steps will work more effectively with certain classroom assignments; for example, ..." (Paris, Lipson, & Wixson, 1983)
15. Use of stimulus cards pictorially reviewing the self-instruction steps ("STARS") and attributional ideas ("Cool CATSS") as student cues for the training setting and regular classroom (Graybill, 1984).

The acronym "Cool CATSS" represented the device through which teachers conveyed attributional messages and fostered student attributional analyses and shifts. The "Cool CATSS" attribution retraining approach has embedded key attributional notions from the model proposed by Borkowski, Weyhing, and Turner (1986) and other relevant recent research. The "CATSS" sequence generally stresses that the student:

1. "C": Can do—can accomplish the tasks,
2. "A": Ability—has the ability to accomplish the tasks,
3. "T": Try hard—will increase probability of success if he/she will try hard,
4. "S": Strategy—will increase probability of success with accurate strategy application, and
5. "S": Success—will achieve and should reward self for success in adhering to strategy steps and belief in the previous tenets can do, ability, and try hard.

Component Attentional Skill Exercises.

Component attentional skill materials and exercises
are based upon those originally employed by Egeland (1974) and later by Brown and Alford (1984) and Wiesner (1986). Brown and Alford (1984) suggested that the criteria established by Douglas (1976) should be considered in selecting materials and tasks: materials should overlap as little as possible with the tests and measures used to assess training effects, be varied and interesting, and facilitate generalization of strategies taught to problems in the visual, auditory, and tactile modes; tasks should be varied and sequentially presented in an ascending order of difficulty. The self-instruction steps proposed by Meichenbaum and Goodman (1969, 1971) were presented as a systematic means of training children to implement a cognitively directed task-analytic approach with resultant effective selection and deployment of visual scanning and detailing skills on attentional skill tasks.

The component attentional skill exercises and sequence as presented by Wiesner (1986) were replicated, but modified and compressed in order to lend clarity to the differential impact of attribution retraining and session modifications upon treatment effectiveness:

1. Match-to-sample tasks using geometric designs first with two alternative and then three alternative choices. The designs become progressively more complex during
succeeding sessions. The sample and choice alternatives were always available to the students while they recorded their answers.

2. Match-to-sample tasks using single letters and numbers circumscribed by geometric designs fading to numbers and letters alone and becoming successively more complex. Selected alternatives omit a letter or number; students were directed to identify and fill in the omitted letter or number.

3. Match-to-sample tasks using simple reading and math problems. Math problems were initially presented in completed form; as complexity increases, answers were not provided and students were required to complete each problem.

4. Match-to-sample memory tasks sequentially presenting simple geometric designs, letters and numbers, and simple math problems and words. Samples were presented to the students for ten seconds and removed; students were asked to identify the correct alternative. Students will be asked to calculate and record answers on increasingly difficult math problems.

5. Memory tasks sequentially presenting simple geometric designs, letters and numbers, and simple math problems and sentences. Samples
were presented to the students for ten seconds and removed; students were asked to reproduce the sample on paper.

**General Training Schedule.**

Training sessions in the treatment conditions occurred five days per week, approximately thirty minutes per session in the SCLD classroom. The final session of each week in the primary treatment condition ("Cool CATSS" are "STARS") served as an attribution-oriented group processing experience regarding application of the attributional ideas and cognitive self-instruction strategy. In the primary treatment condition, attribution retraining procedures were applied systematically throughout Phase 1 Component Attentional Skill exercises, Phase 2 Transition tasks, and Phase 3 Standard Curricular Materials; in both treatment conditions, cognitive self-instruction procedures were systematically applied. Assessments of cognitive self-instruction knowledge and application were regularly scheduled and completed. Teachers in the treatment and control conditions participated in procedural instruction as defined in **Teacher Training** (see Appendices for **Teacher Training Procedures**).
Teacher Training Procedures

Primary Treatment Condition ("Cool CATSS" are "STARS").

A three session group training module was presented by the researcher to teachers. Session length was approximately one to one and one half hours. Incorporation of a significant and positive prospective outcome was consistent with the attributional and efficacious orientation of the study. Teacher capability in applying training skills competently, adhering to instructional parameters, and assisting children in developing identified strategy skills were stressed. Teachers were encouraged to ask questions and request individual support as needed (see Appendices for a complete description of procedures in Teacher Training Procedures).

Session 1.

With an orientation toward the child with learning disabilities, Session 1 addressed the following issues and needs: (a) treatment rationale, (b) the "STARS" acronym and strategy, (c) treatment design, (d) expected difficulties and questions, (e) presentation of treatment guidebooks, (f) approximate pretesting schedule, (g) distribution of related articles, and (h) completion of Characteristics of Teachers data sheet.
Session 2.

The following areas were addressed: (a) discussion of cognitive self-instruction theory and practice, (b) discussion of component attentional training, (c) review of the "STARS" acronym and strategy, (d) discussion and researcher modeling of the "STARS" strategy teaching method, (e) introduction and discussion of "Cool CATSS" are "STARS" posters and cue cards, and (f) discussion of attribution theory, attribution retraining, locus of control, and metacognition.

Session 3.

The following areas were addressed: (a) review of the "STARS" strategy, (b) discussion and researcher modeling of the "STARS" strategy, (c) teacher demonstration of the "STARS" strategy with corrective feedback, (d) review of attributional theory and attribution retraining, (e) review of "Cool CATSS" acronym, process, ideas, and visual aids, (f) discussion of the integration of the "STARS" strategy and "Cool CATSS" process and ideas with controlled materials in Phase 1, transition materials in Phase 2, and standard curricular materials in Phase 3, (g) selected teachers adaptation of the "STARS" strategy in completing sample component attentional tasks with researcher modeling of attributional statements, (h) researcher provision of sample classroom scenarios and request for teacher
attributional statements, (i) teacher adaptation of the "STARS" strategy in completing sample component attentional tasks before the group with teachers presenting attributional statements, (j) teachers presentation of sample instructional items from activity pages, providing "STARS" strategy cues and "Cool CATSS" attributional statements, and receiving clarifying feedback, (k) review of group processing session intent and content and simulation of group processing session, (l) review of 'weekly' assessment procedures and use of Weekly Strategy Assessments and Direct Instructions Activities forms, (m) review of probe sheet use and implementation, (n) review and discussion of general procedures, (o) individual teacher consultation and completion of Completion of Training Teacher Observation Form, Primary Treatment, and (p) description to teachers of random monitoring to be conducted to assure application accuracy.

Secondary Treatment Condition ("STARS").

A three session training module was presented by the researcher to teachers. Session length was approximately one to one and one half hours. Teacher capability in applying training skills competently, adhering to instructional parameters, and assisting children in developing identified strategy skills were stressed. Teachers were encouraged to ask questions and request...
individual support as needed.

Session 1.
Session 1 presented an overview similar to that for the primary treatment group with omission of attributional references.

Session 2.
The following areas were addressed: (a) discussion of cognitive self-instruction theory and practice, (b) discussion of component attentional training, (c) review of the "STARS" acronym and strategy, (d) introduction and discussion of "STARS" posters and cue cards, and (e) discussion and researcher modeling of "STARS" strategy teaching method on sample component attentional tasks.

Session 3.
The following areas were addressed: (a) review of "STARS" strategy, (b) discussion and researcher modeling of "STARS" strategy on sample component attentional tasks, (c) teacher demonstration of "STARS" strategy on sample component attentional items with researcher provision of corrective and clarifying observations and discussion, (d) discussion of the "STARS" strategy with transition materials in Phase 2 and standard curricular materials in Phase 3, (e) review of 'weekly' assessment procedures and use of Weekly Strategy Assessments and Direct Instruction Activities forms, (f) review and discussion of general procedures, (g) individual teacher
consultation and completion of **Completion of Training Teacher Observation Form, Primary Treatment**, and (h) description to teachers of random monitoring to be conducted to assure application accuracy.

**Teacher Training Observations.**

The researcher completed a **Completion of Teacher Training Observation Form, Primary Treatment** and **Completion of Teacher Training Observation Form, Secondary Treatment** for each teacher in the appropriate treatment conditions (see Appendices). Responses to training were favorable and knowledge and practical areas pinpointed in the training module and on the respective forms were successfully mastered in the judgment of the researcher.

The researcher and research assistant completed a sequence of **Post-Training Teacher Observation Form, Primary Treatment** and **Post-Training Teacher Observation Form, Secondary Treatment** checksheets for each teacher in the appropriate treatment conditions totaling two observation hours. The researcher and research assistant alternated observations: the researcher completed approximately two-thirds of the primary and one-third of the secondary treatment observations and the research assistant approximately two-thirds of the secondary and one-third of the primary treatment observations (by minutes). Teachers generally adhered satisfactorily to
treatment approaches as described in the observation forms (to the 90% level) and assistance and clarification were provided on an as needed basis to assure consistent and competent procedural administration. An informal record or summary of each observed session was maintained in addition to each observation form.

**Control Condition.**

Teachers involved in the control group met with the researcher for two scheduled sessions: the first addressing the value of their participation in the study and practical issues such as student pretesting and posttesting, administration of probe sheets, duration of the study, researcher/assistant random observations, and encouragement to provide educational services in force in current IEP's; the second serving a debriefing and discussion function. Periodic as needed consultation was provided to clarify probe sheet assessment procedures.
Instrumentation

The following instruments were used in this study as pretest and posttest measures: the Children’s Nowicki-Strickland Internal-External control scale (N-SLOC), the Woodcock-Johnson Tests of Achievement (WJTA) from the Woodcock-Johnson Psycho-Educational Battery (WJPEB), the Matching Familiar Figures Test (MFFT), the Visual-Aural Digit Span Test (VADS), and the Burks’ Behavior Rating Scales (BBRS).

The Children’s Nowicki-Strickland Internal-External control scale (N-SLOC)

The Children’s Nowicki-Strickland Internal-External control scale (N-SLOC) was constructed by Nowicki and Strickland (1973) and designed to measure and assess a child’s beliefs in personal internal-external dimensions of locus of control (LOC). The scale is based on Rotter’s (1966) internal-external locus of control of reinforcement dimensions and assessment focus is upon attitudes regarding affiliation, achievement, and dependency. Rotter suggests that an internal LOC reveals a perception of personal responsibility for the consequences of one’s own actions and that related events are under one’s personal control; conversely, an external LOC reveals a perception that events and resultant consequences are determined by factors such as luck, fate, chance, or influential others outside of one’s
personal control. Nowicki and Strickland suggest that "the development of a belief of behavior-reinforcement contingencies is likely a particularly important influence as a growing child learns appropriate social and personal behavior." The N-LSOC consists of 40 forced-choice questions describing various reinforcement situations across interpersonal and motivational areas. The child is asked to evaluate each situation positively or negatively by answering yes or no; a low score on the scale indicates an internal LOC and a high score, an external LOC.

Reliability.

Nowicki and Strickland (1973) report test-retest reliabilities (6 weeks apart) of between .63 and .71 for three grade levels and estimates of internal consistency via a Spearman-Brown corrected split-half method of $r= .63$ through $r= .81$ for grades three through twelve. Halpin and Ottinger (1983) indicate in a replication of Gorsuch, Henighan and Barnard (1972) that reliability estimates may be related to verbal ability, but that such relationships may not be generalizable across grades.

Validity.

Construct validity as assessed by the relationship of the N-SLOC to three other measures of LOC was found to be significant, i.e. on the Intellectual Achievement Responsibility scale an $r$ of .31 and .51 respectively was
found on the I+ scores for black third- and seventh-grade students. Nowicki and Roundtree (1971) found significant relationships between internal LOC and higher grade point averages for secondary and college students. Roberts (1971) identified significant relationships between internal LOC and reading achievement for seventh-grade students; however, no significant relationship was identified for third-grade students. Internals and a self-initiated cue group performed with greater accuracy than externals and subjects for whom verbal cues were supplied on a visual recognition task (Ludwigsen and Rollins, 1971). Omizo, Omizo and Michael (1987) report significant correlations ranging from $r=-.21$ and $-.57$ between scores on the N-SLOC and four of six dimensions assessed on the Locus of Control for Three Achievement Domains (LOCITAD).

**Target population.**

The N-SLOC has been administered to a variety of student groups including behavior disordered (Langsner, et al, 1987), epileptics (Correa, 1987), cerebral palsied (Center & Ward, 1986), and learning disabled (Loper & Reeve, 1983; Omizo, Cubberly, & Longano, 1984; Omizo, Cubberly, & Omizo, 1985).

**The Woodcock-Johnson Psycho-Educational Battery**

The Woodcock-Johnson Psycho-Educational Battery as developed by Woodcock and Johnson (1977) provides a
comprehensive diagnostic assessment instrument that addresses a broad range of content areas and age ranges. The battery assesses three domains: cognitive abilities, scholastic achievement, and an interest inventory. The test is based on 27 individual subtests and the recommended unit of interpretation is the 18 available cluster scores. Comparisons of percentiles, profile analysis of clusters, achievement-aptitude profiles, and instructional ranges are among the various methods recommended for cluster interpretation. The Woodcock-Johnson Tests of Achievement (WJTA) provides scores in the following areas: Reading (letter-word recognition, word attack, and passage comprehension), Mathematics (calculation and applied problems), Written Language (dictation and proofing), and Knowledge (science, social studies, and humanities). The Written Language section assesses skills in spelling, grammatical usage, and punctuation and capitalization as components of the dictation and proofing subtests. For the purposes of this study, the Reading, Mathematics, and Written Language sections only will be administered for pretest and posttest measures.

Reliability.

Woodcock and Johnson (1977) report split-half reliability coefficients for the cluster scores generally exceeding .85. Test-retest reliabilities on achievement
clusters were typically within the .80 to .95 range.

Validity.

Concurrent validity of .72 and above was reported by Woodcock (1977) for a severely learning disabled sample. Hall, Reeve, and Zakreski (1984) found concurrent validity coefficients between WJTA and corresponding Wide Range Achievement Test and Peabody Individual Achievement Test subtests ranging between .64 and .93 for samples of students of elementary age with learning disabilities. Coefficients reported by Hall et al. equaled or exceeded those reported by Woodcock for the severely learning disabled sample; further, the authors addressed convergent and discriminant validity and found the WJTA technically adequate regarding concurrent validity. Beden, Rohr, & Ellsworth (1987) investigated the concurrent validity of the achievement sections of the Woodcock-Johnson Psycho-Educational Battery with four other traditionally used achievement tests (Key Math, Brigance Inventory of Basic Skills, Peabody Individual Achievement Test, and Wide Range Achievement Test). In assessing the degree of agreement between Learning Disabilities placement decisions based in the first condition upon standard instruments and in the second condition upon the Woodcock-Johnson, a chi square test indicated statistically significant agreement ($x^2=8.58, p < .05$) between the two conditions for
placement purposes. In a rank ordering of cluster means for learning disabled and regular placement students, Bracken, Prasse, and Breen (1984) found the Mathematics, Reading, and Written Language scores of the WJTA to fall at the end of the rank orders, a finding which indicates that the three academic subtests were the most difficult for the learning disabled children.

**Target population.**

The WJTA has been administered to a range of student samples including learning disabled (Beden, Rohr, & Ellsworth, 1987; Hall, Reeve, & Zakreski, 1984; Wiesner, 1986; Woodcock, 1977; Ysseldyke, Algozine, Shin, & McGue, 1982;), educable retarded (Sanville & Cummings, 1981), and black preschool children (Kuznik-Arffa, Rider, & Cummings, 1982).

**The Visual-Aural Digit Span Test**

The Visual-Aural Digit Span Test (VADS) as developed by Köppitz (1977) was designed as a diagnostic tool with stress upon the assumed relationship between children's reading, spelling, and mathematics achievement and their functioning in intersensory integration and recall. Building upon the work of Rudel and Teuber (1971), Murray and Roberts (1968), and Lindner and Fillmer (1970), in which memory span and integration were assessed across modalities, Köppitz determined that preliminary efforts to access these areas were crudely related to and
necessarily ineffective as predictors of school achievement. Koppitz reasoned that letters as the ideal form for assessing integration, sequencing, and recall as pertinent to reading and spelling skills was valid; however, the strong emotional associations of letters for children with learning problems and the tendency of children to attempt to attach meaning to letters contraindicated their adaptation for this instrument. Digits were selected as stimuli due to the ease in which numbers are learned by school-age children (9 digits versus 26 letters) and the lessened anxiety-invoking associations in school performance. The VADS consists of four subtests: Aural-Oral, Aural-Written, Visual-Oral, and Visual-Written. The subtests are presented in the order in which children typically acquire the requisite skills. Within each subtest, children are asked to recall a maximum of seven digits per the work of Simon (1974) and Spitz (1972). There are two methods of evaluating scores: first, scores are compared against normative test scores for children of the same age or grade level; second, analysis of the test score pattern is effected by examining the internal consistency of the scores and comparing the various scores. The VADS yields four individual subtest scores, one total score, and six combination scores, the latter an admixture of individual subtest scores which are judged to have a higher
correlation with school achievement than the four individual subtest scores. The VADS combination areas are: Aural Input, Visual Input, Oral Expression, Written Expression, Intersensory Integration, and Intrasensory Integration.

**Reliability.**

Koppitz (1977) reports test-retest reliability using Pearson product moment coefficients for two groups of school-age children described as possessing learning and behavioral problems as ranging between .72 and .92. Carr (1974) identified six of the VADS test measures as significantly related to the Total VADS Test and to the Oral Expression, Written Expression, and Intersensory Integration scores. The degree of interrelatedness depended largely upon the mode in which the digit sequences were presented; when the mode of input differed, the correlation between measures was low.

**Validity.**

Koppitz (1973) reports Chi-square values ranging from 4.14 to 12.66 at levels of significance ranging from .05 to kindergarten students administered the VADS and Comprehensive Test of Basic Skills and again administered the battery as third-grade students. Hurd (1971) found significant differences at the .05 level between high and low achieving middle-class students on eight of the individual subtest and combination scores. The VADS was
found to effectively discriminate between a group of pupils with learning disabilities and average pupils matched for age, sex, and IQ levels with Chi-square values ranging from 8.9 to 22.7 at levels of significance ranging from .01 to .001.

Target population.

The VADS has been administered to a range of student samples including learning disabled (Baldwin, 1976; Koppitz, 1973), rural elementary (Bridgeman & Buttram, 1975), kindergarten and third-grade (Koppitz, 1973), second-grade (Witkin, 1971), and low socioeconomic, rural (Shumar, 1976).

The Matching Familiar Figures Test

The Matching Familiar Figures Test (MFFT) was developed by Kagan and his associates (Kagan, Rosman, Day, Albert, & Phillips, 1964) to assess conceptual tempo as dichotomized by reflective and impulsive response patterns. Impulsivity is viewed as a cognitive response style typified by quick, inaccurate responding and reflectivity as a slow/moderated and accurate response style. Kagan and associates reasoned that children with inefficient visual search and scanning patterns would perform less adequately on learning tasks than those with efficient patterns; impulsive children were theorized to possess less efficient and reflective children more efficient patterns. The MFFT consists of a series of
match-to-sample tasks in which a single picture of a familiar object is displayed; the child is then provided variants of the original stimulus picture and instructed to identify that variant which is identical to the original. Variants presented differ considerably in match to the original and multiple attempts to isolate the identical picture are permitted. Errors and response latency (speed) to first response are recorded; errors and latency are averaged over the total test and error and latency scores are received. Scores above the median error score and below the median latency score are characterized as impulsive; those below the median error score and above the median latency score are identified as reflective.

Reliability.

Alternate-form reliabilities of .91 for latencies and .89 for errors and test-retest reliabilities of .85 for latencies and .77 for errors were identified by Cairns and Cammock (1978). Egeland and Weinberg (1976) compared the MFFT favorably with other measures of cognitive style on measures of reliability.

Validity.

Egeland et al. (1976) trained second-grade students with learning disabilities in visual information-processing skills; significant improvements in reading and on visual processing tasks were noted compared to
controls, and training effects generalized to latency but not error scores. Application of a cognitive-behavioral modification program by Robertson and Keeley (1978) with first- and second-grade impulsive children resulted in improvement on error scores and academic achievement but not on latency scores. Myers and Cohen (1982) implemented a set of four procedures using mathematics problems as training materials with teacher-referred poorly controlled third- and fourth-grade students with the MFFT and other instruments identified as dependent measures; gains were found on the MFFT and spelling, general information, and total test scores on the Peabody Individual Achievement Test. The MFFT score differentiated Attention Deficit Disorder (ADD) boys between ages six and twelve from Specific Learning Disabled (SLD) boys and ADD subjects from a normal control group while ADD boys made significantly more errors than both SLD and normal controls: however, Kuehne et al. (1987) report no significant difference between the SLD and normal control group. Brown and Alford (1984) adapted criteria established by Douglas (1976) in developing a cognitive behavior modification program of materials and exercises designed to train 20 children placed in SCLD programs to selectively and accurately attend to and process visually presented information; gains were reported on the reading subtest of the Wide
Range Achievement Test and on both the latency and error scores of the MFFT. In adapting Brown and Alford's procedures to a larger group of SCLD children (N=36), Wiesner (1986) found a cognitive behavior modification package stressing visual attention and processing to result in gains in reading and mathematics on the Woodcock-Johnson Psycho-Educational Battery, but not in written language, and significant improvement on latency but not error scores on the MFFT.

**Target population.**

The MFFT has been administered to a range of student samples including learning disabled (Brown & Alford, 1984; Epstein, Hallahan, & Kauffman, 1975; Quay & Brown, 1980; Wiesner, 1986), retarded adolescents (Jackson & Haines, 1983; Lin, 1983), behavior disordered/emotionally disturbed (Finch, 1982), hearing impaired (Anderson, 1983), and hyperactive (Brown & Wynne, 1983).

**The Burks' Behavior Rating Scales**

The Burks' Behavior Rating Scales (BBRS) was developed by Burks (1968) as a means of screening children for specific problems or more pervasive patterns of problems. Burks reports factor analysis of scores to reflect variant behavior patterns across and within normal and exceptional populations. There are 19 category scores identified from a pool of 110 items which describe behaviors infrequently observed in the normal
school-age population. Category scores are based upon the sum of scores of the category item pool with item scores ranked from one (behavior not noticed at all) sequentially to five (behavior noticed to a very large degree). Category scores are then recorded on a profile sheet displaying a three-tiered continuum of functioning: not significant, significant, and very significant. Of the 19 categories, the descriptors 'poor impulse control', 'poor attention', and 'poor academics' were identified as focal behaviors consistent with the tenets of the cognitive self-instruction model and stated hypotheses; the descriptors 'poor ego strength' and 'excessive dependency' were identified as focal behaviors given the orientation of attribution retraining and locus of control and related hypotheses. Assessment was based upon raw scores, not the more arbitrary three-tiered continuum of functioning previously described.

Reliability.

BBRS item/item retest correlation coefficients ranged between .60 and .83 for a group of 95 exceptional first- to sixth-grade children rated and rerated 10 days apart (Burks, 1970).

Validity.

Burks cites support for contrasted-group validity in a study conducted with primary-age children: primary-age children referred for guidance assistance were
assigned significantly higher category ratings than a regular classroom cross sample. A chi-square of 36.99 (.001 level of significance) was determined for the category 'poor physical strength'; this category represented that which least differentiated between the two groups, highlighting by implication the significance of the differences on the remaining categories. Content validity is established by Burks as existing via the developmental process of instrument design: 22 qualified School Psychologists and over 200 special needs and regular classroom teachers judged content validity and usefulness. Test items were selected from clinical observations of children and documented evidence in the literature. Construct validity is documented in a study by Burks (1970) in which the majority of children rated by teachers as possessing the least and most inner disturbance on an attitude survey were correctly identified by their BBRS scores.

**Target population.**

The BBRS has been administered to a range of student samples including 7-12 year old learning disabled (Graybill, 1984), educable mentally retarded, emotionally disturbed/learning disabled, orthopedically handicapped, and speech and hearing handicapped (Report submitted to California State Department of Education, 1968-1969), and behaviorally disruptive kindergarten boys (Williams,
Probe Sheets

Teacher-administered probe sheets in reading, mathematics, and written language were selected from A Resource Manual for the Development and Evaluation of Special Programs for Exceptional Students. Techniques of Precision Teaching (Hefferan, 1983) compiled by the Bureau of Education for Exceptional Students for the State of Florida. The precision teaching and assessment concept was designed to assist teachers in pinpointing skill deficiencies, objectifying skill measurement, and designing interventions. There are no standardization norms; scoring was based upon percent correct in a two-minute time span.

Probe sheets consist of a variable number of selected skill relevant items or tasks at specific grade levels. Reading and mathematics skills are arranged in strands and from less to more difficult within each strand. For the purposes of this study, word recognition in reading and addition and multiplication in mathematics were selected; alphabetizing was adapted from the study skills strand of the reading area as a written language assessment.

Selection of probe sheets necessarily varied between subjects given the wide range of academic skill. The researcher met individually with each teacher
approximately two weeks prior to the implementation of probe sheet assessments. At that time, the researcher and teacher reviewed the probe sheets in the specified skill areas and based upon teacher estimate selected a sheet judged to predict an approximate 50% failure rate; two additional sheets were selected, one each at levels above and below the estimated level. These supplementary sheets were administered when the initially selected sheet did not adequately approximate the desired 50% failure rate. Those sheets used in each skill area as the final indicator of skill level were again administered at the conclusion of the study.

Addition and multiplication were both included in the mathematics assessment due to the failure of the upper-level addition sheets to adequately approximate a 50% failure level in select students; multiplication sheets were substituted in these instances.
Research Design

The Nonequivalent Control-Group Design with pretest and posttest for both treatment and control groups and nonrandom assignment of subjects to groups was used in this study. Naturally intact self-contained learning disabled groups were identified for inclusion with no randomization of individual subjects possible. To examine equality between groups, pretests were used to assess group differences (pretest means for each variable compared); additionally, pretest comparison of treatment and control groups on mean age and IQ further addressed the potential effects of selection-maturation. Control for regression and instrumentation effects was achieved through instrument variety, and local history through similarity of instruction in the SCLD settings.

The following diagram illustrates the nonequivalent control-group design proposed for this study:

\[
\begin{align*}
0 & \quad X(1) & 0 \\
0 & \quad X(2) & 0 \\
0 & \quad 0 & 0
\end{align*}
\]

0 = pretest/posttest measures of the dependent variables

X(1) = primary treatment

X(2) = secondary treatment
Specific Null Hypotheses

HO1: There is no significant difference in the measurement on the Woodcock-Johnson Tests of Achievement of achievement levels of students between the primary treatment group and the secondary treatment or control groups.

HO2: There is no significant difference in the measurement on probe sheets of achievement levels of students between the primary treatment group and the secondary treatment or control groups.

HO3: There is no significant difference in the measurement on the Burks' Behavior Rating Scales of cognitive-behavioral outcomes of students between the primary treatment group and the secondary treatment or control groups.

HO4: There is no significant difference in the measurement on the Children's Nowicki-Strickland Internal-External control scale of internal locus of control of students between the primary treatment group and the secondary treatment or control groups.

HO5: There is no significant difference in the measurement on the Matching Familiar Figures Test of reflective versus impulsive attention skill of students between the primary treatment group and the secondary treatment or control groups.

HO6: There is no significant difference in the
global measurement on the Visual-Aural Digit Span Test of memory/attention skill of students between the primary treatment group and the secondary treatment or control groups.
Data Analysis Techniques

The suggestion of Borg and Gall (1983) that analysis of covariance (ANCOVA) is a data analysis method of choice for nonequivalent control-group designs (after assurance of assumptions underlying analysis of covariance) was adhered to in this study. Analysis of covariance accounted for the difference in groups due to a lack of randomization through compensatory adjustments of posttest means of the two groups. Post hoc analysis of variables revealed as significantly changed on analysis of covariance consisted of Least Square Means (LSM) via the Linear Models Procedure. The .05 level of confidence, unless otherwise noted, was applied for acceptance or rejection of the six hypotheses and other related inquiries.
Summary of Methodology

The population consisted of 77 elementary-age children identified as severely learning disabled and placed with adherence to federal, state, and local guidelines in nine self-contained learning disabilities (SCLD) classes in six elementary schools in a Virginia locality serving 150,000 residents and a school population of 29,000 students. Each student received between three and six hours of daily instruction in the SCLD setting. Student chronological age ranged from 10 to 13 years; grade placement was fourth through sixth.

Teachers in the treatment conditions participated in three training sessions; those in the control condition met for two sessions. Observation and assessment in the treatment conditions of pertinent teacher skills and knowledge were regularly conducted by the researcher and assistant.

Students in the primary treatment condition, entitled "Cool CATSS" are "STARS", an acronym reflecting the integration of attributional themes and cognitive self-instruction methods, and in the secondary treatment condition, entitled "STARS", an acronym reflecting the incorporation of cognitive self-instruction methods alone, received approximately 30 minutes of daily training and/or instruction for a total of 10 weeks. The primary treatment group participated
in a 'group processing' session every Friday in lieu of instruction. The procedure was divided into three sequential phases whereby attributional retraining and cognitive self-instruction methods (primary treatment) or cognitive self-instruction methods alone (secondary) were continually employed: Phase 1—Controlled Instruction incorporating component attentional training; Phase 2—Transition enhancing the ease of shift from controlled to direct instruction materials; Phase 3—Direct Instruction comprising standard curricular materials. Teachers in the treatment conditions regularly assessed student competence in strategy conceptualization, recall, and application.

Students were administered a pretest and posttest battery by state certified School Psychologists consisting of the following instruments and assessment functions: a) Children's Nowicki-Strickland Internal-External locus of control scale—internal versus external locus of control; b) Woodcock-Johnson Tests of Achievement from the Woodcock-Johnson Psycho-Educational Battery—Reading, Mathematics, and Written Language skills; c) Matching Familiar Figures Test—impulsivity versus reflectivity; d) Visual-Aural Digit Span Test—general memory and attention; and e) Burks' Behavior Rating Scales—cognitive-behavioral trends. SCLD teachers administered probe sheets in Reading (word
Recognition), Mathematics (addition or multiplication), and Written Language (alphabetizing) after cooperative teacher and researcher probe sheet review and selection during the Transition phase and upon conclusion of the Direct Instruction phase.

Covariance analysis (ANCOVA) was selected as the statistical technique given pretest differences between groups; post hoc Least Squares Means (LSM) analysis was conducted on variables determined as significantly changed on covariance analysis. The .05 level of confidence was applied, unless otherwise noted.

The proposal for this study was reviewed and approved by the dissertation chairman and committee members, the Human Subjects Research committee at the College of William and Mary, and the Director of Research, Testing, and Student Activities with the Chesapeake Public Schools. Parental consent was attained for all students after procedures and content were explained and participation agreed to by each student (see Appendices for Parent Consent Forms); students and parents were guaranteed the right to decline to participate or to withdraw at any time without penalty, and confidentiality of data was assured.
CHAPTER 4

Analysis of Results

Introduction

There were 15 variables assessed for each of the 77 subjects in this study. The 15 variables on which test scores were obtained are:

1. Cluster scores in reading, mathematics, and written language from the Woodcock-Johnson Tests of Achievement (3).

2. Percent scores in reading (word recognition), mathematics (addition or multiplication), and written language (alphabetizing) from teacher administered probe sheets (3).

3. Total raw scores in 'poor impulse control', 'poor attention', 'poor academics', 'poor ego strength', and 'excessive dependency' from the Burks' Behavior Rating Scales (5).

4. Internal locus of control raw scores from the Children's Nowicki-Strickland Internal-External control scale (1).

5. Latency and error scores from the Matching Familiar Figures Test (2).

6. Total raw scores from the Visual-Aural Digit Span Test (1).
- Univariate statistics revealed no significant preexistent group differences for age, IQ, or gender (see Tables 4.1 and 4.2). Pretest group comparisons revealed statistically significant differences on 2 of 15 dependent variables (see Table 4.3). Pretest and posttest descriptive statistics for dependent variables were calculated for the entire sample (N=77) (see Table 4.4) and for groups (see Tables 4.5 through 4.10). To approximate equality between these naturally intact groups where randomization of subject to group placement was untenable, analysis of covariance (ANCOVA) was conducted on each variable as a means of correcting for pretest differences on dependent variables between groups via compensatory adjustments of posttest means of the groups; post hoc analysis through the general linear models procedure via least squares means (LSM) with adjusted posttest means was conducted on variables found significant in analysis of covariance (see Tables 4.11 through 4.16).

There are six hypotheses that will be separately considered in the analysis of results. Analysis of covariance and post hoc least squares means are the statistical procedures that will be cited for hypothesis discussion purposes. The .05 level of confidence, unless otherwise noted, was applied for acceptance or rejection of hypotheses.
Hypothesis One

The first hypothesis states that there would be a significant difference in the measured improvement of reading, mathematics, and written language skills on the Woodcock-Johnson Tests of Achievement for elementary-age children with learning disabilities served in self-contained learning disabilities programs who completed an integrated attributional retraining-cognitive self-instruction program (primary treatment) versus those exposed to a cognitive self-instruction procedure alone (secondary treatment) or to a control condition.

The analysis of covariance in Table 4.11 revealed a finding of significant change in reading skills on the Woodcock-Johnson Tests of Achievement, $F(3, 73) = 3.34$, $p < .05$. No significant change was revealed for either mathematics or written language.

Post hoc least squares means analysis of reading skills with adjusted posttest means (see Table 4.11a) revealed significantly greater growth in reading skill improvement in the primary versus secondary treatment condition ($p = 0.0118$). There was no significant difference in reading skills improvement between the primary treatment and control conditions, or between the secondary treatment and control conditions.
Hypothesis Two

The second hypothesis states that there would be a significant difference in the measured improvement of reading (word recognition), mathematics (addition or multiplication), and written language (alphabetizing) skills on teacher-administered probe sheets for elementary-age children with learning disabilities served in self-contained learning disabilities programs who completed an integrated attributional retraining-cognitive self-instruction program (primary treatment) versus those exposed to a cognitive self-instruction procedure alone (secondary treatment) or to a control condition.

The analysis of covariance in Table 4.12 reveals a finding of significant change in mathematics skills on teacher-administered probe sheets, $F(3, 73) = 5.53$, $p < .01$. No significant improvement was revealed in either reading or written language.

Post hoc least squares means analysis of mathematics skills with adjusted posttest means (see Table 4.12a) revealed significantly greater growth in mathematics skill improvement in the primary versus secondary treatment ($p = 0.0207$) and control conditions ($p = 0.0020$). There was no significant difference in mathematics skills improvement between the secondary treatment and control conditions.
**Hypothesis Three**

The third hypothesis states that there would be a significant difference in the measured improvement of cognitive-behavioral outcomes on the Burks' Behavior Rating Scales for elementary-age children with learning disabilities served in self-contained learning disabilities programs who completed an integrated attributional retraining-cognitive self-instruction program (primary treatment) versus those exposed to a cognitive self-instruction procedure alone (secondary treatment) or to a control condition.

The analysis of covariance in Table 4.13 reveals a finding of significant change on each of the cognitive-behavioral dependent variables on the Burks' Behavior Rating Scales: poor attention, $F(3, 73) = 5.73, p < .01$; poor academics, $F(3, 73) = 8.45, p < .01$; poor impulse control, $F(3, 73) = 3.36, p < .05$; poor ego strength, $F(3, 73) = 8.10, p < .01$; and excessive dependency, $F(3, 73) = 6.08, p < .05$.

Post hoc least squares means analysis of 'poor attention' with adjusted posttest means (see Table 4.13a) revealed significantly greater desired reduction in poor attention in the primary versus secondary treatment ($p = 0.0014$) and control conditions ($p = 0.0308$). There was no significant difference in reduction in poor attention between the secondary treatment and control conditions.
Post hoc least squares means analysis of 'poor ego strength' with adjusted posttest means (see Table 4.13a) revealed significantly greater desired reduction in poor ego strength in the primary versus secondary treatment \( (p = 0.0006) \) and control conditions \( (p = 0.0015) \). There was no significant difference in reduction in poor ego strength between the secondary treatment and control conditions.

Post hoc least squares means analysis of 'excessive dependency' with adjusted posttest means (see Table 4.13a) revealed significantly greater desired reduction in excessive dependency in the primary versus secondary treatment \( (p = 0.0009) \) and control conditions \( (p = 0.0441) \). There was no significant difference in reduction in excessive dependency between the secondary treatment and control conditions.

Post hoc least squares means analysis of 'poor academics' with adjusted posttest means (see Table 4.13a) revealed significantly greater desired reduction in poor academics in the primary versus secondary treatment condition \( (p = 0.0001) \) and in the control versus secondary treatment condition \( (p = 0.0085) \). There was no significant difference between the primary treatment and control conditions.

Post hoc least squares means analysis of 'poor
impulse control' with adjusted posttest means (see Table 4.13a) revealed significantly greater desired reduction in poor impulse control in the primary versus secondary treatment condition ($p = 0.0091$). There was no significant difference between the primary treatment and control conditions, or between the secondary treatment and control conditions.
Hypothesis Four

The fourth hypothesis states that there would be a significant difference in the measurement of internal locus of control on the Children's Nowicki-Strickland Internal-External control scale for elementary-age children with learning disabilities served in self-contained learning disabilities programs who completed an integrated attributional retraining-cognitive self-instruction program (primary treatment) versus those exposed to a cognitive self-instruction procedure alone (secondary treatment) or to a control condition.

The analysis of covariance in Table 4.14 reveals a finding of no significant difference in the desired trend toward internal locus of control on the Children's Nowicki-Strickland Internal-External control scale. It is worthy to note that while the differences are not significant, only the two treatment groups moved in a more internal direction, the control group remaining stable (see Table 4.8).
Hypothesis Five

The fifth hypothesis states that there would be a significant difference in the measurement of latency rates and error scores as a reflection of attentional skills on the Matching Familiar Figures Test for elementary-age children with learning disabilities served in self-contained learning disabilities programs who completed an integrated attributional retraining-cognitive self-instruction program (primary treatment) versus those exposed to a cognitive self-instruction procedure alone (secondary treatment) or to a control condition.

The analysis of covariance in Table 4.15 reveals a finding of no significant difference in the desired trend toward higher latency rates (reflecting sustained attention) or lower error scores (reflecting accurate attention) on the Matching Familiar Figures Test. It is notable that latency rate, $F(3, 73) = 3.00, p = .0561$, is near significance, providing a tentative indication of a trend toward a change in attentional style.

Given near significant findings, post hoc least squares means analysis of latency rate with adjusted posttest means (see Table 4.15a) revealed significantly greater desired increase in response latency in the primary versus control condition ($p = 0.0184$). There was no significant difference between the primary and
secondary treatment conditions or between the secondary treatment and control conditions.
Hypothesis Six

The sixth hypothesis states that there would be a significant difference in the global measurement of attention/memory skills on the Visual-Aural Digit Span Test for elementary-age children with learning disabilities served in self-contained learning disabilities programs who completed an integrated attributional retraining-cognitive self-instruction program (primary treatment) versus those exposed to a cognitive self-instruction procedure alone (secondary treatment) or to a control condition.

The analysis of covariance in Table 4.16 reveals a finding of no significant difference in the desired trend toward higher raw scores (reflecting improved global attention/memory) on the Visual-Aural Digit Span Test. There was little change in mean raw scores for any of the three groups (see Table 4.7).
### Table 4.1

**Univariate Statistics for Age and IQ by Group (Age in months; IQ)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age-A</td>
<td>27</td>
<td>143.07</td>
<td>9.94</td>
<td>122-158</td>
</tr>
<tr>
<td>Age-B</td>
<td>25</td>
<td>145.64</td>
<td>8.18</td>
<td>134-162</td>
</tr>
<tr>
<td>Age-C</td>
<td>25</td>
<td>141.88</td>
<td>11.92</td>
<td>123-158</td>
</tr>
<tr>
<td>IQ-A</td>
<td>27</td>
<td>86.93</td>
<td>8.67</td>
<td>70-105</td>
</tr>
<tr>
<td>IQ-B</td>
<td>25</td>
<td>86.08</td>
<td>5.79</td>
<td>76-97</td>
</tr>
<tr>
<td>IQ-C</td>
<td>25</td>
<td>85.60</td>
<td>11.63</td>
<td>69-118</td>
</tr>
</tbody>
</table>

*Group A- Primary treatment
Group B- Secondary treatment
Group C- Control*
Table 4.2

**Group by Gender**

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>20</td>
<td>26.0</td>
</tr>
<tr>
<td>A</td>
<td>2</td>
<td>7</td>
<td>9.1</td>
</tr>
<tr>
<td>B</td>
<td>1</td>
<td>19</td>
<td>24.7</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>6</td>
<td>7.8</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>17</td>
<td>22.1</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>8</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Male=1, Female=2

Group A - Primary treatment
Group B - Secondary treatment
Group C - Control

**Statistics for Table of Group by Gender**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Value</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>0.441</td>
<td>0.802</td>
</tr>
<tr>
<td>Likelihood Ration Chi-Square</td>
<td>0.436</td>
<td>0.804</td>
</tr>
<tr>
<td>Mantel-Haenszel Chi-Square</td>
<td>0.229</td>
<td>0.632</td>
</tr>
</tbody>
</table>
Table 4.3

Pretest Group Comparisons on Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>WJTA-R</td>
<td>2.99</td>
<td>0.0564</td>
<td>(NS)*</td>
</tr>
<tr>
<td>WJTA-M</td>
<td>4.47</td>
<td>0.0148</td>
<td>(S/.05)</td>
</tr>
<tr>
<td>WJTA-WL</td>
<td>2.70</td>
<td>0.0736</td>
<td>(NS)</td>
</tr>
<tr>
<td>PRS-R</td>
<td>1.16</td>
<td>0.3188</td>
<td>(NS)</td>
</tr>
<tr>
<td>PRS-M</td>
<td>2.60</td>
<td>0.0803</td>
<td>(NS)</td>
</tr>
<tr>
<td>PRS-WL</td>
<td>0.11</td>
<td>0.8999</td>
<td>(NS)</td>
</tr>
<tr>
<td>BBRS-1</td>
<td>0.68</td>
<td>0.5122</td>
<td>(NS)</td>
</tr>
<tr>
<td>BBRS-2</td>
<td>4.63</td>
<td>0.0128</td>
<td>(S/.05)</td>
</tr>
<tr>
<td>BBRS-3</td>
<td>0.68</td>
<td>0.5114</td>
<td>(NS)</td>
</tr>
<tr>
<td>BBRS-4</td>
<td>1.19</td>
<td>0.3105</td>
<td>(NS)</td>
</tr>
<tr>
<td>BBRS-5</td>
<td>2.67</td>
<td>0.0759</td>
<td>(NS)</td>
</tr>
<tr>
<td>NSIE-IS</td>
<td>0.38</td>
<td>0.6855</td>
<td>(NS)</td>
</tr>
<tr>
<td>MFFT-L</td>
<td>2.00</td>
<td>0.1423</td>
<td>(NS)</td>
</tr>
<tr>
<td>MFFT-E</td>
<td>0.62</td>
<td>0.5385</td>
<td>(NS)</td>
</tr>
<tr>
<td>VADS-RS</td>
<td>1.89</td>
<td>0.1582</td>
<td>(NS)</td>
</tr>
</tbody>
</table>

*Near significance

(Note on abbreviations: WJTA- Woodcock-Johnson Psycho-Educational Battery, R- reading, M- mathematics, WL- written language; PRS- Probe Sheets, R- reading, M- mathematics, WL- written language; BBRS- Burks’ Behavior Rating Scales, 1- poor attention, 2- poor academics, 3- poor impulse control, 4- poor ego strength, 5- excessive dependency; NSIE- Nowicki-Strickland Internal-External control scale, IS- internal score; MFFT- Matching Familiar Figures Test, L- latency, E- errors; VADS- Visual-Aural Digit Span Test, RS- raw score)
Table 4.4

Pretest and Posttest Descriptive Statistics for Dependent Variables (N=77)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>WJTA-R</td>
<td>469.95</td>
<td>17.23</td>
</tr>
<tr>
<td>WJTA-M</td>
<td>485.10</td>
<td>13.30</td>
</tr>
<tr>
<td>WJTA-WL</td>
<td>480.90</td>
<td>14.18</td>
</tr>
<tr>
<td>PRS-R</td>
<td>64.30</td>
<td>24.49</td>
</tr>
<tr>
<td>PRS-M</td>
<td>44.13</td>
<td>26.44</td>
</tr>
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<td>PRS-WL</td>
<td>68.69</td>
<td>26.86</td>
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<td>4.60</td>
</tr>
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<td>BBRS-2</td>
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<td>BBRS-3</td>
<td>13.78</td>
<td>4.82</td>
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<td>BBRS-4</td>
<td>11.73</td>
<td>4.98</td>
</tr>
<tr>
<td>BBRS-5</td>
<td>10.21</td>
<td>5.38</td>
</tr>
<tr>
<td>NSIE-IS</td>
<td>16.74</td>
<td>4.02</td>
</tr>
<tr>
<td>MFFT-L</td>
<td>11.99</td>
<td>6.97</td>
</tr>
<tr>
<td>MFFT-E</td>
<td>12.00</td>
<td>5.90</td>
</tr>
<tr>
<td>VADS-RS</td>
<td>20.96</td>
<td>2.55</td>
</tr>
</tbody>
</table>

(Note on abbreviations: WJTA- Woodcock-Johnson Psycho-Educational Battery, R-read, M-mathematics, WL-written language; PRS- Probe Sheets, R-read, M-mathematics, WL-written language; BBRS- Burks' Behavior Rating Scales, 1-poor attention, 2-poor academics, 3-poor impulse control, 4-poor ego strength, 5-excessive dependency; NSIE-Nowicki-Strickland Internal-External control scale, IS-internal score; MFFT-Matching Familiar Figures Test, L-latency, E-errors; VADS-Visual-Aural Digit Span Test, RS-raw score)
Table 4.5

Pretest and Posttest Means Comparisons of the Woodcock-Johnson Psycho-Educational Battery Reading (WJTA-R), Mathematics (WJTA-M), and Written Language (WJTA-WL) scores included in Covariance Analysis

<table>
<thead>
<tr>
<th></th>
<th>Treatment A Pretest</th>
<th>Posttest</th>
<th>Treatment B Pretest</th>
<th>Posttest</th>
<th>Control Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
</tr>
<tr>
<td>WJTA-R</td>
<td>471.63/17.21</td>
<td>477.81/20.37</td>
<td>463.64/19.57</td>
<td>463.64/19.57</td>
<td>474.84/14.78</td>
<td>478.36/17.13</td>
</tr>
<tr>
<td>WJTA-M</td>
<td>490.63/17.21</td>
<td>495.89/12.64</td>
<td>484.00/13.33</td>
<td>484.36/12.33</td>
<td>480.24/12.36</td>
<td>484.80/13.14</td>
</tr>
<tr>
<td>WJTA-WL</td>
<td>484.70/13.25</td>
<td>488.74/12.27</td>
<td>475.86/14.73</td>
<td>481.78/14.33</td>
<td>481.80/13.64</td>
<td>485.80/11.70</td>
</tr>
</tbody>
</table>
Table 4.6

Pretest and Posttest Means Comparisons of Probe Sheet Reading (PRS-R), Mathematics (PRS-M), and Written Language (PRS-WL) scores included in Covariance Analysis

<table>
<thead>
<tr>
<th></th>
<th>Treatment A</th>
<th>Treatment B</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td></td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
</tr>
<tr>
<td>PRS-R</td>
<td>69.81/27.17</td>
<td>78.44/20.17</td>
<td>62.88/24.92</td>
</tr>
<tr>
<td>PRS-M</td>
<td>35.52/24.26</td>
<td>78.85/24.47</td>
<td>45.92/29.06</td>
</tr>
<tr>
<td>PRS-WL</td>
<td>70.00/25.25</td>
<td>84.11/12.14</td>
<td>66.88/24.55</td>
</tr>
</tbody>
</table>
Table 4.7

Pretest and Posttest Means Comparisons of the Burks' Behavior Rating Scales scores included in Covariance Analysis: Poor Attention (BBRS-1), Poor Academics (BBRS-2), Poor Impulse Control (BBRS-3), Poor Ego Strength (BBRS-4), Excessive Dependency (BBRS-5)

<table>
<thead>
<tr>
<th></th>
<th>Treatment A</th>
<th></th>
<th>Treatment B</th>
<th></th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
</tr>
<tr>
<td></td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
</tr>
<tr>
<td>BBRS-1</td>
<td>11.07/5.11</td>
<td>8.78/3.25</td>
<td>11.84/3.87</td>
<td>11.48/3.97</td>
<td>10.32/4.91</td>
<td>9.72/3.94</td>
</tr>
<tr>
<td>BBRS-2</td>
<td>14.44/5.99</td>
<td>12.63/4.89</td>
<td>17.08/4.75</td>
<td>18.72/5.50</td>
<td>12.68/4.50</td>
<td>12.48/5.47</td>
</tr>
<tr>
<td>BBRS-3</td>
<td>13.51/4.77</td>
<td>12.07/4.78</td>
<td>14.68/4.55</td>
<td>15.32/4.56</td>
<td>13.16/5.16</td>
<td>12.68/4.70</td>
</tr>
<tr>
<td>BBRS-4</td>
<td>10.92/4.25</td>
<td>8.67/3.19</td>
<td>12.56/5.26</td>
<td>12.84/4.55</td>
<td>11.36/5.38</td>
<td>11.52/4.89</td>
</tr>
<tr>
<td>BBRS-5</td>
<td>9.11/4.53</td>
<td>7.87/3.50</td>
<td>12.24/5.73</td>
<td>12.64/5.25</td>
<td>9.36/5.40</td>
<td>9.40/5.18</td>
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</tbody>
</table>
Table 4.8

Pretest and Posttest Means Comparisons of Internality scores (NSIE-RS) on the Children's Nowicki-Strickland Internal-External control scale included in Covariance Analysis

<table>
<thead>
<tr>
<th></th>
<th>Treatment A</th>
<th>Treatment B</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td></td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
</tr>
<tr>
<td>NSIE-IS</td>
<td>18.44/4.30</td>
<td>16.11/3.92</td>
<td>16.48/4.82</td>
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</tbody>
</table>
Table 4.9

Pretest and Posttest Means Comparisons of the Matching Familiar Figures Test Latency rate (MFFT-L) and Error (MFFT-E) scores included in Covariance Analysis

<table>
<thead>
<tr>
<th>Treatment A</th>
<th>Treatment B</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
</tr>
<tr>
<td>MFFT-L</td>
<td>9.86/5.41</td>
<td>14.28/7.53</td>
</tr>
<tr>
<td>MFFT-E</td>
<td>13.00/5.96</td>
<td>10.30/6.11</td>
</tr>
</tbody>
</table>
Table 4.10

Pretest and Posttest Means Comparisons of the Visual-Aural Digit Span Raw Scores (VADS-RS) included in Covariance Analysis

<table>
<thead>
<tr>
<th></th>
<th>Treatment A</th>
<th></th>
<th>Treatment B</th>
<th></th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
<td>Posttest</td>
<td>Pretest</td>
</tr>
<tr>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
<td>Mean/SD</td>
</tr>
<tr>
<td>VADS-RS</td>
<td>21.11/2.51</td>
<td>22.11/2.24</td>
<td>20.20/2.12</td>
<td>20.72/2.26</td>
<td>21.56/2.87</td>
</tr>
</tbody>
</table>
Table 4.11

Covariance Analysis of Woodcock-Johnson Tests of Achievement Variables: Reading (WJTA-R), Mathematics (WJTA-M), and Written Language (WJTA-WL)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>WJTA-R</td>
<td>3.34</td>
<td>0.0411</td>
<td>(S/.05)</td>
</tr>
<tr>
<td>WJTA-M</td>
<td>0.93</td>
<td>0.3981</td>
<td>(NS)</td>
</tr>
<tr>
<td>WJTA-WL</td>
<td>0.16</td>
<td>0.8509</td>
<td>(NS)</td>
</tr>
</tbody>
</table>

Table 4.11a

Least Squares Means with adjusted Posttest Means on Woodcock-Johnson Tests of Achievement Reading (WJTA-R) - General Linear Models Procedure

Woodcock-Johnson Reading

<table>
<thead>
<tr>
<th>Treatment</th>
<th>WJTA-R LS Mean</th>
<th>STD ERR</th>
<th>WJTA-R LS Mean</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>STD ERR</td>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>476.05</td>
<td>1.478</td>
<td>A</td>
<td>0.0118</td>
</tr>
<tr>
<td>B</td>
<td>470.45</td>
<td>1.571</td>
<td>B</td>
<td>0.0118</td>
</tr>
<tr>
<td>C</td>
<td>473.45</td>
<td>1.553</td>
<td>C</td>
<td>0.2264</td>
</tr>
</tbody>
</table>
Table 4.12

Covariance Analysis of Probe Sheets Variables: Reading (PRS-R), Mathematics (PRS-M), and Written Language (PRS-WL)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRS-R</td>
<td>0.92</td>
<td>0.4019</td>
<td>(NS)</td>
</tr>
<tr>
<td>PRS-M</td>
<td>5.53</td>
<td>0.0058</td>
<td>(S/.05/.01)</td>
</tr>
<tr>
<td>PRS-WL</td>
<td>1.55</td>
<td>0.2184</td>
<td>(NS)</td>
</tr>
</tbody>
</table>

Table 4.12a

Least Squares Means with adjusted Posttest Means on Probe Sheets Mathematics (PRS-M) scores- General Linear Models Procedure

Probe Sheets Mathematics (PRS-M)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>PRS-M</th>
<th>STD ERR</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LS Mean</td>
<td>LS Mean</td>
<td>A</td>
</tr>
<tr>
<td>A</td>
<td>81.54</td>
<td>5.408</td>
<td>A</td>
</tr>
<tr>
<td>B</td>
<td>63.20</td>
<td>5.515</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>56.18</td>
<td>5.588</td>
<td>C</td>
</tr>
</tbody>
</table>

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Table 4.13

Covariance Analysis of Burks' Behavior Rating Scales Variables:
Poor Attention (BBRS-1), Poor Academics (BBRS-2), Poor Impulse
Control (BBRS-3), Poor Ego Strength (BBRS-4), Excessive
Dependency (BBRS-5)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBRS-1</td>
<td>5.73</td>
<td>0.0049</td>
<td>(S/.05/.01)</td>
</tr>
<tr>
<td>BBRS-2</td>
<td>8.45</td>
<td>0.0005</td>
<td>(S/.05/.01)</td>
</tr>
<tr>
<td>BBRS-3</td>
<td>3.36</td>
<td>0.0306</td>
<td>(S/.05)</td>
</tr>
<tr>
<td>BBRS-4</td>
<td>8.10</td>
<td>0.0007</td>
<td>(S/.05/.01)</td>
</tr>
<tr>
<td>BBRS-5</td>
<td>6.08</td>
<td>0.0036</td>
<td>(S/.05)</td>
</tr>
</tbody>
</table>

Table 4.13a

Least Squares Means with adjusted Posttest Means on Burks'
Behavior Ratings Scales: Poor Attention (BBRS-1), Poor
Academics (BBRS-2), Poor Impulse Control (BBRS-3), Poor Ego
Strength (BBRS-4), Excessive Dependency (BBRS-5)- General
Linear Models Procedure

Burks' Behavior Rating Scales- Poor Attention (BBRS-1)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>BBRS-1</th>
<th>STD ERR</th>
<th>Probability</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LS Mean</td>
<td>LS Mean</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>8.78</td>
<td>0.463</td>
<td>A</td>
<td>0.0014</td>
</tr>
<tr>
<td>B</td>
<td>11.09</td>
<td>0.483</td>
<td>B 0.0014</td>
<td>.</td>
</tr>
<tr>
<td>C</td>
<td>10.18</td>
<td>0.483</td>
<td>C 0.0388</td>
<td>0.2354</td>
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Burks' Behavior Rating Scales- Poor Academics (BBRS-2)

<table>
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<tr>
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<th>BBRS-2</th>
<th>STD ERR</th>
<th>Probability</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LS Mean</td>
<td>LS Mean</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>12.84</td>
<td>0.677</td>
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<tr>
<td>B</td>
<td>16.91</td>
<td>0.728</td>
<td>B 0.0001</td>
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</tr>
<tr>
<td>C</td>
<td>14.05</td>
<td>0.722</td>
<td>C 0.2244</td>
<td>0.0085</td>
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</table>
### Burks' Behavior Rating Scales - Poor Impulse Control (BBRS-3)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>BBRS-3 STD</th>
<th>Probability</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS Mean</td>
<td>LS Mean</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>12.26</td>
<td>0.626</td>
<td>0.0091</td>
</tr>
<tr>
<td>B</td>
<td>14.69</td>
<td>0.654</td>
<td>0.0091</td>
</tr>
<tr>
<td>C</td>
<td>11.76</td>
<td>0.563</td>
<td>0.3455</td>
</tr>
</tbody>
</table>

### Burks' Behavior Rating Scales - Poor Ego Strength (BBRS-4)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>BBRS-4 STD</th>
<th>Probability</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS Mean</td>
<td>LS Mean</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>9.18</td>
<td>0.544</td>
<td>0.0006</td>
</tr>
<tr>
<td>B</td>
<td>12.05</td>
<td>0.569</td>
<td>0.0006</td>
</tr>
<tr>
<td>C</td>
<td>11.76</td>
<td>0.563</td>
<td>0.0015</td>
</tr>
</tbody>
</table>

### Burks' Behavior Rating Scales - Excessive Dependency (BBRS-5)

<table>
<thead>
<tr>
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<th>BBRS-5 STD</th>
<th>Probability</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS Mean</td>
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<td>A</td>
<td>B</td>
</tr>
<tr>
<td>A</td>
<td>8.46</td>
<td>0.529</td>
<td>0.0009</td>
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<tr>
<td>B</td>
<td>11.16</td>
<td>0.559</td>
<td>0.0009</td>
</tr>
<tr>
<td>C</td>
<td>10.01</td>
<td>0.548</td>
<td>0.0441</td>
</tr>
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</table>
Table 4.14

Covariance Analysis of Children's Nowicki-Strickland Internal-External control scale Internality scores (NSIE-IS)

<table>
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<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSIE-IS</td>
<td>0.54</td>
<td>0.5842</td>
<td>(NS)</td>
</tr>
</tbody>
</table>
Table 4.15

Covariance Analysis of Matching Familiar Figures Test Variables: Latency rate (MFFT-L) and Error scores (MFFT-E)

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>MFFT-L</td>
<td>3.00</td>
<td>0.0561</td>
<td>(NS)*</td>
</tr>
<tr>
<td>MFFT-E</td>
<td>1.74</td>
<td>0.1834</td>
<td>(NS)</td>
</tr>
</tbody>
</table>

*approaches significance

Table 4.15a

Least Squares Means with adjusted Posttest Means on Matching Familiar Figures Test Latency rate (MFFT-L)- General Linear Models Procedure

Matching Familiar Figures Test (MFFT-L)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>MMFT-L LS Mean</th>
<th>STD ERR LS Mean</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
<tr>
<td>A</td>
<td>15.12</td>
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<td>1.193</td>
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<td>C</td>
<td>11.05</td>
<td>1.197</td>
<td>C 0.0184</td>
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</table>
Table 4.16

**Covariance Analysis of Visual-Aural Digit Span Test Raw Scores (VADS-RS)**

<table>
<thead>
<tr>
<th>Variable</th>
<th>F Value</th>
<th>PR&gt;F</th>
<th>Significance</th>
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</thead>
<tbody>
<tr>
<td>VADS-RS</td>
<td>1.10</td>
<td>0.3381</td>
<td>(NS)</td>
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CHAPTER 5

Summary, Conclusions, and Recommendations

This chapter serves to summarize the purpose and design of the study, describe the findings, address the hypotheses and conclusions, and provide recommendations for future study.

Summary

Elementary-age children classified as severely learning disabled often demonstrate inadequacies in attentional skills, processing and integrating information, and cognitive-behavioral variables which inhibit academic growth and school progress. Such children have been found to perceive themselves as possessing little or no control over achievement outcomes and to view their efforts as valueless (Licht, 1983), thus lending credence to the exploration of attribution retraining as a procedure potentially enhancing the effectiveness of other instructional methods. This study was designed to investigate the validity of the merger of attribution retraining and cognitive self-instruction methods as an instructional procedure as applied by special education teachers with elementary-age children.
with learning disabilities served in self-contained learning disabilities programs (SCLD).

An examination was conducted of the differential effects of this integrated program upon the academic growth (Woodcock-Johnson Psycho-Educational Battery and teacher administered probe sheets), cognitive-behavioral outcomes (Burks’ Behavior Rating Scales), locus of control trends (Children’s Nowicki-Strickland Internal-External control scale), attentional style (Matching Familiar Figures Test), and global attention/memory (Visual-Aural Digit Span Test) of three groups of elementary-age children with learning disabilities served in nine SCLD programs located in six southeastern Virginia public schools (N=77).

Placement criterion and procedures adhered to federal, state, and local guidelines. Parents and students were fully informed of rights and prerogatives of participation before offering consent.

Teachers received uniform pre-intervention training from the researcher; random observations of teacher implementation of treatment procedures were regularly conducted by the researcher and research assistant.

A primary treatment group (n=27) was exposed to a superordinate attribution retraining-subordinate cognitive self-instruction procedure; a secondary treatment group (n=25) to a cognitive self-instruction
procedure alone; and a control group (n=25) to standard, unmodified instruction. Attribution retraining procedures were adapted by the researcher from recent literature (e.g., Borkowski, Weyhing, & Carr, 1988; Licht, Kistner, Ozkaragoz, Shapiro, & Clausen, 1985; Schunk, 1981; Weiner, 1985) with an orientation toward providing an efficacious "attributional climate" for learning; teachers focused upon the notions of effort, ability, and generalization, among others, in a manner consistent with previous research applications of attribution retraining. Cognitive self-instruction procedures follow that of Meichenbaum (1977) as adapted by Wiesner (1986) with modifications to enhance the concepts of effective strategy use and self-recognition of success.

Instruction in the treatment conditions was presented in daily 30-minute sessions in the SCLD classrooms over approximately 10 school weeks. A three phase instructional sequence consisted of (a) Controlled Instruction, (b) Transition, and (c) Direct Instruction. Component attentional materials were utilized exclusively during the Controlled Instruction phase and standard curricular materials during the Direct Instruction phase. The primary treatment group participated in a weekly processing session focused upon attributional issues and feedback. Regular assessments of attributional
conceptualization and self-instruction practices were conducted by teachers in the pertinent treatment conditions.

Pretesting was initiated three weeks prior to treatment implementation and posttesting completed three weeks after treatment completion. Assessments were administered by state certified School Psychologists.

Analysis of covariance (ANCOVA) was the statistical procedure selected as most relevant for this study due to the presence of pretest group differences on dependent variables; where pertinent, post hoc analyses were conducted via Least Squares Means (LSM) with adjusted posttest means using the General Linear Models Procedure. The .05 level of confidence was applied for acceptance or rejection of the six hypotheses.
Statement of Hypotheses and Findings

This study proposed to investigate a series of queries regarding the academic, cognitive-behavioral, locus of control, reflective attention, and memory/attention effects of incorporating an integrated attribution retraining-cognitive self-instruction procedure with severely learning disabled children in self-contained learning disabilities classrooms. In addressing these queries, the following specific objectives were identified:

1. To determine if completion of an attribution retraining-cognitive self-instruction curricular program would differentially affect the standardized and teacher administered achievement scores of elementary-age children served in self-contained learning disabilities programs.

2. To determine if completion of an attribution retraining-cognitive self-instruction curricular program would differentially affect the teacher-rated cognitive-behavioral outcomes of elementary-age children served in self-contained learning disabilities programs.

3. To determine if completion of an attribution retraining-cognitive self-instruction curricular program would differentially affect the measurement of internal locus of control of elementary-age children served in self-contained learning disabilities programs.
4. To determine if completion of an attribution retraining-cognitive self-instruction curricular program would differentially affect the measurement of reflective versus impulsive attentional style scores of elementary-age children served in self-contained learning disabilities programs.

5. To determine if completion of an attribution retraining-cognitive self-instruction curricular program would differentially affect the global measurement of attention/memory scores of elementary-age children served in self-contained learning disabilities programs.

Each of the six hypotheses formulated to respond to these objectives is separately examined below in the following statement of findings based upon analysis of covariance and post hoc least squares means statistical procedures.

For elementary-age children with learning disabilities served in self-contained learning disabilities programs as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure compared to a cognitive self-instruction or control condition:

Hypothesis One

There was a significant difference at the .05 level in the measured improvement of reading skills on the
Woodcock-Johnson Tests of Achievement for the primary versus secondary treatment condition. There were no group differences in mathematics or written language skills.

**Hypothesis Two**

There were significant differences at the .05 level in the measured improvement of mathematics skills on teacher-administered probe sheets for the primary versus control condition and the .01 level for the primary versus secondary treatment condition. There were no group differences in reading or written language skills.

**Hypothesis Three**

There were significant differences at the .05 level (ranging to the .01 level) in the measured improvement of the cognitive-behavioral variables 'poor attention', 'poor ego strength', and 'excessive dependency' on the Burks' Behavior Rating Scales for the primary versus secondary treatment and control conditions. There was a significant difference at the .05 level in the measured improvement of 'poor academics' for the primary and control conditions versus the secondary treatment condition. There was a significant difference at the .01 level in the measured improvement of 'poor impulse control' in the primary versus secondary treatment condition.
Hypothesis Four

There were no significant differences at the .05 level in the measurement of internal locus of control on the Children's Nowicki-Strickland Internal-External control scale.

Hypothesis Five

There were no significant differences at the .05 level in the measured improvement of latency rates as an indicator of reflective attentional style or error scores as an indicator of accurate response style on the Matching Familiar Figures Test. Latency rate approached significance ($p = .0561$) and post hoc analysis suggested a trend toward a more reflective attentional style in the primary versus control condition ($p = .0184$).

Hypothesis Six

There were no significant differences at the .05 level in the global measurement of attention/memory skills on the Visual-Aural Digit Span Test.
Conclusions

A review of the objectives and hypotheses, results, statistical analyses, and findings suggests that the following conclusions may be derived from this study:

1. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may exhibit more significant growth on a standardized assessment of reading skills as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-instruction program alone. While the statistical analysis hypothetically accounts for such differences, it is important to note that the low entry level of the secondary treatment group in reading skill may confound this outcome, and that the significant observed difference may be an artifact of this relationship.

2. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may not exhibit more significant growth on a standardized assessment of mathematics or written language skills as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-instruction program alone or a standard, unmodified control condition curriculum.
3. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may exhibit more significant growth on teacher-administered probe sheet assessments of mathematics skills as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-instruction program alone or a standard, unmodified control condition curriculum.

4. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may not exhibit more significant growth on teacher-administered probe sheet assessments of reading or written language skills as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-instruction program alone or a standard, unmodified control condition curriculum.

5. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may exhibit more significant growth in teacher-perceived attention, ego strength, and dependency on a teacher-completed standardized assessment of cognitive-behavioral trends as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-
instruction program alone or a standard, unmodified control condition curriculum.


7. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may exhibit more significant growth in teacher-perceived academics on a teacher-completed standardized assessment of cognitive-behavioral trends as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure or standard, unmodified control condition than those exposed to a cognitive self-instruction program alone.

8. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may not exhibit a more significant trend toward internality on a standardized assessment of locus of control as an outcome of exposure to an attribution retraining-cognitive self-instruction
procedure than those exposed to a cognitive self-instruction program alone or a standard, unmodified control condition curriculum.

9. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may not exhibit more significant growth on latency rate or error measures of reflective attentional style as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-instruction program alone or a standard, unmodified control condition curriculum; however, there may be a trend toward a more reflective attentional style in the attribution retraining-cognitive self-instruction versus control condition.

10. Elementary-age children with learning disabilities served in self-contained learning disabilities programs may not exhibit more significant growth in global attention/memory on a standardized measure of attention/memory as an outcome of exposure to an attribution retraining-cognitive self-instruction procedure than those exposed to a cognitive self-instruction program alone or a standard, unmodified control condition curriculum.
Discussion

Elementary-age children classified as severely learning disabled and served in self-contained learning disabilities programs are reported to be deficient in cognitive-behavioral self-regulation, metacognitive and strategy knowledge and application, attentional style, and antecedent attributional views of effectual personal causality over achievement outcomes in addition to the fundamental presence of achievement delays. Attribution theory and specifically the tenets of the attributional theory of achievement motivation (Wiener, 1974, 1979, 1980, 1985) have provided impetus for development of attribution retraining programs seeking to alter belief systems in a more adaptive direction as a means of enhancing academic progress and the incorporation of other pertinent educational strategies and skills. Cognitive self-instruction methods (Meichenbaum, 1969, 1971) have been effectively adapted for academic and behavioral purposes with elementary-age impulsive, learning disabled populations. The current study sought to merge attribution retraining as a superordinate umbrella, hence creating an efficacious learning environment and climate, under which a subordinate cognitive self-instruction strategy would be implemented as a tool for restructuring the attentional style of severely learning disabled children. The principal issue
was then the differential impact such an integrated attribution retraining-cognitive self-instruction program would have upon the dependent variables selected for examination versus programs incorporating cognitive self-instruction alone or a standard, unmodified curriculum.

The present study suggests that the notion of an attributional climate coupled with a cognitive learning strategy may have a positive effect upon the cognitive-behavioral trends of elementary-age children identified as severely learning disabled and served in self-contained learning disabilities programs. The finding of significant differences in teacher-perceived growth in vital cognitive-behavioral areas suggests a rapid, albeit short-term internalization and application of trained cognitive and attributional principles. Students appear to have become more self-aware and self-governing in key areas which characteristically undermine academic performance and progress for learning disabled children than those peers in the secondary treatment or control conditions. An important corollary to this assumption of student progress is the human response of the teacher to find such a responsive student a more teachable and optimistic one, conceivably altering the direction of the instructional relationship in one to the learner's advantage, and ultimately in a direction enhancing skill acquisition, retention, and application. Speculatively,
significant teacher-perceived increases in impulse control, attention, academics, ego strength, and independence appear an effect of the interaction of attributional concepts and processes and those of cognitive self-instruction, and not of attribution retraining alone. From a practical perspective, only those students in the primary treatment group persistently demonstrated the desired trend toward cognitive-behavioral change, suggesting that cognitive self-instruction alone had a less powerful effect. From a theoretical perspective, the potential of ongoing, regulated exposure to a medium for rehearsing and honing an impulse-reduction strategy in which a "strategy-success" association is stressed was realized through reiterated teacher acknowledgements of student ownership of the "strategy-success" outcome. Attribution retraining alone without a strategy framework upon which to build may not yield such a pervasive effect in a similar population. Borkowski, Weyhing, and Carr (1988) found this to be the case in a study assessing variously integrated reading strategy and attributional measures with learning disabled children; generally, the improvements of the attribution control group were negligible when compared to those of groups integrating strategy training and differing levels of attribution. Notable is that these important findings in cognitive-
behavioral areas are a demarcation from that of the bulk of other attribution retraining investigations where the focus has been upon the assumed direct impact of an approach rooted in an achievement theory of motivation, that being academic progress. Here, then, may be reason to expand the generally academic orientation of attribution retraining approaches in the classroom to other arenas.

It is worthy to note that differences in 'poor academics' and 'poor impulse control' between the primary/control and secondary conditions in the first case, and the primary and secondary conditions in the second case may reflect predominantly the somewhat unsettling finding of a minimum of movement in the secondary condition as much as the progressive movement in the primary and certainly in the control condition. That pretest and posttest scores, and post hoc LSM findings note more progressive movement in the primary and control conditions must raise some question regarding the nature of extraneous (speculatively teacher) variables, i.e., a postulated expectation for step-wise progression of movement with the primary condition effecting the greatest gains, the secondary condition the next greatest gains, and the control condition no gain was not borne out in the findings.
The finding that the attribution retraining condition improved significantly in reading on a standardized instrument in comparison to the cognitive self-instruction alone condition is consistent with previous studies of the influence of cognitive self-instruction alone upon effective selective attention to reading stimuli (Egeland, 1974; Wiesner, 1986); here, the presence of attributional foci coupled with strategy training spurred a greater change than noted for the secondary treatment group, a finding consonant with past research (Borkowski, Weyhing, & Carr, 1988; Carr and Borkowski, in press). Carr and Borkowski's (in press) cogent observation "that the addition of attributional components to strategy training improved reading performance by bridging the gap between [metacognitive] knowledge and action..." (p. 2) is applicable, clearly distinguishing the influence such approaches, or their absence, may ultimately have upon instructional effectiveness.

It is appropriate to reiterate that the low entry level reading skill for the secondary group may have impacted upon this finding; further, certainly those purely speculative extraneous variables discussed above in respect to certain Burks' findings may be present here.
The failure of mathematics and written language skills to progress significantly for the primary treatment group on a standardized instrument suggests that student generalization may have been selective or self-limiting, or that the attributional-cognitive self-instruction strategy training approach may lend itself most readily to reading applications. There is a scarcity of attributional literature devoted to the questions of growth in these academic areas. This preliminary result does not preclude mathematics or written language from potential growth enhancement via attribution retraining coupled with an appropriate cognitive restructuring or retraining strategy, the truer test of the attributional contribution being found in studies devoted exclusively to mathematics or written language instruction. Further, in this study mathematics was the highest pretest skill area among the groups and may have been limited in the comparative room for growth, contrasting reading, the lowest of the standardized academic skills across each group.

Student performance on the mathematics probe sheets increased significantly in the primary treatment condition, an increase that may be visualized through mean percent differences: 43.3% - primary treatment, 17.8%.- secondary treatment, 6.9% - control (see Table 4.6) and underscored by post hoc findings at the .03
level of confidence (see Table 4.12a). As the probe sheets are a teacher-administered and monitored assessment, and classroom-like in nature, the dramatic impact on math performance may be the singular and most-telling reflection of the potential in vivo academic application of metacognitive and cognitive-behavioral changes reported in this study. The essence of the probe sheet administration for this investigation being to assess increased accuracy more than skill growth, per se, a heightening of reflective responding may have surfaced most readily in this skill area where minor calculation or procedural flaws are translated into incorrect responses. Attributional feedback that contributed to cognitive-behavioral changes and a trend toward a change in attentional style (i.e., MFFT latency rate; see Tables 4.9 and 4.15a) appears to have inspired a more efficient and accurate application of available math skills.

While neither written language nor reading probe sheets scores increased significantly, a mean percent differences view of changes in written language indicates the most progressive trend in the primary treatment condition: 14.1% - primary treatment, 13.3% - control, 7.4% - secondary treatment (see Table 4.6), while in reading the most progressive trends were noted in the treatment conditions: 8.6% - primary treatment,
8.1% - secondary treatment, 5.8% - control (see Table 4.6). Whereas the Woodcock Johnson Tests of Achievement reading cluster incorporates three subtests, the single word recognition content of the reading probe sheet may have been delimiting and less sensitive to broad-based adjustments in metacognitive knowledge and strategy employment.

The lack of significant findings on the Children's Nowicki-Strickland Internal-External control scale are not inconsistent with the literature which has only sporadically reported attributional shifts as an effect of an attributional retraining program (Cecil & Medway, 1986); antecedent attributions are often entrenched for severely learning disabled children and while program-specific attributions (Reid & Borkowki, 1987) may respond readily to intervention, those of a global, pervasive nature may tend to be resistant to change in a short-term program. As Cecil and Medway (1986) caution, an individual's modification of antecedent beliefs may require a testing period to assess the legitimacy of the emerging reshaped beliefs; only after such a trial may the beliefs be owned and, once internalized, then assessed. Moreover, the global character of the selected locus of control scale may have limited access and sensitivity to the achievement oriented beliefs and behaviors that were the focus of this study. In this
regard, a two-way analysis of covariance identifying extreme high internal-low internal groups may more explicitly examine the power and predictiveness of the *general* locus of control variable than accomplished here; further, the concealed role of personal causality or achievement motivation and beliefs pertaining to treatment responsiveness may be more suitably evaluated through alternative instruments (see Recommendations).

The significant finding on latency rate between the attribution retraining-cognitive self-instruction and control conditions does suggest a possible trend toward a more reflective response style for the primary treatment group, while the lack of significant changes between groups on error rate is consistent with previous studies adapting primarily cognitive self-instruction methods (Egeland, 1974; Wiesner, 1986) in which latency rate improves but error rate does not. It is worthy to report that latency rate moved in the desired direction only in the primary treatment group with the secondary treatment group stabilizing and the control group moving toward a less reflective style (see Tables 4.9 and 4.15a).

The results of the Visual-Aural Digit Span Test suggest that the integrated program did not have a differentially significant effect upon the development of global memory/attention skills. Given the balance of
aural and visual tasks on the VADS, the primarily visual matching composition of the Phase 1 training tasks may have reduced the effectiveness of this instrument to assess changes.

Informal discussion with teachers during the progress and at the conclusion of the study presented a generally positive response to the thrust, content, and utility of the integrated attributional-CSI approach, but certainly reflected a preference for specific elements. Within the CSI structure, the presence of a "review" piece that was regulated for both teacher and student served to positively frame and obligate the use of a fundamental work and study skill. The act of describing oneself as experiencing "success" appeared to elicit strong positive affective responses in select students, an observation which is consistent with Weiner's contention of the association between achievement motivation and affect.

The emphasis upon generalization of skills noted during daily training sessions and reexamined in group processing sessions appeared to capture the imagination of select students who would advise the teacher or group of pragmatic "real world" applications of primarily CSI but also attributional ideas. Teachers found students constructively adapting ideas and strategies in other
classroom settings as cooperatively discussed in training sessions.

Conversely, there were elements that received less favorable response. For example, acclimation to responding and observing in "attributional" terms was strenuous and required frequent self-monitoring; however, the Attribution Retraining Daily Checklist served as an effective reminder and cuing tool and teachers by personal recall and checklist review tended to gravitate toward comfortable response patterns which coincidentally reflected the core attributional concepts, i.e., effort, ability, and generalization. Other attributional concepts were not ignored but were adapted less consistently.

The progression through component attentional worksheets was subjectively viewed by some as either slower than necessary, with assumptions of rapid student internalization of CSI strategies the apparent catalyst, or occurring too frequently, and hence becoming monotonous. Pragmatically, teachers would more readily tend to adapt CSI in vivo to direct instruction materials without progressing first through a lengthy prelearning sequences.

Analyses of findings appears to support the validity and utility of an integrated attribution retraining-cognitive self-instruction approach for curricular
incorporation with elementary-age children with severe learning disabilities served in self-contained learning disabilities programs with particular emphasis upon cognitive-behavioral development and goals. The presentation of an attributional climate in conjunction with cognitive self-instruction strategy training should be considered for application to other similar at-risk populations.
Recommendations

The specific and general recommendations for further study or consideration that follow respond to the literature review that prefaced and buttressed this study and the outcomes and conclusions that resulted:

1. In studies similar to the present investigation where the intervention emphasis is upon cognitive and academic change and locus of control is selected as a dependent variable, the Intellectual Achievement Responsibility Scale (IAR; Crandall, Katkovsky, & Crandall, 1965) may provide a superior medium for assessing the more specific questions of internality-externality shifts in the metacognitive and learning domains than the Children’s Nowicki-Strickland Internal-External control scale (Nowicki & Strickland, 1973) a more global measure of locus of control.

2. Similarly, the issue of attributional change may be addressed more explicitly through measures which clearly highlight effort and ability distinctions, e.g. the Antecedent Attributions Questionnaire (Borkowski, Weyhing, & Carr, 1988) or the EAX (Effort vs. Ability Vs. External) Scale modified by Licht, Kistner, Ozkaragoz, Shapiro, and Clausen (1985).

3. Studies of attributional retraining have suggested that the measurable effects of attributional shift may be delayed as such shifts are idiosyncratically...
formulated and evaluated; future research may gain a discerning understanding of the interactive and differential effects of an attribution retraining-cognitive training program, or attribution retraining alone, by completing ongoing, immediate and delayed assessments of antecedent attributional change. For example, it is speculated that in this study the significant progress in teacher-perceived cognitive-behavioral outcomes may have represented the initial evidence of experimental, evolutionary changes in the students self-perspective, and that such changes may have been initially hidden from the students themselves whose allegiance to antecedent attributions is rigidly reserved. The long-term nature of significant internalized causality and control shifts may imply that for children with severe learning disabilities devotion of energy to cognitive-behavioral changes must be individually and vigilantly addressed before unencumbered access to instructional intervention and potential academic growth is achieved; that broad academic growth did not occur, in addition certainly to other variables, may partially be evidence of the cautionary, trial and error nature of the students assimilation of and accommodation to attributional-cognitive restructuring ideas and strategies.
4. Future research should examine the relationship between the effectiveness of attribution retraining and the personality and/or instructional styles of teachers; additionally, observation of master teachers may clarify the natural occurrence of attributional statements and messages as an effective teaching tool, and distinguish the intuitive versus learned nature of such an approach.

5. A Solomon four-group design will more clearly resolve the issue not addressed in this study of the effectiveness of attribution retraining alone and the hypothesized formation of an efficacious learning climate versus that of an integrated attribution-cognitive restructuring program, as in this study, or cognitive restructuring program alone. The impact upon cognitive-behavioral outcomes would be of particular interest given that the bulk of the significant changes in this study were found in this domain.

6. Future studies may examine the effectiveness of attribution retraining as a separate entity or in conjunction with cognitive restructuring programs with respect to descriptive subject variables such as levels and stages of cognitive and maturational development, the nature and severity of handicaps in applications to other special or at risk populations, familial variables (e.g., parental attribution trends, metacognitive strategies, self-esteem, and socio-economic status), and socio-
emotional states (e.g., self-esteem, peer status, happiness and satisfaction, and adaptiveness to change).

7. The inclusion of peer-mediated attributional observation, cuing, and processing may provide a vital generalization link in an attribution retraining program.

8. Self-monitoring procedures may be examined as an efficient means of fostering student attention to application of attributional concepts (e.g., behavioral contracting, self-recording, self-evaluation, and self-reinforcement).

9. Research on attribution retraining or related strategies may be extended to other than purely academic applications in the school environment (e.g., vocational training, work and study strategies, student, parent, teacher, and administrative conferencing, disciplinary consultations, teacher training, and organizational, operational, and professional practices).

10. Future research may combine teacher perception and report of student cognitive-behavioral change with random researcher observation and recording of select cognitive-behavioral areas to increase confidence in related outcomes.

11. Additional study may adapt dismantling procedures to the attributional climate approach developed in this study in order to more clearly distinguish the elements contributing most powerfully to
the observed cognitive-behavioral changes (e.g., generalization, effort and ability feedback, and weekly processing).

12. With respect to the growth of mathematics or written language skills, attributional climate or retraining research may more effectively assess the gains in these areas by limiting intervention and assessment to mathematics or written language alone.

13. A further means of assessing cognitive-behavioral outcomes may be through monitoring of natural behavioral consequences (e.g., office referrals, point sheets, suspensions, and absences).

14. Similarly, inclusion of graded performance changes as a natural academic consequence may further assess the 'real-world' impact of attribution retraining programs; an extension of this proposition is that research designed to integrate evidence of attributional movement (e.g., increased effort, attempts to generalize, participation in peer-mediated processing) with resultant paper and pencil performance as criterion for grades may more readily provide a powerful and measurable attributional message to the students: action in the desired attributional direction will have a direct, not vague impact upon that one area that historically validates one's achievement—grades.
15. Future study may clarify the influence of student level of involvement in attribution retraining; that is, as a passive receptor of teacher attributional feedback versus an active participant engaged, for example, in group processing, self-monitoring, and peer-observation.

16. Individualized versus group-oriented attributional emphases may be addressed in future studies.

17. In similar research utilizing the Woodcock-Johnson Tests of Achievement, analyzing the subtest scores comprising the cluster scores may provide a more specific view of the change or lack of change in academic areas; it is conceivable that certain of the subtests are more sensitive to the influence of an attribution-cognitive restructuring approach and that a masking of the specific changes may occur as a result of a delimiting cluster analysis.

18. Given the importance of generalization effects in attribution retraining research, future investigations may incorporate parent training modules, either separate from or in conjunction with school setting attributional interventions, designed to heighten parent awareness of attributional opportunities and develop attributional response skills similar to those addressed with teachers in this study.
19. The added pairing of 'review' and 'success' as closing cues to the "Stop-Think-Act" cognitive self-instruction paradigm adapted by Wiesner (1986) may warrant further review, either through dismantling procedures focused on the cognitive self-instruction approach alone or in conjunction with attribution retraining methods.

20. Researchers seeking in teacher training to enhance effective communication of attribution retraining methods and statements may incorporate in vivo researcher or trainer modeling and/or provision of videotaped samples to which teachers can readily reference for review and cuing to retraining-consonant applications. Videotaping of teacher participants during random researcher observations may provide a format for clarification and reinforcement of attributional methods.

21. Aides in SCLD classrooms, or other special populations classrooms, should be actively encouraged to participate in training sessions and provide direct instructional assistance normative for the aide's classroom responsibilities. The removal of the aide from both the training and implementation processes may place an undue burden upon the primary instructor to meet the demanding requirements of program development and monitoring, and by such exclusion inject a confounding element of artificiality to the social and instructional
cooperativeness otherwise evident in the teacher-aide relationship.
APPENDICES
APPENDIX A

Student: __________________ School: __________________
Birthdate: ________________ Teacher: ________________

PARENT PERMISSION FORM

Dear ______________________:

The purpose of this letter is to request permission to allow your child, ________________, to participate in a study titled "Cool CATSS" are "STARS", which will be conducted in several Chesapeake schools during February, March, and April, 1990.

Please carefully read the following information and sign the last section marked Informed and Voluntary Consent to Participate if you give permission for your child to participate in the study and have discussed your child's participation and gained his or her agreement.

Please ask your child to promptly return the letter in the enclosed envelope to his or her teacher.

The study will only involve elementary-age children served in Self-Contained Learning Disabilities programs. The purpose is to determine if children who are presented training in a thinking strategy and who receive additional teacher instruction in the productive use of their ability and effort will show progress in achievement, attitudes, behavior, and attention. Your child would be in the "Cool CATSS" are "STARS" group and would receive both aspects of the training described above. The study is intended to provide valuable information about the educational methods best suited for elementary-age children served in Self-Contained Learning Disabilities programs. The study will last approximately 9 weeks and is described below in greater detail.

All students will attend regularly scheduled Self-Contained Learning Disabilities classes; schedule adjustments should not be necessary. A 1-hour assessment of achievement, attention, and attitudes will be completed at the beginning and end of the 9-week period covered by the study. Each assessment will be conducted by a state certified School Psychologist with the Chesapeake Public Schools. Classroom training sessions will last 30-minutes in length for four days of the week. The fifth session of each week will be a 30-minute 'group processing' session in which students discuss the thinking strategy and the productive use of ability and effort. The teacher will complete a series of
assessments in Math and Reading at the midpoint and end of the study. There will be brief weekly teacher assessments of the students progress with the thinking strategy. The first half of the study introduces new materials while the second half returns to standard curricular materials as described in the IEP. There will be 2 hours of observation conducted by the researcher and/or an assistant to assure that each teacher applies the procedures correctly.

The study is being conducted by A. Vance Morgan, IV, NCSP, School Psychologist with the Chesapeake Public Schools, 2107 E. Liberty St., Chesapeake, Va. 23324, 545-3541, under the supervision of Dr. Roger Ries, Professor, School of Education, College of William and Mary, Williamsburg, Va. 23185, 253-4289.

All data collected in this study will be kept in confidence. Students will be assigned numbers for the purpose of research analysis. Only the researcher will have access to this number. Only group data will be utilized in analyzing and discussing the results. The data will be used only for the purpose specified in this study.

Participation in this study is strictly voluntary. Each individual is guaranteed the right to decline to participate or to withdraw at any time without penalty.

Mr. Morgan may be contacted at 545-3541 after the study has been completed in order to discuss the results.

Informed and Voluntary Consent to Participate:

As we have been fully informed of the study and understand the assurances described above of confidentiality and voluntary participation, my child and I agree that _______ may participate in the study "Cool CATSS" are "STARS."

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</tr>
</thead>
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<tr>
<td>Parent Signature/Date</td>
<td>Parent Signature/Date</td>
</tr>
</tbody>
</table>
Dear _____________________:

The purpose of this letter is to request permission to allow your child, _____________________, to participate in a study titled "Cool CATSS" are "STARS", which will be conducted in several Chesapeake schools during February, March, and April, 1990.

Please carefully read the following information and sign the last section marked Informed and Voluntary Consent to Participate if you give permission for your child to participate in the study and have discussed your child's participation and gained his or her agreement.

Please ask your child to promptly return the letter in the enclosed envelope to his/her teacher.

The study will only involve elementary-age children served in Self-Contained Learning Disabilities programs. The purpose is to determine if children who are presented training in a thinking strategy and who receive additional teacher instruction in the productive use of their ability and effort will show progress in achievement, attitudes, behavior, and attention. Your child would be in the "STARS" group and would receive the thinking strategy training alone; this group will be extremely important in helping to determine which parts of the training programs are most beneficial. The study is intended to provide valuable information about the educational methods best suited for elementary-age children served in Self-Contained Learning Disabilities programs. The study will last approximately 9 weeks and is described below in greater detail.

All students will attend regularly scheduled Self-Contained Learning Disabilities classes; schedule adjustments should not be necessary. A 1-hour assessment of achievement, attention, and attitudes will be completed at the beginning and end of the 9-week period covered by the study. Each assessment will be conducted by a state certified School Psychologist with the Chesapeake Public Schools. Classroom training sessions will last 30-minutes in length for five days of the week. The teacher will complete a series of assessments in Math and Reading at the midpoint and end of the study. There will be brief weekly teacher assessments of the students progress with the thinking strategy. The first half of
the study introduces new materials while the second half returns to standard curricular materials as described in the IEP. There will be 2 hours of observation conducted by the researcher and/or an assistant to assure that each teacher applies the procedures correctly.

The study is being conducted by A. Vance Morgan, IV, NCSP, School Psychologist with the Chesapeake Public Schools, 2107 E. Liberty St., Chesapeake, Va. 23324, 545-3541, under the supervision of Dr. Roger Ries, Professor, School of Education, College of William and Mary, Williamsburg, Va. 23185, 253-4289.

All data collected in this study will be kept in confidence. Students will be assigned numbers for the purpose of research analysis. Only the researcher will have access to this number. Only group data will be utilized in analyzing and discussing the results. The data will be used only for the purpose specified in this study.

Participation in this study is strictly voluntary. Each individual is guaranteed the right to decline to participate or to withdraw at any time without penalty.

Mr. Morgan may be contacted at 545-3541 after the study has been completed in order to discuss the results.

Informed and Voluntary Consent to Participate:

As we have been fully informed of the study and understand the assurances described above of confidentiality and voluntary participation, my child and I agree that _________ may participate in the study "Cool CATSS" are "STARS."

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td></td>
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<tr>
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Please carefully read the following information and sign the last section marked Informed and Voluntary Consent to Participate if you give permission for your child to participate in the study and have discussed your child's participation and gained his or her agreement.

Please ask your child to promptly return the letter in the enclosed envelope to his/her teacher.

The study will only involve elementary-age children served in Self-Contained Learning Disabilities programs. The purpose is to determine if children who are presented training in a thinking strategy and who receive additional teacher instruction in the productive use of their ability and effort will show progress in achievement, attitudes, behavior, and attention. Your child would be in the Control group and would experience no adjustments in their standard curriculum or daily activities; this group will be extremely important in helping to determine which parts of the training programs are most beneficial. The study is intended to provide valuable information about the educational methods best suited for elementary-age children served in Self-Contained Learning Disabilities programs. The study will last approximately 9 weeks and is described below in greater detail.

All students will attend regularly scheduled Self-Contained Learning Disabilities classes; schedule adjustments should not be necessary. A 1-hour assessment of achievement, attention, and attitudes will be completed at the beginning and end of the 9-week period covered by the study. Each assessment will be conducted by a state certified School Psychologist with the Chesapeake Public Schools. The teacher will complete a series of assessments in Math and Reading at the midpoint and end of the study. There will be 2 hours of observation conducted by the researcher and/or an assistant to assure that each teacher applies the
procedures correctly.

The study is being conducted by A. Vance Morgan, IV, NCSP, School Psychologist with the Chesapeake Public Schools, 2107 E. Liberty St., Chesapeake, Va. 23324, 545-3541, under the supervision of Dr. Roger Ries, Professor, School of Education, College of William and Mary, Williamsburg, Va. 23185, 253-4289.

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</tr>
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</table>
Dear Parent,

We have an opportunity for the children served in our Self-Contained Learning Disabilities program(s) to participate in a group educational experience this semester. In order to satisfy doctoral dissertation requirements at the College of William and Mary, Mr. A. Vance Morgan IV, a state and nationally certified School Psychologist employed with the Chesapeake Public Schools will be conducting a study in which your child's Self-Contained Learning Disabilities teacher will be provided training and materials in an educational strategy designed to help children with learning disabilities gain skills in several areas including achievement and attention, and belief in themselves as capable learners. Research has shown that many children with learning disabilities have come to believe that they are not able to learn, when in fact they often seriously underestimate their learning potential. An emphasis of this study will be to focus upon the student's belief in their ability and sustained effort in an attempt to change this misconception. All results will be confidential. We see this experience as an important opportunity for all children in Self-Contained Learning Disabilities programs to gain either directly or indirectly through the completion of this research. Your child would be a member of one of 3 groups in the city totaling 60-75 children.

This preliminary letter is sent to you at this time in order to provide general information regarding the forthcoming study and notification of a Parent Consent Form that you will receive shortly which will request your permission to have your child participate in this study. The Parent Consent Form will describe the study in more detail than this introductory letter.

Please contact Mr. Morgan at 545-3541 or Principal's Name should you have any questions prior to or after receipt of the Parent Consent Form.

Respectfully,

John Q. Principal,  A. Vance Morgan IV, NCSP
Principal  School Psychologist
Dear Parent,

We have an opportunity for the children served in our Self-Contained Learning Disabilities program(s) to participate in a group educational experience this semester. In order to satisfy doctoral dissertation requirements at the College of William and Mary, Mr. A. Vance Morgan IV, a state and nationally certified School Psychologist employed with the Chesapeake Public Schools will be conducting a study in which your child's Self-Contained Learning Disabilities teacher will be provided training and materials in an educational strategy designed to help children with learning disabilities gain skills in several areas including achievement and attention. All results will be confidential. We see this experience as an important opportunity for all children in Self-Contained Learning Disabilities programs to gain either directly or indirectly through the completion of this research. Your child would be a member of one of 3 groups in the city totaling 60-75 children.

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Principal School Psychologist
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This preliminary letter is sent to you at this time in order to provide general information regarding the forthcoming study and notification of a Parent Consent Form that you will receive shortly which will request your permission to have your child participate in this study. The Parent Consent Form will describe the study in more detail than this introductory letter.

Please contact Mr. Morgan at 545-3541 or Principal’s Name should you have any questions prior to or after receipt of the Parent Consent Form.

Respectfully,

John Q. Principal
Principal

A. Vance Morgan IV, NCSP
School Psychologist
APPENDIX C

CHARACTERISTICS OF TEACHERS

Biographical Data

1. Name: ________________________________

2. School: ________________________________

3. Sex:  Female ___  Male ___

4. Age: 20-29 ___ 30-39 ___ 40-49 ___ 50-59 ___ Other ___

5. Teaching Experience (years):   LD ___ Other SPED ___

                                      Non-SPED ___

                                      TOTAL ___

6. Degree:  BA/BS ___ MA/MS ___ CAGS ___ Other ___

7. Endorsements: 1. ________________________________

                 2. ________________________________

                 3. ________________________________

8. Prior participation as teacher in research:

       Yes ___ if Yes, how many studies ___

       No ___
APPENDIX D

Teacher Training Procedures

Primary Treatment Condition—"Cool CATSS" are "STARS"

A three session group training module was presented by the researcher to teachers. Session length was approximately one to one and one half hours. Incorporation of a significant and positive prospective outcome was consistent with the attributional and efficacious orientation of the study. Teacher capability in applying training skills competently, adhering to instructional parameters, and assisting children in developing identified strategy skills were stressed. Teachers were encouraged to ask questions and request individual support as needed.

Session 1

With an orientation toward the child with learning disabilities, Session 1 presents an overview of:

1. Approval status through college and school system committees and departments, and building principals.

2. Emphasis upon assessment of student variables and performance versus teacher variables and performance.

3. Treatment rationale.

4. Review and discussion of "STARS" acronym and strategy; compare and contrast with "Stop-Think-Act" (Wiesner, 1986).
5. Treatment design: methodology, population, pretesting and posttesting, and the 3-phase treatment package and sequence. Issues stressed include:

- scripted teacher instructions and presentations during early sessions
- consistent adherence to described procedures
- length of sessions
- assessment schedule
- group processing session schedule
- value of aides as instructional supports
- use of probe sheets
- notion of 3 phases
- importance and process of transition to standard curriculum
- summary of rationale and integration of "STARS" strategy and "Cool CATSS" approach

6. Anticipated difficulties and questions, including:

- unstable student attendance (illness, moves, etc.)
- parent questions
- differences in student ability to progress
- distinguishing between group processing and group 'counseling'
- continued use of preexistent behavioral plans
- possible student tendency to slow response
speed during strategy acquisition and application process
- assurance of teacher competencies via monitoring and assessment of teacher skills
- adjustment to standard grading procedures (a recognition of daily participation was suggested)
- acceptability of student request to apply strategy use outside daily sessions

7. Present treatment guidebooks (including Phase 1 through Phase 3 descriptions, instructions, and activity pages, Attribution Retraining Daily Checklist, Supplement to Attribution Retraining Daily Checklist, and sample probe sheets); advise teachers to review guidebooks for second training session.

8. Stress need for consistent teacher attendance at teacher training sessions.

9. Advise of "STARS" review and practice function of second training session.

10. Teachers provided approximate pretesting schedule and approximate date of program initiation and conclusion.

11. Distribution of articles addressing cognitive self-instruction, attribution theory, and attribution retraining.

12. Teachers complete Characteristics of Teacher
biographical data sheet describing participants' sex, age, years of teaching experience, degree, current endorsement(s), and prior experience as a teacher in research.

Session 2

The following areas were addressed:


2. Review of the "STARS" acronym and strategy.

3. Discussion and researcher modeling of "STARS" strategy teaching method on five sample component attentional tasks from activity pages 1-5.

4. Introduction and discussion of "Cool CATSS" approach and "STARS" posters and cue cards.

5. Historical and general discussion of attribution theory, attribution retraining, locus of control, and metacognition.

6. Advise teachers of integration of "Cool CATSS" approach and "STARS" strategy in training session 3.

7. Encourage teachers to review guidebook further and prepare for teacher modeling of sample component attentional tasks and simulation of group processing session scheduled for training session 3.

Session 3

The following areas were addressed:
1. Brief review of "STARS" strategy.

2. Discussion and researcher modeling of "STARS" strategy on 2 sample component attentional tasks from activity pages 6 and 7.

3. Teacher demonstration of "STARS" strategy on minimum of three sample component attentional items from activity pages 2-5; researcher provided corrective and clarifying observations and discussion; teachers advised that researcher will present attributional feedback during sample tasks.


   - reference to researcher use of attributional statements in preceding teacher practice activities as sample of expected application
   - review and modeling of attributional statements per Daily Checklist and Supplement

4. Discussion of the integration of the "STARS" strategy and "Cool CATSS" process and ideas with controlled materials in Phase 1, transition materials in Phase 2, and standard curricular materials in Phase 3.

5. Researcher selected teachers to adapt "STARS"
strategy in completing minimum of three sample component attentional tasks from activity pages 2-5 before group, modeling attributional statements per Daily Checklist and Supplement.

6. Researcher provides sample classroom scenarios and requests teacher attributional statements (allowing reference as needed to Daily Checklist and Supplement).

7. Researcher and teachers adapted "STARS" strategy in completing minimum of three sample component attentional tasks from activity pages 2-5 before group with teachers presenting attributional statements (allowing reference as needed to Daily Checklist and Supplement).

8. Teachers presented minimum of three sample instructional items from activity pages 2-5, providing "STARS" strategy cues and "Cool CATSS" attributional statements, and receiving clarifying feedback.

9. Review of group processing session intent and content (referring to summary first described in session 5).

10. Simulation of group processing session with researcher first modeling and teachers then assuming facilitator role; provision of clarifying feedback.

12. Review of probe sheet use and implementation.
13. Review and discussion of general procedures.
14. Individual teacher consultation and completion of Completion of Training Teacher Observation Form.
   Primary Treatment: teachers demonstrating failure to attain specific competencies would receive individualized or small group review and support in order to address and strengthen problematic areas to desired competency levels.
15. Teachers advised of random monitoring to be conducted by the researcher (a state and nationally certified School Psychologist) and a research assistant (a state certified School Psychologist who is Coordinator for Chesapeake Public Schools Psychological Services) for application accuracy via a cumulative two hour observation and consultation period during the treatment phases. Corrective and clarifying feedback would be provided as needed. Each observation would be recorded and logged (Post-Training Teacher Observation Form, Primary Treatment and Post-Training Teacher Observation Log).
16. Teachers requested to independently review and practice the "STARS" strategy and "Cool CATSS" approach outside the SCLD classroom, increase familiarity with materials and visual aids, and to contact researcher for clarification and guidance.
A three session training module was presented by the researcher to teachers. Session length was approximately one to one and one half hours. Teacher capability in applying training skills competently, adhering to instructional parameters, and assisting children in developing identified strategy skills were stressed. Teachers were encouraged to ask questions and request individual support as needed.

**Session 1**

With an orientation toward the child with learning disabilities, Session 1 presented an overview of:

1. Approval status through college and school system committees and departments, and building principals.

2. Treatment rationale.

3. Treatment design: methodology, population, pretesting and posttesting, and the 3-phase treatment package and sequence. Issues stressed include:
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   - consistent adherence to described procedures
   - length of sessions
   - assessment schedule
   - value of aides as instructional supports
- use of probe sheets
- notion of 3 phases
- importance and process of transition to standard curriculum
- summary of rationale of "STARS" strategy

4. Anticipated difficulties, including:
- unstable student attendance (illness, moves, etc.)
- parent questions
- differences in student ability to progress
- continued use of preexistent behavioral plans
- possible student tendency to slow response speed during strategy acquisition and application process
- assurance of teacher competencies via monitoring and assessment of teacher skills
- adjustment to standard grading procedures (a daily participation grade will be suggested)
- acceptability of student request to apply strategy use outside daily sessions


6. Review and discussion of the "STARS" acronym and strategy; compare and contrast with "Stop-Think-Act" (Wiesner, 1986).

7. Discussion of the application of the "STARS"
strategy with controlled materials in Phase 1, transition materials in Phase 2, and standard curricular materials in Phase 3.

8. Presentation of treatment guidebooks (including Phase 1 through Phase 3 descriptions, instructions, and activity pages, and sample probe sheets); teachers advised to review guidebooks for second training session.

9. Review of use and implementation of probe sheet assessments.

10. Stress need for consistent teacher attendance at teacher training sessions.

11. Advise of "STARS" review and practice function of second training session.

12. Teachers advised of approximate pretesting schedule, and approximate date of program initiation and conclusion.

13. Distribution of articles addressing cognitive self-instruction.

14. Teachers complete Characteristics of Teacher biographical data sheet describing participants' sex, age, years of teaching experience, degree, current endorsement(s), and prior experience as a teacher in research.

Session 2

The following areas were addressed:

1. Historical and general discussion of cognitive

2. Review of the "STARS" acronym and strategy.

3. Introduction and discussion of "STARS" posters and cue cards.

4. Discussion and researcher modeling of "STARS" strategy teaching method on five sample component attentional tasks from activity pages 1-5.

5. Encourage teachers to review guidebook further and prepare for teacher modeling of sample component attentional tasks scheduled for training session 3.

Session 3

The following areas were addressed:

1. Brief review of "STARS" strategy.

2. Discussion and researcher modeling of "STARS" strategy on 2 sample component attentional tasks from activity pages 6 and 7.

3. Teacher demonstration of "STARS" strategy on minimum of five sample component attentional items from activity pages 2-7; researcher provided corrective and clarifying observations and discussion.

4. Discussion of the "STARS" strategy with transition materials in Phase 2 and standard curricular materials in Phase 3.

5. Review of 'weekly' assessment procedures and use of Weekly Strategy Assessments and Direct Instruction
**Activities forms.**

6. Review and discussion of general procedures.

7. Individual teacher consultation and completion of *Completion of Training Teacher Observation Form, Primary Treatment*; teachers demonstrating failure to attain specific competencies would receive individualized or small group review and support in order to address and strengthen problematic areas to desired competency levels.

8. Teachers advised of random monitoring to be conducted by the researcher (a state and nationally certified School Psychologist) and a research assistant (a state certified School Psychologist who is Coordinator for Chesapeake Public Schools Psychological Services) for application accuracy via a cumulative two hour observation period during the treatment period. Corrective and clarifying feedback would be provided as needed. Each observation would be recorded and logged (*Post-Training Teacher Observation Form, Secondary Treatment* and *Post-Training Teacher Observation Log*).

9. Teachers requested to independently review and practice the "STARS" strategy outside the SCLD classroom, increase familiarity with materials and visual aids, and to contact researcher for clarification and guidance.

End of "STARS" Training Sessions
Control Condition

Teachers involved in the control group met with the researcher for two scheduled sessions: the first addressing the value of their participation in the study and practical issues such as student pretesting and posttesting, administration of probe sheets, duration of the study, researcher/assistant random observations, and encouragement to provide educational services in force in current IEP's; the second serving a debriefing and discussion function. Periodic as needed consultation was provided to clarify probe sheet assessment procedures.
APPENDIX E

COMPLETION OF TEACHER TRAINING OBSERVATION FORM

PRIMARY TREATMENT

Teacher: __________________ Date: ____________
School: __________________ Observer: ____________

Upon completion of the training module, the teacher has demonstrated in individual and group activities the following competencies:

____ 1. Knowledge of component attentional skills.
____ 2. Implementation of component attentional skills exercises.
____ 3. Knowledge of CSI steps.
____ 4. Implementation of CSI steps with component attentional skill exercises.
____ 5. Knowledge of attribution retraining.
____ 7. Use of Attribution Retraining Daily Checklist.
____ 8. Implementation of CSI steps with component attentional skill exercises within an attributional framework.
____ 9. Facilitate group processing discussion within an attributional framework.
____ 10. Function and adaptation of pictorial-cue
materials.
POST-TRAINING TEACHER OBSERVATION FORM, PRIMARY TREATMENT

Teacher: ____________________  Date: ____________________

School: ____________________  Observation #: ______

Observ. time (minutes): ____ __  Observer: ______

S   NS   NA

1. Presentation of task requirements. ____________________

2. Review of previous learning. ____________________

3. Relates previous to new learning. ____________________

4. Defines, models, and reviews CSI steps. ____________________

5. Guides student use of CSI steps. ____________________

6. Reinforces student use of CSI steps. ____________________

7. Creates efficacious environment. ____________________

8. Focuses on positive outcomes. ____________________

9. Accurately applies effort feedback. ____________________

10. Accurately applies ability feedback. ____________________

11. Addresses strategy use/outcome relationships. ____________________

12. Encourages strategy generalization. ____________________

13. Encourages uses of pictorial cards. ____________________

14. Applies attributional methods and feedback in group settings. ____________________
Key: §- Satisfactory  NS- Not Satisfactory  NA- Not Applicable

Criteria: 90% Satisfactory on final observation- failure to meet stated criteria will necessitate continued observation and consultation till criteria is met on subsequent observations.
Teacher: __________________ Date: __________________
School: __________________ Observer: ______________

Upon completion of the training module, the teacher has demonstrated through observation of performance in individual and group exercises the following competencies (checked):

1. Knowledge of component attentional skills.
2. Implementation of component attentional skills exercises.
3. Knowledge of CSI steps.
4. Implementation of CSI steps with component attentional skill exercises.
5. Function and adaptation of CSI pictorial-cue materials.
POST-TRAINING TEACHER OBSERVATION, SECONDARY TREATMENT

Teacher: ____________________ Date: __________________

School: ____________________ Observation #: ______

Observ. time (minutes): ____ Observer: ____________

S NS NA

1. Presentation of task requirements. ____________

2. Review of previous learning. ____________

3. Relates previous to new learning. ____________

4. Defines, models, and reviews CSI steps. ____________

5. Guides student use of CSI steps. ____________

6. Reinforces student use of CSI steps. ____________

Key: S- Satisfactory NS- Not Satisfactory NA- Not Applicable

Criteria: 90% Satisfactory on final observation- failure to meet stated criteria will necessitate continued observation and consultation till criteria is met on subsequent observations.
POST-TRAINING TEACHER OBSERVATION LOG

Required cumulative time per teacher: 120 minutes (2 hours)

<table>
<thead>
<tr>
<th>Teacher (Ob 1-4)</th>
<th>Ob 1</th>
<th>Ob 2</th>
<th>Ob 3</th>
<th>Ob 4</th>
<th>TM for Ob 1-4</th>
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</table>

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<tr>
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<th>Ob 6</th>
<th>Ob 7</th>
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<td>D/M</td>
<td>D/M</td>
<td>D/M</td>
<td>D/M</td>
<td></td>
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Key: Ob- Observation   TM- Total Minutes
D/M- Date of/Minutes per observation (example: 6-14/30)
APPENDIX E

ATTRIBUTION RETRAINING DAILY CHECKLIST

Teacher name: ____________ Week of: ________________ 

Attributional Statements

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<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>Positive, credible expectations</td>
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<tr>
<td>2</td>
<td>Social comparative information</td>
</tr>
<tr>
<td>3</td>
<td>Attention to positive performance outcomes/patterns</td>
</tr>
<tr>
<td>4</td>
<td>Ability feedback-prior achievement</td>
</tr>
<tr>
<td>5</td>
<td>Effort feedback-prior achievement</td>
</tr>
<tr>
<td>6</td>
<td>Model internal success attribution</td>
</tr>
<tr>
<td>7</td>
<td>Relation of effort to strategy success</td>
</tr>
<tr>
<td>8</td>
<td>Relation of strategy success to accurate strategy use</td>
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<td>9</td>
<td>Relation of strategy failure to inaccurate strategy use</td>
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<tr>
<td>10</td>
<td>Encourage strategy generalization</td>
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<tr>
<td>11</td>
<td>Strategy value statements</td>
</tr>
<tr>
<td>12</td>
<td>Conditional strategy value</td>
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Procedural

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Use of pictorial attribution cards</td>
</tr>
<tr>
<td>2</td>
<td>Group processing session (Friday)</td>
</tr>
<tr>
<td>3</td>
<td>Review of CSI procedure</td>
</tr>
<tr>
<td>4</td>
<td>Use of pictorial self-instruction cards</td>
</tr>
</tbody>
</table>

Note: See Supplement to Attribution Retraining Daily Checklist for samples of the 12 attributional statements listed above.
APPENDIX G

SUPPLEMENT TO ATTRIBUTION RETRAINING DAILY CHECKLIST

The following represent sample attributional statements for each of the 12 categories listed on the ATTRIBUTION RETRAINING DAILY CHECKLIST. The teacher is encouraged to adapt these sample statements as models but also to exercise accurate and training consistent flexibility and creativity where feasible and appropriate in developing alternative statements conveying a congruent message.

1) Positive, credible expectations for students:
   "I know you'll learn this".
   "You did so well yesterday, I'm confident you'll gain this skill".

2) Social comparative information:
   "See how well Holly and Laura are doing?; I'm sure you can do just as well".
   "You and Kevin have made great effort today; keep up the good work".

3) Attention to positive performance outcomes/patterns:
   "That's correct... you're doing much better".
   "See how well you did... you really applied yourself".

4) Ability feedback for prior achievement:
   "You're good at this".
   "You really know this".
   "You must be pretty smart to have gotten so good at this".

5) Effort feedback for prior achievement:
   "You've been working very hard".
   "You've made such good effort on learning this skill".
   "The way you've listened and tried hard has paid off".

6) Modeled internal success attributions:
   "I tried hard and used the self-instruction steps. It is the most important reason because I have control over myself".

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
"I'm sure I'll get this right because I really know how to use this skill."
"I'm very pleased with how well I did that; I believed I knew what to do and I was right".

7) Relation of effort to strategy success:

"To use a strategy requires effort. We must try hard to use a strategy or we won't remember what it is we are trying to remember."
"Keep working at applying this new strategy; if you do, it will become an easier and more natural thing to do as you become more and more successful".

8) Relation of strategy success to accurate strategy use:

"You were successful because you've learned to apply the strategy at the right point on this task."
"I can tell you've been listening when we've discussed the steps of the new strategy; you completed each problem correctly".

9) Relation of strategy failure to inaccurate strategy use:

"You did not appear to use each of the steps correctly; repeat them again to yourself and try again."
"There is something wrong on this item; review the strategy cards and try the problem again".

10) Encourage strategy generalization:

"I would like you to choose at least one classroom assignment on which to use the self-instruction steps tomorrow, and to describe the experience to the group on Friday."
"You will be given a math homework sheet tonight; be sure to first review and practice the self-instruction strategy before applying it to each of the problems".

11) Strategy value statements:

"As you learn the new strategy, you will find that you can attend to your work more easily and complete more work accurately than before."
"There is a good chance that your grades will improve if you continue to use the strategy this consistently".
Conditional strategy value:

"You will find that the new strategy will work more effectively with certain tasks than others; for example,...".
"If your teacher will be giving you a short, timed math facts test, and you feel using the new strategy will slow you down at this point but also increase your accuracy, consider completing the items you know well first without the strategy, and return to those you know less well for strategy use... in other words, draw a practical compromise".
APPENDIX H

Teacher: ___________________ School: ___________________

WEEKLY STRATEGY ASSESSMENTS

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**Criterion:**

S ("STARS" acronym)- 100% recall of "Stop-Think-Act -Review-Success" sequence.

A (activities)- 2 consecutive activities from the materials presented during the current week correctly completed using the "STARS" strategy.

Successful completion of each area is indicated by a checkmark; failure to do so by an x.
## APPENDIX I

**Teacher:**

**School:**

### DIRECT INSTRUCTION ACTIVITIES

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APPENDIX J

Learning Disabilities Definitions

1. National Association of School Psychologists (1989) - Learning Disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other handicapping conditions (for example, sensory impairment, mental retardation, serious emotional disturbance) or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences.

2. National Joint Committee for Learning Disabilities (1987) - Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. These disorders are
intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (e.g., cultural differences, insufficient/inappropriate instruction, psychogenic factors), it is not the direct result of those conditions or influences.

3. The Association for Children and Adults with Learning Disabilities (1985)- Specific Learning Disabilities is a chronic condition of presumed neurological origin which selectively interferes with the development, integration, and/or demonstration of verbal and/or non-verbal abilities. Specific Learning Disabilities exists as a distinct handicapping condition and varies in its manifestations and in degree of severity. Throughout life, the condition can affect self-esteem, education, vocation, socialization, and/or daily living activities.

4. Interagency Committee on Learning Disabilities (1987)- Learning disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills. These
disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g., sensory impairment, mental retardation, social and emotional disturbance), with socioenvironmental influences (e.g., cultural differences, insufficient or inappropriate instruction, psychogenic factors), and especially with attention deficit disorder, all of which may cause learning problems, a learning disability is not the direct result of those conditions or influences.
APPENDIX K

"COOL CATSS" ARE "STARS"

SESSIONS 1, 2

NOTE: 1) The first session may require approximately one hour; all others approximately 30 minutes.

2) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during Session 1 and all subsequent sessions. Reminders to respond accordingly are periodically interspersed throughout the session directions. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples. Reminders will be simplified and less explicit as the sessions progress. A shorthand attributional cue to the teacher will be 'ATR'.

3) Adhere as closely as possible to the content and sequence of the session(s) as described below; use flexibility primarily in modifying the 'formality' or 'difficulty' of the language to meet the needs of the group.

PART 1

Listen very carefully, I have something important to tell you about this next 9 weeks.

For the next several weeks, we are going to meet for about 30 minutes per day to work on a group of activities using a special new set of skills—what you and I will be calling a strategy.

(teacher writes the word strategy on the board, defines it as 'a plan of action', and uses an example(s) such as Nintendo as a situation where the students might use a plan of action over and over again to help the Mario Brothers to progress from the lowest to the highest levels, reminding the students that they do it over and over again because it works)

This strategy will help you to think about and learn
your school work in a way that you may never have before. It isn’t something magical that’s going to happen, or because you had a little extra luck one day, or even because I taught brilliantly that day, but instead it’s something special in the way you can learn that will happen when you make good effort.

(teacher asks for student input as to the notion/definition of effort; acknowledge student effort and ability in formulating relevant responses)

When you try very hard, even if things get a little frustrating or confusing sometimes, or even if you don’t get every item we work on correct—what’s most important is that you’ve made a good effort and tried hard at using our new strategy. When you do make that good effort, I know you will do fine.

One other thing that I want you to know is that each of you has the ability to learn this new strategy, this new way of thinking and learning... sometimes students may think that they can’t learn something new because it’s going to be hard or because their not smart enough.

(teacher requests student response, personal experience)

I want each of you to know right from the beginning that you do have the ability to do well in the new materials, and that when you do well it will be because of your good ability and those other words I mentioned.

(teacher elicits student response to or recall of effort and restates as follows)

That’s correct (if a correct response is presented), your ability and your good effort. I have a lot of confidence in each one of you, and I know you’ll do well. I’m going to make a point during these sessions of letting you know how well you’re using this new ‘plan of action’, and why I think you’re using it so well. You can also let each other know the same thing when you see someone in the group succeeding with the new strategy and materials. I’ll also be letting you know when I think you need to work differently on the strategy, sometimes just to make more effort at using it.

I’ll tell you about this new strategy soon, but first I want you to know that because this group is so
special, and what it’s doing is so special, we are going to have a special group name. The name has a lot to do with what I said about making effort and having the ability to learn. The group is going to be called the "Cool CATSS".

(teacher writes this on the board)

Every time you see or hear or say the name “Cool CATSS”, it’s going to remind you of the work you’re doing and the progress you’re making and just as important, why you’re having success. If you look real closely, you can see something funny about the word CATSS.

(teacher asks for student observations on the extra S)

That’s right... there’s an extra S and that extra S is a very important S because it stands for Success.

(teacher asks for student definition for success and restates in appropriate terms as follows)

Very good, success basically means having done something right.

(teacher asks how it feels to experience success, and where the students have found success in their lives. In doing so, reinforce the notion that their success was related to a combination of abilities, effort, and use of a plan, or way of doing things)

In our sessions, you will be trying hard and using your good ability to learn the new strategy, so I know you will be having success.

Let me tell you what the rest of the letters stand for:

(teacher goes on to state and explain in appropriate language that
S represents Can do,
A represents Ability,
I represents Try hard,
the first S represents Strategy,
and the second S represents Success).

Here in the classroom I am going to display a poster that shows "Cool CATSS" in action. I am also going to
give each one of you two cards to use that will help remind you of what the "Cool CATSS" are all about. The first one I would like you to tape to a corner of your desk in this classroom where it can be easily seen, and the second one I would like you to tape to a place on one of the notebooks you always take to your regular classes so that you can easily remind yourself of the ideas behind the "Cool CATSS". You see, what you learn in our sessions for the next several weeks can help you tremendously in your regular classes and in the other work we do in this classroom, not just for that half hour per week where we practice the new strategy.

Every fifth session, instead of working on activities we are going to meet as a group and talk about times in this class and your regular classes where you used the new strategy and thought about the ideas of the "Cool CATSS", the way you used them, the success you had in using them, and what you can do differently to use them more successfully if things didn’t go as well as you had planned. That will mean that during the week you will want to make notes in your head about using the strategy and store them up for Fridays. If you want to, you can write them down in a notebook or on a sheet of paper if that will help you remember.

By the way, your teachers and your parents know about what we are going to be working on this 9 weeks, so think about letting them know once and awhile about how the new strategy is helping you, and why you think it is. I know they’ll be interested because they want you to do well in school, and believe that you can.

(BREAK for approximately 5-10 minutes before moving into the initial explanation of the new strategy)

PART 2

NOTE: The teacher should liberally refer to the acronym "STARS" and the associated words as written on the board during verbal descriptions of the "STARS" procedure.

The purpose of teaching you this new strategy is to help you learn to take your time and work very carefully on your schoolwork.

(teacher solicits student reasons for taking your time and working carefully; acknowledge effort and
Students will make fewer mistakes when they learn to slow down and think carefully about their work after having considered all the possibilities before they answer. On the other hand, students will make more mistakes when they rush through their work and don't stop to think carefully about and check their answers. They may find that the answers teacher mark as wrong on homework or tests weren't wrong because the student didn't actually know the answer or how to do the problem or spell the word, but because they didn't carefully think first, if it was in math for example, about the best way to do the problem and consider if their answer was actually correct before writing it down, and then reviewing it to make sure it was correct. That is why we will call this strategy "Stop-Think-Act-Review-Success".

(teacher writes these words on the board in a vertical column and refers to them while proceeding through the following explanation)

You will be learning to 'stop and think' carefully about what you are doing, to then 'act' by completing the activity after having first stopped and thought, to then 'review' your work and your answer to make sure they are correct, and finally to reward yourself for 'success' in having taken your time and completed your work carefully and accurately.

(teacher should highlight or underline the first letter in each of the words and ask the students if any can identify the word that is spelled- "STARS")

(teacher responds affirmatively or cues to identification of 'STARS' and advises students that...)

We will be calling the new strategy "STARS" for short because that is an easy way to remember all the steps.

(teacher points the word that begins with each letter)

As we go through the next several weeks you will see how the "STARS" strategy and the "Cool CATSS" ideas will work together to help you in school.
Now, in order to help you learn to use the "STARS" strategy—remember, "STARS" stands for "Stop-Think-Act-Review-Success"—I will be teaching you how to think out loud. Some of you may do that already on your school work or even when you're playing, and if so, that's fine. Thinking out loud can be a terrific way of helping us figure things out. It will take some practice because it's not always easy to remember a new way of doing things, particularly if it involves a new way of thinking, but I know each one of you will work hard along with the rest of the group on the practice activities so that you can all be successful together.

We will start today on a very short lesson where we match simple shapes and designs. Over the next several weeks, we are going to use the "Stop-Think-Act-Review-Success" strategy, that is, the "STARS" strategy, with more difficult shapes and designs, letters and numbers, and words and math problems. The activities with shapes and designs that you do at the beginning will be pretty easy for you because I want to make sure you get the hang of what it is like to "Stop-Think-Act-Review-and Succeed" before you move to more difficult materials. After a few weeks, we will finish working with the introductory activities and begin to use the "STARS" strategy with your actual math and reading activities for this class. Eventually, I believe that each one of you will know how to use the "STARS" strategy well enough to use it on your own in other activities in this class, and in your regular classes.

Along the way, while you're moving through these first activities, I'll be reminding you, and you're going to be reminding yourselves, of the "Cool CATSS" ideas—they are just as important as the new strategy you'll be learning.

(teacher briefly reviews the five "Cool CATSS" components by soliciting student recall and referring to the poster; acknowledge effort and ability in formulation of student responses)

When we do these activities, we will always try to take our time and not make mistakes but if we do we will always take our time to go back and correct them. That is what review is all about... being able to go back, check your work, and fix it if it needs to be fixed, but also recognize that it's OK if everything checks out right. And, when it is OK, that is when you tell yourself that you did well... that you had success. You won't stop making mistakes completely because you're
using this new strategy, but you should make less mistakes and be able to correct the ones you do make better than before.

(teacher asks the students to individually and/or as a group read the "STARS" sequence from the board; teacher then asks for individuals to volunteer to recall the "STARS" sequence from memory with teacher support as necessary)

That was good! "Stop-Think-Act-Review-Success" will be easy to remember for this group! If you do have any trouble remembering, just think of "STARS" and that will clue you right in to "Stop-Think-Act-Review-Success".

(teacher indicates that s/he and the aide where applicable will be checking the students periodically on their recall and application of the "STARS" strategy)

NOTE: (Before proceeding to the first activity, have page 1 drawn on the board)

NOTE: (Have "STARS" acronym and words on the board for frequent reference during the following activity)

We will now do the first activities which involve matching shapes and designs. Please leave your pencils on the table and watch and listen carefully to what I am doing at the board. These will be easy for you to do if you try hard to watch and listen while I explain what to do.

Look at the designs here on the board. "Stop and Think!", (teacher points to acronym/words) what am I supposed to do? What are the directions? I am supposed to find the shape over here (teacher points to the two designs to the right of the two lines) which is just the same as this one (pointing to the one to the left of the two lines) and underline it.

What should I do first? Remember, "Stop and Think!" (teacher points to acronym/words) What is the first one? It's a shape with three sides and a point at the top (teacher points to the sides and traces the shape while describing). What do we call this shape? (teacher solicits answer of triangle and acknowledges effort/ability involved in watching and listening well in order to make a correct identification) Now, I need
to look at the other two shapes and see which one is just the same as this first one. I need to be sure to look at all my possible choices before I act and underline my choice. (teacher points to first alternative and asks) Does this shape have three sides? Yes, it does. It does look just like this one (teacher points to the stimulus shape)... both have three sides, but I will not underline it until I have checked all of the possible choices.

(teacher points to the second shape and asks) Does this one have three sides? No, it has four (teacher traces and counts four sides aloud). It is not just like this one (teacher points to the correct choice) is right and I will underline it. In order to be very sure, I will look at my choice one more time and check it against the model to be certain I made the right choice. (teacher compares model and choice). Now that I reviewed my choice, I am confident that my choice is correct. (teacher acknowledges success with appropriate statement such as...) That was easy and fun to do and I was successful because I used the "STARS" strategy correctly. I took the time to stop and think carefully, act on my choice, and review my choice, and achieved success because I followed these steps (teacher proceeds to the square on page 1)

Now, I am going to use the same strategy on this shape.

(teacher asks if any student can identify the name of the strategy and after receiving/prompting and rewarding correct response proceeds to follow the same verbal descriptive procedure- i.e., the square has four sides and four points, two at the top and two at the bottom- for matching the square that was used for matching the triangle).

(Upon completion of the second item, activity page 1 is distributed and students perform the same tasks following the teacher's direct step-by-step verbal instructions. Teacher adapts a proximal position allowing close observation and supervision of the students' performance with attention to and successful completion of tasks attributed to merger of effort and ability as referred to in the Attributional Retraining Daily Checklist and as modeled in the Supplement to Attributional Retraining Daily

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(teacher states the following upon completion of the practice activities)

We have finished our introduction to the "Stop-Think-Act-Review-Success" strategy... what we will be calling "STARS" for short over the next several weeks. All of you tried hard and did a good job the way I knew each of you would. You were all definitely "Cool CATSS" today (teacher points to poster as reminder and states in sequence while pointing to each word) and showed yourselves that you can do the work, have the ability to do it, tried hard to use the strategy, and were successful.

(Teacher closes out the session with a statement that the activities the next few days will continue to involve shapes and designs, but be somewhat more challenging and gradually introduce letters and numbers, and that each student will become increasingly adept at the strategy over the succeeding weeks).

—End of Sessions 1, 2—
"COOL CATSS" ARE "STARS"

SESSION 3

NOTE: 1) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during this session and all subsequent sessions. Reminders to respond accordingly are periodically interspersed throughout the session directions. To simplify the presentation format, a shorthand attributional cue to the teacher will be 'ATR'. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples.

2) Adhere as closely as possible to the content and sequence of the session as described below; use flexibility primarily in modifying the 'formality' or 'difficulty' of the language to meet the needs of the group.

3) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

--------------------

Introduction

Look and listen very carefully. Today we are going to continue with the learning strategy that we talked about and practiced yesterday. Before we start, there is a special name that you learned to call this group yesterday (remember, ATR student responses)...

(teacher asks if any student remembers the name "Cool CATSS", writes "Cool CATSS" on the board after the name is prompted/recalled, asks for student recall of the key words associated with each letter of the acronym, and while pointing to each letter in sequence reminds the students that they were successful yesterday and will have success again today because they can do the activities, have the ability to do them, and will try hard to learn and use the new strategy)

Remember that there is a card at the corner of your desk and the poster in our room which you can always refer to when you want to remind yourself of the "Cool
(teacher states the following specifically)

I will make a point of letting each of you know during every session how the "Cool CATSS" ideas are working for you, both as a group and for each of you individually.

---------------

Activity page 2

NOTE: (Before proceeding to this activity, have the complete design sequence for the first two designs on activity page 2 drawn on the board)

Now, we are going to move to the next activity in learning the new strategy (remember, ATR student responses).

(teacher writes the first letter of each word in the "STARS" sequence on the board and requests student recall of the "Stop-Think-Act-Review-Success" phrase from this visual cue; teacher requests student paraphrase of intent of "STARS" concept; after phrase recall, teacher reminds students of the manner in which "STARS" was adapted previously with success on the matching of simple shapes)

Remember, we must stop and think and look at all of our possible choices before we act and review and then underline our answer and reward ourselves for our success. We will always try to take our time and not make any mistakes, but if we do make a mistake we will go back and correct it. We will again be looking at and matching different shapes and designs and I want you to look at and listen to me very carefully as I do the first one.

(teacher models the procedure, as in session 1/2, using designs 1 and 2 on activity page 2 and systematically working through the steps, talking aloud, using first the vertical rectangle with crossed lines and then the sloped triangle with crossed lines, carefully comparing each of the three samples and eliminating the incorrect choices; teacher points out as a component of the design review process that certain of the choices could be completed to look like the sample but are different...
in key respects and should be eliminated as choices; teacher must stop at appropriate points and ask aloud appropriate questions about the process as it is modeled while providing aloud corrective cues and finally positive ATR feedback for completing the respective designs while emphasizing the value of the "STARS" strategy.

(Upon completion of the second item, activity page 2 is distributed and students perform all 5 tasks following the teacher's direct step-by-step verbal instructions; teacher models stopping and careful thinking before making a response and reviewing it, and asking aloud appropriate questions; teacher adopts a proximal position allowing close observation and supervision of the students' performance with attention to and successful completion of tasks attributed to merger of effort and ability in using the strategy as referred to in the Attributional Retraining Daily Checklist and as modeled in the Supplement to Attributional Retraining Daily Checklist).

(teacher selects a student whom observation has indicated may be successful and asks him/her to complete design 1 on activity page 2 at the board aloud for the class; teacher guides student through appropriate verbalizations and provides concluding ATR statements)

(teacher selects other students to complete designs 2 through 5 at the board again with assistance and ATR statements)

(Upon completion of the activity page, teacher refers to the poster as a visual cue and presents informally but pointedly that the students are effectively learning the "STARS" strategy because they are following the "Cool CATSS" guidelines, i.e.,)

"You are finding that you can do these strategy activities successfully because each of you has the ability and is trying hard to watch, listen, and learn"

or

"That was good work, I can see that each one of you was trying hard today to learn how to use the"
"Stop-Think-Act" strategy; I know that you are going to continue to be as successful as we move through the next activities.

Conclusion

(Teacher closes out the session with a statement that the next session will involve matching of shapes with letters and numbers within them)

-End of Session 3-
"COOL CATSS" ARE "STARS"

SESSION 5

Session 5 will be the first of the 'group discussion' sessions. As described and modeled during teacher training, this is an unstructured and unscripted opportunity for the teacher and students to discuss, among other topics:

- clarification of "STARS" strategy steps,
- student awareness of changes in personal self-control,
- the function and utility of the "STARS" strategy and "Cool CATSS" ideas in the practice activities thus far,
- the planned or spontaneous application of the "STARS" strategy and "Cool CATSS" ideas in other settings, i.e., academic, social, family, etc.,
- brainstorming as to the value of the "STARS" strategy and "Cool CATSS" ideas in the students daily lives, both present and future,
- clarification of potential strategy limitations in classroom or other settings,
- teacher observations of the manner in which individual students and/or the group have implemented the strategy and adhered to the "Cool CATSS" ideas with an ATR focus in the content of the observations. The focus is upon the positive and constructive and an ATR consistent view; for example, inconsistent individual student success with the "STARS" strategy may be attributed to inconsistent application of effort, not to a lack of ability, the nature of the activities, or bad luck.
- student 'affective' responses to the use of the strategy and "Cool CATSS" ideas, i.e., does s/he 'feel' good or bad, happy or sad, more or less capable, etc. about what is being learned and how successful they have been thus far, - student sharing of observations made by others such as teachers or parents that appear related to the training,
- teacher sharing of any positive remarks presented to him/her by teachers which appear related to the training and reflect perceptions of forward movement and change.

NOTE: The teacher is encouraged to refer to the Supplement to Attributional Retraining Daily Checklist for guidance and examples concerning the nature and content of ATR oriented responses.

- End of Session 5 -
"COOL CATSS" ARE "STARS"

SESSION 9

NOTE: Teacher statements are not scripted regarding the nature, content, and placement of attributional observations or the demonstration, sequencing, and cueing of strategy training. The teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during this session and all subsequent sessions. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples.

2) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

3) Acknowledge that effective acquisition of the "STARS" strategy is related to their following the "Cool CATSS" guidelines.

4) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

REMINDER: an assessment of student recall and use of the "STARS" strategy will occur at the conclusion of this session.

Introduction

(Teacher introduces lesson with ATR emphasis;

teacher reminds students of the general idea that a strategy is a 'plan of action' and that they have been working the past several days on developing a 'plan of action' that will help in focusing attention and completing work with more accuracy;

teacher selects students randomly to recall and describe the "STARS" strategy: ATR responses;
teacher briefly reminds students of value of "Cool CATSS" ideas and of teacher effort to observe and acknowledge student adherence to these ideas)

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Activity page 14

a. Teacher distributes activity page 14,
b. describes the activity as underlining the alternative choice of number-shape figures which matches the model, stressing that numbers in some cases may be backwards,
c. models item 1 aloud at the board, noting pointedly that the first choice is not correct because the 6 is backwards and the third choice is not correct because the 3 is backwards,
d. selects a student to complete item 1 aloud with teacher assistance as needed,
e. models a soft, whispered voice,
f. has the group complete the remainder of the items independently while engaged in quiet self-talk, and
g. stresses ATR responses for individual and group performance during and at conclusion of activity.

-------------

Activity page 15

a. Teacher introduces activity with request of students to describe briefly—with teacher clarification as necessary—those "Cool CATSS" ideas which influenced student success on the just completed activity and which influence similar success on the upcoming activity; ATR responses and refer to poster or cards as needed,
b. distributes activity page 15,
c. describes the activity carefully as matching a nonsense word inside of a shape with a model and notes that there is only one correct match,
d. reminds students of strategy process,
e. selects a student to complete item 1 aloud with teacher assistance as needed,
f. selects a student to model soft, whispered voice,
g. has the group complete the remainder of the items independently while engaged in quiet self-talk, and
h. has students check their work with answers presented orally by the teacher and ATR responses offered.

-------------

Activity page 16
a. Teacher introduces activity with brief ATR reference to predicted strategy success,
b. advises students that each will be checked individually on the upcoming activity sheet on their recall and use of the "STARS" strategy,
c. distributes activity page 16,
d. describes the activity carefully as adding a letter to each of the choices to exactly match the model and that none of the available choices matches the model without such a change,
e. reminds students of strategy process,
f. provides ATR response set prior to students initiation of the assessment activity, and
g. individually checks each students strategy recall and use on a minimum of 2 items, refers to criteria statement for evidence of acceptable performance, and records results; ATR test responses.

Conclusion

(Teacher concludes session with reminder of relationship between "STARS" strategy and application of "Cool CATSS" guidelines and reminds students that the upcoming session is a group session and that they may choose to begin to think or write down ideas or experiences that they would like to share which are pertinent to the group)

-End of Session 9-
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"COOL CATSS" ARE "STARS"

SESSION 14

NOTE: Teacher statements are not scripted regarding the nature, content, and placement of attributional observations or the demonstration, sequencing, and cueing of strategy training. The teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during this session and all subsequent sessions. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples.

2) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

3) Acknowledge that effective acquisition of the "STARS" strategy is related to their following the "Cool CATSS" guidelines.

4) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

REMINDER: an assessment of student recall and use of the "STARS" strategy will occur on activity pages 26 and 27.

Introduction

(Teacher briefly reminds students of teacher effort to observe and acknowledge student adherence to the "Cool CATSS" ideas;

teacher reminds students of the general idea that a strategy is a 'plan of action' and that they have been working the past several days on developing a 'plan of action' that will help in focusing attention and completing schoolwork with more accuracy;
teacher summarizes the "STARS" strategy)

Activity pages 26, 27

a. Prior to introducing activity pages 26 and 27, teacher advises that the forthcoming activity will involve remembering and selecting shapes and letters in a manner similar to the previous session but that in this session each will be checked individually on the upcoming activity sheets on their recall and use of the "STARS" strategy,
b. distributes activity pages 26 and 27,
c. describes the activity carefully as students recalling from memory a design that will be shown to them for 10 seconds, students underlining the recalled choice on the record sheet after having looked carefully at the design for the full 10 seconds and having stopped and looked at all the available choices before acting and selecting a choice to match the one presented earlier by the teacher, reviewing the choice, and noting success,
d. offers ATR statement regarding past success and predicted success,
e. has aide or self display all items for 10 seconds,
f. has aide or self observe student verbally state strategy sequence and implement strategy on a minimum of 2 items, referring to criteria statement for evidence of acceptable performance,
g. records results,
h. has group check response accuracy on all items at end of individual assessments, and
i. offers ATR statements as appropriate.

Activity page 28

NOTE: Conduct activity if time allows after assessment completion.

a. Teacher preceeds introduction of this activity with ATR statement alluding to success on previous activity extending to success on current activity,
b. distributes activity page 28 (series of blank sheets, one per design),
c. describes the activity carefully as students recalling from memory a design that will be shown
to them for 10 seconds and then drawing the design from memory after having stopped and looked carefully at the design for the full 10 seconds, reviewing the response, and noting success.

d. displays each design for 10 seconds while verbally describing design features,

e. displays model (with teacher verbal description of recall process on items 1 and 2) after student completion of individual items so that students may check personal response accuracy,

f. encourages students to voluntarily share design reproductions with the group and to describe the manner in which the "STARS" strategy was employed, and

g. offers ATR responses.

 Conclusion

(Teacher concludes session with reminder of relationship between "STARS" strategy and application of "Cool CATSS” guidelines and

reminds students that the upcoming session is a group session and that they may choose to begin to think or write down ideas or experiences that they would like to share which are pertinent to the group)

-End of Session 14-
"COOL CATSS" ARE "STARS"

SESSION 22

NOTE: Teacher statements are not scripted regarding the nature, content, and placement of attributional observations or the demonstration, sequencing, and cueing of strategy training. The teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during this session and all subsequent sessions. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples.

2) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

3) Acknowledge that effective acquisition of the "STARS" strategy is related to their following the "Cool CATSS" guidelines.

4) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

NOTE: All subsequent activities will continue to require strategy application to actual reading and math problems.

Introduction

(Teacher briefly reminds students of teacher effort to observe and acknowledge student adherence to the "Cool CATSS" ideas; teacher acknowledges individual or group ATR success; teacher summarizes or asks students to summarize the "STARS" strategy)

Activity page 44
NOTE: The first item will be verbally described by the teacher and students selected to verbally describe the remainder.

a. Prior to introducing activity page 44, teacher advises that the upcoming activities will continue to involve a more advanced, classroom-like employment of the "STARS" strategy,

b. accentuates relationship between careful and successful attention on the upcoming tasks and similar tasks in the SCLD and regular classrooms,

c. emphasizes value of all previous and final practice sessions in effecting a smooth, successful transfer to actual instructional tasks,

d. offers an ATR statement alluding to past success with strategy implementation and probability of success on upcoming activity,

e. distributes activity page 44,

f. describes the activity carefully as students finding from memory the math problem which exactly matches a model described orally but not shown visually, that students will complete the problem they selected, that a student will be asked to come to the board after the completion of each problem to first write and then calculate the problem aloud, that the model will be described and shown immediately afterward to assess choice accuracy and successful problem completion of the group, and that the teacher will present the first item and selected students the remainder,

h. emphasizes the importance of finding the problem with the numbers in the same order as the model and having the correct sign in order to correctly answer the problem,

i. offers an ATR expectation statement,

j. describes each problem aloud,

k. completes activity as described in (f) above, and

l. asks for show of hands or other acknowledgments of success,

m. offers ATR responses.

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Activity page 45

NOTE: The first item will be verbally described by the
teacher and students selected to verbally describe the remainder.

a. Prior to introducing activity page 45, teacher offers an ATR statement alluding to success on activity page 44 and other previous activities with strategy implementation and probability of success on upcoming activity,
b. distributes activity page 45,
c. describes the activity carefully as students finding from memory the word which exactly matches a model described orally but not shown visually, that students will mark the word they selected, that a student will be asked to come to the board after the completion of each word to write the word while describing it aloud, that the model will be described and shown immediately afterward to assess choice accuracy, and that the teacher will present the first item and selected students the remainder,
d. emphasizes the importance of finding the word with the letters in exactly the same order as the model (i.e., notes that the beginning and ending letters should match),
e. emphasizes the importance of sustaining attention to the model for the full oral description,
f. offers an ATR expectation statement,
g. describes or has described each item for 10 seconds with first teacher for item 1 and then students for remainder of items verbally describing relevant features,
h. completes activity as described in (c) above,
i. asks for show of hands or other acknowledgments of success, and
j. offers ATR responses.

Activity page 46

NOTE: Conduct this activity time permitting.

NOTE: The first item will be verbally described by the teacher and students selected to verbally describe the remainder.

a. Teacher precedes introduction of this activity with ATR statement alluding to success on previous activity extending to success on current activity,
b. distributes activity page 46 (series of blank
sheets, one per item),

c. describes the activity carefully as students recalling from memory a math problem or short sentence that will be shown to them for 10 seconds, recording each from memory after having stopped and looked carefully at the problem or sentence for the full 10 seconds, completing the given math problems, students asked to come to the board and first write and then calculate aloud the math problems or write and describe aloud the sentences, that the model will be shown immediately afterward to assess recall accuracy and successful math problem completion of the group, and that the teacher will present the first item and selected students the remainder,
d. displays or has displayed each item for 10 seconds with first teacher for item 1 and then students for remainder of items verbally describing relevant features,
e. completes activity as described in (c) above, and
f. offers ATR responses.

Conclusion

(Teacher concludes session with reminder of relationship between "STARS" strategy and application of "Cool CATSS" guidelines, and that the final training session will include an assessment of the application of strategy skills to actual math and reading tasks similar to those completed during the past few sessions (providing ATR success expectation), and that subsequent sessions will begin to directly involve those math and reading tasks reflecting their specific needs)

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"COOL CATSS" ARE "STARS"

SESSIONS 25, 26

NOTE: Sessions 25 and 26 serve an assessment function as the teacher will use math, reading, and written language probes (see samples in Appendix) to pinpoint students skill levels prior to exposure to Phase 2 transition activities and entry to direct instruction during Phase 3.

1) Teachers provide an ATR framework within which to present assessment probes- ATR and "STARS" teacher cues introducing each Phase 1 activity will be adapted at the introduction of each assessment session, and similar abbreviated cues will introduce individual probe sheet administration. All directions are presented clearly and accurately. No indirect or direct teacher assistance is provided during the assessment periods.

2) Assessments are group administered if estimated skill level is sufficiently homogeneous, or individually administered if skill levels are sufficiently diverse.

3) Additional sessions may be utilized as needed in order to complete probe sheet administration.

General Procedure

a. Given knowledge of concurrent direct math, reading, and written language instructional objectives and skill levels estimated from available measures (Brigance assessments), the teacher will selectively administer math, reading, and written language probe sheets of curricular relevance until a criterion of approximately 50% or less completion accuracy per individual student is realized in a 2-minute assessment period in addition or multiplication in math, vocabulary development in reading, and alphabetizing in written language.

b. At the conclusion of probe administration for all students in the group, teachers individually assess each students oral labeling and definition of the "STARS" and "Cool CATSS" sequence to assure mastery (100% criterion
on independent labeling of acronyms, and 80% criterion on teacher-assisted definition); failure to achieve criterion necessitates additional individual support and review, and transition session activities are not introduced to the group as a whole until stated criterion are realized for each individual student;

Labeling is defined as stating the name of the respective sequence, i.e., "STARS" and that "S" stands for "STOP", etc;

Definition is defined as explaining the meaning of the respective sequence in one's own words, i.e., "STARS" means that you should stop and think before you answer a problem, and that afterward you check to make sure that it's right, and if it is, then you tell yourself that you did a good job; 80% criterion is defined as adequately expressing/conceptualizing 8 of the 10 ideas described in the two acronyms ("STARS" and "CATSS");

Teacher-assisted is defined as providing as needed clarification and supportive responses as the student presents a definition.

-End of Sessions 25, 26-
"COOL CATSS" ARE "STARS"

SESSION 27

NOTE: This session(s) serves a transition function from the guided instruction on controlled materials in Phase 1 to the direct instruction on standard curricular materials in Phase 3.

NOTE: This session may exceed 30 minutes in length.

1) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during this session and all subsequent sessions. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples.

2) Remind students that they will always try to take their time, stop, and think before acting and choosing an answer, review the answer, and acknowledge success.

3) Acknowledge that effective application of the "STARS" strategy to previously mastered materials is related to following the "Cool CATSS" guidelines.

4) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

NOTE: The teacher cues students at the end of this and each subsequent session to think actively about strategy and attributional utility, and to record or remember key ideas or situations that clarify these thoughts for use in group sessions.

Introduction

The teacher proceeds as follows:

a. Begins the session with an ATR reminder of the successful manner in which the "STARS" strategy has been applied to previous controlled materials and that success has been related to their adherence to the "Cool CATSS" ideas;
b. describes a rationale for applying both the "STARS" strategy and the "CooT CATSS" ideas to tasks other than those adapted for Phase 1 purposes, stating essentially that the messages behind the strategy and attributional ideas can be relevant in a wide range of settings and situations and is certainly not limited to the previous controlled materials or to school related tasks, but also to real-life events and decisions; cite pertinent examples and request student response and personal examples;

c. suggests that student effectiveness in using the strategy and attributional ideas will increase as they actively think about the personal and practical issues surrounding their application, and that these thoughts may be shared individually with the teacher or during the group session, and presents questions such as the following as a source of potential self-study:

- How can I remind myself to use this strategy?
- How can I tell when it is "right" to use the skill?
- What cues should I watch for?
- How can I use the skill across different materials, situations, classes, etc.?
- What are the situations where I should not use the strategy?
- What parts of the skill help me most?
- What parts of the skill are hardest to perform?
- How could the skill be changed to make it work better for me?
- What other things could I use to help me do better?

*from Ellis, E.S., Lenz, B.K., & Sabornie, E.J. (1987)

d. advises students of the following:

- standard curricular materials will replace controlled activities throughout the remainder of the sessions and that the first activities utilized will incorporate skills which they have previously attained to mastery levels on IEP's;
- use of such familiar material with which students feel competent and have been measured as successful should ensure an effective
transition of "STARS" implementation and "Cool CATSS" ideas from controlled materials to new learning;
- strategy application to new skills will be monitored by the teacher to ascertain individual and group preparation for complete transition;
- group and individual instruction will incorporate "STARS" strategy teaching cues and methods as deemed appropriate;
- "STARS" strategy teacher and student reviews at session outset will be gradually reduced through the remainder of the sessions;
- "STARS" and "Cool CATSS" cards and posters remain available and beneficial for easy reference;
- group sessions will continue on an every fifth session schedule;
- assessments of strategy recall and use will continue to occur every session preceding a group session;
- grades will be assigned to standard curricular activities at the teacher's discretion and will be based strictly upon standard grading criterion, not the adequacy of use or implementation of the strategy

General Procedure

NOTE: Teacher discretion in assessing the homogenetic balance of the group will determine the individual meeting or group forum as the format for instruction on transition stage mastery level materials. Should the skill differential across students not be significant, then selecting instructional tasks at a common level of mastery may be judicious and group instruction feasible and preferable; should the skill differential be sufficiently significant to cause the identification of a common level of mastery and consequent instruction to be unwieldy, then individualized or smaller group instruction may be more feasible and preferable.

The following description is a sample instructional sequence pertaining to group instruction and should be modified and condensed for individualized instruction:

a. Teacher introduces lesson with ATR emphasis,
b. selects students randomly to recall and describe the "STARS" strategy,
c. selects students randomly to recall and describe the "Cool CATSS" ideas,

d. elicits discussion of merits of integrating the "STARS" strategy and "Cool CATSS" ideas,

e. reminds students of visual cues,

f. provides ATR cue for successful strategy generalization to previously mastered materials,

g. presents instruction appropriately adapting "STARS" skills with at least two sample items performed orally by the teacher at the board,

h. distributes assignments/activity sheets,

i. encourages use of "STARS" strategy,

j. circulates and provides strategy clarification and other feedback in an ATR manner,

k. at task completion requests volunteers or designates students to demonstrate successful strategy use either at the board or from their desks, providing ATR responses,

l. at task conclusion provides task-related group and/or individual ATR observations, and

m. provides supportive ATR statements regarding effective predictive strategy generalization to new materials.

-End of Session 27-
"COOL CATSS" ARE "STARS"

SESSIONS 30 TO END

NOTE: Direct Instruction during Sessions 30 through conclusion of the study addresses the following objective: Extension of the "Cool CATSS" ideas and "STARS" strategy to current instruction in standard curricular math, reading, and written language materials based upon stated IEP goals and objectives.

NOTE: Teacher statements are not scripted regarding the nature, content, and placement of attributional observations or the demonstration, sequencing, and cueing of strategy training. The teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Acknowledge effort and ability in relevant student formulation of responses when input and answers are requested during this session and all subsequent sessions. Have the Attributional Retraining Daily Checklist and Supplement to Attributional Retraining Daily Checklist available for guidance and examples.

2) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

3) Acknowledge that effective acquisition of the "STARS" strategy is related to their following the "Cool CATSS" guidelines.

4) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

------------------------------------------

General Procedure

a. Controlled and mastery level activities are no longer incorporated for instructional purposes.

b. The teacher should directly incorporate the "STARS" strategy in daily curricular presentations and discussions in a manner reflecting the careful, step-by-step, orally guided approach repeated in previous
sessions while judiciously presenting ATR observations.

- An introductory session set is established via the teacher restating the "Cool CATSS" ideas and/or "STARS" strategy or requesting similar student restatements and referring to visual cues (posters and cards). The use of such introductory references should be gradually decreased over the remainder of the sessions as appropriate for the group.

c. A group processing session will be conducted every fifth session.

d. An assessment will be conducted every session preceding a group processing session on worksheet or other relevant activities in the manner described for Session 18 (see Phase 2).

- The teacher will observe each student orally utilizing the "STARS" strategy on a minimum of two randomly selected items until a criterion of 100% correct recall of the strategy acronym (only one strategy recall is necessary and should precede the initial assessment item), and correct oral incorporation of the strategy in the completion of the given items is realized on a minimum of two consecutive items. Individual support and review is provided as needed to encourage mastery.

e. The teacher concludes Phase 3 as described in the following instruction page entitled The Final Session.
"COOL CATSS" ARE "STARS"

FINAL SESSION

The final session(s) serves an assessment function as the teacher will repeat math, reading, and written language probes presented during Sessions 25 and 26. Probes providing cutoff pinpoints (approximately 50% or below success rate) will be readministered under identical conditions; probes will be administered with "Cool CATSS" ideas and "STARS" cues at the introduction of each assessment session, and similar abbreviated cues will precede individual probe sheets.

-End of Final Session-
SESSION 1

NOTE: 1) Session length is approximately 30 minutes.

2) Adhere as closely as possible to the content and sequence of the session(s) as described below; use flexibility primarily in modifying the 'formality' or 'difficulty' of the language to meet the needs of the group.

3) Provide supportive responses, corrective aid, and reinforcement as appropriate.

General Procedure

Listen very carefully, I have something important to tell you about this next 9 weeks.

For the next several weeks, we are going to meet for about 30 minutes per day to work on a group of activities using a special new set of skills—what you and I will be calling a strategy. Your teachers and your parents know about what we are going to be working on this 9 weeks, so think about letting them know once and awhile about how the new strategy is helping you, and why you think it is. Now, let's talk about what a strategy really is.

(teacher writes the word strategy on the board, defines it as 'a plan of action', and uses an example(s) such as Nintendo as a situation where the students might use a plan of action over and over again to help the Mario Brothers to progress from the lowest to the highest levels, reminding the students that they do it over and over again because it works)

This strategy will help you to think about and learn your school work in a way that you may never have before.

NOTE: The teacher should liberally refer to the acronym "STARS" and the associated words as written on the board during verbal descriptions of the "STARS" procedure.
The purpose of teaching you this new strategy is to help you learn to take your time and work very carefully on your schoolwork.

*(teacher solicits student reasons for taking your time and working carefully)*

Students will make fewer mistakes when they learn to slow down and think carefully about their work after having considered all the possibilities before they answer. On the other hand, students will make more mistakes when they rush through their work and don't stop to think carefully about and check their answers. They may find that the answers teacher mark as wrong on homework or tests weren't wrong because the student didn't actually know the answer or how to do the problem or spell the word, but because they didn't carefully think first, if it was in math for example, about the best way to do the problem and consider if their answer was actually correct before writing it down, and then reviewing it to make sure it was correct. That is why we will call this strategy "Stop-Think-Act-Review-Success".

*(teacher writes these words on the board in a vertical column and refers to them while proceeding through the following explanation)*

You will be learning to 'stop and think' carefully about what you are doing, to then 'act' by completing the activity after having first stopped and thought, to then 'review' your work and your answer to make sure they are correct, and finally to reward yourself for 'success' in having taken your time and completed your work carefully and accurately.

*(teacher should highlight or underline the first letter in each of the words and ask the students if any can identify the word that is spelled- "STARS")

*(teacher responds affirmatively or cues to identification of 'STARS' and advises students that...)*

We will be calling the new strategy "STARS" for short because that is an easy way to remember all the steps.

*(teacher points the word that begins with each*
Now, in order to help you learn to use the "STARS" strategy—remember, "STARS" stands for "Stop-Think-Act-Review-Success"—I will be teaching you how to think out loud. Some of you may do that already on your school work or even when you're playing, and if so, that's fine. Thinking out loud can be a terrific way of helping us figure things out. It will take some practice because it's not always easy to remember a new way of doing things, particularly if it involves a new way of thinking.

We will start today on a very short lesson where we match simple shapes and designs. Over the next several weeks, we are going to use the "Stop-Think-Act-Review-Success" strategy, that is, the "STARS" strategy, with more difficult shapes and designs, letters and numbers, and words and math problems. The activities with shapes and designs that you do at the beginning will be pretty easy for you because I want to make sure you get the hang of what it is like to "Stop-Think-Act-Review-and Succeed" before you move to more difficult materials. After a few weeks, we will finish working with the introductory activities and begin to use the "STARS" strategy with your actual math and reading activities for this class. Eventually, I believe that each one of you will know how to use the "STARS" strategy well enough to use it on your own.

When we do these activities, we will always try to take our time and not make mistakes but if we do we will always take our time to go back and correct them. That is what review is all about... being able to go back, check your work, and fix it if it needs to be fixed, but also recognize that it's OK if everything checks out right. And, when it is OK, that is when you tell yourself that you did well... that you had success. You won't stop making mistakes completely because you're using this new strategy, but you should make less mistakes and be able to correct the ones you do make better than before.

(teacher asks the students to individually and/or as a group read the "STARS" sequence from the board; teacher then asks for individuals to volunteer to recall the "STARS" sequence from memory with teacher support as necessary)
That was good! "Stop-Think-Act-Review-Success" will be easy to remember for this group! If you do have any trouble remembering, just think of "STARS" and that will clue you right in to "Stop-Think-Act-Review-Success".

(teacher indicates that s/he and the aide where applicable will be checking the students periodically on their recall and application of the "STARS" strategy)

NOTE: (Before proceeding to the first activity, have page 1 drawn on the board)

NOTE: (Have "STARS" acronym and words on the board for frequent reference during the following activity)

We will now do the first activities which involve matching shapes and designs. Please leave your pencils on the table and watch and listen carefully to what I am doing at the board. These will be easy for you to do if you watch and listen while I explain what to do.

Look at the designs here on the board. "Stop and Think!", (teacher points to acronym/words) what am I supposed to do? What are the directions? I am supposed to find the shape over here (teacher points to the two designs to the right of the two lines) which is just the same as this one (pointing to the one to the left of the two lines) and underline it.

What should I do first? Remember, "Stop and Think!" (teacher points to acronym/words) What is the first one? It's a shape with three sides and a point at the top (teacher points to the sides and traces the shape while describing). What do we call this shape? (teacher solicits answer of triangle and acknowledges students' watching and listening well in order to make a correct identification) Now, I need to look at the other two shapes and see which one is just the same as this one (pointing to the one to the left of the two lines) and underline it.

(Teacher points to the second shape and asks) Does this one have three sides? Yes, it does. It does look just like this one (teacher points to the stimulus shape)... both have three sides, but I will not underline it until I have checked all of the possible choices.

(Teacher points to the second shape and asks) Does this one have three sides? No, it has four (teacher
traces and counts four sides aloud). It is not just like this one (teacher points to the stimulus shape). Now, I am believe that this one (teacher points to the correct choice) is right and I will underline it. In order to be very sure, I will look at my choice one more time and check it against the model to be certain I made the right choice. (teacher compares model and choice). Now that I reviewed my choice, I am confident that my choice is correct. (teacher acknowledges success with appropriate statement such as...) That was easy and fun to do and I was successful because I used the "STARS" strategy correctly. I took the time to stop and think carefully, act on my choice, and review my choice, and achieved success because I followed these steps (teacher proceeds to the square on page 1)

Now, I am going to use the same strategy on this shape.

(Teacher asks if any student can identify the name of the strategy and after receiving/prompting and rewarding correct response proceeds to follow the same verbal descriptive procedure- i.e., the square has four sides and four points, two at the top and two at the bottom- for matching the square that was used for matching the triangle. Upon completion of the second item, activity page 1 is distributed and students perform the same tasks following the teacher's direct step-by-step verbal instructions. Teacher adapts a proximal position allowing close observation and supervision of the students' performance with attention to successful completion of tasks).

(Teacher states the following upon completion of the practice activities)

We have finished our introduction to the "Stop-Think-Act-Review-Success" strategy... what we will be calling "STARS" for short over the next several weeks.

(Teacher closes out the session with a statement that the activities the next few days will continue to involve shapes and designs, but be somewhat more challenging and gradually introduce letters and numbers, and that each student will become increasingly adept at the strategy over the succeeding weeks).

-End of Session 1-
"STARS"

SESSION 2

NOTE: 1) Adhere as closely as possible to the content and sequence of the session as described below; use flexibility primarily in modifying the 'formality' or 'difficulty' of the language to meet the needs of the group.

2) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

3) Provide supportive responses, corrective aid, and reinforcement as supportive.

Introduction

Look and listen very carefully. Today we are going to continue with the learning strategy that we talked about and practiced yesterday. Remember, this strategy is a 'plan of action' that you will use with your school work.

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Activity page 2

NOTE: (Before proceeding to this activity, have the complete design sequence for the first two designs on activity page 2 drawn on the board)

Now, we are going to move to the next activity in learning the new strategy.

(teacher writes the first letter of each word in the "STARS" sequence on the board and requests student recall of the "Stop-Think-Act-Review-Success" phrase from this visual cue; teacher requests student paraphrase of intent of "STARS" concept; after phrase recall, teacher reminds students of the manner in which "STARS" was adapted previously with success on the matching of simple shapes)

Remember, we must stop and think and look at all of our possible choices before we act and review and then underline our answer and reward ourselves for our
success. We will always try to take our time and not make any mistakes, but if we do make a mistake we will go back and correct it. We will again be looking at and matching different shapes and designs and I want you to look at and listen to me very carefully as I do the first one.

(teacher models the procedure, as in session 1, using designs 1 and 2 on activity page 2 and systematically working through the steps, talking aloud, using first the vertical rectangle with crossed lines and then the sloped triangle with crossed lines, carefully comparing each of the three samples and eliminating the incorrect choices; teacher points out as a component of the design review process that certain of the choices could be completed to look like the sample but are different in key respects and should be eliminated as choices; teacher must stop at appropriate points and ask aloud appropriate questions about the process as it is modeled while providing aloud corrective cues for completing the respective designs while emphasizing the value of the "STARS" strategy)

(Upon completion of the second item, activity page 2 is distributed and students perform all 5 tasks following the teacher's direct step-by-step verbal instructions; teacher models stopping and careful thinking before making a response and reviewing it, and asking aloud appropriate questions; teacher adopts a proximal position allowing close observation and supervision of the students' performance with attention to adequacy of task completion)

(Teacher selects a student whom observation has indicated may be successful and asks him/her to complete design 1 on activity page 2 at the board aloud for the class; teacher guides student through appropriate verbalizations)

(teacher selects other students to complete designs 2 through 5 at the board)

(Upon completion of the activity page, teacher refers to the "STARS" poster as a visual cue and presents informally but pointedly that the students are effectively learning the "STARS" strategy)
Conclusion

(Teacher closes out the session with a statement that the next session will involve matching of shapes with letters and numbers within them)

-End of Session 2-
"STARS"
SESSION 10

NOTE: Teacher statements are not scripted regarding the demonstration, sequencing, and cueing of strategy training. The teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

2) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

3) Provide supportive responses, corrective aid, and reinforcement as appropriate.

4) Acknowledge that effective acquisition of the "STARS" strategy is related to students carefully following and practicing the sequence of steps as described and demonstrated during the session.

Introduction

(Teacher selects students to recall and describe the "STARS" strategy and clarifies student response as needed)

Activity pages 23, 24

a. Prior to introducing activity pages 23 and 24, teacher advises that the forthcoming activity will again involve memorization and reminds them of the personal examples and observations they had presented the previous session regarding the value of memory or memorization skills,
b. distributes activity pages 23 and 24,
c. describes the activity carefully as students recalling from memory a design that will be shown to them for 10 seconds, students underlining the recalled choice on the record sheet after having looked carefully at the design for the full 10 seconds and having stopped and looked at all the available choices before acting and selecting
a choice to match the one presented earlier by
the teacher, reviewing the choice, and noting
success,

d. displays items 1 and 2 for 10 seconds while
verbally describing design features but all other
items without verbal description,

e. displays model after student completion of
individual items so that students may check
personal response accuracy, and

f. asks for show of hands or other demonstration of
accurate performance, encouraging discussion.

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**Activity page 25**

a. Teacher distributes activity page 25 (series of
blank sheets, one per design),
b. describes the activity carefully as students
recalling from memory a design that will be shown
to them for 10 seconds and then drawing the
design from memory after having stopped and
looked carefully at the design for the **full 10
seconds**, reviewing the response, and noting
success,
c. displays each design for 10 seconds while
verbally describing design features,

d. displays model (with teacher verbal description
of recall process on items 1 and 2) after student
completion of individual items so that students
may check personal response accuracy, and
e. encourages students to voluntarily share design
reproductions with the group and to describe the
manner in which the "STARS" strategy was
employed.

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**Conclusion**

(Teacher reminds students that effective acquisition
of the "STARS" strategy is related to following and
practicing the "STARS" sequence; and

advises students that the upcoming activities will
involve memory tasks with designs and letters)

-End of Session 10-
"STARS"

SESSION 15

NOTE: Teacher statements are not scripted regarding the demonstration, sequencing, and cueing of strategy training. The teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

2) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

3) Provide supportive responses, corrective aid, and reinforcement as appropriate.

4) Acknowledge that effective acquisition of the "STARS" strategy is related to students carefully following and practicing the sequence of steps as described and demonstrated during the session.

NOTE: All subsequent activities will continue to require strategy application to actual reading and math problems.

Introduction

(Teacher summarizes or asks students to summarize the "STARS" strategy)

Activity page 38

a. Prior to introducing activity page 38, teacher advises that the upcoming activities will continue to involve a more advanced, classroom-like employment of the "STARS" strategy,

b. distributes activity page 38,

c. describes the activity carefully as students finding from memory the math problem which exactly matches a model described orally but not shown visually, that students will complete the problem they selected, that a student will be asked to come to the board after the completion
of each problem to first write and then calculate the problem aloud, and that the model will be described and shown immediately afterward to assess choice accuracy and successful problem completion of the group,

d. emphasizes the importance of finding the problem with the numbers in the same order as the model and having the correct sign in order to correctly answer the problem,

e. emphasizes the importance of sustaining attention to the model for the full oral description.

f. describes each problem aloud, and

Procedure page 39

g. completes activity as described in (c) above.

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**Activity page 39**

a. Teacher distributes activity page 39,

b. describes the activity carefully as students finding from memory the word which exactly matches a model described orally but not shown visually, that students will mark the word they selected, that a student will be asked to come to the board after the completion of each word to write the word while describing it aloud, and that the model will be described and shown immediately afterward to assess choice accuracy,

c. emphasizes the importance of finding the word with the letters in exactly the same order as the model (i.e., notes that the beginning and ending letters should match),

d. emphasizes the importance of sustaining attention to the model for the full oral description.

e. describes each word aloud, and

f. completes activity as described in (b) above.

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**Activity page 40**

**NOTE:** Conduct this activity time permitting.

a. Teacher distributes activity page 40 (series of blank sheets, one per item),

b. describes the activity carefully as students recalling from memory a math problem or word similar to those from the previous activity that will be shown to them for 10 seconds, recording each from memory after having stopped and looked carefully at the problem or word for the full 10 seconds, completing the given math problems, students asked to come to the board and first
write and then calculate aloud the math problems or write and describe aloud the words, and that the model will be shown immediately afterward to assess recall accuracy and successful math problem completion of the group,
c. displays each item for 10 seconds while verbally describing relevant features, and
d. completes activity as described in (b) above.

Conclusion

(Teacher reminds students that effective acquisition of the "STARS" strategy is related to following and practicing the "STARS" sequence; and
advises students that the final few training sessions will continue to involve the application of strategy skills to actual math and reading tasks similar to those they may see in the SCLD or regular classrooms, but that all subsequent sessions will begin to directly involve those math and reading tasks reflecting their specific needs)

-End of Session 15-
"STARS"

SESSIONS 19, 20

NOTE: Sessions 19 and 20 serve an assessment function as the teacher will use math, reading, and written language probes (see samples in Appendix) to pinpoint students' skill levels prior to exposure to Phase 2 transition activities and entry to direct instruction during Phase 3.

1) "STARS" strategy cues introducing each Phase 1 activity will be adapted at the introduction of each assessment session, and similar abbreviated cues will introduce individual probe sheet administration. All directions are presented clearly and accurately. No indirect or direct teacher assistance is provided during the assessment periods.

2) Assessments are group administered if estimated skill level is sufficiently homogeneous, or individually administered if skill levels are sufficiently diverse.

3) Additional sessions may be utilized as needed in order to complete probe sheet administration.

General Procedure

a. Given knowledge of concurrent direct math, reading, and written language instructional objectives and skill levels estimated from available measures (Brigance assessments), the teacher will selectively administer math, reading, and written language probe sheets until a criterion of approximately 50% or less completion accuracy per individual student is realized in a 2-minute assessment period in addition or multiplication in math, vocabulary development in reading, and alphabetizing in written language.

b. At the conclusion of probe administration for all students in the group, teachers individually assess each student's oral labeling and definition of the "STARS" sequence to assure mastery (100% criterion on independent labeling of the acronym, and 80% criterion on teacher-assisted definition).
failure to achieve criterion necessitates additional individual support and review, and transition session activities are not introduced to the group as a whole until stated criterion are realized for each individual student;

*Labeling* is defined as stating the name of the strategy sequence, i.e., "STARS" and that "S" stands for "STOP", etc;

*Definition* is defined as explaining the meaning of the strategy sequence in one's own words, i.e., "STARS" means that you should stop and think before you answer a problem, and that afterward you check to make sure that it's right, and if it is, then you tell yourself that you did a good job; 80% criterion is defined as adequately expressing/conceptualizing 4 of the 5 ideas described in the acronym "STARS";

*Teacher-assisted* is defined as providing as needed clarification and supportive responses as the student presents a definition.

-End of Sessions 19, 20-
"STARS"

SESSION 21

NOTE: This session may exceed 30 minutes in length.

NOTE: Teacher statements are not scripted regarding the demonstration, sequencing, and cueing of strategy training; the teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Remind students that they will always try to take their time and stop and think before acting and choosing an answer, review the answer, and reward themselves with success.

2) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

3) Provide supportive responses, corrective aid, and reinforcement as appropriate.

4) Acknowledge that effective acquisition of the "STARS" strategy is related to students carefully following and practicing the sequence of steps as described and demonstrated during the session.

NOTE: This session(s) serves a transition function from the guided instruction on controlled materials in Phase 1 to the direct instruction on standard curricular materials in Phase 3.

Introduction

(Teacher proceeds as follows)

a. Describes a rationale for applying the "STARS" strategy to tasks other than those adapted for Phase 1 purposes, stating essentially that the messages behind the strategy ideas can be relevant in a wide range of educational applications certainly not limited to the controlled materials in Phase 1;

b. advises students of the following;

- standard curricular materials will replace controlled activities throughout the remainder of
the 9-week period and that the first activities utilized will incorporate skills which they have previously attained to mastery levels on IEP's;

- strategy application to new skills will be monitored by the teacher to ascertain individual and group preparation for complete transition;

- "STARS" strategy teacher and student reviews at session outset will be gradually reduced through the remainder of the sessions;

- "STARS" cards and posters remain available and beneficial for reference and reminders;

- Assessments of strategy recall and use will continue on an every fifth session or as needed schedule;

- Grades will be assigned to standard curricular activities at the teachers' discretion and will be based strictly upon standard grading criterion, not the adequacy of use or implementation of the strategy.

General Procedure

NOTE: Teacher discretion in assessing the homogenetic balance of the group will determine the individual meeting or group forum as the format for instruction on transition stage mastery level materials. Should the skill differential across students not be significant, then selecting instructional tasks at a common level of mastery may be judicious and group instruction feasible and preferable; should the skill differential be sufficiently significant to cause the identification of a common level of mastery and consequent instruction to be unwieldy, then individualized or smaller group instruction may be more feasible and preferable.

NOTE: The following description is a sample instructional sequence pertaining to group instruction and should be modified and condensed for individualized instruction.

(Teacher proceeds as follows)

a. Selects students randomly to recall and describe the "STARS" strategy,
b. elicits discussion of merits of the "STARS" strategy in educational applications,
c. reminds students of visual cues,
d. presents instruction appropriately adapting "STARS" skills with at least two sample items performed orally by the teacher at the board,
e. distributes assignments/activity sheets,
f. encourages use of "STARS" strategy,
g. circulates and provides strategy clarification and other clarification as needed,
h. at task completion requests volunteers or designates students to demonstrate successful strategy use either at the board or from their desks, and
i. at task conclusion provides task-related group and/or individual observations of successful "STARS" application.

-End of Session 21-
"STARS"

SESSIONS 23 TO END

NOTE: Direct Instruction during Sessions 23 through conclusion of the study addresses the following objective: Extension of the "STARS" strategy to current instruction in standard curricular math, reading, and written language materials based upon stated IEP goals and objectives.

NOTE: Teacher statements are not scripted regarding the demonstration, sequencing, and cueing of strategy usage; the teacher is urged to refer to previous session procedures and descriptions for guidance. In general, the teacher should:

1) Remind students that they will always try to take their time and **stop and think** before **acting** and choosing an answer, **review** the answer, and reward themselves with **success**.

2) Circulate actively among students to provide an optimal opportunity for teacher observation and feedback.

3) Provide supportive responses, corrective aid, and reinforcement as appropriate.

4) Acknowledge that effective acquisition of the "STARS" strategy is related to students carefully following and practicing the sequence of steps as described and demonstrated during the session.

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**General Procedure**

a. Controlled and mastery level activities are no longer incorporated for instructional purposes.

b. The teacher should directly incorporate the "STARS" strategy in daily curricular presentations and discussions in a manner reflecting the careful, step-by-step, orally guided approach repeated in previous sessions.

- An introductory session set is established via the teacher restating the "STARS" strategy or requesting similar student restatements and referring to visual cues (posters and cards).
The use of such introductory references should be gradually decreased over the remainder of the sessions as appropriate for the group.

c. An assessment will be conducted every fifth session during worksheet or other relevant activities in the manner described for Session 18 (see Phase 2).

- The teacher will observe each student orally utilizing the "STARS" strategy on a minimum of two randomly selected items until a criterion of 100% correct recall of the strategy acronym (only one strategy recall is necessary and should precede the initial assessment item), and correct oral incorporation of the strategy in the completion of the given items is realized on a minimum of two consecutive items. Individual support and review is provided as needed to encourage mastery.

d. The teacher concludes Phase 3 as described in the following instruction page entitled The Final Session.
"STARS"

FINAL SESSION

The final session(s) serves an assessment function as the teacher will repeat math, reading, and written language probes presented during Sessions 19 and 20. Probes providing cutoff pinpoints (approximately 50% or below success rate) will be readministered under identical conditions; probes will be administered with "STARS" cues at the introduction of each assessment session, and similar abbreviated cues will precede individual probe sheets.

-End of Final Session-
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