COGNITIVE-BEHAVIOR MODIFICATION: THE USE OF SELF-INSTRUCTION STRATEGIES BY FIRST GRADERS ON ACADEMIC TASKS

By

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To Judd, Sara, and Steve

with

thanks and love
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COGNITIVE-BEHAVIOR MODIFICATION: THE USE OF SELF-INSTRUCTION STRATEGIES BY FIRST GRADERS ON ACADEMIC TASKS

by

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The purpose of this study was to apply the cognitive-behavior modification self-instruction model, which involves the use of cognitive modeling and children's private speech to develop children's self-guiding statements and images in task performance, to actual classroom practice and content.

Fifty-six first grade students were randomly assigned within intact reading groups to two treatment conditions. Students in the experimental group were trained by their teachers in self-instruction on non-reading tasks during four sessions separate from reading instruction. Both experimental and control groups participated in regular, basal-directed reading instruction. The dependent measure for this study was children's performance on six selected independent seatwork tasks provided by the reading series.
A multivariate analysis of variance (MANOVA) using a two-way nested design was used to test the hypothesis that there were no significant differences between experimental and control groups on their overall task performance. Univariate analyses of variance (ANOVAs) were then used to determine if the overall difference between groups existed for each task. The MANOVA analysis yielded a highly significant difference between groups, followed by the ANOVAs' smaller but significant differences on five of the six tasks.

From the above results, the following conclusions were drawn. First, children who used self-instruction applied academic skills with significantly higher accuracy through increased skill in problem definition, strategy selection, self-evaluation, self-reinforcement, and error coping. Second, self-instruction, as a teaching-thinking process which focuses on the processes students use in task performance, is generalizable across at least some tasks. Third, self-instruction can be effectively used to teach planful behavior in academics with groups of normal children in classroom settings. Fourth, teachers can be easily and effectively trained to incorporate self-instruction into their curricula. Fifth, cognitive strategy changes can be demonstrated on ordinary performance in naturalistic settings. All conclusions point to promising gains through further applied cognitive-behavior modification research.
CHAPTER I
INTRODUCTION

Statement of the Problem

One of the major challenges in education today is the development of students' independent thinking skills and work habits. Children often acquire information in a passive, rote fashion, and then are unable to respond to questions and solve problems unless those questions and problems closely resemble the learning task. This sort of "patterned learning" effect has been particularly apparent to this researcher (a teacher) in school-based reviews of standardized test errors and math problem-solving mistakes, in children's composition efforts, and, in the middle school years, their inability to work on class or home assignments without guidance or supervision. One approach to increasing children's personal control over learned information is to train them in self-instruction, a cognitive control technique developed within the cognitive-behavior modification paradigm by Donald Meichenbaum and others in the early 1970s.

By the end of the 1950s operant conditioning had begun to evolve from various forms of laboratory
stimulus-response investigations to behavior therapy programs with children. Educators in the 1960s became familiar with behavioral objectives, behavior modification, token economies, and precision teaching. "Modeling," "shaping," and "positive reinforcement" became part of everyday professional language and the theme of teacher inservice programs in the early 1970s. Further, during the 1970s behavior therapy underwent a "shift from an emphasis on modification of attentive and disruptive motor behaviors to a concern with educational tasks that involve cognitive or thinking skills" (Meyers & Craighead, 1984, p. 4). This transition was fostered by the work of social learning theorists which provided cognitive explanations of modeling effects, and by the recognition that behavior therapy, or simple operant conditioning, did not produce generalizable or long-lasting behavior change. Self-instruction evolved from cognitive-behavior modification investigations of cognitive processes and strategies children use in task performance.

**Self-Instruction Training**

In self-instruction training, cognitive modeling and private speech are combined as an approach to teaching thinking skills. Children are taught how to use self-statements and images to think and plan behavior; they are
not instructed in what to think or encouraged to focus on "right answers." Although right answers would appear to be a logically correct educational goal, both metacognitive and self-instruction researchers reject that aim and set the development of underlying thinking skills or executive processes as a priority of teaching efforts.

Self-instruction in task performance requires that the student engage in problem definition, appropriate strategy selection, self-evaluation of performance, self-reinforcement, and coping behaviors. To date, the self-instruction process has been used with young children on social, interactive, motor, and academic tasks. Meichenbaum's model includes the following steps:

1. cognitive modeling (an adult performs the task and talks to self);
2. child performs the task with model's direction for guidance (overt external guidance);
3. child performs task and talks aloud to self (overt self-guidance);
4. child whispers and performs task (faded, overt self-guidance);
5. child performs task via inaudible or private speech or nonverbal self-instruction (covert self-instruction). (Meichenbaum, 1977, p. 32)

At step three the child's skills in problem definition, planful behavior, and implementation of strategies can be observed.
Self-Instruction Research

The cognitive-behavior modification investigations utilizing self-instruction during the 1970s and early 1980s have demonstrated success in modifying subjects' performance. Research designs have included, usually, single subjects of specialized (hyperactive, learning disabled) populations in laboratory settings. Tasks presented have been sensorimotor or interpersonal, and treatment effects have been measured on tests other than direct performance (such as Porteus Mazes, standardized tests, or the Matching Familiar Figures Test). These designs have been apropos for theoretical development and, in effect, piloting the use of a new intervention. Such intervention research is normally prompted by some need in a clinical population and focuses on resolving various dysfunctions for a long period before being used in a preventative or developmental fashion.

If self-instruction is to be proved a useful way to enhance the development of thinking skills in normal early learners, previous research designs must be altered. To begin with, utility with groups of normal subjects on academic tasks in naturalistic settings must be demonstrated. Once such success is established, Craighead, Meyers, Craighead, and McHale (1983) indicate that client assessment, generalization of treatment effects, and loci of
interventions, and use of paraprofessionals will become the issues of the 1980s. In other words, the testing of the self-instruction model as a teaching-thinking program in classroom settings can begin to address the question of its practicality. Meichenbaum sets the stage for self-instruction research in academics by stating,

We can conceive of academic tasks where the teacher provided the children with a set of tasks . . . and the child's job was to identify what the problem is, how he or she will go about solving the task, where the likely pitfalls are, etc. . . . Teachers could give assignments and ask the children to describe in detail how they are going to go about performing the assignment. . . . Discussion could center on the process, not only the product, of the assignment. (Meichenbaum, 1985, p. 421)

A number of other studies have investigated self-instruction in designs which would not be replicable or appropriate in regular classrooms (see Meichenbaum, 1985, for a review of these studies). There have been only two doctoral studies done (Rhodes, 1979; Sullivan, 1981) which have begun to approach the full applied Meichenbaum model. In one of these studies (Sullivan, 1981), "self-instruction" was interpreted as verbalization of a given problem in mathematics rather than as the development of self-guiding strategy statements and was used in conjunction with a mathematics problem-solving strategy, yielding no information about the metacognitive advantages of self-instruction per se. In the other study (Rhodes,
1979), the self-instruction process was abbreviated until only its cognitive-modeling component was taught, and, again, the effects of the full self-instruction model were not assessed. The Meichenbaum model does involve cognitive modeling and overt-to-covert skills practice, but these procedures must further include opportunity for the child to engage in problem definition, strategy selection and implementation, and error management. This study provides necessary information regarding the feasibility of utilizing the full self-instruction model in classroom situations, with normal children, on academic tasks.

The Purpose of the Study

The purpose of this study is to apply the cognitive-behavior modification self-instruction model as developed by Meichenbaum to actual classroom practice and content. The design includes the use of the full self-instruction model without abbreviation, extension, or collaboration with other problem-solving methods and is in direct response to the following needs statements in general reviews of the field.

1. Kendall (1977), in a discussion of obtaining generalization of learning through use of cognitive-behavior modification techniques, stated "the focus of the training materials and the setting contribute
meaningfully to the type of generalization achieved" (p. 331), and suggested that the way to promote "the natural development of verbal mediation" (p. 331) and to "foster each child's personal cognitive control" (p. 331) in the classroom is to use psychoeducational materials in a teacher-student situation.

2. Meichenbaum and Asarnow (1979) maintained that self-instruction training should teach "cognitive skills or executive routines that are transsituational" (p. 28) and that such training should "focus directly and explicitly on the skills and tasks that are to be learned, not on some presumed underlying deficit" (p. 30).

3. Hobbs, Moguin, Tyroler, and Lahey (1980) questioned the demonstrated utility of cognitive-behavior modification with children, indicating that the common problems with this research area were the specificity of the independent variable, lack of results from natural settings and normal performance, and lack of information on the impact of treatment in classroom or home situations.

4. Meichenbaum and Burland (1981), commenting on the self-instruction format, stated, "At this point we can share the general training strategy that is being employed and make a call for more research to assess the pedagogical potential of cognitive-behavior modification procedures" (p. 112).
5. Kazdin (1982) emphasized the need to show that "changes in cognitive skills are reflected in measures of ordinary performance in naturalistic situations" (p. 77) and stated that when the target population is "not identified on the basis of deficits of dysfunction, the criteria for significant change may be demonstration that the intervention produces a significant increment above the previously accepted normative level" (p. 78).

6. Meichenbaum (1985) pointedly stated the need for classroom teacher participation in self-instruction research and set guidelines for the development of teaching-thinking classes to be integrated into the school curricula.

In this study, first grade teachers from among volunteers in a local school district were randomly assigned to treatment or control groups; self-instruction supplemented regular reading instruction for the treatment groups. Teachers in the treatment conditions were trained in the principles and administration of self-instruction, and they trained their students in self-instruction. The investigation took place in normal first grade classroom settings; academic tasks from the established curriculum were presented to the students in both treatment and control groups to be done independently.

For the purpose of this study, the following terms are defined by specific characteristics.
"Normal first graders" are those children in regular classrooms who have not been retained in the grade and who are not staffed into any special program. It is assumed that students not identified or referred for special education programs are "normal" or "average" in that they possess a range of abilities exclusive of the very high and the very low.

A "classroom setting" refers to a nonlaboratory educational situation consisting of one teacher and approximately 25 students. The students involved in the study were not participating in any other school-based programs (tutoring, precision teaching, etc.).

"Academic work" means written basal reading assignments in the district-adopted reading series, Ginn. These workbook pages provide a set of work for the children which has content validity and direct relevance to skills taught. Children are tested for correct placement in this series.

"Self-instruction training" is the use of images and self-guiding statements to direct behavior.

"Private speech" refers to egocentric or self-addressed verbalizations; it is not intended for a listener to hear or to communicate with others.
Significance of the Study

The original self-instruction studies targeted hyperactive/impulsive children in an effort to teach those children to engage in planful behavior, to be aware of and use cognitive strategies as skills increased in self-control or interpersonal behavior. There is still interest in changing the reflective/impulsive balance or cognitive tempo of such specialized populations, but applied research in self-instruction is needed to extend knowledge of its effectiveness on academic tasks and its use as a preventative or developmental approach to problems apparent in specialized populations.

In normal populations, using self-instruction to teach students planful behavior in academics remains to be investigated and may provide a remedy for those problems which are easily visible in school settings: students' inadequate study skills, inability to work independently, and inability to solve problems in any fashion other than that patterned from the teacher. The positive results of this study will substantially extend the limited existing information in this area and will contribute to the literature on the explicit training of metacognitive strategies.
Limitations of the Study

The following limitations must be considered in this study.

1. Teachers were selected from a volunteer pool recruited by open invitation across the district. These teachers' professional curiosity and willingness to participate in experimentation may be indicative of other qualities which make them "more effective" or "more dynamic" than others.

2. The treatment condition could have been misinterpreted or incorrectly administered by individual teachers in spite of careful training; the control groups could have been affected by their teachers' needs for them to do well.

Hypothesis

Treatment teachers participating in this study supplemented regular basal-directed reading instruction with students' training in self-instruction. Measures of normal classroom performance were taken on six sets of basal reading tasks completed independently by the children. The control groups received regular basal-directed reading instruction and completed the same assignments as the treatment groups, but without self-instruction training.
The supposition was that children with self-instruction training would apply academic skills with significantly higher accuracy because of increased skills in problem definition, strategy selection and implementation, and error management. The multivariate null hypothesis developed was as follows:

There will be no significant differences between the experimental and control groups in terms of performance on a set of six separate academic tasks including: word identification in context and reality/fantasy discrimination; decoding verbs with inflected -s; word insertions in sentences and puzzles; sequencing pictures or sentences; completing sentences with inflected-s verbs; advanced word insertions in sentences and in puzzles.
CHAPTER II
REVIEW OF THE LITERATURE

Historical Development

The Shift from Operant Conditioning

Cognitive-behavior modification experimentation began in an attempt to advance results gained in operant conditioning: That is, the intent was to develop the subject's capacity to retain skills or patterns learned and to generalize those skills and patterns across different situations and tasks. Such retention and transfer were not generally a product of operant conditioning.

Craighead (1982) identifies three major factors leading to the shift, in the 1970s, from operant to cognitive-behavioral interventions with children. The first was a cognitive information processing explanation of modeling effects; the second was development of self-control interventions; and the third, independent of the first two, was developments in cognitive therapy.

Cognitive information processing. In the area of modeling or observational learning, Craighead (1982) cites Bandura's (1969) work on the roles of attention and
retention as the beginning of new interpretations of behavior therapy procedures. Bandura's social learning theory proposed that cognitive and environmental influences are mediated by the cognitive processes of perception and attribution, and that the person and the environment influence one another. From the tenets of social learning theory sprang laboratory-based investigations of children's self-mediational strategies in enhancing self-control on such tasks as delay of gratification and resistance to temptation (see Meichenbaum, 1985, for a review of these studies).

**Self-control.** Self-control studies, which had been placed within the realm of operant conditioning for the duration of behaviorism's influential decade, began, in the 1970s, to be conceptualized as more cognitive in nature. Craighead (1982) cites Kanfer's work dividing self-control into the components of self-monitoring, self-evaluation, and self-reinforcement as advances in clinical application and research in self-control interventions. These "advances" later contributed significantly to the principles involved in Meichenbaum's self-instructional format.

**Cognitive therapy.** Cognitive-behavior therapy with adults began in attempts to "combine the clinical concerns of cognitive-semantic therapists with the behavior therapy technology" (Meichenbaum & Burland, 1979, p. 426).
Craighead (1982) maintains that fundamental to cognitive therapy is the assumption that maladaptive cognitions such as inappropriate, irrational and illogical self-statements (based on personal assumptions and beliefs) produce psychological disorders which are best alleviated by modification of those cognitions. Cognitive-behavior therapy with children was given impetus as this relationship between cognitive and behavioral/physiological events began to be established and continued to develop as a therapeutic alternative to psychoanalysis or behavior therapy in the treatment of childhood disorders. Meichenbaum's use of self-statements in behavior change evolved independently of this work in cognitive-behavior therapy, but against its favorable backdrop.

The Impact of Language Development Studies

Soviet research. Added to the converging influences of social learning theory, self-control interventions, and cognitive-behavior therapy was the work of Soviet psychologists in language development. According to Vygotsky (1962), children's speech progresses from an obvious externally oriented, overt stage, through an egocentric, self-addressive phase, to inner speech. Vygotsky suggests that inner speech is a foundation for children's thinking. The overt-to-covert
language development model suggested to Meichenbaum that "private speech is initially facilitative and then drops out of the repertoire with the development of task proficiency" (Meichenbaum, 1977, p. 23).

Meichenbaum's use of private speech. In 1969 Meichenbaum's doctoral research involved training schizophrenics to emit "healthy talk" to control their verbalizations and behavior; his success in this area led him to ask if other clinical populations could be explicitly trained to self-instruct and spontaneously generate statements to guide behavior (Meichenbaum, 1977).

Influence of Verbal Mediation and Task Analysis

Verbal mediation. Coincidental to the developments in cognitive-behavior modification were efforts being made in the analysis of "verbal mediation deficiencies." In the area of verbal mediation, the use of task-appropriate mediators is seen as involving comprehension of task, production of strategies, and, importantly, implementation of those strategies (Meichenbaum & Asarnow, 1979). While the cognitive-behavioral self-instruction process does not call for such emphasis on a phase-division of mediational intervention with children, it does call for a "cognitive-functional analysis of children's task performance" (Meichenbaum & Asarnow, 1979, p. 12).
Task analysis. The cognitive-functional analysis of task performance requires an awareness of the child's self-statements and images (which can be observed during the overt self-guidance step of self-instruction) and an understanding of the task components. Meichenbaum used the work of Gagne (1964) as a model for identifying the hierarchy of behaviors within a task, but translated each step into self-statements and strategies that could be modeled by the trainer and rehearsed by the child (Meichenbaum & Asarnow, 1979).

Relevant Metacognition Research

The field of cognitive-behavior modification progressed parallel to and convergent with the field of metacognition. Each is concerned with cognitive strategy deficits leading to poor performance on tasks, and each is concerned with the learner's ability to identify the problem at hand, select and implement strategies, and evaluate performance. Cognition refers directly to such acts of thinking as attending, remembering, and choosing; metacognition refers to one's personal awareness of those acts.

Researchers laboring under the rubric of "metacognition" tend to demonstrate interest in identifying the cognitive processes leading to deficit performance;
researchers working in cognitive-behavior modification tend to maintain concern for the subject's performance when applying appropriate cognitive strategies. Each group is concerned with effective use of cognitive strategies and the subject's awareness of personal control over those strategies. Those of the metacognitive ilk focus more on breaking the cognitive processes into components, while the cognitive-behavior modifiers focus more on breaking the task into components.

Work on metacognitive development suggests that "children fail to consider their behavior against sensible criteria, they follow instructions blindly, and they are deficient in self-questioning skills that would enable them to determine these inadequacies" (Brown, 1980, p. 457). Self-instruction (saying guiding statements to oneself) is one technique from the cognitive-behavior modification camp which is "often used to teach a person to monitor his progress, compare what he/she is going to what he/she should be doing, and self-reinforce" (Craighead et al., 1978, p. 164); in other words, self-instruction provides a mechanism for one to engage in metacognitive acts before, during, and after task performance.

In a review of studies on the use of cognitive instruction, Meichenbaum (1985) points out that children who receive cognitive instruction on specific skills without attention or training given to the development of
superordinate processes are not able to generalize learned skills to other tasks or maintain improvements across time. On the other hand, children taught to define problems, engage in planful behavior, and monitor that behavior achieve substantial transfer of learning. The self-instruction sequence fosters the development of those planful behaviors or thinking skills.

**The Formal Self-Instruction Model**

*The original study.* The research in language development and his own successful clinical use of private speech implied to Meichenbaum that a therapeutic package could be developed which would utilize self-instructional statements in behavior change; with Goodman, (Meichenbaum & Goodman, 1971), Meichenbaum formalized a self-instruction model for use with children to control impulsivity and motor behavior and to develop self-control. The final structure of the model reflected current progress in social learning theory, self-control interventions, cognitive therapy, language development, verbal mediation, and task analysis.

*Current reviews.* After reviewing the results of almost a decade of self-instruction investigations, Meichenbaum and Asarnow (1979) theorized that the overt speech in self-instruction training organizes the
information available, facilitates problem definition, and aids in strategy selection and implementation. Further, they suggested that orientation and attention to task may be enhanced, and that coping skills and self-reinforcement skills become a useful part of the child's repertoire.

The self-instruction format provides a content-free question set which the child can utilize across a variety of tasks. The goal of cognitive-behavior self-instruction is to teach children to generate, choose, and apply cognitive strategies, not to increase a specific skills-base. Meichenbaum's (1985) review of the field indicates that the time has come to investigate the use of self-instruction in classrooms on academic tasks.

General Studies in Self-Instruction

Meichenbaum's Original Study

Research in cognitive-behavior modification utilizing self-instruction began with Meichenbaum and Goodman's (1971) study in which hyperactive, impulsive preschoolers were trained to talk to themselves as they did a variety of sensorimotor (copying patterns, coloring figures) and problem-solving (completing pictorial series, solving mazes) tasks. Results of this study indicated that hyperactive, impulsive children could be taught to think before they acted and not be subject to the dominant motor
response (Meichenbaum & Goodman, 1971). The children trained in self-instruction had significantly better performance on a variety of standard psychological tests and demonstrated increased reflectivity on the Matching Familiar Figures Test. Further, more than half of the trained impulsive children continued to use self-instruction strategies on the posttest and in later sessions (Meichenbaum & Burland, 1981).

The Meichenbaum and Goodman study used (a) single subjects of (b) a special population in (c) a laboratory setting; (d) the tasks involved were sensorimotor and (e) were not tested on a direct performance measure, but on tests quite removed from the task. Most of the relevant investigations done in the decade following this 1971 study were different in theme but almost identical in composition; these studies are presented here to show, for historical purposes, the types of studies done in self-instruction.

Self-Instruction Studies Since 1971

The most comprehensive review of studies in self-control is Meichenbaum's (1985) "Teaching Thinking: A Cognitive-Behavioral Perspective," a chapter in Chipman, Segal and Glaser's Thinking and Learning Skills (Volume 2): Research and Open Questions, which was sent to the
investigator by Meichenbaum when a request for material relevant to applying self-instruction to academics was made. This review includes most of the studies specified below and represents the main body of research in self-instruction; most investigations cross-reference others which pre-date them, and they represent the range of topics studied before an interest in academic application was developed.

In a review of cognitive-behavior modification with children, Meichenbaum and Burland (1981) cite its successful use to establish "inner speech control" over the disruptive behavior of hyperactive children and aggressive children; with cheating behavior; with Maze performance of hyperactive boys; over the conceptual tempo of emotionally disturbed children; and over the conceptual tempo of normal children.

Other investigations cited by Meichenbaum and Burland combined self-instruction training with imagery practice and with operant procedures. Also cited are work with learning disability children; work with hyperactive children; work with retarded children; and articles on social reasoning and problem-solving using self-instruction.

In another review paper, Meichenbaum and Asarnow (1979) reference work with hyperactive children on arithmetic tasks, work on verbal control tasks, and use of self-instruction on kindergarteners' handwriting skills.
In an article by Hobbs, Moguin, Tyroler, and Lahey (1980), work with hyperactive children's conceptual tempo is cited. Again, the interest of this study is in the use of self-instruction with normal children, in nonlaboratory settings, on academic work normally distributed to the children; the preceding references have been presented as sources for the interested reader and to illustrate the nature of investigative interest to this point.

**Academic Studies in Self-Instruction**

An extensive review of the literature including the Current Index to Journals in Education (CIJE), Resources in Education (RIE), Educational Resources Information Center (ERIC), and the Dissertation Abstracts International yielded two studies concerning academic tasks and normal children in conjunction with self-instruction. These two studies are the most directly relevant done to date since they involved academic research in self-instruction with regular classroom populations. They are described below.

was directed at comparing results for impulsive and reflective children, and his results were measured on a researcher-developed math criterion test, various standard intelligence tests and achievement tests, all of which would have negated interest by this researcher, there were other disengaging differences illustrative of the ways in which self-instruction research is interpreted.

Sullivan used direct instruction to teach math computation skills to one group, and, for the second group, coupled that instruction with self-instruction in the sense that children were "verbalizing key phrases aloud as they worked through the task" (Sullivan, 1981, p. 44). Sullivan's math problems were "academically relevant materials" (p. 8), but were not a subsection of the students' normal math curriculum. Sullivan's study "did not assess the effectiveness of verbal self-instruction as a treatment without specific attack strategies" (p. 84). In other words, children verbalized statements of particular strategies which were taught to them; they did not generate their own self-statements and strategies. This approach fits more closely with studies concerned with the influence of self-verbalization on academic achievement (Grimm, Bijou, & Parsons, 1973; Lovitt & Curtis, 1968); these studies found that simple verbalization of problems in the math area enhanced children's performance. The true self-instruction procedure is content-free: It calls for
problem definition by the student, selection of strategies by the student, and self-monitored implementation of those strategies. Sullivan's "self-instruction" group did outperform his attack-strategy-only group, and his study was based on Meichenbaum's work, but his interpretation of the self-instruction purpose and format and its application are not in alignment with that of this researcher or with the stated guidelines for research by Meichenbaum (see next section).

Rhodes, 1979. The University of Louisville dissertation by Rhodes (1979) is problematic in some of the same ways as Sullivan's. The author's intent was to demonstrate that Meichenbaum's self-instruction could be used to direct readers' attention to task and to teach students to generate questions regarding the purpose and meaning of assigned reading passages. Although the results of this dissertation indicate that behavioral methods do increase reading comprehension (on standardized tests after five weeks of intervention), the Meichenbaum model was substantially abbreviated, and the task so narrow that it was not clear that cognitive self-instruction was responsible for the increase in comprehension, or that, as a modus operandi, the children learned a task-generalizable self-instruction model; they may have learned simply to question the title and paragraph of any story.
In the Rhodes study the "self-instruction" format involved, first, the teacher's modeling or scanning the assigned story, reading the title and first paragraph, and questioning for purpose and meaning as cued by the teacher's manual; this took up one week. For the second week, students individually scanned the material, generated questions regarding purpose and meaning, and read silently. The teacher selected certain of the student-generated questions for discussion at the conclusion of reading. During the third, fourth, and last weeks these procedures were repeated, but the children's spoken questions faded to silence.

In the Rhodes study children had to generate questions regarding story purpose or meaning from the title and first paragraph; there was no problem definition or strategy selection in that task, nor was there any of the necessary self-reinforcement or error management modeling. Further, it is not clear whether the control group was directed to scan and then re-read the story (without the modeling and question-generating time), in which case the number of times each story was read and the following question-discussion could have increased comprehension for the experimental group.

It appears that the Rhodes study is one in which the cognitive modeling portion of the full self-instruction model was used as a teaching strategy for a particular
reading task; the procedures used are, actually, more akin to the SQ3R (Survey, Question, Read, Recite, and Review) method cited in Pressley and Levin's (1983) *Cognitive Strategy Research: Educational Applications* and in much of the reading literature. In this process, the reader scans titles, subheadings, and summaries to get an idea about the story before reading and then restates any boldface headings in question form. Again, as with Sullivan's study, in the Rhodes study there is both a distortion of the Meichenbaum model and an overlap with research in the content area, or, at best, use of a simple faded cognitive-modeling teaching strategy.

**Summary of academic studies.** The two dissertations reviewed above present varying points of view as to the uses and interpretations of self-instruction. They do not, however, clearly apply the Meichenbaum self-instruction format to academic instruction. Each of these authors seemed to perceive self-instruction as a new mode of instruction for the purpose of getting more "right answers" in a particular subject area rather than as an approach to teaching thinking skills.

In order to further explore and understand the use of self-instruction with young children, the research must focus on development of strategies which are content-free and not patterned as a "set" of attack plans for a particular "set" of problems. The dissertations reviewed
do not address the research need or adhere to the guidelines for self-instruction research.

Guidelines for Effective Research in Self-Instruction

Meichenbaum (1985) makes recommendations in two areas for those who wish to do research in self-instruction training: First, he describes a point of view to which the teacher must be committed in order to effectively transmit the training, and, second, gives guidelines for the training to foster generalization.

Ideally, the teacher should model a metacognitive perspective, one which indicates openness to thinking and anticipation of mistakes which, when they occur, are viewed as problems to be solved. The instructor should be careful of attributions made when failures occur, with statements directed at nurturing the problem-solving attitude. Lastly, the teacher must conduct a task analysis of skills to be taught, as self-instructions are comprised of superordinate cognitive strategies which are implemented to successfully apply content skills.

To maximize generalization, training in self-instruction must be on a task which has the same requisites or elements of the performance task, but is overtly different from that performance task. The pupil must be a collaborator in generating the strategies to be used, and the private
speech trained must be developed with and compatible with the child's natural style. The cognitive strategy training should take place after component skills and experience with the task are in the child's repertoire, and the pupil must be helped to recognize the new task as one facilitated by self-instruction and requiring transfer of those strategies. The instructor needs to ensure against rote repetition of patterned strategies, encouraging personal involvement by the student through use of faded cues and acceptance of the child's wording. The teacher should directly encourage the child to generalize strategies to various tasks or situations, perhaps by engaging in discussion of other suitable uses. Lastly, a sense of self-satisfaction should be nurtured in the child, with attention given to developing the child's self-reinforcing and coping skills and flexibility in the use of strategies is fostered.

**Summary of the Literature Review**

From the foregoing review of the literature the following conclusions are apparent.

1. Self-instruction provides a mechanism for one to engage in metacognitive acts before, during, and after task performance; in other words, self-instruction can be used to teach "planful" behavior.
2. Since the original Meichenbaum study dealing with hyperactive/impulsive children on sensorimotor tasks, many investigations using self-instruction with specialized populations on sensorimotor or interpersonal tasks have been done.

3. Most self-instruction studies have involved single subjects, special populations, and laboratory settings. Most tasks studied have been sensorimotor and have not been tested through measures of normal performance.

4. The two studies done on the use of self-instruction in academics have not interpreted self-instruction in a metacognitive sense and have not met the current needs for applied research.

5. No studies have been done utilizing self-instruction with normal children, in a classroom setting, on normal performance of academic work.
CHAPTER III
METHODOLOGY

Research Question and Hypothesis

The following research question emerged from the review of research on the use of self-instruction with young children: Can the performance of normal first graders on basal seatwork tasks be improved through the use of self-instruction? Or, in other words, can cognitive strategy changes made be reflected to a measurably significant degree on classwork?

The following null hypothesis was developed to be tested by this study:

There are no significant differences between the experimental and control groups in terms of performance on any of six separate academic tasks including: word identification in context and reality/fantasy discrimination; decoding verbs with inflected s; word insertions in sentences and in puzzles; sequencing pictures or sentences; completing sentences with inflected-s verbs; advanced word insertions in sentences and in puzzles.
Method of the Study

Subjects

First grade students were chosen as the target group for this study for two reasons: the speech characteristics of their age and their academic skills level.

In the state of Florida first grade students must be six years old on or before September first of the entry year. Between ages five and seven children's speech is more overt than covert; before age five speech is largely reflective and modeled from others and after age seven is likely to be internalized, or covert. The overt-speech characteristic is necessary for observation of the self-instruction development.

Self-instruction training provides the student or client with strategies for problem identification, strategy selection, and implementation. The student or client utilizes self-instruction in conjunction with his or her skills in the problem or content area. First graders who would be considered "normal" have an adequate but not sophisticated skills-base in reading and math; such a skills base becomes the point of departure for self-instruction training. In the reading area assigned level chosen for this study, children do recognize letters and sounds and are aware of what reading is, but have not
begun to generate their own word attack strategies or to develop sight vocabularies.

Nine teachers with a total of 56 student subjects from 2 rural and 3 city schools were recruited by open invitation to all first graders in the Alachua County, Florida, schools. Each teacher's instructional assignment for the year included a class of approximately 25 students with a range of ability in the reading area. Within each of the nine classes, the group of students in the beginning first grade instructional level was randomly assigned to the treatment or control group for the study. No school contained both treatment and control groups; each treatment condition contained both urban and rural schools.

**Instruments**

Any academic task for which instruction and standardized seatwork materials are provided would lend itself to self-instruction. For this study reading seatwork tasks were chosen because, in the Ginn district-adopted reading series, such lessons are prescribed in the teachers' manuals, pacing is set for each book, and workbook materials (the "Skillpack" and "Studybook") correlate with the instruction and pacing. These seatwork materials are intended to be presented within the regular classroom setting to be done independently by the children. Further,
for this series children are tested for correct placement before beginning a level, ensuring that all subjects belonged at the given level of instruction.

The choice of Ginn Level 3, Fish and Not Fish (Clymer, Venezky, Johnson, & Pearson, 1984) was made for several reasons. First, Levels 1 and 2 are primarily letter/sound and experiential materials without basal-structured worksheets involving reading on the students' part. Many first graders enter with sufficient skills to waive Levels 1 and 2, since those levels simply review and reinforce the kindergarten program. Level 3 is an acceptable first-instruction book for first graders. Levels 4, 5, and 6, the remaining books for instruction in first grade, would also be appropriate for use with self-instruction, but students' placement in those levels in the early part of the year would indicate somewhat sophisticated reading skill. Successful training might be attributed to the learner's earlier readiness for assignment to that level. For Levels 4, 5, or 6 to be tested, the timing of the investigation for normal first graders should be October-November or later.

Levels 3, 4, and 5 of the Ginn reading series, all being potential choices for the investigation (depending on the implementation dates of the study), were subjected to a task analysis by the investigator. This means that within each level specific tasks were identified for which
cognitive strategies would be useful. These tasks included phonics exercises, word-identification in context, use of multiple meanings, identifying the main idea, sequencing, and distinguishing reality/fantasy. A set of tasks for each book was assembled from among the tasks which had a large enough item bank (9-27 items) to be useful.

Level 3 thus became the appropriate selection for self-instruction training because it is normally assigned to children in first grade between ages five and seven, it has a standardized independent-work program, it is an acceptable first book for first graders, and its materials contain a sufficient item bank of specified skills to make measurement feasible; these advantages dovetailed with the timing of the study.

The specific tasks from Level 3 which were involved with this study included phonics exercises, word identification in context, and sequencing, all with different underlying reasoning required of the student. The tasks, which were divided into six sittings, are described below and illustrated by Figures 3-1 through 3-6.

**Set 1** is word identification in context and reality/fantasy discrimination, demonstrated by matching pictures to sentences using lines, within Unit 1 of the book (Figure 3-1).
Read each sentence. Then draw a line to the picture it matches.

1. The fish is for the dolphin.
   The fish is for the cat.

2. "Look at the fish!"
   "Look at the dolphin!"

3. "We can get fish for the dolphin."
   "We can get fish to eat."

4. The man can get the fish.
   The dolphin can get the fish.

Figure 3-1. Performance Tasks, Set 1
(Clymer et al., 1984, used with permission.)
Set 2 deals with word identification in context demonstrated by matching sentences to pictures using circles, lines, or bubbles, within Unit 2 of the book; and decoding verbs with inflected s (Figure 3-2).

Set 3 involves word insertions using sight vocabulary with key words at the top of the page, within Unit 1, and word insertions in crossword puzzles (Figure 3-3).

Set 4 is sequencing pictures or sentences, within Unit 2, by assigning a number to the pictures or sentences (Figure 3-4).

Set 5 involves word insertions in sentences using verbs with s inflection, with the verbs written above or below the sentence, within Unit 2 (Figure 3-5).

Set 6 deals with word insertions using sight vocabulary with words at top of the page, within Unit 2, and word insertions in crossword puzzles (Figure 3-6).

The performance score is the total right/wrong measure for each task set, representing the students' abilities to apply academic skills in reading to independent seatwork tasks, with or without self-instruction.

Two self-instruction pilot studies were conducted. The first, in April, 1984, was done to test the success of cognitive modeling and self-guiding statements with little children. Kindergarteners preparing for the Metropolitan Readiness Test were trained in self-instruction and found, through informal observation, to be responsive.
Figure 3-2. Performance Tasks, Set 2 (Clymer et al., 1984, used with permission.)
Trace the letters to make words. Then write one of the words to finish each sentence.

**see whole big will**

1. **Jim** will look in here.
   - He will see the big **whale**.
   - "Come here, Sam," said Jim.
   - "You will **see** the big whale!"
   - Will the big whale eat?
   - The big whale will get the **ball**.

2. She can play with the **fish**.

The dolphin can **eat** the **fish**.

---

**Grandma made can't**

1. This is ________.

2. Ken ________ get the book.

3. She can ________ a whale.

---

**Mom What This**

1. What book will **Mom** get?
   - The **shark** book is for **Beth**.
   - "What a big shark this is!" said **Beth**.
   - "Look at this shark, **Mom**."
   - **Mom** will get her a big shark book.

2. The **shark** book is for **Beth**.

---

**water**

1. Where is the **ball**?
   - The **ball** is in the **water**.
   - The cat is not like the **water**.
   - Will the cat run in the **water**?

2. The cat is not like the **water**.

3. Will the cat run in the **water**?

4. Where does **Ann** like to play?
   - Does **Beth** like to play?
   - **Ann** and **Beth** play in the **water**.
   - **Ann** and **Beth** will get the **ball** for the cat.

---

Figure 3-3. Performance Tasks, Set 3
(Clymer et al., 1984, used with permission.)
Look at the pictures in each row. Write 1 in the picture that comes first. Write 2 in the picture that comes next. Write 3 in the picture that comes last.

1. Grandma will mix the clay.  
   Then Grandma will bake it.

2. Sara and Ken look in.  
   Sara and Ken see Mom with the shark.

3. 

4. 

Read the stories. Then write 1 next to the first thing that happens in each story. Write 2 next to the next thing that happens.

1. Grandma will mix the clay.  
   Then Grandma will bake it.  
   Grandma will mix the clay.

2. Sara and Ken look in.  
   Sara and Ken see Mom with the shark.  
   Sara and Ken look in.

   Sara and Ken see Mom with the shark.

---

Figure 3-4. Performance Tasks, Set 4  
(Clymer et al., 1984, used with permission.)
From Phillips for Level 1, Fish and the Fish, of the Hungry Fish Series by Tannvara Silver and others. Copyright, 1984, by Dan and Company. Used with permission.

Write a word to finish each sentence.

1. get gets
   Sara ___ gets __ a book.

2. likes like
   The dolphin ______ fish.

3. works work
   This man _____ on a van.

4. run runs
   And _____ to Jim.

5. sees see
   Ken _____ the cat.

---

From Phillips for Level 1, Fish and the Fish, of the Hungry Fish Series by Tannvara Silver and others. Copyright, 1984, by Dan and Company. Used with permission.

Read the sentence. Fill in the circle next to the word that goes into the sentence.

1. Grandma can _____ bread.
   o make o runs o eats

2. A fish _____ water.
   o gets o likes o need

3. The cat _____ here.
   o look o plays o puts

4. Ana and Sam _____ in the van.
   o get o hops o looks

5. Sam _____ for Jim.
   o come o looks o plays

6. Sora _____ with the toy.
   o play o works o get

---

From Phillips for Level 1, Fish and the Fish, of the Hungry Fish Series by Tannvara Silver and others. Copyright, 1984, by Dan and Company. Used with permission.

Beth plays with the ball. Beth and Jim play with the ball. work works
1. He ___ work ___ with fish.

look looks
2. Sara ___ at a dolphin.

like likes
3. Jim and Ana ___ the water.

see sees
4. Grandma ___ the cat.

---

From Phillips for Level 1, Fish and the Fish, of the Hungry Fish Series by Tannvara Silver and others. Copyright, 1984, by Dan and Company. Used with permission.

1. Ken _____ to the van.

hops digs runs


looks plays works


needs books sees

4. He _____ a shark in the book.

makes puts likes

5. Ken _____ the book!

---

Figure 3-5. Performance Tasks, Set 5 (Glymer et al., 1984, used with permission.)
Figure 3-6. Performance Tasks, Set 6 (Clymer et al., 1984, used with permission.)
to its structure and format. In May, 1985, a second pilot study was conducted with 10 first grade children to test the organization and choice of materials for this study; the materials were found to be practical and appropriate for use with self-instruction.

Procedure

Subject recruitment. During the preplanning session for the 1985-86 school year, curriculum resource teachers from every elementary school were addressed at their first county-wide meeting and asked to forward to the researcher a report on the number of first graders at their schools and the reading levels to which those children were assigned. Additionally, names of first grade teachers were obtained. Immediately following this report, first grade teachers at each school were contacted by the researcher and invited to participate in the study. This invitation (see Appendix A) included information to the teacher that participation would be relevant to the current emphasis on problem-solving skills development in Alachua County. Nine teachers with a total of 56 students in the beginning reading level of the Ginn series volunteered to participate in the study. Each student/teacher group was randomly assigned to treatment or control groups.
Subject information collected for analysis included the race, sex, socioeconomic status, and age of each student. Students in the study were not in any special education or remedial education programs or participating in any other educational/tutorial or research programs. The subject recruitment was successful in creating comparable groups of normal first graders ready to be taught to read and perform independently on written tasks.

**Teacher training.** Training sessions of approximately two hours were scheduled at the convenience of the participating teachers; experimental and control teachers were trained separately. The training for the experiment teachers included (a) information about self-instruction training or the metacognitive approach (see Appendix B); (b) guidelines for effective self-instruction (see Appendix C); (c) training on student self-instruction training tasks (described below); and (d) all materials for data collection (the training tasks and/or performance tasks). Complete teacher instructions for the experimental group are in Appendix E; for the control group instructions are shown in Appendix F.

Teachers were also provided with a timetable for action which correlated with the Ginn reading pacing.

**The training tasks.** Self-instruction training tasks should be similar to the performance tasks in terms of their need for strategy selection and implementation, but
should not overtly resemble the performance task. For this reason, non-reading tasks requiring strategy selection and reasoning were selected to train the children in the self-questioning, self-instruction process. These tasks involved matching similar pictures, picture association tasks, completing pathways, tracing figures to completion, reasoning tasks with matching, figure completion, and recognition of quantity. The self-instruction training was done in four separate sessions, and the tasks are illustrated in Figures 3-7 through 3-11.

The experimental groups teachers were trained to use overt-to-covert cognitive modeling and children's speech to formulate four self-guiding questions which included the following steps derived from Meichenbaum's protocol as described in the Introduction and presented in Appendix D:

1. "What should I do here?"
2. "Am I doing what I said I would do?"
3. "What if I make a mistake, how will I fix it?" and
4. "How did I do?" or "Let me check my paper before I give it to the teacher."

The children developed and practiced the self-guiding questions on the training tasks, which were broken into four sets of approximately 15-minute sessions. Thus, the experimental group children had about one hour, over four different days, of practice in self-instruction alone.
Figure 3-7. Training Set 1
Figure 3-8. Training Set 2
Figure 3-9. Training Set 3
Figure 3-10. Training Set 4
The children were taught to apply the self-guiding sequence as they worked and to repeat the sequence over again if mistakes were found. These self-guiding questions are, by design and purpose, content-free and later aided the children in selecting strategies from their reading skills repertoires to complete the performance tasks. Teachers guided the children to develop four questions which reflected the mandated steps in the self-instruction model, but understood the importance of accepting the children's wording of those questions. Each experimental group, with students working together, arrived at four questions which were acceptable to the children and met the format.

The performance tasks. The performance tasks selected were the students' independent worksheets from the Ginn skillpack and studybook, as specified in the Instruments section. These follow prescribed lessons which the teachers were encouraged to follow as exactly as possible for the duration of the study. Specifically, for each student, each teacher in the experimental group was provided with (a) training tasks for self-instruction and (b) a packet of chosen reading tasks keyed to the lesson and point in the teaching series when those tasks should be distributed to the students. The control group teachers received the same materials exclusive of the training tasks.
Implementation. Ginn Level 3 has a five-week instructional plan. Teachers in both the experimental and control groups instructed reading as usual according to the Ginn teachers' manual. Each group received the same page assignments at approximately the same time. During the third week of instruction in reading, but separately from the reading group setting, the treatment teachers provided four sessions (about 15 minutes each) of self-instruction training using the provided training tasks. During Level 3 instructional weeks four and five, five minutes of self-instruction review took place in the reading group, and then children were given the performance tasks and data collection began. Again, the self-instruction question set was structured from the previously agreed-upon wording or private speech of each group of children and was content-free; no reference was made to the work at hand, but strategies for doing work were reinforced. The control group participated in reading instruction and received the performance tasks as the experiment group did. All assignments were collected and scored by a master key by the researcher.

All teachers, experimental and control, were in weekly contact with the investigator during the experimental period, and each received a visit during the study. The investigator was easily accessible by telephone or visitation to answer questions and/or model the self-instruction process.
Statistical Design

Student performance on the Ginn reading tasks, testing the hypothesis that there were no significant differences between experimental and control groups on the reading performance tasks, was analyzed using a multivariate analysis of variance (MANOVA) on a two-way nested design. As shown in Figure 3-11, teachers are nested within group and students are nested within teacher. An alternative design was also considered in which school nested within group was a factor and teachers were nested within school. As subsequent analysis revealed virtually no difference in results for these two designs, the school factor was deleted from the model in the interest of parsimony and ease of reporting results; Figure 3-11 depicts the simpler design for which results are reported in Chapter IV.

GROUP

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<th>CONTROL</th>
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Figure 3-11. Nesting Design
A repeated measures design was considered, but since interest was in comparing overall group performance across tasks rather than group performance by (between) individual tasks, a MANOVA was used.
CHAPTER IV
RESULTS AND CONCLUSIONS

The purpose of this study was to compare the performance of first graders with and without self-instruction strategy training, on academic tasks. Children in the experimental (self-instruction) and control (no self-instruction) groups each completed six sets of basal seatwork tasks distributed by their teachers to be done independently. Each task set contained a particular set of items from among the basal skills presented for study.

A multivariate analysis of variance (MANOVA) on a two-way nested design was used to analyze the difference between the two groups for the six tasks. Teachers were nested within group, and students were nested within teachers. Following the MANOVA, six univariate analyses of variance (ANOVAs) were used to compare the difference between the experimental and control group on each separate task. The results of these analyses are presented below.

Table 4-1 presents the means and standard deviations of the different groups on each task.
Table 4-1

Means and Standard Deviations for Experimental (N = 29) and Control (N = 27) Groups

<table>
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Table 4-2 shows the partial correlation coefficients between tasks 1-6 after controlling for experimental condition. Some tasks have strong correlation and others have little or no correlation; for example, the highest partial correlation observed occurred for tasks 1 and 2; the lowest occurred for tasks 2 and 4.

The MANOVA was performed using SAS and Wilks' Criterion was used to analyze the overall difference between groups. This multivariate test showed a substantial difference between groups with F = 191.11 with
Table 4-2
Partial Correlation Coefficients, Tasks 1-6

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<th>Task 3</th>
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<td>Task 6</td>
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<td>0.06</td>
<td>0.23</td>
<td>0.27</td>
<td>0.08</td>
<td>1.00</td>
</tr>
<tr>
<td>p</td>
<td>0.80</td>
<td>0.66</td>
<td>0.08</td>
<td>0.04</td>
<td>0.53</td>
<td>0.00</td>
</tr>
</tbody>
</table>
6 numerator degrees of freedom and 2 denominator degrees of freedom, and $p = .0052$. Using a pre-established alpha level of .05, this led to a general rejection of the multivariate null hypothesis (at alpha $\leq .05$): There is a difference between the experimental and control groups in terms of performance on the six separate seatwork tasks selected from the basal reader workbooks.

As a follow-up procedure univariate ANOVAs were used to determine if the overall difference between groups existed for each task. Table 4-3 shows the Fs and probabilities for each task.

Table 4-3

Results of Univariate Tests by Task

<table>
<thead>
<tr>
<th>Task</th>
<th>df (numerator)</th>
<th>Type III SS</th>
<th>df (denominator)</th>
<th>Type III SS</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task 1</td>
<td>1</td>
<td>42.15</td>
<td>7</td>
<td>46.59</td>
<td>6.33*</td>
<td>.04</td>
</tr>
<tr>
<td>Task 2</td>
<td>1</td>
<td>7.56</td>
<td>7</td>
<td>7.29</td>
<td>7.26*</td>
<td>.03</td>
</tr>
<tr>
<td>Task 3</td>
<td>1</td>
<td>56.74</td>
<td>7</td>
<td>32.94</td>
<td>12.06*</td>
<td>.01</td>
</tr>
<tr>
<td>Task 4</td>
<td>1</td>
<td>36.72</td>
<td>7</td>
<td>7.13</td>
<td>36.01*</td>
<td>.0005</td>
</tr>
<tr>
<td>Task 5</td>
<td>1</td>
<td>106.11</td>
<td>7</td>
<td>14.73</td>
<td>50.42*</td>
<td>.0002</td>
</tr>
<tr>
<td>Task 6</td>
<td>1</td>
<td>11.90</td>
<td>7</td>
<td>19.31</td>
<td>4.31</td>
<td>.07</td>
</tr>
</tbody>
</table>

*Significant for alpha $\leq .05$. 
The six individual F-tests using TEACHER(GROUP) mean square error in the denominator (the nesting effect for teacher within group) showed significant treatment effect on each of tasks 1-5, with respective p-values of .04, .03, .01, .0005, and .0002. Although the nesting model was used, the actual effect of nesting was nonsignificant; therefore, these results are conservative.

For task 6, significant nesting effect was found (p = .008). The F-value for GROUP using TEACHER(GROUP) in the denominator is only marginally lower than the critical F-value required for statistical significance, with p = .07.

To summarize, the effects on five of the six univariate tests are significant. While it is ordinarily good statistical practice to require a higher degree of significance in repeated testing to protect against compounded Type I errors, two aspects of the present study give added protection against compounded Type I error. First, reported univariate F-values used TEACHER(GROUP) as the denominator, even though the nesting effect was not significant. F-tests using residual error as the denominator produced p-values of .017, .016, .0004, .0001, and .0001. The reported F-values are therefore taking a conservative approach and retaining the integrity of the nested model. Second, the MANOVA F was very highly significant (p = .0052), which gives global protection against compounded Type I error of repeated univariate testing.
To summarize, first graders trained in self-instruction performed significantly better on basal seatwork tasks presented to them to be done independently.

The first task called for word identification in context and reality/fantasy discrimination. This task required matching sentences to pictures and involved reasoning skills. Task 1 was done better by the self-instruction group.

The second task also called for word identification in context, but with a different format: Children had to circle pictures at the end of each sentence, and there were "distractors" or incorrect pictures available for choice. Children also had to deal with the inflection-s verb skill as they selected their answers. Task 2 was done better by the self-instruction group.

The third task involved recognizing vocabulary words and inserting them into sentences and crossword puzzles. The self-instruction group did better on this task.

On Task 4, reasoning skills were again required. Children had to use numbers to arrange pictures in a logical sequence, and, also, had to read a passage and then sequence its events. The self-instruction group did better than the no-self-instruction group.

Task 5 involved decoding verbs with and without the inflected-s ending and putting those words into sentences
that made sense. The self-instruction group performed better than the no-self-instruction group on this task.

Task 6 required that students insert vocabulary words into sentences and that they do a crossword puzzle. On this task, on which the self-instruction group performed marginally better (but not to a statistically significant degree), there were two factors which may have confounded the children. One, on the vocabulary-insertion task, some answer words could be used more than once, which broke an implied rule—"use each word once." Two, the crossword puzzle required answers in both the "across" and "down" sets; the children had previously had to insert words in one direction or the other. Each of these differences was subtle. This was the only task on which the nesting effect was significant. It is possible that, perceiving the format difficulties of this task, some teachers extended directions help beyond the requirements of the basal.

One question that occurred as this study was concluded was whether the self-instruction group outperformed the no-self-instruction group by virtue of being better readers: Had something happened which simply increased their reading skill? For this reason, the curriculum resource teachers at each school were again contacted and asked for each child's mastery score on the Ginn reading test for Level 3. This mastery test is teacher-dictated,
so that the children know, item by item, what to do. There is no problem identification or strategy selection required. On the mastery test there is no significant difference (at $\alpha \leq .05$) between the self-instruction and no-self-instruction groups, as evidenced by the t-test in Table 4-4.

Table 4-4

Scores on Ginn Level 3 Mastery Test

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>44.68</td>
<td>1.94</td>
<td>-1.6</td>
<td>.10</td>
</tr>
<tr>
<td>(N = 29)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td>43.62</td>
<td>2.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N = 27)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Alpha set $\leq .05$. 
CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to apply the cognitive-behavior modification self-instruction model to classroom practice and content. Cognitive modeling and children's private speech were combined to develop children's self-guiding statements and images as they engaged in independent work from their reading curriculum.

From a review of the literature on the use of cognitive-behavioral strategies with children, the following research needs were indicated:

1. The use of cognitive-behavior behavior with normal subjects on academic tasks in natural settings must be tested.

2. Some research must focus on the processes rather than the product(s) of learning.

3. The capacity to obtain increased generalization or transfer of learning through cognitive-behavior modification must be tested.

4. There must be greater specificity of the independent variable in cognitive-behavior research.
5. The impact of cognitive-behavior modification as a treatment in classroom and home settings has not been tested.

6. There is a need to show that metacognitive changes are reflected in normal performance.

Fifty-six first grade students (within nine intact reading groups in five schools) were randomly assigned to two treatment conditions. Each reading group was within a normal first grade classroom in a public school; although some schools had more than one experimental group, no school contained both an experimental and control group, and no classroom had more than one participating reading group. There were three urban and two rural schools, with one of the rural schools in each treatment condition.

The treatment condition consisted of self-instruction training using non-reading materials (picture association tasks, mazes, counting tasks) imposed separately from reading instruction. The control group received reading instruction only. The dependent measure for this study was children's performance on the usual independent seat-work tasks provided with the reading series; those tasks were selected and removed from the children's daily workbooks and totaled 85 items in the areas of phonics, word identification in context, and sequencing. The tasks were grouped into six sets for data collection according to the pacing requirements for reading instruction.
A multivariate analysis of variance (MANOVA) on a two-way nested design was used to compare overall group performance across tasks; this analysis showed a very high difference between experimental and control groups (F = 191.99, p = .0052). Six separate univariate ANOVAs were used to determine if the overall difference between groups existed for each task, and these analyses did show a measurably significant difference between groups on five of the six tasks.

**Conclusions**

Overall, the results of this study indicate that the cognitive-behavior modification technique of self-instruction is effective and appropriate as a means of improving the academic task performance of normal children. It is important to note that the positive results here were obtained with groups of children in naturalistic settings and on specific academic tasks done without teacher assistance. For the self-instruction group to do significantly better indicates that cognitive strategy changes can be seen on measures of ordinary performance, and children's use of study time could be improved through development of skills in self-monitoring.
Children trained in self-instruction applied academic skills with significantly higher accuracy through the development of planful behavior. Since self-instruction training was implemented with pictorial or reasoning tasks rather than reading items, its successful use in the reading area by students reflects its focus on processes or executive skills and demonstrates its generalizability across some tasks.

The results of this study reinforce the appropriateness of the practical application of self-instruction: Teachers were easily and effectively trained to incorporate it into their curricula, and students' performance on academic tasks directly from the district-based curriculum improved.

Implications

The results of this study have implications for further research on the "pedagogical potential" of cognitive-behavior modification. If self-instruction is instrumental in producing a positive change in the independent work and skills application of young students over a period of a few weeks, its continued (year-to-year) use could possibly establish a repertoire of metacognitive or executive skills students put to use as they work.
As students improve processes or strategies with which to approach problems, attendant positive changes in products (test scores, problem solving) should be apparent and might be compared to similar successes attained through methods from the area of metacognition. Also, as executive processes improve, their generalizability and durability over time could be examined.

Eventually, attention could be given to finding the critical elements within the self-instruction process to find those which directly apply to school curricula and/or to certain age groups.

The effective use of self-instruction in a study such as this one but with children over seven remains to be done; once children have begun to internalize speech, adjustments in the type of self-instruction training might have to be made.

Most importantly, the successful results of this study were due to (a) careful adherence to Meichenbaum's guidelines for effective self-instruction; (b) thorough task analysis and expert knowledge of the students engaged in task performance; and (c) thoughtful, patient attention to the development of cognitive processes. Replication or further application of this work should cautiously include those cares.
For education and for children, successful applied use of self-instruction has other implications. One direct result of self-instruction seems to be students' increased independent behavior by virtue of being able to identify problems better and then plan behavior (or perhaps it is their new knowledge that they are expected to do those things rather than wait for the teacher). Although concern here was for an increase in normal class-task performance, it is logical that such behavior would carry over to tests, homework, and projects assigned to be done independently. It would be ideal for educators to have methods for emphasizing cognitive processes which would, in turn, positively affect the learning products. Educators have spent time and money to raise standards of education through program evaluation, teacher evaluation, examination of pupil/teacher ratios and funding levels; the results that can be obtained with self-instruction suggest that working with students on cognitive strategies may help them make better use of resources currently available.

Recommendations

Given the success of self-instruction on specific classwork tasks in the reading area by first graders, the obvious expansions of this investigation would be as follows:
1. Replicate this study with tasks from other content areas.

2. Compare classes with and without self-instruction in a year-long study.

3. Follow classes with and without self-instruction into the next grade, looking for generalization and stability of strategy learning.

4. Train children in self-instruction and investigate their use of it across subject matter and situations.

5. Expand the five-to-seven year old age category utilizing self-instruction in academics to see if internalization of speech hampers the use of self-instruction or visa versa.

This researcher has particular interest in integrating a full-year, full-class self-instruction regime into the curriculum for a kindergarten group, working long-term to fully automatize the self-instruction strategies, followed by comparison of those students' work in first grade to students without self-instruction training.
APPENDIX A
INVITATION TO PARTICIPATE

Dear First Grade Teacher,

I am a kindergarten teacher at Stephen Foster and a doctoral student in educational psychology at the University of Florida.

I would like to invite you to be part of the research project for my dissertation; the topic is teaching cognitive strategies to young children. You will find this directly relevant to current interest in problem-solving, developing independent work habits, and teaching thinking skills.

I am looking for teacher volunteers and am primarily interested in using students in Ginn Level 3. Here is a brief overview of what involvement would mean (using Level 3 as an example):

Week 1: Begin Level 3 instruction as usual.

Week 2: Continue Level 3 instruction as usual.

Week 3: All continue Level 3 instruction. Those in the experimental group will provide four fifteen-minute cognitive strategy lessons for their students. Those in control groups will teach as usual.

Week 4: Continue Level 3 instruction as usual. Experimental group: Distribute the independent seatwork tasks to your students, reminding them that the strategies they have learned might be good to use. Control group: Distribute the independent seatwork tasks to your students.

Week 5: Same as previous week.
All work for both groups will be provided. That work comes directly from the Ginn workbooks and will be organized, stapled, and delivered, along with a pacing schedule keyed to the Ginn manual.

You would not need to check any experimental or control work. Errors are expected from both groups. No individual or class data will be used or reported; interest is in comparing the performance of the experimental and control groups which will be comprised of students from several schools.

TRAINING

Before the third week of instruction, teachers randomly assigned to the experimental group will be trained in teaching cognitive strategies and provided with all materials. Those in the control group will meet (separately from experimental) and receive procedural training and prepared materials.

Training will be fun (!), very informative, and brief (maximum two hours for experimental, a little less for control). At the end of data collection, training will be provided for control group teachers and results will be shared with everyone.

The strategies you learn to teach your students will work with all subject areas, are pleasing to the children, and enhance the independent work level in your class.

Please consider joining this study!

Thanks,

If you have Level 3 students in your first grade, and are willing to participate in this study, please notify your curriculum resource teacher or call me at Stephen Foster (372-4363) or at home (378-3992).
APPENDIX B
SELF-INSTRUCTION TRAINING

In self-instruction training, cognitive modeling and private speech are combined as an approach to teaching thinking skills. Children are taught how to use self-statements and images to think and plan behavior; they are not instructed in what to think or encouraged to focus on "right answers." Although right answers would appear to be a logically correct educational goal, both metacognitive and self-instruction researchers reject that aim and set the development of underlying thinking skills or executive processes as a priority of teaching efforts.

Self-instruction in task performance requires that the student engage in problem definition, appropriate strategy selection, self-evaluation of performance, self-reinforcement, and coping behaviors. To date, the self-instruction process has been used with young children on social, interactive, motor, and academic tasks. Meichenbaum's model includes the following steps:

1. cognitive modeling (an adult performs the task and talks to self);

2. child performs the task with model's direction for guidance (overt external guidance);
3. child performs task and talks aloud to self (overt self-guidance);

4. child whispers and performs task (faded, overt self-guidance);

5. child performs task via inaudible or private speech or nonverbal self-instruction (covert self-instruction). (Meichenbaum, 1977, p. 32)

At step three the child's skills in problem definition, planful behavior, and implementation of strategies can be observed.

Meichenbaum begs the question of self-instruction research in academics by stating,

We can conceive of academic tasks where the teacher provided the children with a set of tasks . . . and the child's job was to identify what the problem is, how he or she will go about solving the task, where the likely pitfalls are, etc. . . . Teachers could give assignments and ask the children to describe in detail how they are going to go about performing the assignment. . . . Discussion could center on the process, not only the product, of the assignment. (Meichenbaum, 1985, p. 421)

The purpose of this study is to apply the cognitive-behavior modification self-instruction model as developed by Meichenbaum to actual classroom practice and content. Teachers participating in the experimental group of this study will supplement regular reading instruction with students' training in self-instruction. The student training will involve four sessions of approximately 15 minutes during which the teacher will, through cognitive modeling and the use of the children's own speech,
develop self-guiding statements based on Meichenbaum's model. Using that overt-to-covert style, the self-guiding statements for each group will follow the pattern of

1. problem definition and strategy selection ("Hmmm. What do I do here?");

2. strategy implementation ("Am I doing what I said I would do?");

3. error management ("What if I make a mistake, how can I fix it?"); and

4. self-reinforcement/self-checking ("How did I do?" or "Let me check my paper before I give it to the teacher.").

Measures of normal performance will be taken on a set of reading tasks from the Ginn studybook and skill-pack. Our interest is in the children's use of self-instruction, not in individual scores or teacher performance. Errors are, as usual, expected, and the teacher should feel comfortable in accepting the children's independently done work without correcting it.
APPENDIX C
GUIDELINES FOR EFFECTIVE SELF-INSTRUCTION

Ideally, the teacher should model a metacognitive perspective, one which indicates openness to thinking and anticipation of mistakes which, when they occur, are viewed as problems to be solved. The instructor should be careful of attributions made when failures occur, with statements directed at nurturing the problem-solving attitude.

To maximize generalization, training in self-instruction must be on a task which has the same requisites or elements of the performance task, but is overtly different from that performance task. The pupil must be a collaborator in generating the strategies to be used, and the private speech trained must be developed with and compatible with the child's natural style. The cognitive strategy training should take place after component skills and experience with the task are in the child's repertoire, and the pupil must be helped to recognize the new task as one facilitated by self-instruction and requiring the transfer of those strategies. The instructor needs to ensure against rote repetition of patterned strategies, encouraging personal involvement by the student by use of
faded cues and acceptance of the child's wording. The teacher should directly encourage the child to generalize strategies to various tasks or situations, perhaps by engaging in discussion of other suitable uses. Lastly, a sense of self-satisfaction should be nurtured in the child, with attention given to developing the child's self-reinforcing and coping skills as flexibility in the use of strategies is fostered.
APPENDIX D
MEICHENBAUM'S SELF-INSTRUCTION MODEL

Meichenbaum's self-instruction model includes the following steps:

1. cognitive modeling (an adult performs the task and talks to self);

2. child performs the task with model's direction for guidance (overt external guidance);

3. child performs task and talks aloud to self (overt self-guidance);

4. child whispers and performs task (faded, overt, self-guidance);

5. child performs task via inaudible or private speech or nonverbal self-instruction (covert self-instruction). (Meichenbaum, 1977, p. 32)
APPENDIX E
INSTRUCTIONS FOR THE EXPERIMENTAL GROUP

Experimental Group

Look over the chart for Level 3 indicating the pages that will be used in the study (attached). Please discard those pages from your student books.

During the third week of instruction, plan four 15-minute Training Sessions in self-instruction. These should be separate from reading group. Do not make any reference to reading.

Training Sessions

The training sessions are used to elicit the four self-instructional questions from your particular group. Use your reminder card (pictured below) for guidance in structuring the questions, but accept your own children's wordings. Work to get four specific questions, in general language (not a rote phrase) that appeals to your group.

Introduce this in the following way:

"When you are in school you have a lot of jobs to do. Sometimes you need help with directions. Other times you can figure out what to do by yourself. Let's start a Thinking Class together, and look at some work to see if, together, we can ask some questions that will help you to figure out what to do on your own."

Use Training Set 1

What is the problem on the page?

How can you mark the answer?

Sometimes when you are working, the teacher comes around and checks to see if you are working correctly. Is that something you could do for yourself?
How?

What if you make a mistake?

What would people who are thinking want to do?

What usually happens when you turn your work in to the teacher?

What does she find?

Is that something you could do for yourself?

Teacher guidance and summation:

Let's go back and see what happens in Thinking Class. First you found the problem on the page—is there a question you can think of to help find the problem?

"Hmmm. What do I do here?"*

After you figure out what to do, how can you be your own teacher and see how your work is going?

"Am I doing it?"*

What if you make a mistake, what can you do to fix it and make it OK with yourself?

"Am I messing up? What can I do?"*

What is a question you could ask yourself in order to be your own "checker" so the teacher won't find so many mistakes?

"How did I do?" "Let me check this."*

*Samples of answers developed by other students in self-instruction. Your students' self-guiding statements or questions will reflect their mutual language and style.

Repeat the process, streamlining it, over the next three training sessions.
Data Collection

After the last training session, in a reading group time, give children Set 1 of the performance tasks. To receive this set, they should be through the story "Look at Fish." Spend a minute reminding them of self-instruction questions before the set is distributed. Have them do Set 1 independently; take up the work and go on with reading group as you wish. Do not help the children with their independent work or worry about their mistakes.

Continue instruction according to the Ginn manual. There are five data collection points left. Fit them in in the following order:

After "What Grandma Does"—Set 3
After "Mix and Make"—Set 5
After "Bread to Eat"—Sets 4 and 6 (in two separate sessions)
After "The Hen and the Bread"—Set 2

Put each child's work in a pile of six sets and call me up! I will take it away and see what happened and will be back in touch with you.

Thanks,

Additional Administrative Procedures

I will place a call to you weekly to check your pacing and progress. I will ask for your training session times and your reading group times for the upcoming week, and answer any questions you have. Additionally, observation times during the term of the study will be planned, and I may drop in at the training session or reading group times.
Reminder Card

(You will have this card, laminated, to keep with you to channel your students' questions.)

PROBLEM DEFINITION AND STRATEGY SELECTION
"Hmmm. What do I do here?"

IMPLEMENTATION
"Am I doing what I said I would do?"
"Am I doing it?"

ERROR MANAGEMENT
"What if I make a mistake, how can I fix it?"
"Am I messing up?"
"Ooops! I can cry or I can fix it!"

SELF-REINFORCEMENT/SELF-CHECKING
"How did I do?"
"Let me check my paper before I give it to her!"
**Level 3 Pacing Sheet**

Here is a list of the stories from Level 3. The skillpack (SP) and studybook (SB) pages I am interested in are underlined.

| Text | Story                  | SP  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
|------|------------------------|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 6-9  | Ken and the Fish       | SP  | 1 | 2 | 3 | 4 | 5 | 6 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  | 3 | 4 | 5 | 6 | 7 | 8 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10-13| Ana and the Whale      | SP  | 7 | 8 | 9 |10 |11 |12 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  | 9 |10 |11 |12 |13 |14 |15 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 14-19| What Is It?            | SP  |13 |14 |15 |16 |17 |18 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |16 |17 |18 |19 |20 |21 |22 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 20-21| Here Come the Whales  | SP  |19 |20 |21 |22 |23 |24 |25 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |23 |24 |25 |26 |27 |28 |29 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 22-26| Look at Fish           | SP  |19 |20 |21 |22 |23 |24 |25 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |23 |24 |25 |26 |27 |28 |29 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 30-35| What Grandma Does      | SP  |25 |26 |27 |28 |29 |30 |31 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |30 |31 |32 |33 |34 |35 |36 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 36-43| Mix and Make           | SP  |32 |33 |34 |35 |36 |37 |38 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |37 |38 |39 |40 |41 |42 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 44-48| Clay to Bake           | SP  |39 |40 |41 |42 |43 |44 |45 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |43 |44 |45 |46 |47 |48 |49 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 49-55| Bread to Eat           | SP  |46 |47 |48 |49 |50 |51 |52 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |50 |51 |52 |53 |54 |55 |56 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 56-63| The Hen and the Bread  | SP  |53 |54 |55 |56 |57 |58 |59 |60 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                        | SB  |57 |58 |59 |60 |61 |62 |63 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
APPENDIX F
INSTRUCTIONS FOR THE CONTROL GROUP

Control Group

Look over the chart for Level 3 indicating the pages that will be used for the study (attached). Please discard those pages from your student books.

Data Collection

After finishing the story "Look at Fish" distribute task Set 1 to your students to be done independently. When they finish, take up the work and go on with reading group as you wish. Do not help the children with their independent work or worry about their mistakes.

Continue instruction according to the Ginn manual. There are five data collection points left. Fit them in in the following order:

After "What Grandma Does"—Set 3

After "Mix and Make"—Set 5

After "Bread to Eat"—Sets 4 and 6 (in two separate sessions)

After "The Hen and the Bread"—Set 2

Put each child's work in a pile of six sets and call me up! I will take it away and see what happened and will be back in touch with you.

Thanks,

Additional Administrative Procedures

I will place a call to you weekly to check your pacing and progress. I will ask for your reading group times for the upcoming week and answer any question you have. Additionally, observation times during the term of the study will be planned; I may drop in at the reading group times.
Level 3 Pacing Sheet

Here is a list of the stories from Level 3. The skillpack (SP) and studybook (SB) pages I am interested in are underlined.

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APPENDIX G
RESEARCH DESIGN

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Where $X₁......X₆$ are the six task scores for each child

$S₁......S₆₃$ are the children (subjects)

$T₁......T₉$ are the teachers

$E₁-E₂$ are the experimental and control conditions
REFERENCES


BIOGRAPHICAL SKETCH

Christopher Williams Sparks was born on March 23, 1946, in Shreveport, Louisiana, second in a family of six children. She grew up in university towns and settled in Gainesville, Florida, as a result of her family's migration there.

Chris has a Bachelor of Arts in Education and a Master of Education from the University of Florida, with specialization in early childhood. She will receive a Doctor of Philosophy in foundations of education in May, 1986, from the University of Florida.

Chris has been a teacher in the Alachua County, Gainesville, Florida, school district for 18 years. Although she has a preference for kindergarten-age people, she has also enjoyed her part-time employment in the Childhood Education department at Gainesville's Santa Fe Community College.

Post-graduation plans for Chris include further research in cognitive-behavior modification, publication of several articles which have been on the "back burner," and continued teaching. Additionally, she intends to reacquaint her patient children Judd and Sara, who have
been eating a lot of frozen pizza, with good food and motherhood.
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Gordon E. Greenwood, Chairman
Professor of Foundations of Education

John M. Newell
Professor of Foundations of Education

Linda M. Crocker
Professor of Foundations of Education
I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

Suzanne L. Krogh
Associate Professor of Instruction and Curriculum

This dissertation was submitted to the Graduate Faculty of the College of Education and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

May 1986

Chairman, Foundations of Education

Dean, College of Education

Dean, Graduate School