THE EFFECTS OF INVERSE TUTORING ON READING DISABLED STUDENTS IN A PUBLIC SCHOOL SETTING

By

KAREN CHRISTENSEN LAMPORT

Bachelor of Arts
University of South Florida
Tampa, Florida
1966

Master of Science
Oklahoma State University
Stillwater, Oklahoma
1979

Submitted to the Faculty of the Graduate College
at the Oklahoma State University
in partial fulfillment of the requirements
for the Degree of
DOCTOR OF PHILOSOPHY
December, 1982

THE EFFECTS OF INVERSE TUTORING ON

READING DISABLED STUDENTS IN A

PUBLIC SCHOOL SETTING

Thesis Approved:

J Barbara Peel
Thesis Adviser

Paul G. Ward

Imogene L. Land

Nema Jo Campbell

Harjit S. Sandhu

Norman N Durham
Dean of the Graduate College

ACKNOWLEDGMENTS

The author wishes to express appreciation to each member of her doctoral committee: Drs. Paul Warden, Barbara Peel, Imogene Land, Noma Jo Campbell, and Harjit Sandhu. A special thanks is extended to Dr. Paul Warden, Chairman, for his sincere interest and support during this study, and to Dr. Barbara Peel, thesis adviser, for her time and assistance given to this research.

Genuine appreciation is expressed to the administrators of the Stillwater School District, school principals, and school personnel for their assistance and support of this study. Also, grateful thanks to Dr. Kay Bull for his valuable suggestions. His assistance and comments were most encouraging.

A unique debt of gratitude, both personal and professional, is due my husband, Lance, and my two daughters, Terri and Lara, without whose sacrifices, faith, and understanding this study would not have been possible.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I

THE NATURE OF THE PROBLEM

Introduction

> The saying, 'He who teaches others, teaches himself,' is very true, not only because constant repetition impresses a fact indelibly on the mind, but because the process of teaching in itself gives a deeper insight into the subject taught (Comenius, 1896, p. 28).

One of the challenges facing special educators today is to identify and evaluate specific, effective instructional techniques that can be utilized with children who have learning difficulties. The effectiveness of instructional techniques as successful teaching strategies needs to be determined if there are to be significant improvements in the academic and social achievement of youngsters with learning deficiencies. A recent study by Stanbrook and Wasserman (1981) investigated the use of tutoring to effect gains in a ninth-grade reading disabled student's reading performance while he was engaged in assisting a reading disabled student in the first grade. Stanbrook's term for the process in which one student with learning difficulties serves as a tutor to another student with learning difficulties is "inverse tutoring". The positive results of this study indicate that inverse tutoring is an instructional strategy worthy of additional research.

The use of children to teach other children in the schools is by no means a recent innovation. The technique was particularly popular

in British schools in the early 19th century. Revival of interest in the technique of children teaching other children was due to the promising reports about academic and social effects of tutoring programs (Gartner, Kohler, and Reissman, 1971). Results suggested that both the tutor and the tutee not only gain in academic achievement, but sometimes improve in social behavior, attitudes and self-esteem.

As tutoring programs have gained increased acceptance in the educational community, they have been instituted in numerous schools throughout the country. Until recently, most of the empirical research on tutoring has focused on the effects on the students being tutored, while only a few studies have examined the effects of tutoring on the tutors themselves (Allen, 1976). In studies of tutoring reported in the literature, empirical support for generalizations about the effects of tutoring on tutors and tutees has often been inconclusive. Evidence concerning effectiveness of programs in the schools often has consisted of anecdotal reports rather than rigorous data. Further research is needed to determine the full effects of the tutorial experience.

Statement of the Problem

This investigation determined whether participation in an inverse tutoring program improved the reading achievement, reactions toward school, and classroom behavior of reading disabled elementary school aged tutors and tutees. Furthermore, this investigation evaluated the effectiveness of an inverse tutoring program as an instructional strategy for use by teachers of disabled readers in a public school setting.

Significance of the Study

This study is significant in that it contributes to the research in the fields of reading and special education by focusing on an instructional technique that can be utilized with children who are reading disabled. It is of utmost importance to have viable alternative methods available to teachers when more traditional teaching strategies have failed. Moreover, this investigation makes a contribution by identifying a method that develops a more positive reaction toward school in children who have reading deficiencies. With inverse tutoring demonstrated to be an effective strategy for improving classroom behavior, the programming and disciplinary burdens of the special educator should be eased.

Hypotheses

The investigation will test the following null hypotheses:

1. There is no significant difference at the 0.05 level of confidence between the auditory vocabulary of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who attend their regularly scheduled remedial reading class.

2. There is no significant difference at the 0.05 level of confidence between the phonetic analysis skills of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who attend their regularly scheduled remedial reading class.

3. There is no significant difference at the 0.05 level of confidence between the reading comprehension of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who attend their regularly scheduled remedial reading class.

4. There is no significant difference at the 0.05 level of confidence between the frequency of classroom disturbance behaviors of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who attend their regularly scheduled remedial reading class.

5. There is no significant difference at the 0.05 level of confidence between the frequency of inattentive-withdrawn behaviors of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who attend their regularly scheduled remedial reading class.

6. There is no significant difference at the 0.05 level of confidence between the reactions toward school of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who attend their regularly scheduled remedial reading class.

7. There is no significant difference at the 0.05 level of confidence between the auditory vocabulary of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who attend their regularly scheduled remedial reading or learning disabilities class.

8. There is no significant difference at the 0.05 level of confidence between the phonetic analysis skills of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who attend their regularly scheduled remedial reading or learning disabilities class.

9. There is no significant difference at the 0.05 level of confidence between the reading comprehension of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who attend their regularly scheduled remedial reading or learning disabilities class.

10. There is no significant difference at the 0.05 level of confidence between the frequency of classroom disturbance behaviors of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who attend their regularly scheduled remedial reading or learning disabilities class.

11. There is no significant difference at the 0.05 level of confidence between the frequency of inattentive-withdrawn behaviors of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who attend their regularly scheduled remedial or learning disabilities class.

12. There is no significant difference at the 0.05 level of confidence between the reactions toward school of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who attend their regularly scheduled remedial reading or learning disabilities class.

Definition of Terms

The following definitions of terms are important to this study:

Tutor: An older (11 to 12 years of age) reading disabled sixth grade student who provides instructional assistance and guidance in reading to a younger reading disabled student on a one-to-one basis.

Tutee: A younger (7 to 9 years of age) reading disabled second, third, or fourth grade student who is tutored in reading on a one-to-one basis by an older reading disabled student.

Inverse tutoring: The process in which one student with learning difficulties in a specific area serves as a tutor to another student with learning difficulties in the same area.

Classroom behavior: The overt behavior a student exhibits which is related to classroom achievement in both normal and special classes. Behavior is judged by the teacher from observations of the students' performance in the classroom and rated on the Devereaux Elementary School Behavior Rating Scale (Spivack and Swift, 1967).

Students in the control and experimental groups of tutees were rated by their regular classroom teachers from observations of student behavior in the regular classroom.

Remedial reading and learning disability teachers were responsible for judging the behavior of control and experimental groups of tutors from observations made in learning disabilities or remedial reading class.

Reading disabled student: A child is considered to be reading disabled if he requires special services in reading and is enrolled in remedial reading class and/or learning disabilities class. In grades

two through sixth, special reading services are provided when there is a discrepancy of one year or more between the level at which a child should be functioning and his reading achievement. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, or of emotional disturbance.

Data from general achievement tests, intelligence tests, and diagnostic tests are the basis for the estimated level of functioning of the child. Informal and formal reading tests are the basis for determination of the child's reading achievement (Durrell, 1960; Austin and Morrison, 1963; Stahl, 1965).

Instructional reading level: The level at which the child is able to recognize 95 percent of the words in the selection with a comprehension score of 75 percent. This is the reading level at which the child will profit from directed reading instruction (Lerner, 1980).

Reading achievement: The child's level of success in reading which is represented by his scores on the skill domains sampled by the Stanford Diagnostic Reading Test (SDRT), Form A-1976 (Karlsen, Madden, and Gardner, 1977). The skill domains include decoding, vocabulary, comprehension, and rate.

Quality of school life: The student's reactions to school in general, to his classwork, and to his teachers as measured by responses to the Quality of School Life Scale (Epstein and McPartland, 1978).

Reading comprehension: Measured by the Comprehension Subscale on SDRT, utilizes both short reading passages presented in a multiple-choice format and short passages followed by questions to assess literal

and inferential comprehension. The passages are written to represent a variety of subject-matter areas.

Auditory vocabulary: Measured by the Auditory Vocabulary Subtest on the SDRT, consists of words which represent the different parts of speech and are sampled from three general content areas: reading and literature, mathematics and science, and social studies and the arts. A word or words are selected that best fit the meaning of a sentence when both the item stem and the three options are dictated.

Phonetic analysis skills: The relationships between sounds and letters as measured by the Phonetic Analysis Subtest on the SDRT. Particular sounds in words are determined, and then each sound is related to a common or variant spelling of that sound. Words or sounds with various regional pronunciations are not included.

Classroom disturbance behavior: The extent to which the child's behavior is active, social (although inappropriate), and disruptive or obstreperous as measured by the Classroom Disturbance Subtest on the Devereux Elementary School Behavior Rating Scale (DESB) (Spivack and Swift, 1967). These behaviors usually necessitate teacher imposition of controls and structure, disrupt the classroom functioning of others, and interrupt the flow of work.

Inattentive-withdrawn behavior: The child's tendency to lose contact with what is going on in class as measured by the Inattentive-Withdrawn Subtest on the DESB. It indicates the degree to which the child is unable or unwilling to focus his attention in an appropriate manner.

Limitations of the Study

The results and conclusions are limited to the population of elementary children having similar characteristics as the sample utilized in the study.

There was only one instructor, the investigator, who taught the training sessions and monitored the tutoring sessions; consequently, teacher influence as a threat to the external validity of the study was not controlled or cancelled.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

In reports about students teaching students, the advantages of tutoring are generally purported to be valuable in many ways for both tutors and tutees. These are the general feelings. But what does research say specifically about the results of tutoring programs? This chapter represents a review of the literature pertinent to the implementation of an inverse tutoring program. The first section is concerned with the available published research on tutoring and the variables that affect the outcome of a tutoring program. The chapter continues with a discussion of the effectiveness of utilizing tutoring techniques with children with handicapping conditions and concludes with a discussion of tutoring as it relates to reading.

Research Findings on Tutoring

Previous research studies have not confirmed what will make a tutoring program successful. However, studies have determined that specific variables may affect the outcomes of tutoring. Lazerson (1980) contends that maximum benefits occur when proper materials and clearly defined objectives for tutoring sessions are under teacher direction.

The sex of tutors and tutees is another variable which may affect the outcome of a tutoring program. The findings of Foster (1972)

determined that fifth grade tutors preferred tutoring younger children of the same sex. His research suggests that same-sex preference patterns should be considered when assigning tutors and tutees. In another study which manipulated sex of tutor and of tutee, Klentschy (1971) found that sixth grade males seemed to benefit more, overall, from acting as a tutor for second and third grade tutees, but there were no differences due to tutoring same- or cross-sex tutees.

Tutoring programs have varied widely in the assignment of age or grade difference between tutor and tutee. Linton (1972) studied the effects of grade difference of eighth, tenth, and twelfth grade tutors on math achievement of eighth grade tutees. In his investigation, Linton concluded that the greater age difference between tutor and tutee results in somewhat better tutee performance.

Another factor in the tutoring process which has received some attention by researchers is the effect of ethnic origin. Gartner et al. (1971) reported specific facts about matching tutoring pairs by race and sex. The investigators found that Blacks perform better if the pairs are homogeneous as to race and sex, that these factors do not seem significant for Puerto Ricans and Caucasions; and that, Mexican-American males did not do well with female tutors. Dahlem (1973) concluded in his study that Chicano tutees performed equally well with Chicano and Caucasion tutors.

The literature on tutoring does not contain any studies comparing differing amounts of time spent tutoring in reading or other subject areas. Tutorial projects showing significant differences in reading improvement have been implemented with ranges in length of time from six weeks (Plumb and Wilkinson, 1974) to three years (Brottman, 1975).

A number of eight-week reading related tutoring projects have resulted in significant gains for the tutors and tutees in the experimental groups (Klentschy, 1971; Lakin, 1971; Robertson, 1972). Most successful programs involve 20 to 60 minutes of actual tutoring two or more times each week. Tutors generally devote more time than this to their duties, as they are often requested to devise materials, attend evaluation sessions, and/or prepare written reactions to each tutoring session (Shaw, 1973; Mavrogenes and Galen, 1979).

The importance of tutoring programs takes on additional significance in view of the mandate that teachers prepare and implement individualized educational programs for handicapped students. Tutoring procedures can provide considerable assistance to teachers faced with growing demands for individual attention (Lewis, 1979). Furthermore, tutoring enables students to benefit from personalized instruction without isolating them from interaction with other students (Steiner, 1977).

Investigators have identified special behaviors employed by tutors in their teaching efforts. When Niedermeyer (1970) compared trained with untrained fifth grade tutors who were teaching kindergarten children, the trained tutors displayed significantly more of the following behaviors: engaging the pupil in friendly conservation, confirming the correct pupil response, praising the pupil, giving the correct answer when the pupil was incorrect, and eliciting the correct response before going on.

Many studies have emphasized the need for careful structure, systematic tutor training, and consistent support from adults (Ellis and Niedermeyer, 1971; Melaragno, 1976, 1977; Jason, Ferone, and Soucy, 1979).

In contrast, Hartley (1977) noted in her study that intensive supervision and instruction of the student tutors did not increase effectiveness, although some instruction was beneficial.

Lundell and Brown (1979) proposed the following rules for an effective program, regardless of the size or purpose of the peer tutoring model selected:

> 1. Consistent monitoring of the tutoring process is important. This task can be done by a parent volunteer, teacher, or perhaps, the school counselor.
>
> 2. Pre- and post-assessment is essential. One must know academic strengths and weaknesses for effective teaching to occur.
>
> 3. Instructional materials hould be 'high interest' (game-type activities are preferred) and directly related to the objectives the learner is to master.
>
> 4. Tutor training is important. This can be done by role playing with some of the instructional materials used (p. 292).

Academic Benefits to Tutors and Tutees

Several studies have suggested that tutors and tutees benefit academically from the tutoring procedure. Dineen, Clark, and Risley (1977) investigated the acquisition of spelling words by three elementary students in a peer tutoring program. They determined that peer tutoring is profitable for the tutor as well as the tutee. The experimental design which was utilized allowed a simultaneous comparison of each child's gain in performance on comparable word lists. At times, the three students received the same treatment. Each child tutored another child, was tutored by another child, or received no treatment. The children's spelling improved comparably on those words on which

they tutored another child as on the words on which they were tutored. No such change was noted on the words on which they neither gave nor received tutoring.

Hartley (1977) utilized meta-analysis methodology to synthesize the results of 153 experimental studies of the efficiency of four techniques of mathematics instruction. The four techniques were computer assisted instruction, cross-age and peer tutoring, individual learning packets, and programmed instruction. On the basis of the studies collected, tutoring was the superior technique for increasing mathematics achievement. Peer tutoring, in which classmates tutor one another, was as effective as paid adult aides, while cross-age tutoring, in which older students tutor students younger than themselves, was more effective than peer tutoring.

Conn (1970) reported that tutors, in assuming teacher-type verbal behavior, utilized more mature language. Conn checked the complexity of language used by sixth grade tutors and nontutors. The former group produced T-units significantly longer than the latter group. The T-unit, an independent clause with its modifiers, is generally considered the most reliable measure of syntactic maturity.

Jenkins, Mayhall, Peschka, and Jenkins (1974) conducted a series of studies to compare small group and tutorial instruction in resource room settings. Each of the five children in the study was taught both by a resource teacher and by a cross-age tutor. Results suggested that the children learned more from the one-to-one instruction of the tutoring than in a small group. The effect was observed for word recognition, spelling, oral reading, and multiplcation.

Chandler (1975) explored the difference between "internals" and "externals". Individuals near the internal end of a locus of control dimension feel that they control their own destinies, and thus, as they take control of their learning, they tend to be higher in academic achievement and more effective in interpersonal relations. In contrast, individuals at the external end feel that destiny is a matter of luck and beyond their personal control; therefore, they tend to be lower in academic achievement and more anxious, aggressive, dogmatic, and suspicious. Chandler cites a pilot study showing that tutoring may move external adolescents toward internality, as measured by the Children's Locus of Control Scale. He contends that, as the underachieving tutors see that they may have motivated others, they may begin orientation to a more internal outlook. Birch (1978) maintains that young people, as they sample the activities, problems, and satisfactions of the professional educator, become more knowledgeable themselves and more likely to understand the role of the teacher.

Affective Gains to Tutors and Tutees

In reviewing the results of tutoring programs in the affective domain, evidence for change is less clear than that for cognitive achievement. This is due to the fact that data in this area must be collected from often imprecise questionnaires, attitude scales, and anecdotal observations (Melaragno, 1977).

Bierman and Furman (1981) examined the role of contextual factors, such as assignment rationale, on the attitudinal effects of peer tutoring. One-hundred-twelve fourth graders engaged in brief tutoring experiences as either a tutor or a tutee. Subjects received four

rationales for being selected as tutor or tutee: a competence rationale, a physical characteristic rationale, a chance rationale, or no rationale. Tutors had more positive attitudes than tutees when they had been given a competence or physical characteristic rationale but not when the tutors were provided a chance rationale. In addition, both the tutors' and tutees' attitudes were enhanced when no rationale was provided.

Lane (1972) described a tutoring project in a Brooklyn health center. After seven months as tutors in a phonic-linguistic reading program, adolescents who had displayed disruptive behavior in class were rated by guidance counselors and teachers as having lessened their disruptive behavior and achieved more confidence and a greater sense of responsibility.

Proponents of students teaching other students perceive the technique as an effective means of personalizing instruction without isolating students from interaction with others. Ehly and Larsen (1976) express the belief that this type of social exchange may be equal in value to the academic benefits which can be derived:

> The prestige gained when a problem child teaches is frequently incalculable . . . In most cases, the tutored child is more relaxed with a peer tutor than a teacher. The academic or social gains from the tutoring can heighten confidence so that the child can return to the classroom determined to work harder (p. 479).

As another example of affective gains, Bean and Luke (1972) developed a sentence completion test to evaluate improvement in self-concept. After ten weeks of tutoring, 56 percent of the high school and 87 percent of the elementary tutees completed their answers in the most positive way.

Other reports (Gartner et al., 1971; Allen, Devin-Sheehan, and Feldman, 1976) have indicated that both tutors and tutees have improved in self-concept, behavior, social acceptability, and increased interest in school after participation in a tutoring program.

Affective gains from a tutoring program were noted by John (1976) in his report of a cross-age tutoring project conducted in the Washington, D.C., public schools. In this study, students at the junior and senior high school levels tutored low-achieving elementary school children in both math and reading skills. Based upon the observations of tutors, the role of the student tutor was established as having several advantages over that of adult or parental aides: students were more facile with their peers' language and thus able to communicate more effectively, less threatening than older tutors or teachers, and less locked-in by a set of limiting concepts about what constitutes effective teaching. The final conclusion of the project, based on evaluations by student tutors, tutees, and teachers was that the tutoring approach represents a viable instructional strategy in education.

In summary, it is important to note that many of these reports on tutoring have been haphazardly and unsystematically researched (Allen et al., 1976). In some studies control groups have not been included; in others, volunteer students have been compared with nonvolunteers, or only post-tests have been given with no pretests (Allen et al., 1976; Steiner, 1977; Mavrogenes and Galen, 1979; and Chiang, Thorpe, and Darch, 1980). Knowledge concerning this subject area is still far from complete and further research is needed to discover those applications in which tutoring can be most successfully utilized.

Effectiveness of Tutoring Techniques with Children with Handicapping Conditions

When descriptions of the results of tutoring projects are surveyed, the overall impression given by investigators is one of unanimous enthusiasm. But what does research say specifically about the effectiveness of tutoring programs with children with handicapping conditions.

Groher (1976) evaluated the effectiveness of using inverse techniques in speech remediation. Twenty-four high school students with articulation problems were matched with elementary children with articulation problems. All older students effected change in the articulation patterns of the younger children with articulation errors. However, there was no significant improvement in the articulation skills of the tutors.

In another study, physically handicapped, mentally handicapped, and emotionally disturbed children in the intermediate grades were helped by their regular education peers with music activities (Dykman, 1979). The major program benefit recorded by the investigator was the close associations which developed between the handicapped and the nonhandicapped boys and girls.

Eleven severely mentally handicapped junior high school students were tutored by their nonhandicapped peers in an investigation by Rose (1979). The children were observed as they socialized on the playground, and their social interactions were categorized on an adapted version of the Parten Social Participation Scale. Following the tutoring program, there was a significant increase in associative and cooperative play, while there was a significant decrease in the level of negative attention seeking and inappropriate behaviors.

Abrams (1977) developed the Supplemental Instruction Program for a group of perceptually impaired secondary students in a public school district in New Jersey. Central to the program was its peer tutoring component which increased opportunities for the perceptually handicapped students to receive individualized instruction. After one semester, results of pretest/posttest statistical comparisons concerning academic self-esteem and academic achievement in reading and mathematics did not prove to be statistically significant. However, parent, teacher, administrator and, perhaps most important, student impressions suggest that participation in the program had a positive effect on perceptually impaired participants.

McGuigan and Sherbenou (1979) explored the effects of peer tutors on the implementation of individual education programs for elementary aged mentally handicapped children. Teacher-to-student versus student-to-student instruction was examined. The results of this study indicated no consistent or definitive differences between teacher and student instruction on either correct or error responses of the handicapped youngsters.

The increase in mainstreaming programs for handicapped children is associated with a growing awareness that peer relationships are important in promoting social and cognitive growth. McHale, Marcus, Olley, and Simeonsson (1981) instituted a study to determine whether peer tutors would be able to exert a degree of influence on autistic children's pre-academic behavior in the classroom. The effectiveness of nonhandicapped children in promoting task related behavior in autistic children was assessed to determine whether this was a feasible instructional approach for severely handicapped children. From exhibiting tantrums,

self-injurious behavior, and active avoidance of the nonhandicapped tutors, the autistic children began to sit at their work tables by the fifth week of observation, attending to the task and their tutors. In addition, they displayed a tolerance for physical contact with their tutors and did not require their teacher's presence during the session. The nonhandicapped children's behavior as tutors was described as impressive. The tutors exhibited a remarkable tolerance for the autistic children's deviant behavior. The investigators contend that this approach appears to be a viable procedure for integrating autistic and nonhandicapped children and for fostering adaptive behaviors in a particular group of severely handicapped children.

From his exploration of the benefits of peer tutoring for aggressive and withdrawn children, Lazerson (1980) reported positive findings. Sixty children with similar behavioral problems were randomly assigned to three groups: tutors, tutees, and control subjects. After five weeks of peer tutoring, almost all children who actively participated in the program showed higher gains than the control subjects. They had higher self-concepts and made greater behavioral improvements. In addition, they demonstrated a renewed interest in school and in the learning process.

Only a few research studies have directed their efforts toward the development of tutoring programs for students who have been identified as having a specific learning disability. Kane and Alley (1980) maintain that the number of learning disabled students requiring services has increased beyond the optimal teacher to student ratio and the demand for learning disabilities teachers has also increased. Therefore, other instructional management approaches need to be considered to assist this

student population. These researchers examined the feasibility of an instructional management program for learning disabled, incarcerated youths. It compared peer tutors and learning disabilities teachers as implementers of a computational mathematics program for incarcerated, learning disabled juvenile delinquents. After an eight week program, results showed no differences between the gains made by students tutored by peers and students taught by learning disabilities teachers. Peer tutoring was found to be a workable alternative when individualizing a computational mathematics program for incarcerated, learning disabled students.

Another study was conducted which utilized a tutoring program to effect changes in learning disabled, incarcerated juveniles (Bachara and Zaba, 1978). The data indicated that juvenile offenders who received remediation in the form of special education, tutoring, or perceptual-motor training exhibited a significantly lower recidivism rate than those juveniles who did not.

A recent case study of a tutoring relationship between a hearing impaired boy with above average academic achievement and a learning disabled boy was investigated by Jasnow and Frank (1980). Learning activities were arranged so that they could benefit both students. Although there were only moderate academic gains achieved, the authors emphasized the positive value of the learning atmosphere. There was a mutual caring, sharing, and learning. It was proposed that this instructional technique is more valuable and can be utilized more effectively with handicapped children than with nonhandicapped children.

The primary purpose for the research conducted by Chiang et al. (1980) was to obtain measures of learning disabled tutors' and tutees' performance on word recognition in order to determine the effectiveness of inverse tutoring. The study utilized a multiple-baseline design to evaluate the effects of four fifth grade learning disabled students tutoring one third grade and three second grade learning disabled students. The findings suggested that the inverse tutoring procedure was mutually beneficial for the learning disabled tutors and tutees. During the 18 session intervention phase, all tutees improved their performance on reading 60 morphemes, while all tutors showed impressive gains in reading multisyllable words containing one or more of the morphemes they had taught. According to the investigators, the implications of the present findings for programming for the learning disabled are significant. The authors contend that cross-age tutors can be of service to learning disabilities teachers and other younger learning disabled children by providing instructional assistance.

In summary, research has suggested that tutoring strategies facilitate instruction for children with handicapping conditions. However, it is apparent that much research and experimentation are still needed and specific applications need to be identified in this area.

Tutoring as It Relates to Reading

As the acquisition of knowledge is a major task of the learner in the elementary and secondary school, the most common and well-accepted purpose of special education is to provide remedial training in basic academic skills and subjects to children and youth with learning difficulties (Marsh and Price, 1980). According to noted authorities,

children with learning difficulties may have deficiencies in any area of learning and development, but poor reading skills are the handicap of the majority of children in remedial classes or educational programs for children with learning difficulties (Kauffman and Hallahan, 1976; Hammill and Bartel, 1978; Lerner, 1980). Indeed reading is the basic tool for all subjects in school, and failure in a school subject is frequently due to inadequate reading skills.

According to Muehl and Forell (1973-1974), the effectiveness of reading remediation will diminish with the age of a student. Students who are moderately to severely reading disabled and make little progress in elementary school tend to continue this pattern and remain disabled at the secondary level. Most seriously disabled readers, in view of present evidence, cannot be expected to make significant gains with known techniques.

Marsh and Price (1980) point out an important factor in this cycle of continuous failure. Older students who have been subjected to remedial instruction for a number of years will become calloused to further attempts because of persistent failure. The authors note that it is especially important to avoid methods that have been used repeatedly as this cannot be encouraging and these methods are associated with failure.

When reviewing the successes of reading projects in which children tutor other children, it should be recognized that studies utilizing adults as tutors have also been beneficial. Parents and volunteers serving as tutors for reading retarded children have increased word recognition and reading comprehension (Heller, 1977; Lyon and Morgan, 1979).

A five month cross-age tutoring program in reading was instituted by Erickson (1971). Factors besides reading under investigation were behavior, grades, interests and attitudes, social acceptance, and attendance. Analyses of results indicated that tutoring improved only the reading achievement of the tutors and tutees. According to the researcher, the main implication of the study was that tutoring, as a process, improves the one area emphasized with little transfer to other areas.

Several other studies (Gardner, 1978; Moore, 1978) have found significant gains in reading achievement for elementary level tutors and tutees participating in cross-age tutoring programs. Howell and Kaplan (1978) concluded from their investigation that all tutees experienced positive changes in oral reading as a result of tutoring and that peer tutors can be used to increase the oral reading rates of tutees. Other studies have also been conducted which utilized peer tutors to effect marked improvements in the reading achievement of tutees (Olson, 1978; Gajar, 1980). In contrast, Gardner's (1973) results indicated no differences in reading gains of experimental and control groups of tutees. However, it should be noted that the secondary purpose of this study was to investigate the effects of group guidance activities on reading achievement, behavior, and self-concept utilizing the same experimental and control groups of students. His negative results may have been due to the confounding of factors under investigation.

In summary, it should be noted that methodological problems exist with many of the published reports on the effects of tutoring on

reading achievement. There is a need for more rigorous research of the use of tutoring as an alternative technique for the acquisition of reading skills with different student populations.

Summary of the Review of Literature

A search of the literature revealed the complexity of variables involved in evaluating the outcome of tutoring as a teaching technique. Characteristics of the tutor and tutee as well as functions of the interaction itself have been found to be significant factors. Typically, studies which are not systematically designed and anecdotal descriptions rather than empirical research have resulted from tutoring interventions. However, studies which have been conducted indicate that tutors and tutees benefit academically and socially from the tutoring procedure.

Results of investigations into the effectiveness of tutoring programs for children with handicapping conditions suggested that participation produced positive gains for students. Limited studies utilizing the inverse tutoring procedure with children with learning disabilities showed it to be mutually beneficial for tutors and tutees. The literature also reflected a general consensus among the researchers that tutoring can be utilized to improve reading skills.

In conclusion, there has not been enough research on the effect of an inverse tutoring program on the reading disabled child. Specifically, there has not been enough research on the effect an inverse tutoring program has on the auditory vocabulary, phonetic analysis skills, reading comprehension, reactions toward school, withdrawn-inattentive behavior, and classroom disturbance behavior of reading disabled students.

CHAPTER III

METHODOLOGY AND DESIGN

Introduction

The purpose of this chapter is to describe the research methodology employed in the present study. Descriptions of the subjects, the research design, the variables, the instruments used for the collection of data, the procedures followed, and the statistical analysis of the data are presented.

Subjects

The subjects involved in this study were male students identified as disabled readers attending two public schools in a university town in central Oklahoma. Forty-eight students participated in the investigation, 24 attended an elementary school containing kindergarten through fifth grade, and 24 were enrolled in a nearby school composed of only sixth grade students. All of these children were capable of functioning in regular classes for the major part of each school day. Children with learning problems which were primarily the result of visual, hearing, or motor handicaps, of mental retardation, or of emotional disturbance had been identified by the school district's competent staff and placed in special classes. These children were not included in this investigation.

The following criteria were met by all of the male students from the two selected schools who participated in this study:

1. Referral by regular classroom teachers as being in need of special services in reading. All sixth grade students identified as learning disabled in reading attended remedial reading classes. At the elementary school, some students identified as learning disabled with a reading deficiency were provided remedial reading services, others received reading instruction in their learning disabilities classroom.

2. Exhibiting potential for functioning at grade level or above in reading. General achievement tests, intelligence tests and diagnostic tests were utilized for this determination. Children who were having learning difficulties and were the most severely retarded readers were administered a full battery of tests which included an intelligence test. Only children with average or above intelligence were included in remedial reading classes and/or learning disabilities classes. This study was limited to this population.

3. Reading achievement being at least one year below estimated reading capacity. The results of informal and formal reading tests were compared to the students' capability level as a basis for this determination.

Due to the differences between the daily schedules of lunchtime, recesses, and class periods at the two schools, tutoring sessions were arranged during two specific time periods (Table I). Twelve sixth grade students enrolled in a morning remedial reading class from 10:40 to 11:30 a.m. or an afternoon remedial reading class from 2:30 to 3:20 p.m. were utilized as the treatment group. During the eight-week treatment

period, these 12 students were involved in the tutoring program and did not attend their regularly scheduled remedial reading class. Twelve other students attending one of the remaining three remedial reading classes scheduled each day from 8:40 to 9:30 a.m., 9:40 to 10:30 a.m., and 11:40 a.m. to 12:30 p.m. were assigned to the control group (Table I). These students attended their regularly scheduled remedial reading classes each day. In order to assure equality of reading level of the groups, students in the sixth grade treatment group were matched by instructional reading level to students in the control group before assignment to groups. Both groups were composed of the same number of students performing on the third, fourth, and fifth grade instructional reading levels.

TABLE I

TUTOR EXPERIMENTAL GROUP AND CONTROL GROUP
READING CLASS MEETING SCHEDULE

Group	Time*	Number of Students	Treatment				
			Mon.	Tues.	Wed.	Thurs.	Fri.
Experimental Group	10:40-11:30	6	Tutoring Session	Training Session	Tutoring Session	Tutoring Session	Training Session
	2:30- 3:30	6					
Control Group	8:40- 9:30	4	Remedial Reading	Remedial Reading	Remedial Reading	Remedial Reading	Remedial Reading
	9:40-10:30	6					
	11:40-12:30	2					

*The tutors' school day ran from 8:30 a.m. to 3:30 p.m. and the tutees' school day ran from 8:45 a.m. to 3:30 p.m.

Twelve elementary students enrolled in learning disabilities lab for reading and/or in remedial reading classes were assigned to the tutee treatment group and 12 other students attending learning disabilities lab for reading and/or remedial reading classes were included in the tutee control group. Elementary students in the treatment group were matched by grade level and instructional reading level to students in the control group to assure equality of groups.

Students in the tutee experimental group enrolled in remedial reading or both remedial reading and learning disabilities class did not attend remedial reading class during the eight-week treatment period. Tutees in the experimental group who were only enrolled in learning disabilities class did not receive a portion of their learning disabilities class but attended the three 30 minute tutoring sessions during one of the two time periods of the tutoring program. Twelve other students attending remedial reading, remedial reading and/or learning disabilities class attended their regularly scheduled remedial reading or learning disabilities class. Schedules for tutee remedial reading are not presented in tabular form as individual programs were not set up on an hourly basis and some varied from week to week. Control group students attended remedial reading three to five times each week for 20 to 30 minutes per meeting and/or their regularly scheduled learning disabilities class.

The 12 students in the sixth grade treatment group served as tutors, and the 12 students in the elementary level treatment group served as tutees. The instructional reading level was utilized to match tutors and tutees. Sixth grade students and elementary students were ranked from highest to lowest according to their instructional reading level for each of the

two time periods. The two lists of tutors ranked in descending order were matched with the corresponding two lists of tutees ranked in descending order. A tutor's instructional reading level was at least two grade levels above his tutee. Using this method, there were 12 matched pairs in the treatment group and 12 in the control group.

Research Design and Variables

The research design utilized in this investigation to test the statistical hypothesis was the Nonequivalent Control Group Design (Campbell and Stanley, 1963). This design is specified for intact groups.

The independent variables in this study are the separate treatments which were administered to the experimental and control groups of tutors and tutees. Treatment for the groups consisted of the following:

1. Experimental group of tutors: sixth grade male students identified as reading disabled who participated as tutors in an eight-week tutoring program.

2. Control group of tutors: sixth grade male students identified as reading disabled who attended regularly scheduled remedial reading classes during the eight-week treatment period.

3. Experimental group of tutees: second, third, and fourth grade male students identified as reading disabled who participated as tutees in an eight-week tutoring program.

4. Control group of tutees: second, third, and fourth grade male students identified as reading disabled who attended regularly scheduled learning disabilities and/or remedial reading classes during the eight-week treatment period.

The dependent variables in this study were the auditory vocabulary, phonetic analysis skills, reading comprehension, reactions toward school, classroom disturbance behavior, and withdrawn-inattentive behavior of the reading disabled students.

Instrumentation

The dependent variables were measured by the following instruments:

1. The SDRT (Karlsen et al., 1977), Form A-1976, was utilized to measure the reading achievement of tutors and tutees. The test content was designed for use with pupils in grades one through 12. Four skill domains are sampled by the SDRT: decoding, vocabulary, comprehension, and rate. (Rate is only assessed for children in grade five and above.)

The SDRT is a group-administered device which is both norm-referenced and criterion-referenced. Reliability of raw scores earned on the test was ascertained by assessing both internal-consistency and alternate-form reliability. Internal-consistency coefficients for all subtests at all levels exceed .90 with the exception of coefficients for Auditory Vocabulary (these consistently range from .85 to .90). Alternate-form reliability coefficients range from .75 to .94. Standard errors of measurement in both raw-score and scaled-score units are tabled in the manuals. Data reported in the manuals indicate that the SDRT is a reliable measure of specific reading skills.

In selecting the standardization sample for ths SDRT, the authors used a stratified random-sampling technique. The test was standardized in 55 school districts; approximately 31,000 pupils participated in the standardization. The manual includes detailed tables illustrating the demographic characteristics of the school districts sampled which

closely parallel those indicated in the 1970 census. Validity for the SDRT was judged by determining the extent to which the pupils' performance on the SDRT agreed with their performance as assessed by the Reading Tests of the Stanford Achievement Test. The SDRT criterion-related validity information was obtained during the Standardization Phase of the National Standardization Research Program, in which pupils taking Form A of SDRT also took the Reading Tests of the Stanford Achievement Test. Correlations of raw scores range from .45 to .98 with the majority of the correlations falling between .70 to .85. Intercorrelations, means, and standard deviations are tabled in the manuals for each of the levels.

2. The Quality of School Life Scale (QSL) (Epstein et al., 1978) was utilized as a multi-dimensional measure of student reactions to school in general, to their classwork, and to their teachers. The QSL consists of 27 items based on three dimensions of the concept of the quality of school life.

The total QSL scale score is the broadest gauge of student reactions to school life. Scores suggest the students' evaluation of the relative success of the school programs in meeting their needs. For purposes of interpretation of total QSL scores, high, low, or mid-range scores suggest students' predispostions to act or react in positive, negative, or neutral ways to school and school activities.

QSL Research norms for individuals and groups were based on the responses of a sample of 4,266 students at elementary and secondary grade levels. The research norms were based on a two-thirds random sample of students in grades 5, 6, 7, 9, and 12 who attended 23 elementary, 10 middle, and six high schools in a Maryland district. The

research sample was a diverse population in terms of background characteristics, achievement levels, and types of schools attended. The research sample is somewhat higher than the national student population in average standardized achievement scores and socioeconomic composition These differences from a nationally representative student sample may not be significant, as evidence indicates that QSL scores are not strongly related to social class or standardized test scores.

The QSL was designed for use with students in grades four through 12. As this is the only scale of its kind available, the QSL was adapted to use with the second and third graders in this study. The QSL does recommend that examiners assist students by reading words or phrases to children requesting help. The researcher adapted the QSL by reading the directions and scale items to all second graders, third graders, and other children requiring assistance reading the QSL. This adaptation for children in lower grade levels has been utilized successfully with other scales. The Piers-Harris Children's Self-Concept Scale (Piers, 1969) is an example of a scale, which although it was designed for children in third grade and above, may be read to children in the lower grades or to those who read below third grade level.

The overall Kuder-Richardson reliability for the QSL was respectively .87 and .89 for the 4,266 secondary and elementary students in the final sample survey. These analyses show the QSL to be a highly reliable scale.

QSL scores on several external criteria were obtained to examine the concurrent validity of the scale. QSL scores were found to correlate with measures collected from students, teachers, and school records, e.g., anxiety about school -.428, classroom behavior .345,

written comments of liking school .576, hours spent on homework .288, report card grades .217, parents' approval of child's school .337, control of environment scale .268 and college plans .230.

The validity of the QSL was tested by analyzing its ability to discriminate between groups of students expected to differ in their reactions to school life. QSL scaled scores for elementary and secondary students nominated by teachers for positive and negative interest in class were compared. Another group of students was nominated by peers for positive social and behavioral attributes. Higher QSL scale scores were reported for students recognized by their teachers for high interest in school. Similarly, more positive reactions to school were obtained for students who were known and admired by their peers.

Intercorrelations were reported for the subscales of the QSL. Since each subscale contributes to the total measure of the concept of quality of school life, the intercorrelations between subscales was high, ranging from .53 to .70. A principal component factor analysis was performed to determine the existence of separate dimensions among the 27 items of the QSL scale. The analysis showed that subsets of QSL items cluster or load on four interpretable factors. Two of these correspond to the SAT and COM subscales; two other factors divide the specific instructional qualities of the teacher-student relationship.

3. The Devereaux Elementary School Behavior Rating Scale (DESB) (Spivack and Swift, 1966; Spivack and Swift, 1967; Spivack and Swift, 1968) was utilized to measure classroom behavior. The DESB is a sophisticated and carefully developed rating scale. The behaviors to be rated are clearly described, and instructions for rating are carefully given. A child is rated on 47 different items in terms of the

relative frequency with which the described behavior occurs. The behavior rating scale can be reliably and validly used in grades one through six to rate classroom behaviors that relate to academic success or failure. It provides a profile of 11 dimensions of overt behavior that experienced teachers have judged as being related to classroom achievement in both normal and special classes. The 11 factors include: the factors and additional item means and standard deviations for the entire sample were employed in constructing the standard score DESB profile. The test-retest correlations (i.e., reliabilities) of the factors are quite satisfactory, the mean coefficient for the factor classroom disturbance being .91 and the coefficient for the factor inattentive-withdrawn being .89. The standard error of measurement for these factors was quite small, suggesting that the scores obtained on a youngster at any one point in time were reasonably accurate estimates of the "true" scores for that child at the particular time.

Procedure

Summarized below is the sequence of activities accomplished by the investigator in developing and implementing the inverse tutoring program for a group of reading disabled students in the public schools. The investigator:

1. Presented program and obtained approval and support from the superintendent, principals, and remedial reading and learning disabilities teachers.

2. Notified parents to obtain parental permission for the students who participated in the program.

3. After receiving parental permission to participate, assigned elementary and sixth grade students to experimental and control groups of tutors and tutees.

4. Established a tutoring schedule. Fifty-minute training sessions were provided twice a week for tutors. Training sessions stressed: specific procedures to follow when working with a younger classroom disturbances, impatience, disrespect-defiance, external blame, achievement anxiety, external reliance, comprehension, inattentive-withdrawn, irrelevant responsiveness, creative-initiative, and need for closeness to teacher. The scale also includes three separate item scores: unable to change, quits easily, and slow work.

A score above plus one standard deviation is indicative of an abnormally high amount of a particular behavior. For all but factors 7-comprehension, 10-creative-initiative, and 11-need for closeness to the teacher, a score above plus one standard deviation suggests an area of behavioral difficulty which is not conducive to successful academic functioning. For factors, 7, 10, and 11, a score below minus one standard deviation is indicative of learning difficulties.

Normative DESB data were obtained from 13 elementary schools in a consolidated small city public school system. Thirty-two kindergarten through sixth grade teachers made ratings of the behavior of 809 children. The backgrounds of the children were quite heterogeneous as indicated by figures on parental education. The average years of education of mothers and fathers were 12.7 and 13.1, respectively, with standard deviations of 2.0 and 2.9. Thus, the group of youngsters rated come from homes wherein approximately one-half of the parents did not go beyond high school, but approximately 16 percent of fathers

completed college. Of the 809 children who were rated, 721 were white and 88 black.

Retest ratings supplied data for test-retest reliability and standard errors of measurement. These data suggested that the results at different grade levels for each factor were quite similar, and did not point to a need for different norms at each level. Therefore, student; reading skills, materials, record-keeping, and activities to be used with tutees; and how to deal with problems and successes encountered during tutoring (see Appendix for details of the program).

Three 30 minute tutoring sessions were scheduled each week during the eight-week treatment period. Tutors were scheduled for 50 minutes of classtime. This included ten minutes of preparation before tutoring sessions and ten minutes of time to travel to and from the elementary school.

5. Pretested elementary and sixth-grade students.

6. Implemented training sessions and tutoring sessions for the eight-week treatment period. The training sessions for the sixth grade tutors were conducted by the researcher in a classroom provided by the middle school for the tutoring program. After the first two tutoring sessions, tutors independently traveled to the elementary school located half a block away from the middle school. Tutors went to their tutees' classrooms, picked up their tutees, and accompanied them to their assigned tutoring stations upon arrival at the elementary school. Tutoring stations consisted of private, glass-enclosed teachers' offices which were located in each of the large classrooms in the school. These rooms allowed tutor and tutee behavior to be easily monitored while providing them with a quiet, private work area. During the first four

weeks of the program, tutoring pairs were observed by the researcher each session for appropriate behavior, tutor strengths, and areas in which further training was needed. Students were observed about twice each week during the last four weeks of the program.

7. Posttested elementary and sixth grade students.

Data Analysis

Pretests were administered to all of the students participating in the study within one week's time. Testing was accomplished during students' regularly scheduled reading classes. During this week, reading teachers and learning disabilities teachers were responsible for completing the pretest behavior rating scales for the tutors, and regular classroom teachers completed the behavior rating scales for the tutees. Pretest scores obtained on the SDRT Phonetic Analysis Subscale, SDRT Auditory Vocabulary Subscale, SDRT Reading Comprehension Subscale, DESB Classroom Disturbance Subscale, DESB Inattentive-Withdrawn Subscale, and Total Quality of School Life Scale were used as covariates. Scores obtained on the posttests were utilized as the dependent variables. All groups received posttests within one week's time at the conclusion of the eight-week treatment period.

The hypotheses as stated were tested by subjecting the data to an analysis of covariance so that initial differences between groups could be "partialed out" of the experimental variables. Posttests were completed within one week following the eight-week treatment period. The analysis of covariance was utilized to analyze the data for significant differences between the reading achievement, the reactions toward school, and the classroom behavior of the experimental and control groups of tutors and tutees.

CHAPTER IV

RESULTS OF THE STATISTICAL ANALYSIS

The primary concern of this study was to determine if significant differences existed in auditory vocabulary, phonetic analysis skills, classroom disturbance behavior, withdrawn-inattentive behavior, and reactions toward school of the control groups compared to the experimental groups as a result of an eight-week inverse tutoring program. The chapter has been divided into two sections to facilitate discussion. The first section presents a comparison of the results of the pretests and posttests of the experimental groups and control groups of tutors and tutees. The second section includes a report of the results of this research as they relate to the stated hypotheses. The format for this section includes statement of each hypothesis, presentation of the analysis of the related data, and presentation of the data in tabular form.

Results of Pretests and Posttests

Summarized in Tables II and III are the results of the pretest and posttest scores of the 24 students in the tutor groups and the 24 students in the tutee groups who participated in the investigation. The data exhibited in Table II and Table III are the pretest and posttest means, standard deviations, and numbers of students tested. It should be noted that scores for one of the students in the experimental group

TABLE II

MEANS AND STANDARD DEVIATIONS OF PRETEST AND UNADJUSTED POSTTEST SCORES FOR TUTORS

Test	Pretest			Posttest		
	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation
Experimental Group						
SDRT Auditory Vocabulary	12	491.42	54.92	12	512.50	58.20
SDRT Phonetic Analysis	12	506.17	56.48	12	571.67	60.52
SDRT Reading Comprehension	12	448.33	44.43	12	484.42	46.44
Total QSL	12	8.92	5.99	12	14.08	6.68
DESB Classroom Disturbances	12	15.08	4.01	12	12.33	4.27
DESB Inattentive-Withdrawn	12	14.08	5.05	12	12.83	5.49
Control Group						
SDRT Auditory Vocabulary	12	483.17	68.18	12	513.17	86.29
SDRT Phonetic Analysis	12	508.50	57.03	12	529.33	83.14
SDRT Reading Comprehension	12	487.58	37.34	12	509.08	54.35
Total QSL	12	14.50	5.70	12	14.67	6.47
DESB Classroom Disturbances	12	12.83	3.74	12	11.67	3.60
DESB Inattentive-Withdrawn	12	9.83	3.66	12	9.92	4.91

TABLE III

MEANS AND STANDARD DEVIATIONS OF PRETEST AND UNADJUSTED POSTTEST SCORES FOR TUTEES

Test	Pretest			Posttest		
	Number	Mean	Standard Deviation	Number	Mean	Standard Deviation
Experimental Group						
SDRT Auditory Vocabulary	12	329.00	65.31	11	344.91	73.08
SDRT Phonetic Analysis	12	384.50	44.48	11	414.55	38.06
SDRT Reading Comprehension	12	290.25	111.29	11	359.73	72.58
Total QSL	12	15.50	3.66	11	18.36	2.62
DESB Classroom Disturbances	12	11.58	5.50	12	12.08	6.01
DESB Inattentive-Withdrawn	12	13.00	6.22	12	12.92	4.89
Control Group						
SDRT Auditory Vocabulary	12	343.17	68.35	12	338.50	75.24
SDRT Phonetic Analysis	12	422.25	66.57	12	425.17	47.60
SDRT Reading Comprehension	12	293.58	77.93	12	345.58	70.77
Total QSL	12	15.33	6.18	12	14.67	5.42
DESB Classroom Disturbances	12	12.50	5.89	12	14.17	6.29
DESB Inattentive-Withdrawn	12	10.17	5.27	12	11.00	5.20

of tutees was not included in four of the posttests. This child withdrew from school during the eighth week of the tutoring program and was not able to be posttested. However, a behavior rating scale was completed for him by his teacher and these scores were included in the calculations for DESB Classroom Disturbances and DESB Inattentive-Withdrawn Subtests.

Testing the Hypotheses

The data obtained from this investigation were used for the primary purpose of testing the null hypotheses presented in Chapter I of this study. Analysis of covariance was the selected statistical analysis used. The rationale for using this particular statistical tool was based on the fact that intact student groups were utilized. Elashoff (1969) has pointed out that analysis of covariance allows the use of intact groups while still controlling variables which might otherwise confound the results of the investigation. This technique, an extension of analysis of variance model combined with certain features of regression analysis, permitted the researcher to statistically equate the independent variable groups with respect to the dependent variables which were under investigation. The analysis of covariance was used to determine the significance of the differences between the means of the experimental groups and the control groups on the posttests. The F ratio is of primary importance as it signifies differences between two groups which are due to the treatment, the inverse tutoring program. Scores on the pretests serve as the covariates.

The presentation and analysis of data for this research is reported as related to each of the hypotheses. Wherever statistical

tests were employed to test the hypotheses, it was assumed that differences were not statistically significant unless they were at or above the .05 level of confidence.

Hypothesis one:

> There is no significant difference at the 0.05 level of confidence between the auditory vocabulary of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who will attend their regularly scheduled remedial reading class.

The analysis of covariance was utilized to statistically equate the experimental group and control group of tutors. Presented in Table IV are the unadjusted and adjusted means for the posttest, SDRT Auditory Vocabulary. The results of the analysis of covariance indicated that there is no significant difference ($F = .320$, $df = 1/21$, $p > .05$) in auditory vocabulary between the two groups. Therefore, null hypothesis one is not rejected.

Hypothesis two:

> There is no significant difference at the 0.05 level of confidence between the phonetic analysis skills of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who will attend their regularly scheduled remedial reading class.

Table IV presents the unadjusted and adjusted means for the experimental and control groups of tutors for the posttest, SDRT Phonetic Analysis. The results of the analysis of covariance are shown in Table V. It is concluded from an analysis of this data that there is a significant difference between the experimental group and the control group ($F = 5.430$, $df = 1/21$, $p < .05$). A comparison of means (Table IV) revealed that the performance in phonetic analysis skills of the students in the experimental group significantly surpasses that of the students in the control group on this subtest.

TABLE IV

UNADJUSTED AND ADJUSTED MEANS FOR TUTORS' POSTTESTS

	SDRT Auditory Vocabulary	SDRT Phonetic Analysis	SDRT Reading Comprehension	Total QSL	DESB Classroom Disturbances	DESB Inattentive Withdrawn
Experimental Group						
Unadjusted Mean	512.50	571.67	484.42	14.08	12.33	12.83
Adjusted Mean	507.97	594.10	491.05	16.38	12.20	13.16
N	12	12	12	12	12	12
Control Group						
Unadjusted Mean	513.17	529.33	509.08	14.67	11.67	9.92
Adjusted Mean	517.70	506.90	502.45	12.37	11.80	9.59
N	12	12	12	12	12	12

TABLE V

ANALYSIS OF COVARIANCE SUMMARY TABLE FOR
TUTORS' POSTTEST--SDRT
PHONETIC ANALYSIS

Variation	Sum of Squares	df	Mean Squares	F	Significance of F
Treatment	12067.813	1	12067.813	5.430*	0.030
Residual	46669.188	21	2222.342		
Total	127073.563	23	5524.938		

Experimental Group N = 12
Control Group N = 12
*p < .05.

Hypothesis three:

> There is no significant difference at the 0.05 level of confidence between the reading comprehension of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who will attend their regularly scheduled remedial reading class.

The adjusted and unadjusted means for the experimental and control group of tutors for the posttest, SDRT Reading Comprehension, are presented in Table IV. The results of the analysis of covariance indicates that there is no significant difference ($F = .822$, $df = 1/21$, $p > .05$) in reading comprehension between the two groups. Therefore, null hypothesis three is not rejected.

Hypothesis four:

> There is no significant difference at the 0.05 level of confidence between the classroom disturbance behaviors of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who will attend their regularly scheduled remedial reading class.

Presented in Table IV are the unadjusted and adjusted means for the experimental and control groups of tutors for the posttests, DESB Classroom Disturbances. The results of the analysis of covariance indicates that there is no significant difference ($F = .028$, $df = 1/21$, $p > .05$) between the classroom disturbance behaviors of the experimental and control groups. Therefore, null hypothesis four is not rejected.

Hypothesis five:

> There is no significant difference at the 0.05 level of confidence between the inattentive-withdrawn behaviors of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who will attend their regularly scheduled remedial reading class.

The adjusted and unadjusted means for the posttest, DESB Withdrawn-Inattentive, are presented for the experimental and control groups of tutors in Table IV. The analysis of covariance indicates that there is

no significant difference ($F = .094$, $df = 1/21$, $p > .05$) between the withdrawn-inattentive behaviors of the two groups. Therefore, null hypothesis five is not rejected.

Hypothesis six:

> There is no significant difference at the 0.05 level of confidence between the reactions toward school of the reading disabled students who participate in the inverse tutoring program as tutors and of those students who will attend their regularly scheduled remedial reading class.

Presented in Table IV are the unadjusted and adjusted means for the experimental group and the control group of tutors for the posttest, Total QSL. The results of the analysis of covariance are shown in Table VI. It is concluded from an analysis of the data that there is a significant difference ($F = 6.971$, $df = 1/21$, $p < .05$) between the two groups. Therefore, null hypothesis six is rejected. A comparison of means (Table IV) revealed that the reactions toward school of the students in the experimental group are significantly more positive than the reactions toward school of the control group.

Hypothesis seven:

> There is no significant difference at the 0.05 level of confidence between the auditory vocabulary of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who will attend their regularly scheduled remedial reading or learning disabilities class.

Presented in Table VII are the unadjusted and adjusted means for the experimental group and the control group of tutees for the posttest, SDRT Auditory Vocabulary. The results of the analysis of covariance are reported in Table VIII. It is determined from an analysis of the data that there is a significant difference ($F = 5.598$, $df = 1/20$, $p < .05$) between the groups. An inspection of means (Table VII) revealed that the experimental group's auditory vocabulary significantly surpasses that of the control group.

TABLE VI

ANALYSIS OF COVARIANCE SUMMARY TABLE FOR
TUTORS' POSTTEST---TOTAL QSL

Source of Variation	Sum of Squares	df	Mean Squares	F	Significance of F
Treatment	101.353	1	101.353	6.971*	0.015
Residual	305.336	21	14.540		
Total	953.624	23	41.462		

Experimental Group N = 12
Control Group N = 12
*p < .05.

TABLE VII

UNADJUSTED AND ADJUSTED MEANS FOR TUTEES' POSTTESTS

	SDRT Auditory Vocabulary	SDRT Phonetic Analysis	SDRT Reading Comprehension	Total QSL	DESB Classroom Disturbances	DESB Inattentive Withdrawn
Experimental Group						
Unadjusted Mean	344.91	414.55	359.73	18.36	12.08	12.92
Adjusted Mean	358.66	421.97	370.76	20.34	11.50	12.90
N	11	11	11	11	12	12
Control Group						
Unadjusted Mean	338.50	425.17	345.58	14.67	14.17	11.00
Adjusted Mean	325.90	418.37	335.47	12.86	14.75	11.02
N	12	12	12	12	12	12

TABLE VIII

ANALYSIS OF COVARIANCE SUMMARY TABLE FOR
TUTEES' POSTTEST---SDRT
AUDITORY VOCABULARY

Source of Variation	Sum of Squares	df	Mean Squares	F	Significance of F
Treatment	3897.750	1	3897.750	5.598*	0.028
Residual	13924.500	20	696.225		
Total	115907.375	22	5268.516		

Experimental Group N = 11
Control Group N = 12
*p < .05.

Hypothesis eight:

> There is no significant difference at the 0.05 level of confidence between the phonetic analysis of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who will attend their regularly scheduled remedial reading or learning disabilities class.

Presented in Table VII are the unadjusted and adjusted means for the experimental and control groups of tutees for the posttest, SDRT Phonetic Analysis. The findings of the analysis of covariance suggest that there is no significant difference ($F = 1.626$, $df = 1/20$, $p > .05$) between the phonetic analysis skills of the students in the experimental group and the phonetic analysis skills of the students in the control group. Therefore, null hypothesis eight is not rejected.

Hypothesis nine:

> There is no significant difference at the 0.05 level of confidence between the reading comprehension of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who will attend their regularly scheduled remedial reading or learning disabilities class.

The adjusted and unadjusted means for the posttest, SDRT Reading Comprehension, for the experimental and control groups of tutees are presented in Table VII. The results of the analysis of covariance indicate that there is no significant difference ($F = 1.261$, $df = 1/20$, $p > .05$) between the two groups. Therefore, null hypothesis nine is not rejected.

Hypothesis ten:

> There is no significant difference at the 0.05 level of confidence between the classroom disturbance behaviors of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who will attend their regularly scheduled remedial reading or learning disabilities class.

The unadjusted and adjusted means of the posttest, DESB Classroom Disturbance, for the experimental and control groups of tutees are shown in Table VII. The results of the analysis of covariance suggest that there is no significant difference ($F = 1.385$, $df = 1/21$, $p > .05$) between groups. Therefore, null hypothesis ten is not rejected.

Hypothesis eleven:

> There is no significant difference at the 0.05 level of confidence between the inattentive-withdrawn behaviors of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who will attend their regularly scheduled remedial reading or learning diabilities class.

Presented in Table VII are the adjusted and unadjusted means of the posttest, DESB Withdrawn-Inattentive for the experimental and control groups of tutees. The results of the analysis of covariance indicate that there is no significant difference ($F = .001$, $df = 1/21$, $p > .05$) between groups. Therefore, null hypothesis eleven is not rejected.

Hypothesis twelve:

> There is no significant difference at the 0.05 level of confidence between the reactions toward school of the reading disabled students who participate in the inverse tutoring program as tutees and of those students who will attend their regularly scheduled remedial reading or learning disabilities class.

Presented in Table VIII are the unadjusted and adjusted means for the posttest, Total QSL, for the experimental and control groups of tutees. The results of the analysis of covariance are given in Table IX. It is concluded from an inspection of the data that there is a significant difference ($F = 8.431$, $df = 1/20$, $p < .05$) between groups. Therefore, null hypothesis twelve is rejected. A comparison of means (Table VIII) reveals that the experimental group's reactions towards school are significantly more positive than those of the control group.

TABLE IX

ANALYSIS OF COVARIANCE SUMMARY TABLE
FOR TUTEES' POSTTEST---TOTAL QSL

Source of Variation	Sum of Squares	df	Mean Squares	F	Significance of F
Treatment	82.290	1	82.290	8.431*	0.009
Residual	195.219	20	9.761		
Total	469.651	22	21.348		

Experimental Group N = 11
Control Group N = 12
*p < .05.

Summary

This chapter has presented the statistical results yielded in the analyses of the data. Analysis of covariance was utilized to test 12 hypotheses regarding the effectiveness of the eight-week inverse tutoring program. The results for the experimental group and control group of tutors supported the non-rejection of four null hypotheses which were concerned with auditory vocabulary, reading comprehension, classroom disturbance behavior, and withdrawn-inattentive behavior. The results did not support the hypotheses dealing with the tutor groups' phonetic analysis skills and reactions toward school. The performance of the tutors in the experimental group surpassed that of the students in the control group in both phonetic analysis skills and positive reactions toward school. The same statistical technique was used to test the hypotheses for the tutee groups. The four null hypotheses pertaining to phonetic analysis, reading comprehension, classroom disturbance behavior, and withdrawn-inattentive behavior were not rejected. The results led to the rejection of the hypotheses concerned with the tutees' auditory vocabulary and reactions toward school. In both areas, the performance of the students in the experimental group of tutees surpassed that of the students in the control group.

CHAPTER V

DISCUSSION AND CONCLUSIONS, SUMMARY, AND RECOMMENDATIONS

This study was based upon the premise that an inverse tutoring program can be utilized effectively as an alternative instructional strategy to be used with disabled readers in a public school setting. There are a number of conclusions and speculations which can be made on the basis of the findings of this investigation.

In this study, it was evident that the students who participated in the experimental inverse tutoring program benefited as much or more from their reading experiences than the students in the control groups. This conclusion is based upon the knowledge that both of the experimental groups surpassed that of their control groups on two of the six areas tested. The tutors achieved significantly higher scores than their counterparts on phonetic analysis skills and reactions toward school, while the tutees scores were significantly higher than their control group on measurements of auditory vocabulary and reactions toward school. In the other four areas evaluated, there were no significant differences between the control and experimental groups. Therefore, tutors performed as well as the students in their control group in the areas of: auditory vocabulary, reading comprehension, classroom disturbance behavior, and withdrawn-inattentive behavior. The tutees performance was comparable to that of the students in their control

group who remained in their remedial reading and/or learning disabilities class in the areas of: phonetic analysis skills, reading comprehension, classroom disturbance behavior, and withdrawn-inattentive behavior.

The results of the study lend support to the assumption that students who participate in a tutoring program tend to have more positive reactions toward school than those who do not. Various researchers (Bean and Luke, 1972; Gartner et al., 1971; Allen et al., 1976) have reported similar results. According to Kazdin (1977), positive child ratings are important social validation measures. Wolf (1978) indicated that the practical results of an applied program should be measured not only by the objective data that are obtained, but also in terms of social validity. Social validity refers to three aspects: the social significance of the goals (i.e., whether society values what is being done) the social appropriateness of the procedures (i.e., whether the participants consider the treatment procedures acceptable) and the social importance of the effects (i.e., whether the consumers are satisfied with the results).

At program end, all of the sixth grade tutors indicated they liked to tutor and would like to continue in the program the following semester. Comments were made by the tutors at the final meeting concerning their feeling about the termination of the program. One boy stated, "Now that we won't be tutoring any more, we're going to have to do work during this time." Similar comments were made by the tutees, who also expressed their desire to continue the program with their tutors the following semester. The more positive ratings of both the tutors and tutees on the Quality of School Life Scale posttests after participation as tutors and tutees is attributed to participation in the inverse tutoring program.

The one area in which the tutors scored significantly higher than their control group was in phonetic analysis skills. This may have been due to the fact that most of the tutees required assistance with phonics. Games and other activities were developed by tutors to teach phonics skills to their tutees. In the process of teaching, tutors became more proficient in this skill. The researcher must agree with the contention of Chiang et al. (1980), that when reading disabled students are given the opportunity to teach younger children with learning difficulties, they are able to practice some of the skills which are prerequisites to their current learning tasks. In addition, the responsibility vested in the tutorial role often makes clear the reading disabled tutor's need to improve skills in order to successfully instruct the younger child.

The performance of the tutees in the experimental group surpassed that of the students in the control group in the area of auditory vocabulary. Reasons for this difference may be surmised by perusal of the inverse tutoring program's teaching procedures which are included in the Appendix. Normally, in a one-on-one instructional setting, there are more opportunities for verbal exchanges than in a group situation. The sequence of activities utilized by the tutors emphasized vocabulary development, oral reading, and comprehension. Vocabulary words to be learned were incorporated into games and practice exercises. Much of the work that was completed during each tutoring session had an auditory component. It may be concluded, that this emphasis may have been a factor which influenced tutee scores on this subtest.

The implications of the present findings for programming within a remedial reading or a learning disabilities classroom are significant.

Reading disabled tutors can be of service to teachers and other younger reading disabled children by providing welcome and effective instructional assistance. From these observations alone, it appears that inverse tutoring is neither costly nor complicated, it enables teachers to provide additional instructional time for younger children who need it and it offers older children with a longer history of reading failure an alternative to traditional instructional strategies.

Although this study employed a structured tutorial system that may be applicable to a remedial reading or learning disabilities classroom, the investigation did not examine all of the practical applications of the system. Yet, as educational practices become more student centered and individualized instruction plays an increasingly important role in the teaching process, this study does provide positive support for using student tutors who have learning difficulties themselves.

In conclusion, if properly controlled and supervised, inverse tutoring promises to satisfy a vital set of the needs of reading disabled children. It provides an opportunity for direct and healthy exchange with peers; it allows the child to assume a role of giving and responsibility; and it gives the child some long-overdue success, without which no learning can take place. While an inverse tutoring program may not be a panacea for the problems of low-achieving or poorly motivated reading students, it is an exciting and interesting approach toward solution of these problems.

Summary

This study was designed to determine whether reading achievement, classroom behavior, or reactions toward school could be influenced appreciably by an eight-week inverse tutoring program in reading. Inverse tutoring is the process in which a student with learning difficulties serves as a tutor to another student with learning difficulties. Forty-eight reading disabled students were included in the investigation. The 24 students who served in the experimental and control groups of tutors attended a sixth grade center, and the other 24 students in the experimental and control groups of tutees were enrolled in an elementary school located nearby. Elementary students were second, third, and fourth graders.

The experimental group of tutors and the experimental group of tutees participated in the eight-week inverse tutoring program, while the control groups of elementary and sixth grade reading disabled students attended their regularly scheduled remedial reading and/or learning disabilities class. The tutoring treatment for the tutors consisted of two 50 minute training sessions and three 30 minute tutoring sessions per week. However, tutors were allotted 50 minutes on tutoring days: ten minutes for lesson preparation, ten minutes to travel to and from the elementary school, and 30 minutes for the tutoring session. Tutors received no remedial reading instruction during the eight week treatment period. The sixth grade students in the tutors' control group received 50 minutes of remedial reading instruction five days each week throughout the eight weeks of the study. Tutees participated in three 30 minute tutoring sessions each week during the eight weeks. Tutees did not receive remedial reading instruction or

did not attend their learning disabilities class during the 30 minute tutoring sessions three days per week. Students in the tutees' control group attended their regularly scheduled remedial reading and/or learning disabilities classes.

The design of this study was pretest-treatment-posttest. Each group was administered the pretest-posttest instruments: The Stanford Diagnostic Reading Test, Form A; the Quality of School Life Scale, and the Devereaux Elementary School Behavior Rating Scale.

The analysis of covariance was utilized to analyze the data derived from the pretests and posttests. Four of the 12 hypotheses tested were rejected at the 0.05 level of confidence. The results indicate that due to the inverse tutoring program, tutors achieved significantly higher scores in phonetic analysis skills and significantly more positive reactions toward school than the students in their control group. Analysis of the data also revealed that the tutees earned significantly higher scores in auditory vocabulary skills and significantly more positive reactions to school than students in their control group. The inverse tutoring program was found to have no significant effect upon tutors in the areas of: auditory vocabulary skills, reading comprehension, classroom disturbance behavior, and withdrawn-inattentive behavior. For tutees, there was no significant effect in the areas of: phonetic analysis, reading comprehension, classroom disturbance behavior, and withdrawn-inattentive behavior.

It is reasonable to conclude from the results of the present study, that participation as a tutor in an inverse tutoring program produces reading gains equivalent to those received from participation in a remedial reading program. The consistency of the effect is noteworthy

for both tutors and tutees. In no instance, did the control groups learn significantly more than the experimental groups.

Recommendations

In any research endeavor, a number of variables are identified which could relate to the study but have not been included in the design. On the basis of the results of this study, the investigator makes the following suggestions for further research:

1. Studies should be conducted to determine the specific variables which may affect the outcomes of an inverse tutoring program. Variables to be manipulated might include: differing amounts of time spent tutoring per session, per week and over extended periods of time; specific materials; amount of tutor training; and sex of tutors and tutees.

2. Inverse tutoring programs with children with other handicapping conditions should be conducted.

3. Inverse tutoring programs for teaching other subjects such as mathematics, science, and social studies need to be developed.

4. Research should focus on direct observation and manipulation of different dimensions of tutoring behaviors in order to analyze their role in the tutoring process.

5. A study should be made comparing the achievement of middle-school and high school reading disabled students as tutors to determine at what level the greater gain is made in reading.

6. Studies should be made using other methods of instruction for learning disabled students.

Considering the results of this study, it becomes extremely important to try different instructional methods of teaching reading.

BIBLIOGRAPHY

Abrams, D. J. The development and evaluation of a program of supplemental instruction and peer tutoring for perceptually impaired secondary school students. Unpublished Ed.D. dissertation, Rutgers University, 1977.

Allen, V. L. Children as teachers--Theory and research on tutoring. New York: Academic Press, 1976.

Allen, V. L., Devin-Sheehan, L., and Feldman, R. S. Research on children tutoring children: A critical review. Review of Educational Research, 1976, 46, 355-385.

Austin, M. C. and Morrison, C. The first r--The Harvard Report on reading in elementary schools. New York: The MacMillan Company, 1963.

Bachara, G. H. and Zaba, J. N. Learning disabilities and juvenile delinquency. Journal of Learning Disabilities, 1978, 11, 242-246.

Bean, R. and Luke, C. As a teacher I've been learning. Journal of Reading, 1972, 16, 128-132.

Bierman, K. L. and Furman, W. Effects of role and assignment rationale on attitudes formed during peer tutoring. Journal of Educational Psychology, 1981, 73, 33-40.

Birch, J. W. Children teaching children. Teacher, 1978, 95, 65-66.

Brottman, M. A. Multigrade helping relationship program: A third year evaluation of the ESEA Title III. Arlington, VA: 1975. (ERIC Document Reproduction Service No. ED 113 692.)

Campbell, D. T. and Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally College Publishing Company, 1963.

Chandler, T. A. Locus of control: A proposal for change. Psychology in the Schools, 1975, 12, 334-339.

Chiang, B., Thorpe, H. W. and Darch, C. B. Effects of cross-age tutoring on word recognition performance of learning disabled students. Learning Disability Quarterly, 1980, 3, 11-19.

Comenius, J. The great didactic. 1896. New York: Reprinted, Russell and Russell, 1967.

Conn, F. M. The langugage of sixth grade tutors. Unpublished doctoral dissertation, Claremont Graduate School and University Center, 1970. (ERIC Document Reproduction Service No. ED 057041.)

Dahlem. G. G. The effect of like ethnic qualities upon reading tutoring of third graders. 1973. (ERIC Document Reproduction Service No. ED 095488.)

Dineen, J. P., Clark, H. B. and Risley, T. R. Peer tutoring among elementary students: Educational benefits to the tutor. Journal of Applied Behavioral Analysis, 1977, 10, 231-238.

Durrell, D. D. Improvement of basic reading abilities. New York: World Book Company, 1960.

Dykman, R. A. In step with 94-142, two by two. Music Educators Journal, 1979, 65, 58-63.

Ehly, S. W. and Larsen, S. C. Peer tutoring to individualize instruction. The Elementary School Journal, 1976, 76, 475-480.

Elashoff, J. D. Analysis of covariance: A delicate instrument. American Educational Research Journal, 1969, 6, 383-401.

Ellis, P. and Niedermeyer, F. C. Remedial reading instruction by trained pupil tutors. Elementary School Journal, 1971, 71, 400-405.

Epstein, J. L. and McPartland, J. M. The quality of school life scale administration and technical manual. Boston: Houghton Mifflin Company, 1978.

Erickson, M. R. A study of a tutoring program to benefit tutors and tutees. Unpublished Ed.D. dissertation, University of Massachusetts, 1971.

Foster, P. B. Attitudinal effects on fifth graders of tutoring younger children. Unpublished Ph.D. dissertation, University of Oregon 1972.

Gajar, A. H. The effects of peer tutoring on the reading achievement and social acceptance of mainstreamed handicapped children. Paper presented at the Annual International Convention of the Council for Exceptional Children, Philadelphia, Pennsylvania, 1980. (ERIC Document Reproduction Service No. ED 187041.)

Gardner, W. E. The effects of intergrade tutoring with group guidance activities on the reading achievement, self-concept, attitudes toward school and behavior of third and fourth grade tutors and on first and second grade tutees. Unpublished Ed.D. dissertation, Wayne State University, 1973.

Gardner, W. E. Compeer assistance through tutoring and group guidance activities. Urban Review, 1978, 10, 45-54.

Gartner, A., Kohler, M., and Riessman, F. Children teach children--Learning by teaching. New York: Harper and Row, 1971.

Groher, Michael. The experimental use of cross-age relationships in public school speech remediation. Language, Speech, and Hearing Services in Schools, 1976, 7, 250-258.

Hammill, D. D. and Bartel, N. R. Teaching children with learning and behavior problems. Boston: Allyn and Bacon, Inc., 1978.

Hartley, S. S. Meta-analysis of the effects of individually paced instruction in mathematics. Unpublished Ph.D. dissertation, University of Colorado at Boulder, 1977.

Heller, T. P. Project succeed: A volunteer system in action. Bulletin of the Orton Society, 1977, 27, 183-186.

Howell, K. W., and Kaplan, J. S. Monitoring peer tutor behavior. Exceptional Children, 1978, 45, 135-137.

Jasnow, E. and Frank, F. Symbiosis as an aspect of learning therapy. Academic Therapy, 1980, 16, 11-18.

Jason, L. A., Ferone, L. and Soucy, G. Teaching peer-tutoring behaviors in first- and third-grade classrooms. Psychology in the Schools, 1979, 16, 261-269.

Jenkins, J. R., Mayhall, W. F., Peschka, C. M. and Jenkins, L. M. Comparing small group and tutorial instruction in resource rooms. Exceptional Children, 1974, 56, 245-250.

John, T. Junior-senior high tutor-aide program at Malcom X Elementary School: An evaluation study. Final report of Washington, D.C. District of Columbia Public Schools Department of Research and Evaluation, 1976. (ERIC Document Reproduction Service No. ED 132128.)

Kane, B. J. and Alley, G. R. A peer-tutored, instructional management program in computational mathematics for incarcerated learning disabled juvenile delinquents. Journal of Learning Disabilities, 1980, 13, 39-42.

Karlsen, B., Madden, R. and Gardner, E. F. Stanford Diagnostic Reading Test. New York: Harcourt Brace Jovanovich, 1977.

Kauffman, J. M. and Hallahan, D. P. Teaching children with learning disabilities. Columbus, Ohio: Charles E. Merrill Publishing Company, 1976.

Kazdin, A. E. Assessing the clinical or applied importance of behavior change through social validation. Behavior Modification, 1977, 1, 427-452.

Klausmeir, H. J., Jeter, J. T. and Nelson, N. J. Tutoring can be fun. University of Wisconsin, Madison, Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1972.

Klentschy, M. P. An examination of sex-pairing effectiveness for reading tutoring. Paper presented at annual meeting of the California Educational Research Association, San Diego, California, November, 1971.

Lakin, D. S. Cross-age tutoring with Mexican-American pupils. Unpublished Ed.D. dissertation, University of California, Los Angeles, 1971.

Lane, P. Remotivation of disruptive adolescents. Journal of Reading, 1972, 15, 351-354.

Lazerson, D. B. "I must be good if I can teach!"--peer tutoring with aggressive and withdrawn children. Journal of Learning Disabilities, 1980, 13, 43-48.

Lerner, J. W. Children with learning disabilities. Boston: Houghton Mifflin Company, 1980.

Lewis, J. M. Analysis of the tutoring variable in individualized instruction. Educational Technology, 1979, 19, 41-45.

Linton, T., Jr. The effects of grade displacement between student tutors and students tutored. Unpublished Ed.D. dissertation, University of Cincinnati, 1972.

Lundell, K. T. and Brown, W. E. Peer tutoring: An economical instructional model. Academic Therapy, 1979, 14, 287-292.

Lyon, E. and Morgan, R. Paired reading: A preliminary report on a technique for parental tuition of reading retarded children. Journal of Child Psychology and Psychiatry and Allied Disciplines, 1979, 20, 151-160.

Marsh, G. E. and Price, B. J. Methods for teaching the mildly handicapped adolescent. St. Louis: C. V. Mosby Company, 1980.

Mavrogenes, N. A. and Galen, N. D. Cross-age tutoring: Why and how. Journal of Reading, 1979, 22, 344-353.

McGuigan, C. A. and Sherbenou, R. J. The effects of student assistants on the implementation of individual education program. Final report from the Bureau of Education for the Handicapped, Washington, D. C., 1979. (ERIC Document Reproduction Service No. ED 192471.)

McHale, S. M., Marcus, L. M., Olley, J. G. and Simeonsson, R. J. Nonhandicapped peers as tutors for autistic children. Exceptional Children, 1981, 48, 263-264.

Melaragno, R. J. Tutoring with students--A handbook for establishing tutorial programs in schools. Englewood Cliffs, New Jersey: Educational Technology Publications, 1976.

Melaragno, R. J. Pupil tutoring: Directions for the future. Elementary School Journal, 1977, 77, 384-387.

Moore, V. E. The effects of cross-age tutoring on elementary-level tutors and tutees. (Doctoral dissertation, East Texas State University, 1978). Dissertation Abstracts International, 1978, 39, 1314A.

Muehl, S. and Forell, E. A follow-up study of disabled readers: variables related to high school reading performance. Reading Research Quarterly, 1973-1974, 9, 110-122.

Niedermeyer, F. C. Effects of training on the instructional behaviors of student tutors. The Journal of Educational Research, 1970, 64, 119-123.

Olsen, D. H. The effects of a cross-age tutoring program on the reading achievement of mildly retarded student tutees and on the attitudes of "normal" fifth and sixth grade elementary school student tutors toward retarded children. (Doctoral dissertation, Case Western Reserve University, 1978). Dissertation Abstracts International, 1978, 39, 1442A.

Piers, E. V. The Piers-Harris Children's Self-Concept (The Way I Feel about Myself). Nashville, Tennessee: Counselor Recordings and Tests, 1969.

Plumb, G. H. and Wilkinson, J. C. An empirical investigation of the use of paraprofessionals and student tutors in remediating reading deficient primary grade students. Paper presented at the annual meeting of the American Education Research Association, Chicago, Illinois, April, 1974.

Robertson, D. J. Intergrade teaching: Children learn from children. In S. L. Sebesta, and C. J. Wallen (eds.), The first R: Readings on teaching reading. Chicago: Scientific Research Association, 1972.

Rose, C. D. The social acceptance of severely mentally handicapped children in a regular school and the utilization of peer tutors to improve their social interactions. British Columbia Journal of Special Education, 1979, 3, 399-411.

Shaw, J. S. Cross-age tutoring: How to make it work. Nation's Schools, 1973, 91, 43-46.

Spivack, G. and Swift, M. The Devereux elementary school behavior rating scales: A study of the nature and organization of achievement related disturbed classroom behavior. The Journal of Special Education, 1966, 1, 71-89.

Spivack, G. and Swift, M. Devereux elementary school behavior scale manual. Devon, Pennsylvania: Devereux Foundation, 1967.

Spivack, G. and Swift, M. The assessment of achievement-related classroom behavior. The Journal of Special Education, 1968, 2, 137-149.

Stahl, S. S. The teaching of reading in the intermediate grades. Dubuque, Iowa: Wm. C. Brown Company, 1965.

Stanbrook, C. M. and Wassermann, S. Inverse tutoring: An alternative strategy with remedial readers. Phi Delta Kappan, 1981, 62, 672-673.

Steiner, K. Peer tutoring in the reading class. Journal of Reading, 1977, 21, 266-269.

Wolf, M. M. Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. Journal of Applied Behavior Analysis, 1978, 11, 203-214.

APPENDIX

AN INVERSE TUTORING PROGRAM

The program in this study was developed to prepare tutors and tutees to effectively participate in tutoring sessions. The procedures and forms were adapted from a handbook by Melaragno (1976), Tutoring with Students--A Handbook for Establishing Tutorial Programs in Schools, and a text by Klausmeir, Jeter, and Nelson (1972), Tutoring Can Be Fun. The sequence of procedures included in this inverse tutoring program is:

1. Tutoring Materials
2. Tutoring Sessions
    a. Plan for the First Tutoring Session
    b. Sequence for Tutoring Sessions
3. Tutor Training Sessions
    a. First Week
    b. Second Week through the Eighth Week
    c. Additional Training Procedures for Successful Tutoring
4. Forms
    a. Interview Activity Sheet
    b. Tutoring Procedures
    c. Word List
    d. Tutor's Daily Log
    e. Tutor Observation Form

Tutoring Materials

Materials required for tutoring include standard school supplies (reading texts, blank flashcards, pencils, and paper), and tutors' record-keeping forms and information sheets.

For the tutor:

Manila Folder--Each tutor is provided a folder in which to place items needed for tutoring.

Outline of Tutoring Procedures--An outline of the sequence of steps to follow during tutoring sessions as a reminder to tutors.

Word List--A form to record words missed by the tutee during reading.

Tablet of Lined Paper--For use when the need arises during a tutoring session.

Flashcards--Flashcards are made for words missed and recorded on the Word List. These are kept in pockets fastened to the folder.

Daily Log--Used for recording activities, evaluations of tutoring sessions, and items to be discussed with the instructor.

For the instructor:

Tutor Observation Form--To guide the instructor's observations of tutors while they are tutoring.

Tutoring Sessions

Plan for the First Tutoring Session

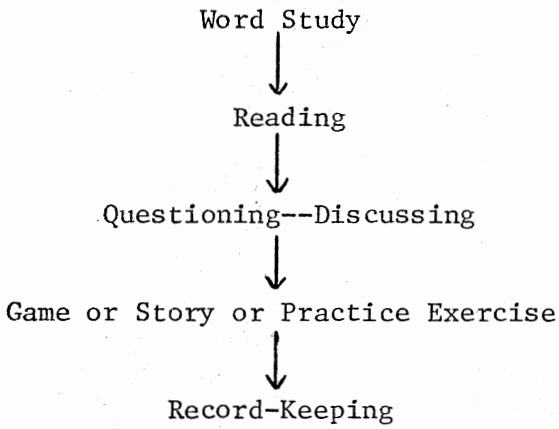
The objective of the first meeting is to provide an opportunity for the tutor and tutee to interact with one another. The students may interview each other during this session. The interview activity sheet is provided for this purpose. The questions should assist the tutor in

gaining information that will be helpful in tutoring. The first session should end with an enrichment activity. The tutor may read a story to the tutee, play an easy game, or do a practice exercise.

Sequence for Tutoring Sessions

The tutor works with his tutee by listening to him read, helping him attack new words, helping him study sight vocabulary words, asking him questions about what has been read, and participating with him in an enrichment activity.

The tutor follows this sequence of activities after the first tutoring session.



Word Study: Before reading the tutor and tutee study the flash-cards made out during previous sessions. The tutor shows the flashcards to the tutee, one at a time, and asks him to read each one. After questioning-discussing, the tutor and tutee make out flashcards for words missed during reading that day. The tutee reads the words missed that day from the Word List and spells them to the tutor who makes out the flashcards. Then the two students review the flashcards following the same procedures described above.

Reading: Before the tutee begins reading from the text, he turns to the appropriate page and reviews what has been read previously. He and the tutor discuss the content of pages read (who are the characters, what has happened, etc.) and anticipate the coming pages (Tutor: "What do you think will happen next?"). Then the tutee reads while the tutor listens carefully.

1. The tutee holds the book and turns pages himself.

2. The tutor helps with any words that give the tutee difficulty. He has the tutee sound out the words, following a word attack procedure preferred by the teacher. Then the tutor has the tutee spell the word while the tutor writes it on the Word List. Finally, the tutor has the tutee re-read the sentence in which the missed word occurred.

3. When five new words have been added to the Word List (or when about 15 mintues remain in the tutoring period) the tutor and tutee stop reading for the day.

Questioning-Discussing: When the actual reading period has ended, the tutor asks the tutee questions about the content of the material read that day. The two students discuss the content, relating it to other material read and to events in their own lives.

Game, Story, or Practice Exercise: Playing a new game, listening to a story, or doing a practice exercise may make learning to read more fun for the tutee. The game or story should be selected by the tutor with the assistance of the instructor.

Record-Keeping: In the final minutes of the session the tutor fills out the Daily Log. He records pages read that day, evaluates the session, and comments on the tutee's progress and needs.

Tutor Training Sessions

During the first week of the tutoring program, the tutors will attend training sessions on three days and meet with their tutees on two days. Throughout the remaining seven weeks, training sessions for tutors will be scheduled on two days and tutoring sessions will be held three days each week.

First Week

Session One. The objective of the first training session is to introduce tutors to the tutoring program and schedule. The following list of suggestions for effective tutoring should be discussed.

Be on time to the tutoring session.
Be prepared with the materials you will use.
Sit beside the tutee, rather than in front of him.
Greet the tutee pleasantly to start the sessions and talk with him about something he is interested in.
Discuss with the tutee what will be studied or practiced that day.
Look at the tutee when either of you speaks.
Speak slowly and clearly.
Wait for the tutee to answer each question you ask or to complete each exercise given.
For each correct and complete answer, tell the tutee his answer is correct.
Praise the tutee for trying.
Correct the tutee's wrong or incomplete answers.
Set a good example for the tutee by paying attention to the work and showing him that you like reading.
Be pleasant and try to be helpful throughout the session especially when the tutee does not seem to be making any progress in his reading.
Near the end of the session, praise the tutee for having worked hard and learned.
Remind the tutee when and where you will meet for the next session.

Sesstion Two. The objective of this meeting is to prepare students for their initial tutoring session and introduce them to the format that will be utilized in subsequent tutoring sessions. (See the Plan

for the First Tutoring Session, Interview Activity Sheet, and Format for Tutoring Sessions.) Tutors will role play their first session in order to be familiar with the Interview Activity Sheet. Steps in role playing are outlined below.

Role Playing

1. Describe the situation in general.
2. Choose the actors.
3. Assign tasks to the audience as observers.
4. Set up the scene and brief the actors, describing what each should do.
5. Start the action when all are ready.
6. Cut the interaction after the point has been illustrated.
7. Thank the actors, using their real names.
8. Discuss what was observed.
    a. Determine what happened.
    b. Ask the actors how they felt in the role.
    c. Focus on what could have been done differently.

Session Three. This session has two objectives for the tutors: the first objective is to help the tutors understand the reading difficulties of the tutees; the second is to motivate tutors to learn techniques for helping their tutee.

The tutors will use the information gained during their first tutoring session as a basis for discussion. They may recall difficulties they had as a younger child. The instructor may have tutors role play situations as illustrations of difficulties. During the discussion

the instructor should lead them to ask these kinds of questions:

--What is the nature of the reading problem?

--How can this problem be overcome?

The technique of brainstorming may be introduced at this time as a method of getting the tutors to develop potential solutions to the problems they identify. Steps in brainstorming are outlined below.

Brainstorming

1. Identify the topic for brainstorming. Write it at the top of a chalkboard or chart paper.
2. Ask for ideas.
3. Write the ideas on chalkboard or chart paper.
    a. Take each contribution one at a time.
    b. Repeat the essence using the contributor's words.
    c. Check that you have understood what he meant.
    d. Write using his words. Abbreviate, but check if meaning is conveyed.
4. List all ideas, without discussion or evaluation.

After brainstorming, the ideas may be organized, best ideas discussed, acted out, or permanently recorded.

Second Week through the Eighth Week

This session is to be held twice each week and is the essential ingredient in effectively preparing tutors for their tutoring session.

The instructor meets with tutors to:

1. Prepare the materials to be used and review format and procedures for tutoring sessions.
2. Air the tutors' concerns and problems.

3. Discuss/brainstorm/role play solutions to the problems.

4. Give positive feedback, support, and encouragement to the tutors. The Tutor Observation Form will be utilized for this purpose.

5. Give additional training in methods for successful tutoring.

6. Provide opportunities in reading skills practice for tutors as needed.

Additional Training Procedures for Successful Tutoring

Establishing a Friendly Atmosphere. The tutor will first need to establish friendly relationship with the tutee. The tutor should be reminded to:

1. Call the tutee by name.

2. Smile.

3. Act friendly.

4. Sit next to learner.

Supporting the Tutee During Tutoring. At every step of the tutoring procedures the key to success lies in the kind of reinforcement the tutor gives the tutee. Continuous attention by the tutor while he is with the tutee is vital. These procedures should be stressed:

1. Praise correct responses regularly.

2. Mark correct responses, if appropriate.

3. Help with errors in a positive manner.

    a. Emphasize the question, not the wrong answer.

    b. Ask the question again.

    c. Help find the answer.

Encouraging Independence in the Tutee. As a successful working relationship is established the tutor should become aware of ways to encourage independence in the tutee. These procedures should be introduced at the beginning of tutoring and stressed increasingly as tutoring goes on:

1. Help the tutee find the answers instead of giving them to him.
2. Praise the tutee for following steps without being told, such as:
    a. Asking questions.
    b. Turning pages, marking answers, etc.
    c. Locating information.
    d. Studying independently in an area of need.

Questions tutors should learn to ask in solving problems encountered by tutees:

1. What difficulty is the tutee having? Why?
2. What needs to happen for him to succeed?
3. What does he need to learn to do a better job?
4. How can I help him feel good about where he is now and at the same time encourage him to learn to do better?
5. Can I explain a difficult idea in more than one way?

INTERVIEW ACTIVITY SHEET

Tutor _____

(Tutors should fill in answers to all questions.)

Tell you name. Tell why you are doing this. Make the child comfortable. Ask for his help.

1. What is your name?
2. How old are you?
3. How many sisters do you have? How old are they?
4. How many brothers do you have? How old are they?
5. Do you have any pets? What kinds?
6. What is your favorite TV program?
7. What do you like to do in school?
8. What do you hate to do in school?
9. What kind of work do you do at home?
10. How do you feel about older kids?
11. How does your best friend feel about school?
12. How do you feel about school?
13. What is the most important thing you are going to do after school today?
14. What is your favorite story? Tell me what it is about.

TUTORING PROCEDURES

Smile! Be Friendly! Use First Names!

Praise! Help!

---

1. REVIEW word cards.

   STUDY missed words.

2. DISCUSS story.

3. LISTEN to child read.

4. HELP with missed words.

   SOUND OUT word.

   WRITE word on Word List.

   Child READS word again in sentence.

After 5 new words on Word List . . .

5. ASK questions about story.

   "What happened?"

   "Who was in the story?"

   "What sentence goes with this picture?"

6. MAKE flashcards for new words.

   STUDY new words.

7. GAME, STORY, or PRACTICE EXERCISE.

8. FILL OUT Daily Log.

WORD LIST

WORD	PAGE	WORD	PAGE

TUTOR'S DAILY LOG

Tutee _____ Tutor _____

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY

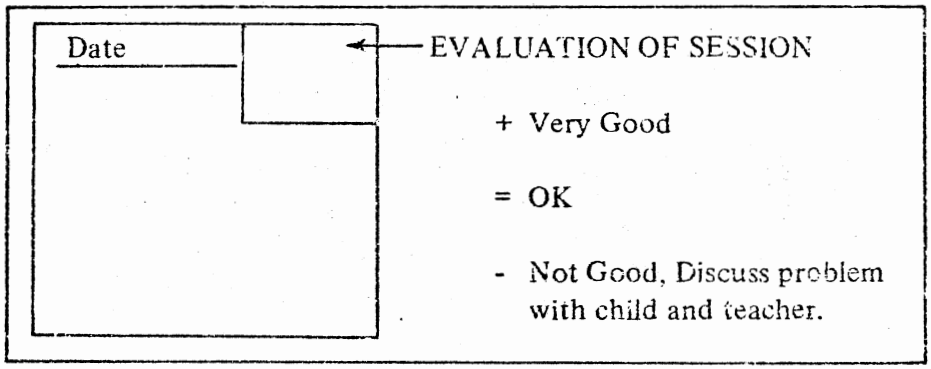
Things to talk about with instructor.....

.....

.....

.....

Directions for use of DAILY LOG.



TUTOR OBSERVATION FORM

Yes _____ No _____ A. Does tutor ESTABLISH A FRIENDLY ATMOSPHERE? (Call tutee by name, smile, act friendly.)

Yes _____ No _____ B. Does tutor SUPPORT TUTEE? (Praise for correct answers, handle errors positively.)

Yes _____ No _____ C. Does tutor ENCOURAGE INDEPENDENCE in tutee? (Help find answer instead of giving it, praise the tutee for following steps without being told.)

Yes _____ No _____ D. Does tutor TAKE RESPONSIBILITY? (Deal with problems, come on time, aware of his own strengths and weaknesses, ask for help when necessary.)

Yes _____ No _____ E. Does tutor FOLLOW TUTORING STEPS?

Tutor Strengths: _____

_____

_____

Training Needed: _____

_____

_____

Comments: _____

_____

_____

VITA

Karen Christensen Lamport

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE EFFECTS OF INVERSE TUTORING ON READING DISABLED STUDENTS IN A PUBLIC SCHOOL SETTING

Major Field: Applied Behavioral Studies

Biographical:

Personal Data: Born in St. Petersburg, Florida, January 24, 1943, the daughter of Ernest and Marien Christensen.

Education: Graduated from St. Petersburg High School, St. Petersburg, Florida in May 1960; attended St. Petersburg Junior College, 1960-61; attended University of Florida, 1961-63; received the Bachelor of Arts degree in Elementary Education from the University of South Florida in 1966; received the Master of Science degree in Educational Psychology from Oklahoma State University in 1979; completed requirements for the Doctor of Philosophy degree at Oklahoma State University in December, 1982.

Professional Experience: Taught grades from one to four in elementary schools in various locations, St. Petersburg, Florida, 1967; Tallahassee, Florida, 1967-69; Knoxville, Tennessee, 1969-70; Albuquerque, New Mexico, 1970-74; taught sixth grade in middle school and coached seventh-eighth grade girls' basketball and track, Clarkston, Washington, 1974-76; coached girls' group in National Youth Sports Program, Lewis Clark State College, Lewiston, Idaho, summer, 1976; served as liason officer in National Youth Sports Program, Oklahoma State University, Stillwater, Oklahoma, summers of 1977-79; graduate teaching assistant, taught and supervised student teachers, Oklahoma State University, 1978-79; instructor, taught classes and supervised student teachers, academic adviser, Department of Applied Behavioral Studies, Oklahoma State University, Stillwater, Oklahoma, September, 1979 to December, 1981; taught class for severely emotionally disturbed and autistic children, Tampa, Florida, January 1982 to June, 1982.

Professional Organizations: Faculty adviser, Oklahoma State University Student Chapter of Council for Exceptional Children, September, 1979 to December, 1981; secretary, 1979, treasurer, 1980, Association for Professional Development in Applied Behavioral Studies, Oklahoma State University; board member of Cimarron Chapter of Council for Exceptional Children, Stillwater, Oklahoma, 1980-81; member of Kappa Delta Pi, Phi Kappa Phi, and Phi Delta Kappa.