


A STUDY OF THE EFFECTIVENESS OF A CHAPTER I  
READING PROGRAM AT THE FIRST GRADE LEVEL  
DESIGNED TO PROVIDE ORAL LANGUAGE DEVELOPMENT,  
READINESS AND BEGINNING READING TRAINING, AND  
COMPUTER ASSISTED DRILL AND PRACTICE  
CORRELATED WITH CLASSROOM INSTRUCTION.

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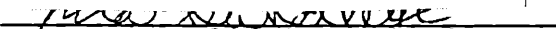
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## ABSTRACT

The purpose of this study was to determine if the Chapter I reading program could be instrumental in a preventive approach in the first grades. Students were identified as not having basic readiness skills intact upon entering first grade by the district language arts consultant, classroom teacher, and the Chapter I reading specialist. There were four experimental groups that received additional readiness and oral language development training, as well as being given more time on reading tasks taught in the regular classroom. The micro-computer was used with software that was designed by the basal publisher to parallel the reading skills being taught in the regular classroom. The objective was to correlate beginning reading instruction closely with classroom instruction while providing a research-based eclectic approach to compensatory language development and readiness instruction.

There were four groups of students identified in the same manner who did not receive the additional reading classes until it was possible under the normal Chapter I policy guidelines, after January on a space available basis, or who did not receive special services at all.

The 41 students selected for the study attended three Chapter I elementary schools in Unified School District 497, Lawrence, Kansas. Nineteen of the first graders were

enrolled in the Chapter I reading program and received reading instruction 30 minutes daily four days a week.

Scores for data analysis were obtained from seven testing instruments: the Clymer-Barrett Readiness Test, the Boehm Test of Basic Concepts, the Structured Photographic Language Test II, and four subtests of an informal survey designed by the reading specialists: (1) independent written production of upper case letters in sequence (2) written production of dictated, lower case, out-of-sequence letters (3) auditory recognition of and verbal production of initial consonant sounds (4) auditory recognition of rhyming words. These seven tests were administered twice during the 1983-1984 school year as pretests and posttests. Raw scores were the criteria used to measure the dependent variable, reading achievement, except for the Structured Photographic Language Test which required the use of percentage scores. The t-test was used to determine the level of difference between the control group and experimental group results. The .05 level of significance was selected as the appropriate level for acceptance or rejection of the null hypothesis.

This study demonstrated that there were significant main effects for treatment groups on three measures: the Clymer-Barrett Readiness Test, the written independent production of upper case letters in sequence, and the

written production of dictated, lower case, out-of-sequence letters. There was no significant main effect on the Boehm Test of Basic Concepts, the Structured Photographic Language Test II, the auditory recognition and verbal production of initial consonant sounds, and the auditory recognition of rhyming words.

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## CHAPTER I

### INTRODUCTION

#### IMPLICATIONS OF A PREVENTIVE APPROACH TO READING DISABILITIES

The age at which a child is ready to learn to read is as variable as the uniqueness of each individual and how he fits into our complex societal structure. Researchers have identified important factors in reading readiness which include language development, auditory discrimination, visual discrimination, cognitive ability, experiential background, as well as social and emotional maturity. For some children, these readiness factors have developed sufficiently to allow for the beginning of the reading process at an early age. Many children are ready to read when they enter first grade, the traditional time for formal instruction to begin in the United States. However, for the remainder of the school population, who do not have the readiness skills adequately developed, there is a pressure to conform to the norm, and failure along with a depressed self-concept are often the unhappy result.

The remediation of a poor reader after he has fallen behind is a complex procedure dealing with the child's self concept as well as finding and repairing the learning gaps. The catching up process is often never-ending. Though a student may improve in basic reading skills, his peers are moving on down the curriculum continuum in which basal

texts generally must be followed in steady succession.

It has been well established that many children from low socio-economic backgrounds are lacking in readiness nurturing. This developmental shortfall can be in a specific skill area, or can be a comprehensive problem dealing with all readiness skills. The federal government has intervened by establishing the Headstart Program, a pre-school readiness program for the culturally deprived as well as the Chapter I (Title I) reading and math remediation programs at the elementary level and secondary levels. Headstart is an early intervention which has much research to substantiate its usefulness in bridging the gap between educationally-culturally deprived homes of pre-schoolers, and formal schooling. Oral language development, social experiences as well as more specific readiness skills are emphasized and the results are positive.

The Chapter I Reading Program began as a government entitlement program with federal funds given to states as their population indicated needs. Due to governmental financial stress, the funding for the program has changed since its conception in the mid-sixties. It began when the Elementary and Secondary Education Act provided for target schools to receive money to help low socio-economic areas compensate for academic unpreparedness. In Lawrence, Kansas, special reading classes were held not only in the

Title I elementary schools, but in the junior highs and the high school as well.

At this time, in the Lawrence, Kansas, Chapter I targeted schools, remedial reading instruction begins when a child entering second grade falls more than half of a year behind the expected average reading level. This means that a child entering kindergarten does not receive any additional reading readiness instruction to help narrow the gap between an educationally deprived child and a child with an educationally enriched background. There is the understanding that there is no need to remediate one just beginning to learn to read. However, what if the evidence leads one to see that preventive teaching, especially in first grade, will give these educationally deprived children a chance to progress more normally? Compensatory education is not a new concept, and may be how Chapter I Reading resources should be invested. A dollar invested in furnishing a child with reading readiness that allows him to learn at a more normal pace would be a dollar well-spent.

The purpose of the study was to determine if the current Chapter I reading program could be instrumental in a preventive approach in the first grades. There were four groups of first graders in two Chapter schools selected for additional readiness training as well as oral language

development instruction. These experimental groups would normally not be eligible candidates for the Chapter I program. There were four comparable groups of first-grade students in Chapter I schools who served in this study as control groups. They received only the classroom reading instruction with no additional compensatory instruction until second semester when Chapter I teachers can normally take first-graders on a space available basis. The experimental groups spent more time on the reading tasks being presented and taught in the classroom as well as having the oral language development emphasis applied which supplemented the reading series being used. The Chapter I teacher and classroom teacher coordinated their efforts to produce an optimum effect with the experimental groups.

All of the children were tested before and after the months of complementary instruction. If the students who have received extra reading readiness instruction in first grade show measurable gains over the students who did not have such instructional intervention, we can suggest a meaningful way for the Chapter I reading program to proceed with its decreased budget and reduced teaching staff. This approach would not certainly eliminate all reading disabilities, as there are many complex reasons why some students encounter reading difficulties; however, if even some students could be kept from experiencing reading failure, preventive, compensatory, primary instruction

would be promising and valid.

#### Statement of Hypotheses

1. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on independent production of upper case letters in sequence.
2. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on production of dictated, lower-case, out-of-sequence letters.
3. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition and verbal production of initial consonant sounds.
4. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition of rhyming words.
5. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no

additional instruction on the Clymer-Barrett Readiness Test.

6. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Boehm Test of Basic Concepts.

7. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Structured Photographic Expressive Language Test II.

## CHAPTER II

### REVIEW OF LITERATURE General and Compensatory Education in Readiness and Beginning Reading

#### FACTORS IN READINESS AND BEGINNING READING:

Harris and Sipay (1980) defined reading readiness as a "state of general maturity, based on attitudes and learned knowledge and skills, which allows a child to learn to read under given instructional conditions." They continue by stating that readiness is a relative concept with the readiness of a particular child being on a continuum in relationship to the demands of the instructional program.

From the psycholinguistic viewpoint, Diane Sawyer (1975) suggests that reading is a cognitive or thinking process and therefore is reliant on prior experience and learning. She continues by reasoning that since reading is based in language, skill in reading is thus dependent on prior development in perceptual and conceptual ability and language use. Sawyer warns that we must be aware of the role of linguistic and cognitive abilities in the reading process and of their sequential development so that we will be alert to see that a child who is not ready for formal reading instruction does not keep getting "more of the same" despite repeated failure. She emphasizes a plea for early identification of potential learning difficulties as the hope for achieving optimal literacy levels.

Harris and Sipay (1980) agree in saying, "The store of

concepts a child has developed and the vocabulary that provides labels for those concepts are essential for carrying on verbal reasoning."

The general cultural background of the child will affect the child's conceptual and language development. The Head Start program was designed to compensate disadvantaged children and Stanley (1972) stated that the preliminary evaluations showed substantial gains in intelligence, language proficiency and reading readiness. The study showed that highly structured cognitive activities at the pre-kindergarten level are the most effective. The Head Start gains tended to diminish after formal schooling had gotten underway.

Children who do not seem to be ready to read need not have reading instruction indefinitely delayed. Robinson, Strickland and Cullinan (1977) summarized the characteristics of a kindergarten child which could be applied to an educationally disadvantaged or immature child as well. They purported that these early childhood characteristics require combining learning with play, incorporating physical activity, manipulatives, and extensive use of both expressive and receptive oral language.

MacGinite (1976) reinforces the point by saying "meaningful reading readiness instruction means a slow and

gentle introduction to reading itself--often gamelike, often hidden in other activities."

For children "at risk" entering first grade, it would seem that all the research concerning transfer of training is pertinent. As readiness training continues, interwoven with beginning reading instruction, time must not be lost. Durrell and Murphy (1953) emphasized the value of visual and perceptual training for first-grade reading success. Frostig Horne's Program for the Development of Visual Perception has been used extensively to practice five aspects of visual perception. H.M. Robinson (1972) and Wiederholt and Hammill (1971) analyzed various research done with the Frostig program and concluded that generally the transfer to reading readiness tasks and tests is not significant.

Harris and Sipay (1980) state that research has long established that "the more closely a learning activity resembles the activity to which transfer of learning is desired, the more likely it is for useful transfer to take place." Thus visual discrimination practice using letters and words is more transferable to reading than is discrimination of non-verbal sounds.

Much research has been carried out in the area of decoding skills and strategies for instructional improvement. Chall (1967) concluded her research by indicating that a code emphasis--one that combines control

of words on spelling regularity--produces better results than a meaning emphasis in beginning reading. She did go on to say that she was not disregarding the importance of context and meaning in the instructional process.

Smith (1970) reported the results of the USOE First Grade Reading Studies. During the first year of this series of studies, data was gathered on 27 individual projects in which different methods and materials were used. Thirteen of the original 27 projects were continued to assess the effectiveness of the programs after two years of instruction. As far as the results of the first grade study were concerned with decoding, Chall was right. Code-emphasis reading programs produced more overall achievement for beginners than meaning-emphasis programs. There appeared to be a strong correlation between instruction in sound-symbol correspondences and reading achievement at the second grade, also.

Six of the USOE investigators (Fry, Harris, Ruddell, Scheneyer, Vilseck, Cleland, Hayes and Wuest) followed the research pupils through the third grade. In five of the six methods compared, (basal readers, i.t.a., linguistic readers, diacritically marked readers, supplemental phonics and phonic/linguistic readers), the test results at the end of third grade showed no significant superiority of any system. Smith (1970) asserts that since no one method

proved best when the pupils were followed through to the end of third grade, the most important factors in reading success are the teacher, the children, the school, the environment, and other general factors.

One of the important conclusions of Bond and Dykstra (1967) after studying the USOE studies was that, "Combinations of programs such as a basal program with supplemental phonic materials, often are superior to single approaches." They also found that in addition to phonics instruction, a writing component is an effective addition in any beginning program.

Mary Austin (1968) states that broadscale research has indicated that there is no best way to teach beginning reading, but that children can learn just as well with very different teaching methods. She adds that, "The truly important factor in creating good or poor reading achievement is the quality of the teacher." She pointed out Fry's three-year project publication indicated that the effect of a good first-grade teacher can still be seen at the end of third grade.

Gray proposes in the Encyclopedia of Educational Research (1960) that the issue isn't which method is best, but what contribution each makes. He points out that a combination of materials and methods would probably meet individual needs best.

Freeman (1969) described his research findings from a

Language and Sensory-Perceptual Training Program. Approximately 100 two to five-year-old culturally deprived children received instruction in groups of six or seven on a half-day basis for 5 days a week. There was a noticeable increase in I.Q., sensory perceptual, linguistic and readiness measures for the experimental group whereas this was not the case for the control group.

In another research project Freeman hypothesized that "a lack of meaningful auditory experience and the random and undifferentiated barrages of sound in the culturally deprived environment may not only preclude adequate vocabulary and grammatical knowledge, but may also produce secondary consequences of altering, or changing, the development of basic auditory perceptual skills. The experimental group was comprised of culturally disadvantaged Negro children and the two control groups were comprised of middle class children, one group white, and the other Negro. The results suggested that the environmental factor was more important than ethnic or racial factors. He concluded that the auditory listening skills of the culturally deprived child are less adequate when compared to his middle class peers.

Paradis and Peterson (1975) agreed that auditory discrimination is an area that requires particular training for the low socio-economic students. In their research,

85% of low socio-economic students with no formal readiness training scored 75% or better on a test of visual discrimination of letters and words. Ninety-seven percent of the middle socio-economic children tested scored 80% or better. The difference between the two groups indicates that it should not be assumed that visual discrimination is an area needing emphasis. However, in contrast, only 59% of the low socio-economic kindergarten-age children with no formal readiness training scored 75% or better on a test of rhyming words. Only 7% scored 75% or more on a test of beginning sounds. They proposed that in general, low socio-economic students need auditory training in discrimination of rhyming words and particularly beginning sounds.

Deblinger and Elkind (1969) cite research done with two groups of second-grade inner-city Negro children who were matched in reading achievement and perceptual ability. The experimental group was trained with a series of non-verbal perceptual exercises for one-half hour three times a week for fifteen weeks. The control group trained with a commercial reading program. The experimental group made significantly greater improvement on word form and word recognition than the control groups. The results are interpreted as supporting a perceptual activity analysis of the perceptual process in reading.

Reiss (1975) reported an early childhood intervention

program for pupils in New York City between ages five and seven. The project was funded by Title I of the Elementary and Secondary Education Act of 1965. The major goal was to increase proficiency in language and speech development, motor coordination, self-expression, self-help activities and work habits. A project coordinator supervised nineteen para-professionals who worked both in the classroom and in separate rooms designed for small group and individualized activities. Individual plans were developed for each child by the teacher and para-professional. The children gained an average of 5.1 points on the Metropolitan Readiness Test, a statistically significant gain, especially considering the program only existed for less than three months. The recommendation was that this program be continued and expanded to include more classes.

In summary, reading is a cognitive process dependent on prior experience and development in perceptual, conceptual, and language abilities. Varieties of materials and approaches to reading instruction can be used effectively if the teacher has the wisdom to use each for its best contribution, and if the teacher is well qualified to teach beginning reading. Educators must be aware of the child's developmental needs and find the most relevant and transferable ways in which to train these areas when the child enters school lacking basic readiness skills.

## ORAL LANGUAGE DEVELOPMENT:

Pressure to increase academic achievement of elementary school children, has brought a more formal approach to reading readiness programs in many kindergartens as well as more academic early childhood programs.

Drake (1975) found evidence of a dominant factor in general readiness to read which she classified "language" or "informational processing skills". A secondary factor dealt with a nonverbal dimension related to maturation.

Hoffman and Fillmer (1979) state that many compensatory programs to assist children in their language development have chosen a highly structured approach. The assumption is that if these children are provided intensive oral and written language experiences, both thinking and language will improve. Hoffman and Fillmer interject that this pre-planned, structured language instruction stems from the view that language promotes thinking as proposed by Vygotsky (1962). However, they agree with Piaget (1973) who asserts that thought has its roots in action -- language transmits only that which is learned through concrete experiences.

Dechant and Smith (1977) write:

"The timing of instruction is especially important in preventing reading disability. Reading disability too often is caused by starting the child in a planned reading program before he is ready. Such a child cannot handle the day-to-day learning tasks

and finds himself farther and farther behind as time goes by. He becomes frustrated and develops antipathy towards reading. He actually learns NOT TO READ. This is quite different and far more serious than not learning to read."

Hoffman (1972) substantiated his curriculum recommendations with an original research effort with three- to five-year-old migrant children. He proposes a program of concrete problem solving experiences and functional language development for prereading children. Language becomes a tool or vehicle for communication about what is known and develops efficiently. Hoffman states, "Learning experiences must be planned so that children work with concrete manipulative materials rather than artificial and abstract drawings or pictures. Each of these concepts with its requisite skills (learned by the child in active involvement with a learning environment created by the teacher) has direct relationship to thought, language, and subsequently, reading."

Washburne (1972) concluded that in approaching the debate between a global approach (language experience, and oral language development) and a specific approach (teaching specific skills) to reading readiness, the teacher should realize that specific skills can be taught along with the global instruction if they are presented in such a way that they do not cause anxiety.

Goodman (1975) discusses the relevance of language

development in reading, and making reading useful to the child. He states that generally children have the ability to learn language and when reading is taught we're trying to teach how to get meaning from print. Since language is learned from whole to part, from general to specific, we should facilitate the use of language as an information processing system instead of irrelevant abstractions in the form of isolated skills. He adds, "Teachers who have empathy for children and who are good observers realize that if you start with children's experiences in their own language, it is easier to begin to talk about things that are relevant and meaningful and easier to begin reading instruction."

Levy (1972) began examining research related to the theoretical models of the reading process that have suggested that the main activity in reading is a psycholinguistic response to written language. Thus, a child who is learning to read relates the symbols to his own language knowledge. Deutch (1963) and Engelmann (1970) are both cited as having asserted that typical poor children are lacking in language abilities. Thus, Levy performed his own research on disadvantaged children's language identifying three linguistic features of inner city black pupils' speech: (1) vocabulary, (2) the mean length of T-units, and (3) three structures within T-units. A T-unit is a minimal grammatical sentence which has one

main clause and any subordinate clauses related to it. The study provided evidence that these disadvantaged inner city black children, insofar as oral language knowledge is related to reading, had adequate language skills to learn to decode words and comprehend written communication. This study did not define the subjects' parameters of language competence. Levy states that published reading and language programs designed for use with disadvantaged children assume the students have no language knowledge. These, he recommends, must be carefully examined because they could inhibit the development of new skills and concepts. Levy asserts that a classroom setting in which children have opportunities to express themselves freely, combined with beginning reading materials reflecting the children's familiar oral language, would create a more positive learning environment.

Strickland (1981) studied the language of linguistically different, black children because of the widespread failure in the acquisition of reading skills among children both poor and black. Due to concern of the mismatch between the language of these children and the school language, a kindergarten program was designed to expand the children's language repertoire to include the dialect in which they would learn to write and read. The experimental group was exposed to a literature-based oral

language program which consisted of daily listening to selected children's books read aloud along with oral language activities such as creative dramatics, choral speaking, puppetry and role-playing. There was an emphasis on imitation and repetition of language patterns just as in teaching English as a second language. The results of this literature-language program confirmed the hypothesis that subjects would expand their language to include standard English to a greater extent than subjects not exposed to the program. This study implies that language expansion, as opposed to language substitution, can help equalize the child's chances for reaching his potential in a society oriented toward standard English. Strickland states that this is far superior to teaching the child that his Negro dialect is intrinsically inferior and must be eliminated. A key in this research is that the children were never asked to imitate the teacher's language, but to use the language of the storybook characters.

McConnell (1969) cited research findings from his Language and Sensory-Perceptual Training Program. The demonstration project reflected the philosophy that the disadvantaged child does need instruction quite early in life and organized, structured, intensive sensory-perceptual and language training methods were found successful. He states, "Because language as it is heard and spoken, read and written, is the key to thought,

communication and learning, it is thus a primary factor in all intellectual and social development. If the child enters school at six without having attained the language skills commensurate with those of his peers, he will undoubtedly fall behind rapidly in the educational setting."

Approximately 100 children from 2 1/2 to 5 1/2-years-old in the McConnell experimental group were provided with daily, small group instruction. Input and output of language were the focus of instruction with face-to-face encounters with language. Each child was required to respond with the appropriate sentence structure, verb form, and word endings. In general, the experimental group made greater gains on the sensory-perceptual, linguistic, and readiness measures than did the control group, as well as showing an increase in IQ level over a nine month period.

Cunningham and Pierce-Jones (1969) undertook a three month pilot project at the University of Texas using a language development program (Buchanan Language Program, 1967) with disadvantaged preschool children. The primary hypothesis was that the rate of gain of the experimental group would be significantly greater than that of the control group. The results highly supported the hypothesis comparing the pre- and posttests on the Metropolitan Readiness Test, the Murphy-Durrell Reading Readiness

Analysis, the Gates Reading Readiness and the Lee-Clark Reading Readiness Test.

Another compensatory program, based on the assumption that many pre-school disadvantaged students have underdeveloped potential in many areas necessary for success in early grades, was the Title I Pre-kindergarten Component in 1970-71. Robinson (1970) evaluated this 21-school project of the Language Development Component of Title I of the Elementary and Secondary Education Act of 1965. The 677 four-year-olds were trained in oral language skills as related to the school environment, vocabulary development, visual perception and auditory discrimination. Eighty-four percent of the pupils improved their test scores related to the objective to develop the child's perceptual abilities as measured on the Bettye Caldwell Preschool Inventory (BCPI). However, only thirty-six percent of the pupils met the objective to score above sixty-five percent on the vocabulary subtest of the BCPI which would indicate the desired growth in oral language skills. The pre-reading program was recommended to continue.

To summarize, it would seem that the literature states an important conceptual dilemma--does language stem from thought and experience, or does it produce thought and thus action? It appears that harm can come from planned and structured reading programs thrust at children who do not

have "school language" developed. Language communicates meaning and so reading must be taught with this concept in mind. Disadvantaged black children can begin reading and decoding with the language store they come with, however an optimum instructional setting would allow opportunities for expression combined with language experience stories in their own familiar language. Successful programs of language expansion and perceptual training have increased the subjects readiness scores on standardized tests which will no doubt affect the students' beginning reading.

#### COMPUTER ASSISTED INSTRUCTION:

Swigger and Campbell (1981) described a computer program put into effect at the North Texas State University Nursery School. The assumption was made that children learn from their environment and if a computer was in a pre-schooler's environment it could accelerate certain learning skills. There was a hypothesis made that the children could learn from their computer-based play that they can control the machine and that they can solve problems. Since three- and four-year-old children are especially vulnerable, Swigger and Campbell felt it was important to see if they could gain control over the computer, what would happen to them once they experienced this control. They also studied gender preferences and competencies in relationship to the computer. The specific

learning materials designed for the pre-schoolers at North Texas were for the purpose of increasing reading readiness skills.

The results of Swigger and Campbell's study were very positive. With a minimum of instruction the children were all able to master the correct manipulation of the computer. None of the children seemed afraid of the machine and they responded more happily and freely when adults were not close by. Mastery of readiness skills took place and in some cases the children surpassed their teachers' expectations.

Piestrup (1981) did a three-week study at a Stanford University pre-school using an Apple II micro-computer as an activity center to teach reading readiness concepts of "above," "below," "left," and "right." The children were monitored, but quickly learned how to operate the computer and how to take care of it. Color graphics, music and voice were responses used in the programs. The children responded enthusiastically almost never leaving the computer voluntarily. Tests of the target concepts before and after the computer activities had striking results. On the pretest, thirty-nine percent of the children passed tests of "above," "below," and "left." Thirty-two percent passed the test of the concept "right." On the posttest, seventy percent passed the test for "above," and "below," fifty-seven percent for "left," and forty-four percent for

"right." The pilot study suggested that children who are very young can use computers easily, and gain in skills.

Green (1968) reported on an IBM 1050 AV computer system including a typewriter keyboard, tape recorder, and slides used to teach four-year-olds word and letter recognition. The child would begin the program by pressing on any key which had a word on it. The screen showed the word on the key that was pressed. The tape recorder responded by saying the word twice. The children each had ten minutes a day to do however much they wanted to on the computer after the initial orientation. The boys showed significant gains on the matching task after using the computer program, whereas the girls did not. Two studies were completed using disadvantaged students and one with middle class students. Among the disadvantaged, boys did better than girls and in the middle-class group the boys and girls did about the same. However, that in itself shows a gain because girls usually show superiority at these beginning stages. Green concluded that a feature of the CAI approach, for disadvantaged children in particular, was that the children had opportunities to learn by making gross motor responses rather than verbal ones.

Fry (1967) researched programmed instruction and automation in teaching reading in the early stages of computer-assisted instruction. He concluded, "There seems

to be plenty of evidence that programmed instruction and its technological neighbors of computer assisted instruction and talking typewriters can teach beginning reading. There is no proof, however, that it can teach beginning reading any better than regular classroom teaching or human tutoring. In fact, in the only well controlled study we were able to find (Ruddell, 1965) programmed learning and basal texts came out in a dead heat. Thus, the classroom teacher should feel free to use as much programmed instruction or automated procedures as her temperament and budget will allow."

While most CAI research has focused on skill acquisition or on computers teaching faster, better or cheaper, Yeager (1977) put the emphasis on the learning process rather than the content. He described some principles of lesson design developed by the PLATO Elementary Reading Curriculum Project (PERC) at the University of Illinois. PERC had developed between twenty and twenty-five hours of beginning reading instruction. One of the primary goals of PERC is to see that the first graders feel they are in control of the computer terminal, not vice versa. Branching stories were a unique use of the computer in teaching reading. In a story about a race the children could decide how fast each runner would go, and whether a bridge would be up or down; in essence the children used the computer as a tool and learned the

importance of comprehending text.

Geoffrion and Bergeron (1977) experimented with computer animation to teach initial reading to children with severe communication and learning handicaps. Lack of communication further debilitates a handicapped child because without feedback, interest is lost in surrounding activities and interactions. The Computer Animated Reading Instruction System (CARIS) provided a stimulating environment in which children could learn to read by directing the computer to make simple, brief, animated cartoons.

CARIS assumed no mastery of English phonology and no particular interest in books or words by the children. Vocabulary and phrases were taught by students selecting a word with a light pen from a list of five words and then a matching graphic or animation would show its meaning. After the child has become proficient in forming sentences a spelling phrase is introduced. At this level the child can not choose the word with the light pen, but must instead spell the word to choose it. It was found that when children were given a system they can control and manipulate, even severely handicapped children became enthralled with the adventure of trying to make the computer respond in a certain manner. Geoffrion and Bergeron conclude that this project demonstrated "that

children who are normally considered unready for reading instruction are capable of learning to read if techniques are adapted accordingly."

Fletcher and Atkinson (1970) reported on a computer-based curriculum for initial reading that was designed to present the decoding aspect of reading. It was assumed that the communication aspect of reading seemed best presented by a human who could teach reading for enjoyment, aesthetics and meaning. This project was funded by title 3 of the Elementary and Secondary Education Act for the Stanford-Brentwood demonstration project involving more than 400 students each day.

Fries (1963) stated that "Learning to make grapheme-phoneme associations was not only necessary for those learning to read, but that these associations must become habits so automatic that the graphic shapes themselves sink below the threshold of attention." Fletcher and Atkinson believed that an effective way for the associations to become automatic was by repetitive presentations for short intensive drill periods. Such drill can be accomplished effectively by an individualized computer-assisted drill program which gives immediate feedback to the students after each response.

The Stanford-Brentwood project computers had audio capacity which allowed communication with the students. Preliminary results showed gains by students who used the

CAI over those who did not use it, and also a significant gain was made for the boys over the girls. This result is the opposite of the usual tendency for superior performance gains by girls than by boys in initial reading. Often it is argued that the last thing a culturally deprived child needs is less contact with human beings in order to learn. However, Fletcher and Atkinson (1970) added an interesting counter claim. They proposed that it is the social-psychological variables that exist in classrooms that can make learning so difficult for culturally deprived children. Fletcher and Atkinson (1970) state, "We believe that for many aspects of the cognitive domain, computers, with their absolute imperturbability and objectivity represent the best means of reaching these children."

Atkinson described the Stanford Project's intent to practically provide solutions to the national low level of reading proficiency. He pronounced individualization as an aspect of CAI that should be considered significant. Management systems can track a student's performance as he progresses from one teaching level or strand to another. The less advanced students were cited as the most enthusiastic, contrary to a classroom reading group environment. Atkinson interjects that "a computer 'never puts a student down' for a wrong answer or, no matter how often he is wrong, exposes him to the slightest form of

ridicule." He sums up his research by saying, "There's no question that CAI in initial reading is a feasible and cost effective way to reach the goal."

It appears that the computer has proven to be a valuable assist in learning, from preschool readiness skills to breaking through communication barriers with severely handicapped, from disadvantaged learners to the more gifted students. It frees the teacher for more individualization as well as allowing for individualized computer assisted drills and phonic skills. As more technological progress is made and more teaching programs are developed, more use can be made of the computer as an assist to teaching.

In conclusion, it is apparent that there is an important place in teaching the disadvantaged student to read for a language development component as well as for use of computer assisted instruction. Language expansion, both in the general sense, and also related to the transferring of dialectal knowledge, is understood to be a primary factor in the child's intellectual development. Some research would indicate a need to offer the disadvantaged child problem solving and concrete experiences as a basis for developing language.

An "unready to read" child should have instruction in cognitive-language development along with training, especially in the area of auditory discrimination. There

is evidence that culturally deprived children have more difficulty with this readiness skill than with visual discrimination. Rather than delaying reading instruction indefinitely, learning could be combined with play activities, manipulatives, physical activity and incorporating visual and auditory training that closely resembles the actual reading process, i.e. letters and words.

The computer has been seen to offer a non-threatening learning environment that motivates students from the severely handicapped to the gifted. Mastery of readiness and specific beginning reading skills can take place with a very individualized approach, offering the repetition some students need.

A combination of these learning experiences taught by proficient teachers would offer invaluable training for a child entering school lacking basic readiness skills.

## CHAPTER III

### METHOD

A first grade intervention program designed to help fill environmentally produced learning deficits for students determined "at risk" was compared to standard classroom instruction without such intervention for comparably identified students.

Research has indicated that language development, auditory and visual discrimination, experiential and cognitive development as well as social and emotional maturity are all important to reading readiness. Instruction in the experimental groups was three-phase with an emphasis on language development, direct instruction on concept development, visual and auditory discrimination from readiness to actual reading skills, and skill reinforcement using a micro-computer with software written to correlate with the basal text being used. Classes were held in addition to classroom instruction for 30 minutes four days a week.

The control groups received traditional classroom instruction in reading using basal text and teacher-made materials. Second semester, the control group at one school received the same Chapter I intervention treatment as did the experimental. It is a local Chapter I policy that if there is space available in the reading program second semester, and a need for first grade students has been

identified by the classroom teacher, the student can at that point begin the treatment.

The two approaches were compared in terms of treatment and reading achievement. The study began mid-November, 1983, and was completed mid-May 1984, a total of six months.

### SUBJECTS

The subjects for this study were from three elementary Chapter I schools in USD 497, Lawrence, Kansas. The schools were designated Chapter I program recipients based on the percentage of enrollment of low-income students. The low-income figure is obtained by determining the number of students receiving free lunches. All students in the experimental groups received instruction in a Chapter I reading room within their building.

The subjects in both experimental and control groups were identified on the basis of their classroom reading placement. All students were in the readiness book Look, Listen and Learn or Sounds, Symbols and Sense published by Harcourt, Brace, Jovanovich in the fall of 1983. Placement of these students was determined in the spring of 1983 on the basis of test scores from the Houghton Mifflin readiness book, Getting Ready to Read.

Initially 41 students were identified for this study: 19 in the experimental group and 22 in the control group.

Due to student transfer or withdrawal from the schools in which the study was conducted, the control group was reduced to 20 students, and the experimental group maintained its original 19 participants. Only students with both pre- and posttest scores were used in this research.

The proportion of boys to girls was greater in all but one group where it was reversed. In one experimental group there were six boys and three girls and the other had seven boys and three girls. One control group had six boys and three girls, but the other one had only three boys and seven girls in it. It was in this group that pretest scores were found to be higher than the others.

Table 1 depicts the two groups initially identified and Table 2 depicts the population that completed the research.

#### INSTRUCTION

Three Chapter I elementary schools in Unified School District 497, Lawrence, Kansas, were used in this investigation. Two Chapter I teachers developed and taught the correlated readiness and beginning reading program. The program was designed to reinforce what was being taught in the regular classroom as well as to find and repair learning gaps.

Students came to the reading rooms in small groups of four or five for thirty minutes of instruction four days a week. There were four instructional groups.

TABLE 1  
STUDENTS INITIALLY IDENTIFIED

CLASS	BOYS	GIRLS	TOTAL
Group A -- Chapter I Intervention Correlated with Classroom Instruction			
1-W*	6	3	9
2-K*	7	3	10
Total	13	6	19
Group B -- Control Group			
1-I*	3	7	10
2-K*	8	4	12
Total	11	11	22
Grand Total	24	17	41

\*Indicates three different participating schools

TABLE 2  
STUDENTS WITH BOTH PRETEST AND POSTTEST RESULTS

CLASS	BOYS	GIRLS	TOTAL
<u>Group A -- Chapter I Intervention</u>			
1-W*	6	3	9
2-K*	7	3	10
Total	13	6	19
<u>Group B -- Control Group</u>			
1-I*	3	7	10
2-K*	7	3	10
Total	10	10	20
Grand Total	23	16	39

\*Indicates three different participating schools

The compensatory reading program consisted of three instructional components, all reinforcing and relating to the students' classroom reading curriculum. There was an emphasis on oral language development, especially at the readiness level. Some field trips were taken to help stimulate thought and language and many activities taken from the Harcourt, Brace, Jovanovich Language Kit were used. Opportunities for the students to express themselves and to develop vocabulary were given. Concrete experiences were used to help the students develop language.

A second component was the use of the micro-computer for drill and practice using software written to correlate with the basal textbooks after students had begun to read.

The third component consisted of direct instruction by the Chapter I teacher on readiness and beginning reading skills. Activities and materials used were: games, teacher-made take-home stories, student-inspired language experience stories, songs and rhythms for teaching letter sounds, kinesthetic activities for letters and sight words, writing, teacher-read stories, Bill Martin Instant Readers, Harcourt Brace Jovanovich picture books and beginning library books, teacher-made games to teach abstract school concepts, bulletin boards for language development, Harcourt Brace's Try This kit for reinforcing skills being taught in the basal texts, puppets and dramatic plays.

The control groups were given classroom instruction

using the Harcourt Brace Jovanovich Reading Programs, Eagle Edition, copyright, 1983. There was no additional teaching done outside of the classrooms until January, when a control group at one school began receiving Chapter I reading services. It is standard for the Chapter I program to include first graders who are progressing slowly in the second semester, if the Chapter I teacher has room in his/her schedule, but it is not the priority.

#### DESIGN

The experimental design used in this study was non-randomized two group, pretest, and posttest design. Group A consisted of 19 students in grade one receiving Chapter I reading reinforcement correlated with the classroom program. Group B consisted of 19 students in grade one receiving no additional reading or readiness training other than the standard classroom instruction, until after January.

#### INSTRUMENTS

The experimental students were selected by their placement in a newly adopted reading series decided upon at the end of their kindergarten year, 1982-1983. This decision was made on the basis of their performance on the readiness test given in conjunction with the readiness materials used in kindergarten to teach letters and sounds, Getting Ready to Read by Houghton Mifflin. These

students' scores had indicated a need for more readiness instruction and, in addition, a slower paced instructional format.

#### PROCEDURE

The dependent variable, reading achievement, was determined by pretest and posttest scores obtained from standardized tests, and informal surveys.

Data was obtained from the following tests administered in the fall and spring. The experimental group and control groups were identified by the classroom teacher, language arts consultant and remedial reading teacher, and on the basis of their evaluation it was determined which basal program they would work in during their first grade year.

The experimental and control groups alike were given pretests on the Clymer-Barrett Readiness Test measuring: visual discrimination through word matching and letter recognition, auditory discrimination through tests on beginning and ending sounds, and visual-motor coordination through a test on completing shapes and copying a sentence. The Clymer-Barrett is a normative test with two forms for pretest and posttest. A stanine score and a percentile rank can be obtained from this test. The pretest (form B) was given in November, 1983, and the posttest (form A) was given in May, 1984.

The Boehm Test of Basic Concepts (BTBC) was given with Forms A and B used for pre- and posttests. The BTBC is

designed to measure children's mastery of concepts considered necessary for achievement in the first years of school. In determining student percentile for grade one students, the decision was made to use the middle socioeconomic norms since the students lived in a middle class community and were being compared to middle class standards academically within the school district. The posttest was given at the end of February to conform with norming data on the Boehm.

The Structured Photographic Language Test (SPLT II) was given to measure oral language of the children entering and completing the first grade intervention program and to the control group as well. Pretests were given in November, 1983, and in May, 1984. Percentages were used to analyze a student's growth because the test was revised and 50 items were on the posttest compared to the 46 on the pretest.

A teacher-designed informal reading readiness screening was given to test students on writing from memory the upper and lower case of the alphabet, initial consonant sounds, and identification of rhyming words.

Comparisons in reading achievement scores were made between students given the additional Chapter I reading intervention, and the control group which did not receive Chapter I services. An in-depth analysis of the data and

comparisons in achievement are made in Chapter IV. A display of tables showing knowledge of basal sight words at posttesting in May, 1984, is also presented with discussion of factors and relevance of limitations.

The statistical procedure used to measure the dependent variable, reading achievement, was the t-test. Although other data was gathered, raw scores were used in all test comparisons in order to obtain the most precise variations in student growth. The independent variable was instructional treatment (Chapter I intervention and no intervention). The data analysis will indicate significant main effects at either the ( $p < .01$ ) or the ( $p < .05$ ) levels. These hypotheses will be examined:

Hypothesis 1. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on independent production of upper case letters in sequence.

Hypothesis 2. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on production of dictated, lower case, out-of-sequence letters.

Hypothesis 3. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with

students given no additional instruction on auditory recognition and verbal production of initial consonant sounds.

Hypothesis 4. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition of rhyming words.

Hypothesis 5. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on readiness concepts on the Clymer-Barrett Readiness Test.

Hypothesis 6. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the concepts tested on the Boehm Test of Basic Concepts.

Hypothesis 7. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the language tested on the Structured Photographic Expressive Language Test II.

CHAPTER IV  
ANALYSIS OF DATA

The data gathered from pretests and posttests of the experimental group and the control group are presented in this chapter. The data were used to test the hypothesis of the study. The purpose of this study was to determine if Chapter I reading classes could have a compensatory, preventive effect on high risk students in the first grade by combining research supported methods and by correlating instruction closely with classroom instruction.

INSTRUMENTS USED

The instruments used for collecting the data were the Clymer-Barrett Readiness Test Revised Edition, Boehm Test of Basic Concepts, 1971 Edition, Structured Photographic Expressive Language Test II and an informal readiness survey. The informal survey tested the students' performance on production of upper case letters of the alphabet in sequence, and the lower case letters by dictation, out-of-sequence, auditory recognition and verbal reproduction of initial consonant sounds and auditory recognition of rhyming words.

Data for students was obtained using raw scores on the Clymer-Barrett, Boehm, and the informal survey pre- and posttest for both control and experimental groups. The Structured Photographic Expressive Language Test II

required the comparison of percentage scores since the test had been revised between the time the pretests and posttests were administered.

Hypothesis 1 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on independent production of upper case letters in sequence. The data on Tables 3 and 4 cite raw scores and mean scores of pretests and posttests given in October, 1983, and May, 1984, on the informal readiness survey of independent production of sequenced upper case letters.

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 1 must be rejected. The analysis of data indicated there was a significant gain at the .05 level for the experimental groups. Table 5 cites mean gains and t-tests for the experimental and control groups on the variable of independent production of sequenced upper letters.

TABLE 3

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS ON THE  
INFORMAL READINESS SURVEY OF INDEPENDENT PRODUCTION OF  
SEQUENCED UPPER CASE LETTERS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 1</u>			
A	21	26	+5
B	23	26	+3
C	23	26	+3
D	25	26	+1
E	22	26	+4
F	4	22	+18
G	22	26	+4
H	23	26	+3
I	16	24	+8
	$\bar{x}=19.9$	$\bar{x}=25.3$	$\bar{x}=+5.4^*$
<u>CONTROL GROUP 1</u>			
A	25	25	0
B	25	19	-6
C	24	23	-1
D	17	26	+9
E	24	25	+1
F	26	25	-1
G	26	26	0
H	25	26	+1
I	24	26	+2
J	22	26	+4
	$\bar{x}=23.8$	$\bar{x}=24.7$	$\bar{x}=+0.9$

\*  $\bar{x}$  = mean score

TABLE 4

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS ON THE INFORMAL READINESS SURVEY OF INDEPENDENT PRODUCTION OF SEQUENCED UPPER CASE LETTERS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	14	25	+11
K	19	23	+4
L	14	26	+12
M	15	25	+10
N	16	21	+5
O	25	26	+1
P	26	26	0
Q	26	26	0
R	20	23	+3
S	24	25	+1
	$\bar{x}=19.9$	$\bar{x}=24.6$	$\bar{x}=+4.7^*$
<u>CONTROL GROUP 2</u>			
K	17	25	+8
L	20	23	+3
M	6	22	+16
N	22	24	+2
O	25	21	-4
P	23	26	+3
Q	26	23	-3
R	26	24	-2
S	26	25	-1
T	26	25	-1
	$\bar{x}=21.7$	$\bar{x}=23.8$	$\bar{x}=+2.1$

\*  $\bar{x}$  = mean score

TABLE 5

MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard deviation	mean	standard deviation	t	p
1. Independent production of sequenced upper case letters	5.05	4.74	1.60	4.94	2.23	*

\* = Significant at the .05 level

$t_{.05} = 2.02^1$

difference = 37 degrees of freedom

<sup>1</sup>Statistical Analysis in Psychology and Education.

George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Hypothesis 2 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on production of dictated, lower case, out-of-sequence letters. The data on Tables 6 and 7 cite raw scores and mean scores of pretests and posttests given in October, 1983, and May, 1984, on the informal readiness survey on the production of dictated lower case, out-of-sequence letters.

TABLE 6

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE INFORMAL READINESS SURVEY OF WRITTEN PRODUCTION  
OF DICTATED, LOWER CASE, OUT-OF-SEQUENCE LETTERS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 1</u>			
A	19	26	+7
B	26	26	0
C	11	25	+14
D	10	26	+16
E	8	26	+18
F	10	24	+14
G	14	26	+12
H	21	26	+5
I	19	26	+7
	$\bar{x}=15.3$	$\bar{x}=25.7$	$\bar{x}=10.3^*$
<u>CONTROL GROUP 1</u>			
A	16	26	+10
B	16	24	+8
C	21	20	-1
D	22	26	+4
E	24	26	+2
F	20	26	+6
G	21	26	+5
H	20	26	+6
I	19	26	+7
J	17	26	+9
	$\bar{x}=19.6$	$\bar{x}=25.2$	$\bar{x}=+5.6$

\*  $\bar{x}$  = mean score

TABLE 7

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE INFORMAL READINESS SURVEY OF WRITTEN PRODUCTION  
OF DICTATED, LOWER CASE, OUT-OF-SEQUENCE LETTERS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	15	24	+9
K	13	25	+12
L	14	11	-3
M	8	11	+3
N	9	20	+4
O	23	26	+3
P	23	25	+2
Q	11	26	+15
R	17	25	+8
S	11	24	+13
	$\bar{x}=14.4$	$\bar{x}=21.7$	$\bar{x}=+6.6^*$
<u>CONTROL GROUP 2</u>			
K	19	20	+1
L	18	18	0
M	14	22	+8
N	17	23	+6
O	22	24	+2
P	17	20	+3
Q	18	23	+5
R	11	17	+6
S	21	25	+4
T	24	26	+2
	$\bar{x}=18.1$	$\bar{x}=21.8$	$\bar{x}=3.7$

\*  $\bar{x}$  = mean score

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 2 must be rejected. There was a significant gain at the .01 level for the experimental groups. Table 8 cites mean gains and t-tests for the experimental and control groups on the variable of production of dictated, lower case, out-of-sequence letters.

TABLE 8

## MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard deviation	mean	standard deviation	t	p
Written production of lower case out-of-sequence letters	8.74	5.88	4.65	3.03	2.71	**

\*\* = Significant at the .01 level

$t_{.01} = 2.71$ <sup>1</sup>

difference = 37 degrees of freedom

<sup>1</sup>Statistical Analysis in Psychology and Education.  
George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Hypothesis 3 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition and verbal production of initial consonant sounds. The data on Tables 9 and 10 cite raw scores and mean scores of pretests and posttests given in October, 1983, and May, 1984, on the informal readiness survey on the auditory recognition and verbal production of initial consonant sounds.

TABLE 9

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE INFORMAL READINESS SURVEY OF AUDITORY RECOGNITION  
AND VERBAL PRODUCTION OF INITIAL CONSONANT SOUNDS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 1</u>			
A	13	30	+17
B	27	30	+3
C	30	30	0
D	28	30	+2
E	26	30	+4
F	19	30	+11
G	26	29	+3
H	29	30	+1
I	28	29	+1
	$\bar{x}=25.1$	$\bar{x}=29.8$	$\bar{x}=4.7$
<u>CONTROL GROUP 1</u>			
A	30	30	0
B	23	30	+7
C	27	30	+3
D	30	30	0
E	24	28	+4
F	29	29	0
G	27	30	+3
H	30	30	0
I	30	30	0
J	30	28	-2
	$\bar{x}=28.0$	$\bar{x}=29.5$	$\bar{x}=1.5$

TABLE 10

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE INFORMAL READINESS SURVEY OF AUDITORY RECOGNITION  
AND VERBAL PRODUCTION OF INITIAL CONSONANT SOUNDS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	24	29	+5
K	0	29	+29
L	16	30	+14
M	15	29	+14
N	21	28	+7
O	27	30	+3
P	29	30	+1
Q	25	30	+5
R	23	30	+7
S	24	30	+6
	$\bar{x}=20.4$	$\bar{x}=29.5$	$\bar{x}=9.1^*$
<u>CONTROL GROUP 2</u>			
K	22	26	+4
L	29	30	+1
M	29	30	+1
N	25	29	+4
O	26	30	+4
P	24	30	+6
Q	24	29	+5
R	8	26	+18
S	26	30	+4
T	26	30	+4
	$\bar{x}=23.9$	$\bar{x}=29.0$	$\bar{x}=+5.1$

\*  $\bar{x}$  = mean score

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 3 must be retained. There was not a significant difference ( $p > .05$ ) between the experimental and control groups. Table 11 cites mean gains and t-tests for the experimental and control groups on the variable of auditory recognition and verbal production of initial consonant sounds.

TABLE 11

## MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard deviation	mean	standard deviation	t	p
Auditory recognition and verbal production of initial consonant sounds	7.00	7.25	3.30	4.20	1.94	

\* = Significant at the .05 level

\*\* = Significant at the .01 level

$t_{.05} = 2.02$  <sup>1</sup>

$t_{.01} = 2.71$

difference = 37 degrees of freedom

<sup>1</sup> Statistical Analysis in Psychology and Education.  
George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Hypothesis 4 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition of rhyming words. The data in Tables 12 and 13 cite raw scores and mean scores of pretests and posttests given in October, 1983, and May, 1984, on the informal readiness survey of the auditory recognition of rhyming words.

TABLE 12

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE INFORMAL READINESS SURVEY OF AUDITORY  
RECOGNITION OF RHYMING WORDS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 1</u>			
A	9	10	+1
B	7	8	+1
C	8	10	+2
D	0	10	+10
E	6	8	+2
F	0	10	+10
G	3	10	+7
H	0	10	+10
I	4	8	+4
	$\bar{x}=4.1$	$\bar{x}=9.3$	$\bar{x}=+5.2^*$
<u>CONTROL GROUP 1</u>			
A	5	9	+4
B	10	10	0
C	7	9	+2
D	7	10	+3
E	6	7	+1
F	5	9	+4
G	10	8	-2
H	1	8	+7
I	9	10	+1
J	8	8	0
	$\bar{x}=6.8$	$\bar{x}=8.8$	$\bar{x}=+2.0$

\*  $\bar{x}$  = mean score

TABLE 13

RAW SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE INFORMAL READINESS SURVEY OF AUDITORY  
RECOGNITION OF RHYMING WORDS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	9	10	+1
K	7	8	+1
L	8	9	+1
M	5	10	+5
N	4	7	+3
O	8	8	0
P	7	7	0
Q	7	9	+2
R	7	10	+3
S	8	9	+1
	$\bar{x}=7.0$	$\bar{x}=8.7$	$\bar{x}=1.7^*$
<u>CONTROL GROUP 2</u>			
K	10	9	-1
L	6	3	-3
M	1	9	+8
N	10	10	0
O	9	9	0
P	10	10	0
Q	9	10	+1
R	10	10	0
S	7	10	+3
T	8	8	0
	$\bar{x}=8.0$	$\bar{x}=8.8$	$\bar{x}=+.8$

\*  $\bar{x}$  = mean score

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 4 must be retained. There was not a significant difference ( $p > .05$ ) between the experimental and control groups. Table 14 cites mean gains and t-tests for the experimental and control groups on the variable of auditory recognition of rhyming words.

TABLE 14

## MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard deviation	mean	standard deviation	t	p
Auditory recognition of rhyming words	3.37	3.42	1.40	2.76	1.97	

\* = Significant at the .05 level

\*\* = Significant at the .01 level

$t_{.05} = 2.02$  <sup>1</sup>

$t_{.01} = 2.71$

difference = 37 degrees of freedom

<sup>1</sup>Statistical Analysis in Psychology and Education.  
George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Hypothesis 5 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Clymer-Barrett Readiness Test. The data in Tables 15 and 16 cite raw scores and mean scores of pretests and posttests given in October, 1983, and May, 1984, on the Clymer-Barrett Readiness Test.

TABLE 15  
RAW SCORES OF STUDENTS IN EXPERIMENTAL AND CONTROL  
GROUPS ON THE CLYMER-BARRETT READINESS TEST

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 1</u>			
A	79	118	+39
B	87	116	+29
C	96	108	+12
D	106	118	+12
E	95	119	+24
F	72	109	+37
G	87	108	+21
H	79	112	+33
I	88	103	+15
	$\bar{x}=87.7$	$\bar{x}=112.3$	$\bar{x}=+24.7^*$
<u>CONTROL GROUP 1</u>			
A	105	110	+5
B	109	110	+1
C	99	110	+11
D	102	106	+4
E	71	102	+31
F	107	110	+3
G	107	110	+3
H	108	119	+11
I	112	110	-2
J	96	101	+5
	$\bar{x}=101.6$	$\bar{x}=108.8$	$\bar{x}=+7.2$

\*  $\bar{x}$  = mean score

TABLE 16

RAW SCORES OF STUDENTS IN EXPERIMENTAL AND CONTROL GROUPS  
ON THE CLYMER-BARRETT READINESS TEST

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	104	115	+11
K	71	103	+32
L	103	105	+2
M	78	112	+34
N	67	98	+31
O	97	112	+15
P	108	112	+4
Q	72	105	+33
R	87	110	+23
S	109	116	+7
	$\bar{x}=89.6$	$\bar{x}=108.8$	$\bar{x}=19.2^*$
<u>CONTROL GROUP 2</u>			
K	73	107	+34
L	91	101	+10
M	94	92	-2
N	87	107	+22
O	85	103	+18
P	92	97	+5
Q	78	111	+33
R	90	99	+9
S	105	116	+11
T	100	115	+15
	$\bar{x}=89.5$	$\bar{x}=104.8$	$\bar{x}=+15.5$

\*  $\bar{x}$  = mean score

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 5 must be rejected. There was a significant gain at the .01 level for the experimental groups. Table 17 cites mean gains and t-tests for the experimental and control groups on the variable of the Clymer-Barrett Readiness Test.

TABLE 17

## MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard deviation	mean	standard deviation	t	p
Clymer-Barrett Readiness Test	21.79	11.79	11.35	11.06	2.85	**

\* = Significant at the .05 level

\*\* = Significant at the .01 level

$t_{.05} = 2.02$  <sup>1</sup>

$t_{.01} = 2.71$

difference = 37 degrees of freedom

<sup>1</sup>Statistical Analysis in Psychology and Education.  
George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Hypothesis 6 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Boehm Test of Basic Concepts. The data in Tables 18 and 19 cite raw scores and mean scores of pretests and posttests given in October, 1983, and February, 1984, on the Boehm Tests of Basic Concepts.

TABLE 18

RAW SCORES OF FIRST GRADE EXPERIMENTAL AND CONTROL GROUPS ON THE BOEHM TEST OF BASIC CONCEPTS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 1</u>			
A	39	45	+6
B	42	48	+6
C	43	49	+6
D	47	49	+2
E	46	47	+1
F	38	47	+9
G	42	45	+3
H	45	50	+5
I	38	44	+6
	$\bar{x}=42.2$	$\bar{x}=47.1$	$\bar{x}=+4.9^*$
<u>CONTROL GROUP 1</u>			
A	43	47	+4
B	45	46	+1
C	45	48	+3
D	47	50	+3
E	35	41	+6
F	41	48	+7
G	41	48	+7
H	43	47	+4
I	47	49	+2
J	43	47	+4
	$\bar{x}=43.0$	$\bar{x}=47.1$	$\bar{x}=+4.1$

\*  $\bar{x}$  = mean score

TABLE 19

RAW SCORES OF FIRST GRADE EXPERIMENTAL AND CONTROL GROUPS  
ON THE BOEHM TEST OF BASIC CONCEPTS

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	45	45	0
K	41	46	+5
L	43	49	+6
M	44	46	+2
N	36	39	+3
O	42	46	+4
P	41	47	+6
Q	36	47	+11
R	47	49	+2
S	42	46	+4
	$\bar{x}=41.7$	$\bar{x}=46.0$	$\bar{x}=+4.3^*$
<u>CONTROL GROUP 2</u>			
K	43	47	+4
L	38	34	-4
M	41	47	+6
N	46	46	0
O	41	43	+2
P	41	46	+5
Q	43	44	+1
R	40	41	+1
S	43	48	+5
T	45	47	+2
	$\bar{x}=42.1$	$\bar{x}=44.3$	$\bar{x}=+2.2$

\*  $\bar{x}$  = mean score

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 6 must be retained. There was not a significant difference ( $p > .05$ ) between the two groups. Table 20 cites mean gains and t-tests for the experimental and control groups on the variable of the Boehm Test of Basic Concepts.

TABLE 20

## MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard deviation	mean	standard deviation	t	p
Boehm Test of Basic Concepts	4.58	2.71	3.15	2.66	1.66	

\* = Significant at the .05 level

\*\* = Significant at the .01 level

$t_{.05} = 2.02$  <sup>1</sup>

$t_{.01} = 2.71$

difference = 37 degrees of freedom

<sup>1</sup> Statistical Analysis in Psychology and Education.  
George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Hypothesis 7 states that there is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Structured Photographic Expressive Language Test II (SPELT). The data in Tables 21 and 22 cite raw scores and mean scores of pretests and posttests given in October, 1983, and May, 1984, on the SPELT.

TABLE 21

PERCENTAGE SCORES OF EXPERIMENTAL AND CONTROL GROUPS ON THE STRUCTURED PHOTOGRAPHIC LANGUAGE TEST

STUDENT	PRETEST	POSTTEST	DIFFERENCE
	<u>EXPERIMENTAL GROUP 1</u>		
A	76	84	+8
B	89	92	+3
C	86	90	+4
D	80	88	+8
E	78	88	+10
F	73	74	+1
G	80	90	+10
H	93	96	+3
I	80	88	+8
	$\bar{x}=81.7$	$\bar{x}=87.8$	$\bar{x}=6.1^*$
	<u>CONTROL GROUP 1</u>		
A	80	92	+12
B	80	82	+2
C	83	86	+3
D	93	84	-9
E	63	86	+23
F	85	88	+3
G	85	94	+9
H	72	90	+18
I	86	88	+2
J	70	84	+14
	$\bar{x}=79.7$	$\bar{x}=87.4$	$\bar{x}=+7.7$

\*  $\bar{x}$  = mean score

TABLE 22

PERCENTAGE SCORES OF EXPERIMENTAL AND CONTROL GROUPS  
ON THE STRUCTURED PHOTOGRAPHIC LANGUAGE TEST

STUDENT	PRETEST	POSTTEST	DIFFERENCE
<u>EXPERIMENTAL GROUP 2</u>			
J	89	92	+3
K	65	90	+25
L	76	88	+12
M	78	84	+6
N	73	80	+7
O	85	96	+11
P	70	88	+18
Q	72	80	+8
R	89	88	-1
	$\bar{x}=77.4$	$\bar{x}=87.3$	$\bar{x}=+8.9^*$
<u>CONTROL GROUP 2</u>			
K	70	72	+2
L	63	84	+21
M	83	82	-1
N	83	82	-1
O	89	90	+1
P	89	86	-3
Q	83	92	+9
R	91	88	-3
S	91	92	+1
T	76	96	+20
	$\bar{x}=81.8$	$\bar{x}=86.4$	$\bar{x}=+4.6$

\*  $\bar{x}$  = mean score

Using the t-test to measure the dependent variable, reading readiness achievement, it was determined that null hypothesis 7 must be retained. There was not a significant difference ( $p > .05$ ) between the two groups. Table 23 cites mean gains and t-tests for the experimental and control groups on the variable of the Structured Photographic Language Test II.

TABLE 23

MEAN GAINS AND T-TESTS FOR EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	mean	standard	mean	standard	t	p
Structured Photographic Expressive Language Test II	8.00	6.17	6.15	9.10	.73	

\* = Significant at the .05 level

\*\* = Significant at the .01 level

$t_{.05} = 2.02$  <sup>1</sup>

$t_{.01} = 2.71$

difference = 37 degrees of freedom

<sup>1</sup> Statistical Analysis in Psychology and Education.  
George Ferguson, Second Edition, McGraw Hill, 1959, 1966

Figures 1 and 2 illustrate composite mean gains from pretest to posttest for ease in viewing pertinent features of student readiness as measured by the Clymer-Barrett Readiness Test.

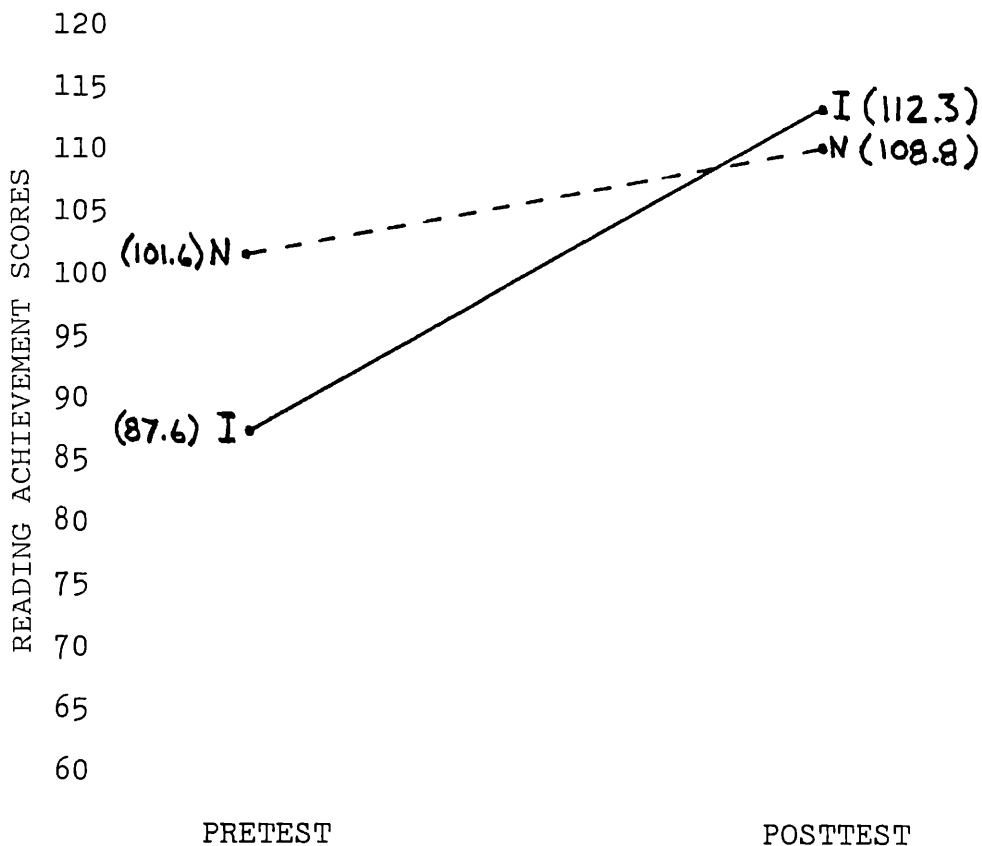
#### SIGHT WORD SURVEY RESULTS

Tables 24 and 25 cite results of a sight word vocabulary survey given in May as a posttest to indicate reading level. The sight word survey is published by the basal text publisher, Harcourt Brace, Jovanovich. The students were given a sampling of thirty sight words from each level book. Testing began a level below student instructional text and established independent, instructional, and frustration reading levels. The students were to read 80-100% of the 30 words correctly in 90 seconds to score at an independent reading level, 50-80% of the 30 words in 90 seconds to score at instructional level, and a score below 50% indicated frustration level.

It is difficult to make statistical analyses of this data because many variables make comparisons invalid. Therefore an explanation of variables will help clarify table results. Because all students entered at the same apparent level in the reading process, i.e., knowing no basal text sight words in the fall, it appears that they are all at the same level of readiness. However if one examines the scores of the Clymer-Barrett readiness pretest in Table 26, the composite mean of experimental group #1 is

FIGURE 1

COMPARATIVE GROWTH OF THE COMPOSITE UNADJUSTED  
MEAN RAW SCORES OF CONTROL GROUPS AND EXPERIMENTAL  
GROUPS ON THE CLYMER-BARRETT READINESS TEST

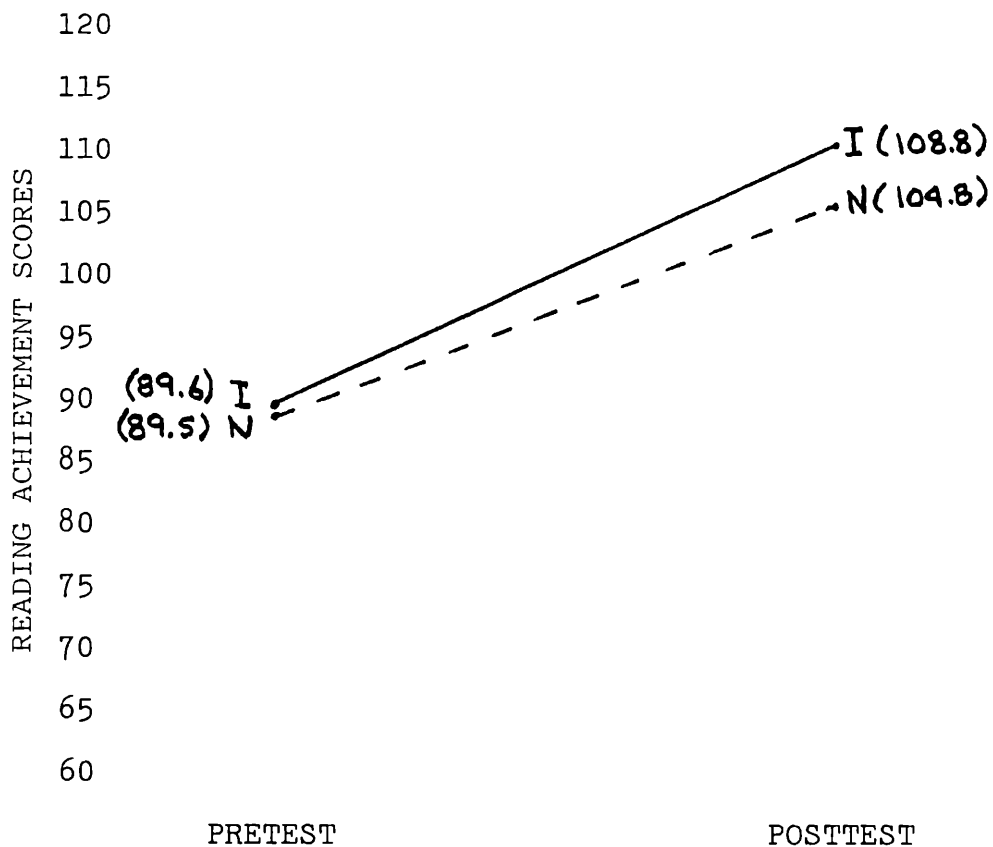


I. \_\_\_\_\_ . CHAPTER I INTERVENTION = EXPERIMENTAL GROUP 1

N. ----- . NO INTERVENTION = CONTROL GROUP 1

FIGURE 2

COMPARATIVE GROWTH OF THE COMPOSITE UNADJUSTED  
MEAN RAW SCORES OF CONTROL GROUPS AND EXPERIMENTAL  
GROUPS ON THE CLYMER-BARRETT READINESS TEST



I. \_\_\_\_\_ . CHAPTER I INTERVENTION = EXPERIMENTAL GROUP 2

N. ----- . NO INTERVENTION = CONTROL GROUP 2

TABLE 24

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HARCOURT BRACE JOVANOVICH SIGHT WORD VOCABULARY SURVEY

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STUDENT    LEVEL 1    LEVEL 2    LEVEL 3    LEVEL 4    LEVEL 5

---

## EXPERIMENTAL GROUP 1

A	100	94	20	--	--
B	100	97	87	33	--
C	97	94	97	54	--
D	100	100	84	47	--
E	100	64	38	--	--
F	97	50	07	--	--
G	97	37	--	--	--
H	100	100	94	64	30

---

## CONTROL GROUP 1

A	Ind.*	Ind.	94	66	27
B	Ind.	Ind.	84	47	14
C	Ind.	90	75	64	17
D	Ind.	77	70	54	20
E	Ind.	Ind.	90	64	10
F	Ind.	Ind.	84	90	20
G	Ind.	Ind.	94	94	66
H	Ind.	Ind.	90	64	20
I	Ind.	93	77	64	20

---

% of words read correctly in 90 seconds:  
80-100% = Independent Reading Level  
50-80% = Instructional Level  
below 50% = Frustration Level

Ind.\* means Independent Reading Level Not Needing Testing

TABLE 25

## HARCOURT BRACE JOVANOVIICH SIGHT WORD VOCABULARY SURVEY

STUDENT	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
EXPERIMENTAL GROUP 2					
J	90	97	87	24	--*
K	90	07	--	--	--
L	97	97	17	--	--
M	60	27	--	--	--
N	90	54	24	--	--
O	100	100	90	94	84
P	100	97	94	94	97
Q	94	90	77	77	--
R	94	90	94	84	30
S	97	94	87	14	--
CONTROL GROUP 2					
K	97	97	87	14	--
L	87	90	84	66	14
M	90	66	77	47	--
N	84	87	40	40	--
O	70	70	70	64	03
P	94	90	94	20	--
Q	100	90	90	20	--
R	80	90	97	10	--
S	97	77	74	20	--
T	97	87	84	84	30

% of words read correctly in 90 seconds:

80-100% = Independent Reading Level

50-80% = Instructional Level

below 50% = Frustration Level

\* Means a Level Beyond Frustration Level and Not Tested

considerably lower than the composite mean of control group #1.

TABLE 26  
CLYMER-BARRETT READINESS PRETEST

TREATMENT	RAW SCORE SUM	RAW SCORE MEAN	N
<u>EXPERIMENTAL GROUP 1</u>	789	87.6	9
CONTROL GROUP 1	<u>1016</u>	<u>101.6</u>	<u>10</u>
DIFFERENCE	227	14.0	1
<u>EXPERIMENTAL GROUP 2</u>	896	89.6	10
CONTROL GROUP 2	<u>895</u>	<u>89.5</u>	<u>10</u>
DIFFERENCE	1	0.1	0

This data can be interpreted to mean that the control group had more readiness skills at the entry point and thus would begin the actual reading process sooner than the experimental group. By looking at the Sight Word Survey, one can see that Control Group 1 did proceed through more reading levels during the year without the Chapter I intervention. However, the experimental group showed high scores on the levels it completed with some carry-over into materials not yet taught.

Control Group 2 and Experimental Group 2 were reasonably well-matched as to beginning readiness at entry

of instruction. However, Control Group 2 received additional Chapter I instructional training on beginning reading skills, including much drill and practice on sight words starting second semester just as actual reading instruction was developing rapidly. Thus differences between these two groups is not distinguishable making comparisons invalid.

#### STATISTICAL PROCEDURES

The statistical procedure used to measure the dependent variable, reading readiness achievement, was the t-test. The independent variable was instructional treatment (Chapter I intervention and no intervention). Table 27 presents descriptive information, obtained from the data, showing a summary of all mean gains and t-tests for the experimental and control groups

The analysis indicated significant main effects ( $p < .01$ ) for two of the hypotheses and one significant difference at the .05 level. Each hypothesis is examined in order.

Hypothesis 1. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on independent production of upper case letters in sequence.

The null hypothesis was rejected. There was a significant difference ( $p < .05$ ) between the two groups.

Hypothesis 2. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on production of dictated, lower case, out-of-sequence letters.

The null hypothesis was rejected. There was a significant difference ( $p < .01$ ) between the two groups.

Hypothesis 3. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition and verbal production of initial consonant sounds.

The null hypothesis was retained. There was not a significant difference ( $p > .05$ ) between the two groups.

Hypothesis 4. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition of rhyming words.

The null hypothesis was retained. There was not a significant difference ( $p > .05$ ) between the two groups.

Hypothesis 5. There is no significant difference between the mean composite end-of-year score of first-grade

students given Chapter I intervention compared with students given no additional instruction on the Clymer-Barrett Readiness Test.

The null hypothesis was rejected. There was a significant difference ( $p < .01$ ) between the two groups.

Hypothesis 6. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Boehm Test of Basic Concepts.

The null hypothesis was retained. There was not a significant difference ( $p > .05$ ) between the two groups.

Hypothesis 7. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Structured Photographic Expressive Language Test II.

The null hypothesis was retained. There was not a significant difference ( $p > .05$ ) between the two groups.

TABLE 27  
 MEAN GAINS AND T-TESTS FOR  
 EXPERIMENTAL AND CONTROL GROUPS

VARIABLE	EXPERIMENTAL		CONTROL		RESULTS	
	Mean	Standard Deviation	Mean	Standard Deviation	t	p
1. Independent production of sequenced upper case letters	5.05	4.74	1.60	4.94	2.23	*
2. Written production of dictated, lower case, out-of-sequence letters	8.74	5.88	4.65	3.03	2.71	**
3. Auditory recognition and verbal production of initial consonant sounds	7.00	7.25	3.30	4.20	1.94	
4. Auditory recognition of rhyming words	3.37	3.42	1.40	2.76	1.97	
5. Clymer-Barrett Readiness Test	21.79	11.79	11.35	11.06	2.85	**
6. Boehm Test of Basic Concepts	4.58	2.71	3.15	2.66	1.66	
7. Structured Photographic Expressive Language Test II	8.00	6.17	6.15	9.10	.73	

\* = Significant at the .05 level

\*\* = Significant at the .01 level

$t_{.05} = 2.02$ <sup>1</sup>

$t_{.01} = 2.71$

difference = 37 degrees of freedom

<sup>1</sup>Statistical Analysis in Psychology and Education.

George Ferguson, Second Edition, McGraw Hill, 1959, 1966

## CHAPTER V

### SUMMARY AND CONCLUSIONS

The purpose of this study was to determine if a Chapter I reading program could be effective as a compensatory, preventive approach to first grade reading problems. By taking first graders early who are considered "at risk" because their basic readiness skills are not intact, it was hoped that the additional readiness, oral language development and beginning reading training would help prevent reading failure and the resulting depressed self-concept.

Nineteen students were identified for purposes of this study who were given the intervention reading program in four small experimental groups meeting 30 minutes a day, four days a week for the duration of six months. There were twenty students similarly identified by the language arts consultant, classroom teacher, and reading specialist, and these students comprised the control groups. All 39 students used in the study attended three Chapter I elementary schools in Unified School District 497, Lawrence, Kansas.

In the intervention reading program, carefully correlated teaching supplemented the classroom instruction along with training in readiness skills and language development. Varied materials were programmed by the

reading specialists as needs and skill deficiencies were diagnosed. In the control groups, basic instruction was provided by the classroom teacher using the basal reading program with no additional training outside of the regular classroom.

Raw and percentage scores for data analysis were obtained from the results of the seven testing instruments given as pre- and posttests during the 1983-1984 school year: the Clymer-Barrett Readiness Test, the Boehm Test of Basic Concepts, the Structured Photographic Language Test and four subtests of a teacher-designed informal survey of readiness skills.

Criteria used to measure the dependent variable, reading readiness achievement, were raw scores on all tests except the Structured Photographic Language Test which required the use of percentage scores for correct analysis. The t-test was used to compare reading achievement of the two treatment groups and two control groups. The .05 level of significance was selected as the level for acceptance or rejection of the null hypothesis. The following null hypotheses were rejected at the .01 level:

Hypothesis 2. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on production of dictated, lower-case, out-of-sequence letters.

There was a significant difference ( $p < .01$ ) between the two groups.

Hypothesis 5. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Clymer-Barrett Readiness Test.

The null hypothesis was rejected. There was a significant difference between the two groups.

The following null hypothesis was rejected at the .05 level:

Hypothesis 1. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on independent production of upper case letters in sequence.

The null hypothesis was rejected. There was a significant difference ( $p < .05$ ) between the two groups.

The following hypotheses were retained with no significance shown between the control and experimental groups:

Hypothesis 3. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory

recognition and verbal production of initial consonant sounds.

Hypothesis 4. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on auditory recognition of rhyming words.

Hypothesis 6. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Boehm Test of Basic Concepts.

Hypothesis 7. There is no significant difference between the mean composite end-of-year score of first-grade students given Chapter I intervention compared with students given no additional instruction on the Structured Photographic Expressive Language Test II.

#### CONCLUSIONS

This study demonstrated that there were significant main effects for treatment groups ( $p < .05$ ) on the posttests of the Clymer-Barrett Readiness Test, the written, independent production of sequenced upper case letters, and the written production of dictated lower case, out-of-sequence letters. There were no significant differences on

the other four test measures.

The findings of this study indicate that the Chapter I Administrator in Unified School District 497, Lawrence, Kansas should continue to research and evaluate the effects a first grade program could have on diminishing early reading failure and the resulting complications of poor self-concept.

#### LIMITATIONS OF STUDY

The following limitations must be considered when examining the findings of this study.

1. The scope of the study was limited. A sample of only 39 students, two reading teachers, and three schools was involved. The possibility of generalizing these findings to larger populations is limited because of the small sample size.

2. The subjects for the study were already intact and randomization was not possible. Although Control Group 2 and Experimental Group 2 were equivalent on the pretests, Control Group 1 entered the study with many more readiness skills than Experimental Group 1 as determined by pretests. Comparisons of the two groups, Control Group 1 and Experimental Group 1 are affected by the apparent readiness of Control Group 1 to begin the reading process. The populations of the groups were affected by uncontrollable variables.

3. The comparisons between the Experimental Group 2

and Control Group 2 are diminished because Control Group 2 received the same intervention as Experimental Group 2, except for five weeks of initial readiness and language development training in the fall. If the Experimental Group had begun instructional treatment early in September, instead of being delayed by extensive research preparations and lengthy pretesting, then perhaps a more significant difference would have been noted.

4. The effect of classroom teacher attitude, ability and consistency in procedure could have affected study results. In December, 1983, the classroom teacher of the Experimental Group 1 left her class on leave, not returning until April, 1984. The substitute teacher needed time to become acquainted with the students, their classroom program, and to reorganize the class to fit her teaching style. This resulted in a delay in reading skills being taught at a crucial time of learning growth. All of the classroom situations were varied and not controlled.

5. The training and experience of the reading specialists may have produced unanticipated results. Two different reading specialists, each with individual strengths and weaknesses, could have influenced the student responses to the instructional treatment of experimental groups.

6. Student motivation and self-concept may have

affected the results. Home influences, support or distraction, may have affected the results.

7. The variable of maturation and events occurring in history during the six months of this study were not controllable and may have affected the results obtained.

8. The testing instruments possibly did not accurately reflect the student progress in reality. For instance, the Boehm Test of Basic Concepts posttest was given in February because the norming data on the test required early administration. However, only raw scores were used in the study data analysis, and had the full six month instructional period been reflected in the test results, perhaps different results would have been observed. Also, the Structured Photographic Language Test did not measure the growth students made in vocabulary understanding, but rather it tested the more grammatical components of speech and language. Had a testing instrument been used that could have accurately reflected the language development that took place in the instructional, experimental groups, perhaps there would have been different results.

#### IMPLICATIONS FOR FURTHER RESEARCH

Since the population of this study was small, it is suggested that a larger-scale study be undertaken using the program design for first grade reading intervention. Closely corresponding classroom beginning reading instruction reinforcing readiness skills should be an

essential part of the study design.

To assess the reading achievement on a larger scale, a more cost and time effective method would need to replace the lengthy testing used in this study. The Metropolitan Readiness Test, which has components designed to test many of the same skills, could be administered as a group test, and used as a pre- posttest for a more practical and time-saving assessment.

A further study should assess the difference between a Chapter I reading student needs assessment after developing a model first grade program and the student needs assessment of the same school district before the first grade intervention. It is recommended that the test data be analyzed for more than one year for substantial findings.

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