

MEASURING READING GROWTH BASED ON  
METHOD PREFERENCE

By

BETTY KALSCHUEUR MORGANS

Bachelor of Science  
Texas Lutheran College  
Seguin, Texas  
1961

Master of Science  
Oklahoma State University  
Stillwater, Oklahoma  
1967

Submitted to the Faculty of the Graduate College  
of the Oklahoma State University  
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Thesis Approved:

David D. Ray  
Thesis Adviser

[Signature]

[Signature]

[Signature]

[Signature]  
Dean of the Graduate College

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## CHAPTER I

### PRESENTATION OF THE PROBLEM

#### Introduction

Effective teaching is based upon the practical recognition of differences among individuals, and until these differences are identified and recognized, instruction cannot proceed on a sound, effective basis. Part of the dilemma in today's education is the failure to admit to differences in learning evident in the uniform treatment and methodology in teaching, regardless of individual differences.

One should not see a class as a whole but rather as a group of individuals unique unto themselves. Not until these differences are recognized can learning take place.

In order for effective learning to result, it is vital to determine each child's abilities, skills, and attitudes. Sound educational principles must be based on the strengths of the learner; then, and only then, will effective learning take place.

#### Statement of the Problem

The purpose of this study was to determine if there was a significant difference between the reading growth of an experimental group of students receiving tutoring based on method preference and a comparison group's instruction determined by teacher preference. Additionally,

This study sought to identify a method that can be used for remedial instruction with the disabled reader and to compare the reading growth after instruction with the reading growth acquired during previous years in school.

#### Need for the Study

What is the best way to teach the child to read? Probably no two individuals are in complete agreement as to an answer to this vital question. For over a decade, or since Flesch (27) wrote Why Johnny Can't Read, much debate has centered around the best method to be used in reading instruction.

DeHirsch (22) noted that people exhibit differences as far as learning how to read is concerned. Various sensory modalities play an important role in the process of learning how to read. DeHirsch concluded that there was a striking difference in learning from month to month, that some children are far advanced in one modality and at the same time are quite slow in another one, and that some children learn slowly in all modalities regardless of good reasoning abilities.

DeHirsch suggested that specific teaching methods would be beneficial for many children. Through a study of the child's various sensory modalities, one can find out the type of learning that the child can best adopt.

Later, DeHirsch (23) observed strengths and weaknesses in the auditory and visual modalities of kindergarten children. Ten children in her study were found to have discrepant modality patterning. Visual strengths evidenced in three of the ten children were supported by high reading scores at the end of second grade. Five of the seven auditorily

gifted children passed all reading tests at the end of second grade. It was reported that these children were intensively trained by an auditory-visual method and were thus able to use their auditory strengths to compensate for their visual deficiencies. DeHirsch further stated that the children might have failed if they had been exposed exclusively to a visual method. In DeHirsch's research two of the children with strong auditory abilities, who failed to read at the end of grade two, did not receive an auditory-visual method of instruction.

DeHirsch felt that modality strengths should then determine teaching methods. Children with both strong visual and auditory modalities, DeHirsch concluded, benefit from either visual or auditory methods; but they will presumably perform best with a combination method. Children with neither of the two strong modalities need a multiple approach including activation of as many learning paths as possible. She also stated that children who have visual deficits and yet good auditory strengths should be taught by an auditory-visual method.

DeHirsch stated that one method of teaching reading should not be preferred over another method, but rather that the approach to teaching should be dependent upon and patterned according to the child's strengths and weaknesses in the different modalities.

Other reading specialists have also claimed that instruction should be based on the strengths and abilities of the learner. Harris and Roswell (41) recommended the use of sample lessons to determine the method of reading instruction to be used in a remedial program. The use of sample lessons in reading diagnosis has also been advocated by Roswell and Natchez (68). Mills (59, 60, 61) standardized a series of teaching lessons based on methods of instruction while Harris (37)



applied the same principle, namely, pretesting to find strengths in learning aptitudes and then modifying teaching to emphasize these strong abilities. Bruininks (14) employed a study based on teaching word recognition skills to disadvantaged boys with the method of instruction given patterned to their visual and auditory strengths. Frostig (31) asserted that ten to twenty-five percent fail to read because the choice of method is not based on the specific strengths and weaknesses of the learner. Johnson and Myklebust (45) advised that initial reading instruction be matched to the child's perceptual strengths and combined with supportive training on skills in the weak sense modality.

This investigator feels that the best method of instruction for the child, should be based upon the child's strengths and not upon his weaknesses. For example, the child who has trouble with words after many visual exposures would do best with an auditory-visual approach if the child's auditory ability is adequate; it would be best to link the visual with the auditory strengths he possesses. Also, children who have difficulty with analysis and synthesis and have low auditory strengths would best learn by the visual-auditory method.

It is often difficult for the teacher to investigate the strengths of all the children in the classroom. One purpose of this study was to devise a means whereby the strengths of the disabled reader could be quickly identified. The Ray-McCoy Reading Prognosis Test was developed with this in mind.

In 1955, Mills (61) devised a Learning Methods Test which was designed to determine the teaching procedure best suited for each child as far as reading was concerned. He identified four methods of teaching word recognition: namely, the visual (look-and-say) in which the

student is taught recognition of words by stressing the appearance and the related visual associations of the word; the auditory (phonic) in which the sound qualities of the word were used in word recognition; the kinesthetic (tracing) in which the child learned words by tracing and other kinesthetic procedures as outlined by Fernald; and the combination of these three methods which gave equal stress to the visual, auditory and kinesthetic approaches. Mills' study was designed to determine the method or combination of methods most effective in teaching word recognition to various types of individuals. The results of his study showed that different children learn to recognize more efficiently by different methods and that no one method is best for all children.

Harris (39) also investigated individualizing first grade reading according to specific learning aptitudes. He used three methods in teaching reading: visual, phonic (auditory) and the kinesthetic approaches. Harris felt the child with a low visual perception score would benefit more from instruction based on the highest pretest score than the children who scored low on all three kinds of pretests. The twenty children in his study receiving special instruction achieved better than expected in reading when instruction was based on the visual perception scores. However, he stated that no significant association could be established with either the specific method of teaching used or the presence of presumed attitude for that method.

Chall (16, 17) examined the reading literature in order to determine if some approaches in teaching reading were better than others. In addition, her inquiry not only attempted to determine if specific kinds of reading problems were related to the methods used but also to define and describe the different approaches used in beginning reading

Results of her research indicated that any method which teaches an early acquisition of the code (auditory-visual or linguistic word structure) is the best way to teach reading.

Coleman (19) conducted a study using Mills' Learning Methods Test. The four learning methods employed were the visual, the auditory, the kinesthetic and a combination of methods. In his study, he found that no single method was the best one for all the underachievers as a group or for sub-groups in terms of age, IQ, and degree of underachievement. However, he did conclude that the visual and combination approaches tended to be the most efficient for all groups.

Much current research is being conducted because some educators feel there is one best method by which a child can learn to read. DeHirsch (22), Harris (39) and others strongly believe that the method of teaching reading should be carefully related to the child's strong sensual modalities. To support this theory, the Ray-McCoy Reading Prognosis Test (Experimental Edition) (63, 65) was developed. It identifies four methods of reading: auditory-visual, visual-auditory, linguistic word structure and linguistic language experience which are based upon the learning strengths of the child and are to be used in remediation. The four methods used in the study are defined and described in Table I. (63).

This study is intended to identify a method of instruction, based upon the child's strengths, which will correct or eventually eliminate the child's reading disability. As Cleland (18) felt, the teacher may have to call upon the child's sensory modalities to assure a permanent association between the written and spoken word. This study will attempt to show that no child can learn best by the use of any of these

TABLE I

## METHODS OF INSTRUCTION

Primary Emphasis	Visual-Auditory Method	Auditory-Visual Method	Linguistic Word Structure Method	Linguistic Language Experience Method
Unit of Instruction	Word	Letter	Word pattern	Meaningful structure
Skill Development	Accumulation of sight word vocabulary  Analytical approach to decoding	Accumulation of sound-symbol relationships  Synthetic approach to decoding	Accumulation of spelling pattern associations  Minimum contrast approach to decoding	Transfer of learner oral communications to visual recognition  Language anticipation approach to decoding
Skill Transfer	Immediate in controlled vocabulary material and scaled material  Delayed in general application	Immediate in consistent sound-symbol patterns  Early in general application	Immediate in consistent spelling-patterns  Delayed in general application	Immediate in learner written material  Early in general application
Pace of Skill Development	Slow	Accelerated	Slow	Accelerated
Learner Strength Requirements	Vision-acuity --Identification --Discrimination --Perception --Memory  Visual-auditory integration	Audition-acuity --Identification --Discrimination --Perception --Memory  Auditory-visual integration	Vision-acuity --Identification --Discrimination --Perception --Memory  Auditory-visual integration	Language skills  Audition perception  Auditory-visual integration

methods chosen at random. Instead the child can best learn by using the method based on his measured strengths.

The Ray-McCoy Reading Prognosis Test was designed to identify the strengths of the disabled reader and to then indicate a method of instruction based on these strengths. The Ray-McCoy Reading Prognosis Test pre-test profile was used to determine the method of instruction to be used with each child in the study.

This study also sought to determine if growth in reading based on method preference would warrant continued instruction by that isolated method. Prior to instruction which was suited to the child's learning method preference, the child had not succeeded by the method of instruction used in the public schools. The child was not reading up to his expectancy as defined by Bond and Tinker (12) and others (37, 38).

This study was designed to identify a method of instruction to be used with the disabled reader and to compare the reading growth of students of two groups, one of which received instruction based on method preference and the other based upon the teacher's selection of the method. The study also sought to determine if growth in reading based upon method of instruction when compared to previous rate of reading growth would be sufficient to suggest continued instruction by that particular method.

#### Definition of Terms

The following are definitions and clarification of terms as they are applied throughout this study.

**Disabled Reader:** A child whose grade placement is presently in the third, fourth, or fifth grade in school, whose IQ is 85+ as measured



by the Wechsler Intelligence Scale for Children and whose reading level is no greater than grade 2.0 as measured by the Durrell Analysis and the Ray Informal.

Bond's (12) Expectancy Formula: The child with an IQ of 150 learns things about one and one-half times as rapidly as the average child, and the child with an IQ of 75 learns only about three-fourths as rapidly. Based upon the assumption that the IQ is an index of the rate of learning each new experience, the Bond formula for reading expectancy was used. It is as follows: (Years in school times IQ) plus 1.0 equals reading expectancy.

Bleisner's (9) Growth Formula in Terms of Past Performance: Bleisner states that reading potential is altered by age. He took the difference in the child's reading potential and the actual reading scores at two different intervals into account; this difference indicated the effectiveness of remedial instruction given. He also stated that the child's improvement in terms of past performance was of equal importance. He recommended that one take the child's score before remediation was begun, subtract 1.0 (due to the fact all children start at a reading level of 1.0 in first grade), and then divide the acquired figure by the number of years the child had been in school. This result would indicate the average reading growth the child obtained each year in school prior to remedial instruction. Another reading score obtained at the end of remediation could then be subtracted from the beginning reading score to determine the amount of gain evidenced during tutoring. Therefore, the amount of growth attributed to tutoring can be obtained by subtracting the average yearly gain before tutoring from the gain evidenced during the tutoring sessions. Although results

obtained might show the child is not reading up to expectancy, it might indicate an accelerated reading growth due to remedial instruction.

Growth Attributed = Average Yearly Gain - Gain During Year of  
to Tutoring            Before Tutoring (Pre- Tutoring (Pre-test  
test score minus 1.0, score subtracted from  
divided by years in post-test score)  
school)

Reading Disability: The difference between the child's reading expectancy and his performance measured in months.

Method of Instruction: The method of instruction to be used in the tutoring sessions.

Visual-Auditory Method: A method of teaching reading where the child is taught to read words as whole units using the visual modality strengths of the child in the initial contact with the word. The teacher's manuals of the Ginn (70) and Macmillan (40) series were followed.

Auditory-Visual Method: The auditory-visual method for this study was a system of associating sounds with letters and letter combinations in the identification of unfamiliar words and in the ability of the child to convert the written word into its oral equivalent (17). The Lippincott Basic Reading Program (54) was used for the study.

Linguistic Word Structure Method: The linguistic word structure method is based on word patterns and the structure of language (28, 60). Words based on spelling regularities were taught with the premise that the child will discover for himself the relationship between the sounds and the letters. The linguistic word structure method teaches that words are read as wholes and is opposed to the sounding and blending of words. For this study, the Merrill Linguistic Readers (29) were used.

Linguistic Language Experience Method: The linguistic language

experience method is a method of teaching reading through a total set of communication skills which involve speaking, listening, writing and reading. Reading instruction is centered around the child's reading his own writings. The child produces some work of art, his stories about this work of art are written by the teacher and later, the child writes his own captions and stories aided by some instruction in writing and in spelling common words. The language experience method as outlined in Allen's Learning to Read Through Experience (49) and in his language experience teacher's resource books (2, 3, 4) were used in this study along with Lefevre's (51, 52) emphasis on the syntax of language.

**Remedial Instruction:** Remedial instruction consisted of a highly individualized and well-organized program based on the strengths of the disabled reader and designed to smoothly develop the skills and abilities of the child.

### Hypotheses

This study has been designed to test the following hypotheses:

**Hypothesis I:** There is no significant difference between the reading growth of an experimental group of students receiving tutoring based on method preference and that of a comparison group of students receiving instruction determined by teacher preference.

**Hypothesis II:** There is no significant difference between the post-test vocabulary scores on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.



Hypothesis III: There is no significant difference between the post-test comprehension scores on the Gates-McGinitie Reading Test of an experimental group of students and those of a comparison group.

A comparison of the rate of reading gains of the experimental group, once instruction was based on the individual's reading method preference, was made with the rate of previous reading growth when instruction was based upon teacher preference for the method. The following hypothesis was also tested:

Hypothesis IV: There is no difference in the rate of reading growth of an experimental group of students prior to instruction based upon method preference and the rate of reading growth during instruction based upon method preference.

#### Assumptions of the Study

The assumptions of the study are as follows:

- 1) The method of instruction was based upon an adequate diagnosis of the learning strengths of each child.
- 2) That Bond's formula for reading expectancy was adequate in determining the reading expectancy of each child and that the Bleismer's formula in terms of past performance was adequate in determining the rate of reading growth.
- 3) That the WISC (78) was adequate for determining the intelligence of each child and that the Durrell Analysis of Reading Difficulty (26) and the Ray Informal (64) gave a valid sample of the child's reading ability.

4) That the use of standardized tests, structured interviews and questionnaires provided a valid approach for the study of the behavior of the disabled reader.

#### Limitations of the Study

This study was limited because of the small sample used. Generalizations drawn from a single case cannot be applied to all cases in a given population.

This study was limited because the Ray-McCoy Reading Prognosis Test (65) having not been standardized, may not as yet be the diagnostic tool it was hoped to be. However, the data collected for the study was of value for the validation and standardization of this instrument.

#### Delimitations

##### Scope of the Study

This dissertation presents a study of twelve disabled readers who were enrolled in the Stillwater Public School System. Ten disabled readers in Kay County, Oklahoma, were matched to the experimental group of children in Stillwater on IQ, grade placement and reading level. The children in Kay County served as a comparison group.

The Ray-McCoy Reading Prognosis Test (65) was administered to the experimental group in order to identify a method of instruction, based upon the students' strengths, to be used for remedial instruction. Comparison between the two groups was also made to determine if significant reading growth was accomplished once methodology was identified. A comparison of the reading growth gained during instruction was made

with the amount of reading growth acquired during the previous year in school.

Information gathered in the pre-remedial diagnostic sessions identified the students' strengths and weaknesses in learning aptitudes and the environmental conditions upon which remedial instruction might be modified in order to emphasize comparatively strong abilities. Further information collected in the data provided pertinent material about the child's environmental conditions, his physical abilities and/or deficiencies, his mental ability, his emotional stability and his past educational experiences to be used in the remedial program.

Besides the comparison of reading growth between the two groups, a comparison of the amount of reading growth gain evidenced at the end of thirty-five hours of instruction was made with the amount of previous growth for the experimental group. Post-test scores determined if the amount of individual growth evidenced in the experiment warranted continued instruction by that isolated method.

#### Controls

The term "control" refers to restraints on conditions.

- 1) The same instructor taught all subjects, thus eliminating additional interpretations of methods.

- 2) Each subject was taught by the same method as the others in his group; that is, there were four groups, each of which was instructed by an isolated method. The language experience group, for example, was not intermingled with the other method groups. Although each child was working at his own level during the instructional sessions, he was not exposed to any other method except the one best suited to his

learning strengths.

3) Instructional sessions were held daily with regular attendance for the most part. Absenteeism was permitted for attendance at scout meetings after school, and for doctor's appointments.

4) The time of day for the instructional sessions was the same for all students. At the end of fifteen hours of instruction the two groups coming during school hours switched with the two groups coming after school hours. Thus all four groups received instruction for the same number of hours both during and after school time.

#### Organization of the Study

Chapter I has introduced the problem to be studied. Included are the statement of the problem, the need for the study, the definition of terms, the scope of the study and the delimitations of the study.

Chapter II will present the review of the literature related to the study.

Chapter III will contain a description of the study, the population, the selection of the sample, and the instruments used to select the population. It will also describe the test used to determine the method of instruction and the other instruments used in collecting data about the disabled reader. It will also include the statistical method used to determine the predictive measure of the Ray-McCoy Reading Prognosis Test and the measure of growth obtained as a result of instruction.

Chapter IV will contain an analysis of the data.

Chapter V will present a discussion of the results of the study and recommendations regarding future research in this area.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

The literature related to reading disability and methods of instruction constitutes a large body of research. Therefore, the literature for this study will be divided into two groups: (1) learning methods, and (2) expectancy and potential formulas.

#### Learning Methods

In 1955, Mills (61) developed a Learning Methods Test to assist the teacher in determining the learning method best suited to the child. He proposed to determine the teaching method or combination of methods most effective in teaching word recognition to various types of individuals. Fifty-eight subjects were divided into nine classifications based on age and intelligence levels. Conclusions of the study showed that different children learned more efficiently by different methods and that no one method was best for all children. For children of low intelligence (IQ of 65-80) the phonic method was least effective, while the kinesthetic method was found to be the best method, although it was not statistically superior to the other methods. Children of average IQ (85-100) showed an equal preference for the combination and visual methods with the kinesthetic method being least effective. The children



of high intelligence (105-120) learned words readily regardless of method. When divided according to age groups, the visual method was best for the eight year olds, and no method was considered outstandingly effective for the nine year olds. Another conclusion of the study was that the higher the intelligence the more readily the child learned words.

Mills further stated that because different children learn to recognize words by different methods, the teacher must be aware of these individual differences in applying instruction. In his study, Mills also found that a diagnostic study of the child was needed to determine the most appropriate method to be used. He further suggested that research should concentrate on determining which method is best for which children rather than developing a best method to teach all the children.

Coleman (19) later used Mills' Learning Methods Test to determine if the visual, auditory, kinesthetic, or the combination of methods was more efficient in a total group, sub-group or individual level. Fifty-one students were used, and the results were as follows: 1) under-achievers as a group learned as efficiently by one method as by another; 2) severe underachievers learned best by the visual and combination methods, and the mild underachievers learned best by the visual method; 3) based on IQ the average and high IQ students favored the visual and combination methods, and the low IQ (below 90) favored the kinesthetic method. The method least effective was the kinesthetic for the average and high IQ group and the phonic for the low IQ group; 4) age was not a significant factor related to learning method; 5) different students learned more efficiency by different methods.

Coleman showed that no particular method was significantly superior for all subjects of sub-groups of underachievers with respect to age, IQ, or degree of underachievement. However, all groups showed a tendency favoring the visual and combination methods. Coleman did agree with Mills that the ascertaining of a student's preference for a given learning method would be of value in teaching him in either a developmental or remedial program.

Roberts and Coleman (67) conducted an experiment testing the use of kinesthetic methods used in remedial reading cases. They found that, as a group, the reading failure cases were more deficient in visual perception than were normal readers and also the reading failure groups were less efficient in learning new materials by visual cues only than were normal readers. As a group, reading failure cases were better able to learn new materials by use of kinesthetic components than those materials using only visual stimuli. Further conclusions were that normal readers were not aided by kinesthetic elements, that reading failure cases who had normal visual perception scores did not profit from kinesthetic cues in learning, and that normal readers who had low visual perception scores learned best when kinesthetic aids were added to visual cues.

Chall (16, 17) reviewed research in order to determine if there was one best method of teaching reading. She concluded, based on a summary of research studies, that any method in which the child is taught an early acquisition of the code--either by auditory-visual method or linguistic word structure method--was the best method of teaching reading.

Chall further examined if method was at fault in producing

reading failure. She felt that both the method and characteristics of the child contributed to reading failure. She stated that the child often fails to read if the initial method of instruction is one which ignores the strengths of the child and ignores his predisposition or a set of characteristics which make it difficult for him to associate printed symbols with their spoken counterparts. She also found that no one method produced more reading failures than did the other methods in initial instruction. In her summary, she concluded that both approaches--a code emphasis and a meaning emphasis--produced some failures and that a heavy emphasis of one method (for example, phonics), was wrong and ineffectual for some children.

Bateman (7) assumed the position that reading should be viewed as a rote, automatic, conditioned non-meaningful process which precedes and is separate from comprehension. She explored the efficiency of an auditory approach compared to a visual approach in first grade reading when the children were homogeneously grouped by preferred learning modality, namely auditory or visual, and when they were not so grouped.

Four of the eight first grade classes in her study were administered the Illinois Test of Psycholinguistic Abilities (53), and the four other classes were not administered the ITPA. Of the four non-placement classes not receiving the ITPA, two classes were taught by an auditory method, and two classes were taught by a visual method. The four first grade classes receiving the ITPA were placed into a visual or auditory group on the basis of performance on the two subtests of memory which measure automatic-sequential language abilities and which highly correlate with reading.

The major findings of the study were as follows: 1) when



heterogeneously grouped without regard to learning modalities, the auditory method of reading instruction was superior to the visual method for both reading and spelling, 2) when the four placement groups were considered, the auditory-modality preferred subjects were superior in both reading and spelling to the visual-modality preferred subjects, and 3) there was no interaction between subjects' preferred modality and the method of instruction used.

Other findings resulting from Bateman's study also revealed that instruction should be geared to the learner's strengths if the child is an auditory learner and to the learner's weakness if a visual learner; that is, the auditory method is considered to be superior regardless of the child's learning pattern. She also found a close correspondence between reading and spelling--a fact which possibly supports the theory that both reading and spelling are basically processes of making sound-symbol relationships. Thus, Bateman stated that evidence appears to be mounting that reading is basically a sound-symbol relationship and should be taught to all children as such.

#### Expectancy and Potential Formulas

Bond and Tinker (12) identified a formula to use in predicting the child's reading expectancy by assuming that the IQ is an adequate index of the rate of learning. The formula is that the IQ times years in school plus 1.0 equals the reading grade. The 1.0 is added because the child starts to school in grade 1.0 and is at 2.0 when he enters second grade. They felt that in using this formula consideration must be given to three factors: first, that the years in school are the actual number of years the child has attended school and not his grade

placement; second, that the teacher has accurate information concerning the grades repeated or accelerated, and last, that 1.0 is added to compensate for the manner in which grade norms are assigned to tests.

Bleismer (9) asserted that reading potential changes with age and that the amount of skill improvement could be evaluated in terms of past performance. Growth up to the child's potential has been considered as a desirable goal of remedial instruction regardless of grade level performance and his actual reading scores should be estimated at different time intervals during remediation. The amount of reading growth can be observed by subtracting the difference between the reading potential and reading growth scores. This procedure is most helpful to the teacher.

Bleismer further stated that evaluation of skill improvement in terms of previous performance is of some advantage to the instructor. By calculating the average yearly gain before tutoring and then comparing that gain with the amount of gain obtained during tutoring, the growth attributed to tutoring can be seen. This figure then indicates the rate of improvement during remediation. In order to use this formula presented by Bleismer, one must first assume that past performance was evenly distributed. This technique provides an indication of the child's skill improvement, however slight.

Wilson (79) stated that the difference between reading potential and grade placement varied with the grade placement of the child. He felt that rarely does one realize their full potential. Tolerable differences between potential and achievement, according to Wilson (97, p. 39) are:

<u>End of Year</u>	<u>I</u> <u>Grade Level</u>	<u>II</u> <u>Grouping: Primary</u> <u>Intermediate, Junior High,</u> <u>Senior High Levels</u>
1	-0.3	
2	-0.5	
3	-0.7	0.5 of a year
4	-0.8	
5	-1.0	
6	-1.2	1.0 year
7	-1.3	
8	-1.5	
9	-1.7	1.5 years
10	-1.8	
11	-2.0	
12	-2.2	2 years

In summary, a need does exist for a study to be made in order to determine if reading disability can in effect be eliminated by the method of instruction used in remediation.

## CHAPTER III

### METHODOLOGY AND DESIGN

This chapter will present a discussion of the procedures and instruments used in this study. The design of the study and method of selection of the subjects are given. Descriptions of the instruments used in measuring reading ability are also presented. Attention is also directed to the methods used to analyze the data.

#### Design of the Study

Children in the public school system of Stillwater, Oklahoma, and in various schools throughout Kay County, Oklahoma, were screened until certain criteria for the study were met. In order to qualify for the sample, the children were to be of average intelligence (IQ of 85+ as measured by the WISC (78)), to be in the 3.0 through the 6.9 year in-school, and to be reading no higher than a 2.0 grade level as defined by the Ray Informal Reading Inventory (64) and the Durrell Analysis of Reading Difficulty (26). The screening of the population took place during the summer and fall term of 1968.

Once the sample was identified, both the comparison and experimental groups received further testing. The comparison group was given the Gates-MacGinitie, Primary B, Form 1 (34) in addition to the screening tests given earlier. The experimental group received more extensive testing to assist in planning remedial instruction. This battery

of tests included the administration of the following tests:

- 1) Illinois Test of Psycholinguistic Abilities (53)
- 2) Durrell Analysis of Reading Difficulties (26) This included the administration of the subtests not administered during the screening period.
- 3) Gates-MacGinitie Reading Tests, Primary B, Form 1 (34)
- 4) Ray-McCoy Reading Prognosis Test, Experimental Edition (65)
- 5) Gates-McKillop Reading Diagnostic Test, Form II (35)
- 6) Frosting Test of Visual Perception (30)
- 7) Keystone Visual Survey (46)
- 8) Bender Motor Gestalt Test for Young Children (8, 48)

The administration of the Ray-McCoy Reading Prognosis Test identified instructional methods to be used in the tutoring sessions. This test was selected to determine methodology because it quickly and easily identifies the method by which the child can best be taught. The strengths of the Ray-McCoy were related to the strengths evidenced on the other tests. These tests were administered during the fall and early winter term of the 1968-1969 school year.

Other diagnostic information was collected in order to provide guidance for establishing the proper teaching-learning situation. Information gathered included the following:

- 1) Physical examination (72)--this was filled out by a local medical doctor during the course of the study.
- 2) Parent and Teacher Conferences (38, 57, 58)--these took place during the tutoring sessions.
- 3) School and Home Developmental Histories (57, 58, 66, 67)--these forms were filled out on the child by the child's parent, home room and/or reading teacher.

After the data was collected, it was analyzed in regard to levels of readiness, learning methods and method preference; then a method of

reading instruction was assigned to each child. A prediction of the method of instruction was based on the Ray-McCoy Reading Prognosis Test. The tutoring sessions consisted of thirty-five hourly sessions for each member of the experimental group. Instruction was given by the author to the experimental group which in turn was divided into four small groups of three children in each group. Instructional method was based upon the child's strengths toward that method. Four members of the original sixteen experimental group were unable to complete the study because of moving to another city or were not able to obtain transportation to the Reading Center. Instructional sessions were held at the Oklahoma State University Reading Center on a daily basis with a release time permission granted by the Stillwater Public Schools. The subjects were rotated half-way during the tutoring session so that time of day would not be a variable. Tutoring sessions began February 12 and 13, 1969, and concluded from April to May, 1969, as each member concluded his thirty-five hours of instruction.

All information pertaining to this study was made available at any time to the reading supervisor, reading teachers, home room teachers, principals, and superintendent of the Stillwater Schools. During the tutoring sessions visitation of the teachers and principals was encouraged.

After tutoring, the members of the experimental group were retested in order to measure their expected growth in reading. The following post-tests were administered:

- 1) Durrell Analysis of Reading Difficulty
- 2) Illinois Test of Psycholinguistic Abilities
- 3) Gates-McKillop Reading Diagnostic Tests, Form I

- 4) Ray Informal Reading Inventory
- 5) Gates-MacGinitie Reading Tests, Primary B, Form 2

The comparison group was also post-tested at the end of a comparable thirty-five hour instructional time which was based upon teacher preference for the method. The Gates-MacGinitie, Primary B, Form 2, was administered.

Following the tutoring sessions for the experimental group and the post-testing periods for both groups, a comparison of the reading gains of the experimental group and the comparison group was made. A comparison of the experimental group's reading pre- and post-test scores were made to determine the rates of reading growth.

#### The Population

Twelve disabled readers from the Stillwater Public School System, Stillwater, Oklahoma, constituted the experimental group for this study. These students were selected during the summer of 1968 based on the following criteria: of average intelligence (85+ as measured by the WISC), in the 3.0 to 6.9 grade in school and reading at a level no higher than the 2.0 grade level as defined by the Ray Informal, and the oral reading and word recognition sections of the Durrell Analysis of Reading Difficulty, New Edition.

Four members of the sixteen original members selected for this study were excluded because they either moved to another city or could not obtain transportation to and from the Reading Center at Oklahoma State University where the instructional sessions were held.

Ten students in schools throughout Kay County, Oklahoma, were members of the comparison group for the study. They were also tested



during the 1967-1968 school term on the basis of IQ, grade placement, and reading level.

All members were alike in the identification of grade placement. Pre-test data were treated by the Mann-Whitney U test to further determine if the population was identical in reference to IQ and reading level. The population was found to be statistically the same on the Full Scale scores of the Wechsler Intelligence Scale for Children when the data were treated by the Mann-Whitney U test. No difference between the two groups was found on the Durrell Analysis of Reading Difficulties and Ray Informal scores when treated by the same test of significance. When data from the Gates-MacGinitie Reading Tests were treated with the U test, there was no difference found between the two groups on the vocabulary and comprehension sections of the test.

Other pre-test data (Bender Motor Gestalt Test for Young Children, Developmental Test of Visual Perception, ITPA, Gates-McKillop Reading Diagnostic Test, Keystone Visual Survey, home reports, school reports) were used to determine similarities within the experimental group. No significant differences between the twelve children were noted, and all were considered to be matched with regard to visual perception, language skills and visual acuity.

Physical examinations and visual screening evidenced that no physical or neurological problems were significant. What vision or speech problems were evidenced were being corrected by glasses or by speech therapy.

#### Instruments Used

All of the tests used were administered during the summer of 1968



and the 1967-1968 and 1968-1969 school terms.

The Wechsler Intelligence Scale for Children

This test (78), an individual intelligence test, consisted of twelve tests divided into two subgroups identified as Verbal and Performance. The tests of the scale were grouped as follows: Verbal (Information, Comprehension, Arithmetic, Similarities, Vocabulary, Digit Span) and Performance (Picture Completion, Picture Arrangement, Block Design, Object Assembly, Coding, Mazes). A Full Scale score was also designated.

Gates-MacGinitie Reading Tests, Primary B, Forms 1 and 2

This test was standardized on the basis of geographic location, size, and socioeconomic level in order to assure a representative sampling at all grade levels. The Primary B level of this test (34) consisted of a series of tests which covered grades one through twelve.

Primary B level was intended for use in the second grade; and it consisted of two equivalent forms, each giving a Vocabulary and Comprehension score. Scores are given as a raw score, grade score, percentile, and standard score.

Ray Informal Reading Inventory

This individually administered reading test (64) measured the oral reading level of the child from the pre-primer I to the first reader level. The test yielded an accuracy, time and a comprehension score for each paragraph read orally. Five paragraphs were included in the test. The Ray-Informal had not been standardized at the time of testing.

The Ray-McCoy Reading Prognosis Test (Experimental Edition)

The Ray-McCoy Reading Prognosis Test (65) was developed on the premise that all children do not learn to read at the same time nor in the same way. The teacher must be alert as to the time to begin reading instruction as well as to the method of reading to be used in instruction. The method of reading presented to a disabled reader must be carefully studied to ascertain that it is both developmental and remedial. It must also be within the ability of the child.

The Ray-McCoy Reading Prognosis Test is designed to determine if a child can learn and retain words, and to ascertain the method by which the child learns more readily. Four methods are used in presenting words to the child: Visual-Auditory, Auditory-Visual, Linguistic Word Structure, and Linguistic Language Experience.

Visual-Auditory:

The words are presented by the use of picture and verbal context clues. Sentences and short stories which include the words are also used in the instruction. Five words are presented to the child during the first instructional period. The second instructional period uses the five previously learned words with an additional five words. After each instructional period, the child is retested on the words in isolation at four separate time periods.

Auditory-Visual:

Five letter sounds are taught before the five words are introduced. In the second instructional period, silent e is added to the words previously presented. Pictures and words can be used to teach the letter

sounds, but they are not used in presenting the words. After each instructional period, the child is retested on the words in isolation at four separate time periods.

#### Linguistic Word Structure:

The child is first taught seven letter names before he spells and says the five words which are presented to him. In the second instructional period, silent e is added to the same words previously introduced. After each instructional period, the child is retested on the words in isolation at four separate time periods.

#### Linguistic Language Experience:

One picture is presented to the child. As he tells about the picture, his sentences are recorded. The examiner selects five words from the sentences for each of the two instructional periods. Instruction of the words is kept in sentence form. After each instructional period, the child is retested on the words in isolation at four separate time periods.

#### The Visual-Auditory Method

The visual-auditory method relies on the eye as the means of receiving and interpreting visual stimuli. The visual-auditory method, according to McKee (56), introduces each new word simply by showing the printed form and then telling the child what the spoken word is. No letter-sound associations are taught in the beginning reading stages. Table I gives a brief description of the main constituents of the visual-auditory method.

The visual-auditory method, as stated by McKee (56) and DeBoer and Dallman (21), teaches reading for meaning from the beginning. In this method, the child learns to associate the printed form with pronunciation and thus derives the meaning of the word. Cleland (18) stated that the elements of the sentence are the basis for instruction in the visual-auditory method (whole-part-whole or analytic-synthetic methods), not the letter elements of the word as in the auditory-visual method. Durkin (25) stated the advantage to the visual-auditory method was that whole words have meaning for children--a significant fact in permitting instantaneous reading.

The visual-auditory method uses the following word recognition skills:

- 1) The use of the general characteristics of the word. Word form plays an important clue in word recognition. Examples of word form are word length (21), general appearance of the word such as striking characteristics of the word (21, 37, 56), configuration (37, 56), unique patterns of letters or such peculiarities in the appearance of a word such as the y in monkey or tt in butter (56, 37). The child learns quickly by recognizing the whole by one or a few of its parts that suggest the whole, such as the initial letter or a group of letters (56).

- 2) The use of the striking characteristics of the word. Striking characteristics are defined as the use of configuration (37, 56) and the use of details and subtle features such as one or two letters which stand for the entire word (5, p. 217).

- 3) The use of picture clues. Picture clues aid in word recognition (37) and in the printed association of symbols (47).

4) The use of context clues. Context clues can be of two types: a) sight and visual context, such as a picture of a mother and the word mother, and b) sight and verbal context clues, such as "The boy had a bat and a \_\_\_\_." (21, 56, 44). DeBoer and Dallman (21) feel that all new words should be used in context.

5) The use of small words within words. Small words within larger words can be used to identify unknown words. An example would be the known part and which would help the student identify sand, band, hand (11, 13).

6) The use of known parts within words. This skill can be taught through the use of similarities of the unknown word to the familiar word. An example would be the arriving at the word class because the child already knows the word glass. The knowledge of common characteristics and their meanings in words is useful in word recognition skills (44). The awareness of familiar parts in compound words aids word recognition--for example, fire and man in fireman (37, 56).

7) The use of syllabication or structural analysis. This skill in word recognition is acquired from the competent use of the other skills. The unit of recognition is eventually broken down into the syllable rather than the words. Inflected word forms, such as plurals (37), common endings added to the base to make variants such as ed, s, and other common syllables, such as -ion, -ness, -full are helpful in this type of word recognition (56).

In summary, the visual-auditory method approaches the word as a whole word where no letter sound associations are taught early. Cleland (18) stated that this method used the whole-part-whole means of word attack. He felt a basic sight vocabulary was essential to

reading and must come before any phonics instruction was initiated. Durkin (27) stated that service words were not phonetic and that it was essential to teach them by sight. In the visual-auditory method, the element of the words constitutes the essential part of the instruction (18).

#### The Auditory-Visual Method

The auditory-visual method is one in which the association of printed letter symbols is made to characteristic speech sound in teaching word recognition (43). McCracken (55) states that reading is defined as turning or decoding the printed symbols into sounds which are language. In the decoding stage, McCracken further asserts, there is little need for thinking or reasoning in the beginning; rather, the child needs many experiences in practicing decoding skill and thinking or comprehension will come along later. He advocates learning this decoding process through regular spellings, starting with short vowels and sounding consonants in order to accumulate a vocabulary very quickly. By taking up regular spellings, which occur with 85-90% regularity in our English language, the child will then not find it difficult to learn the exceptions. The irregular spellings should be organized into groups or patterns.

Bateman (7) advocated that reading be taught as a non-meaningful auditory process. She asserted that reading consisted of two stages: first, the conversion of symbols to sounds and then secondly, the comprehension or attachment of meaning to the sounds produced in the first stage. She urges that reading be taught as a rote, conditioned mechanical process of converting letters to sounds and that the comprehension



of these symbols be taught as a separate process.

McKee (56) and Mills (61) also agreed that an auditory method presents new words with a large number of sound-symbol associations. Table I gives a brief summary of the constituents of the auditory-visual method.

The auditory-visual method utilizes the following techniques for word recognition:

1) The use of auditory discrimination ability. Heilman (43), Durkin (25), McCracken (55) and Gans (32) asserted that the ability to discriminate between similar speech sounds is necessary in order for the child to benefit from the auditory-visual method. Such auditory abilities (25) are being able to hear the th sound as in the, this, there. Auditory discrimination between words of similar sounds is necessary for correct pronunciation and analysis (36).

2) The use of visual discrimination ability. The ability to visually discriminate between letters is essential in order for auditory instruction to have relation to printed symbols (43). Durkin (25) also felt that visual discrimination of the letters was important as was the auditory discrimination of hearing words starting with the same letter.

3) The use of already known sight words to learn units in new words. The child can sound out strange words by using the sounds of words he already knows and by applying them to the unknown elements of the new word (20). Durkin (25) felt that some sight word vocabulary is helpful to illustrate certain letter-sound relationships. She also stated, as did Harris (42), that most of the service words are best taught by sight since they are usually phonetically irregular.

4) The use of letter sounds and combinations. Harris (42) emphasized that the sounds of letters should be taught along with generalizations which apply to new words. Harris advocated starting with long vowels and a few consonant blends and then putting these sounds together to formulate new words. Dolch (24) felt, however, that it was as important to teach the exceptions to the rules as it was to teach the rules themselves. Other auditory approaches are in general agreement except that the order of teaching letter sounds is rearranged. Heilman (43), Durkin (25) and McCracken (55) generally emphasize teaching the consonant sounds and the short vowels first. The general procedure followed in teaching word recognition is as follows:

#### A. Vowel Sounds

1. Vowel sounds determined by the number of vowels in a word (42). Example: one vowel in a one syllable word is usually short (21, 42, 43, 56, 69), or two or more vowels in a word are usually long (21, 42, 43, 56, 69).
2. Sounds are determined by the position of vowels.
3. Vowel sounds determined by word meaning and content. Example: oo can have the sound of  $\bar{o}$ /door,  $\bar{o}o$ /moon,  $\underset{\cup}{oo}$ /look,  $\underset{\cup}{u}$ /blood (42, 43).
4. Sounds of the vowels followed by the consonant r.
5. Diphthongs (20, 21, 42).
6. Vowel blends (69) and diagraphs (21).
7. Silent letters (21).

#### B. Consonants

1. Consonants having one sound--b,h,j,k,l,m,n,p,r,v,w (42).



2. Consonants having more than one sound--c,d,f,g,s,t,x,  
y,z (42).
3. Consonant diagraphs--sh, wh (21, 42, 43).
4. Consonant blends--bl, cl, str (21, 42, 43, 69).
5. Initial, ending and medial consonants (21, 25, 43, 69).
6. Substituting initial consonants (43).
7. Consonant irregularities (43).
8. Silent consonants (43, 69).
9. Contractions (43).

C. Spellings

Example: au and aw have the sound of  $\hat{o}$  as in caught or doubling the final consonants (43).

D. Sight words

Words which cannot be taught by phonetic analysis and are recognized by word form. Repetition demanded.

E. Syllables

Ways of dividing words:

1. One or more vowels per syllable (21, 25, 42, 69).
2. Words of more than one syllable (double consonants,  
between unlike consonants, between vowels and a  
consonant, between two vowels).
3. Accent (43).
4. Blend syllables into words (69).

F. Root words, prefixes and suffixes (42, 43).

G. Compound words (43).

Durkin (25) stated that the more words presented to a child illustrating a particular sound, the easier it would be for the child to

remember that sound. She noted further that the difficulties in learning to recognize the various sounds differ from child to child.

McCracken (55) and Durkin (25) suggested that the identifying of the sounds of letters is a means toward identifying unfamiliar words. This can be done through consonant additions (can/cart) or consonant substitutions (cat/can). What is presented in the auditory-visual method at any grade level should be dependent on what the child knows. The learning of and understanding of generalizations are helpful in applying them to new words (25).

#### Linguistic Word Structure Method

The linguistic word structure method defines reading as developing a range of habitual responses "to a specific set of patterns of graphic shapes" (28). Bloomfield (10) also defined reading as teaching the child to utter the speech sounds corresponding to their graphic representations. Reading materials in the linguistic word structure method present words by a spelling-pattern approach which, according to Fries (28), involves developing a clear-cut understanding of these spelling patterns to the word patterns of language. The development of facility in oral language is a precursor to formal reading instruction (6). Fries (28) believes that "learning to read is learning to do something . . . not to be evaluated in terms of knowledge about something, but in terms of the completeness and the efficiency of performance." Table I gives a brief summary of the constituents of the linguistic word structure method.

Fries (28) divides reading into three stages: the transfer stage (knowledge of letters, shapes, spelling patterns), the productive stage

(meaningful reading comes through the use of intonation and stress).  
and the vivid imagination stage (linguistics is related to literature).

The linguistic word structure method according to Wilson (28, 80) utilizes the following principles which constitute the background for the understanding of the program:

1) The language control achieved by the child is important to beginning reading, and all reading is built upon this control.

2) Vocabulary presented to the child should be within the linguistic experience of the child--the accomplishment of which can be assured by using the three major spelling patterns of English. Words are learned as wholes, not in the phonic-type sounding out of each letter.

3) A thorough knowledge of the alphabet--the shape which identifies each letter and separates it from the others--is important to pre-reading.

4) The elimination of pictures forces reading for meaning (28).

5) The use of the technique of minimum contrast is essential with attention centered upon contrasts between words rather than similarities.

6) The introduction of a number of words with high frequency structure permits the writing of normal sentence patterns.

7) Writing in the form of sentences and stories is introduced early.

8) Story content emphasizes humor and experiences which have appeal and have meaning to children.

9) Early reading success is necessary for the child in order to impel motivation.

10) Meaning is not divorced from reading, yet meaning is subordinate to learning the spelling patterns in the initial stage as compared to the word patterns, structure, intonation, and stress in the productive stage (28). Meaning in reading actually comes in the second stage through the use of intonation and stress.

Specific procedure to be followed in developing word recognition skills by the linguistic word structure method is as follows:

- 1) To teach the alphabet during the readiness stage.
  - a. By learning the letter names--not the sounds.
  - b. By developing a mastery of instant recognition of both lower and upper case letters.
  - c. By developing visual discrimination between letters.
  - d. By developing left to right, top to bottom reading.
  - e. By teaching the sequence of the letters of the alphabet.
  - f. By establishing a referent for future use in word recognition and word attack which lays the ground work for a thorough understanding of the alphabetic principle.
- 2) To introduce words in pattern by reading and then spelling them. Emphasis is placed upon the minimum contrasting features of the word.
- 3) To present sight words without spelling them.
- 4) To use new words in the context of oral and written sentences.
- 5) To proceed from individual sentences to stories using words.
- 6) To work toward normal stress and intonation without offering a pattern.
- 7) To unlock unfamiliar words. If a child has difficulty with a word, he is asked to spell it. Other known words in the spelling

pattern can be compared to the known word.

8) To reinforce visual-auditory images by having the children write all the words or write dictated sentences containing the words.

In summary, the linguistic word structure method introduces whole words based on a spelling pattern approach which emphasizes a minimum contrast between words. No sounding or blending of the letters is emphasized. Reading for meaning is practiced after the initial stage has been completed.

#### Linguistic Language Experience Method

The linguistic language experience method combines all of the communication skills in speaking, writing, and reading into a closely related process. A brief summary of the main characteristics of the language experience method can be seen in Table I. The words used in the beginning reading program are based on the experiences of the learner which in turn emphasizes reading for meaning from the beginning. The major philosophy behind the language experience method according to Lee and Allen (1, 49) is that what a child can think about, he can talk about; what he can talk about can be expressed in art or some other form; what he can write he can read; he can read what he writes as well as what other people write. Lefevre (52) stated in order to comprehend printed matter, the reader must perceive the entire language as wholes or as unitary meaning-bearing patterns. Learning to read, according to Lefevre (52) is not a preoccupation with the alphabet but rather an alertness to the words representing things in his environment. He also feels, as do Lee and Allen, that the words should be treated as a minor language unit. The child arrives at the words

through a study of the meaning bearing patterns or sentences. Lee and Allen (49) stated that reading is not saying words or treating words as isolated symbols but rather expressing thoughts. The reader should not work through the sentence by word analysis skills; instead, he should relate the whole passage to express an idea after identifying unfamiliar words in a previous study. Lefevre (51) believes that sentence level utterances include four signaling systems: Intonation (patterns of pitch, stress and juncture), syntactical-function order in sentence patterns (four sentence patterns are varied by expansion, substitution, inversion and transformation), structure words (includes many sets such as noun markers, verb markers, phrase markers, clause markers, question markers, and sentence connectors) and word-form changes (grammatical inflections, prefixes, and suffixes which include noun plurals, possessives, verb parts, adjective comparison).

Readiness for reading according to Lefevre (51) occurs through the developing of oral language and the oral reading to the children. Anything that develops the child's oral language should be considered. Through listening to stories read aloud to them by adults, the children learn that words are graphic representations of what they see and hear. Lefevre (51) states that reading and writing readiness consists of the child's understanding that the language he hears and speaks can be represented graphically in writing and print and that this writing can say something to him. The sentence should become a meaning-bearing unit to the child, because single words have less significance to the learner than is often felt important. If the child slices the larger segments of the sentence into smaller graphic counterparts, according to Lefevre (51), he will learn what he practices. Further, Lefevre

(51) states if the child practices analyzing, spelling and sounding the words and various word parts, that is what he will learn and that instead, the child learning to read, should practice entire meaning bearing language patterns at the sentence level.

Hall (36, p. 2) stated that oral language and reading are closely related and that speech is the primary form of language, whereas written language is the imperfect representation of speech. Lefevre (50, 127) claimed that learning reading and writing requires a mastery of interrelated skills. Each skill, although related, is also separate and distinct; they are audio-lingual (mouth and ear) and manual-visual (hand and eye). This interrelatedness according to Hall (36, p. 3) must be clearly understood in order to effectively teach children in reading, speaking, writing, and listening.

Oral language development provides the basis for teaching communication skills in decoding and comprehending written language. Reading must be viewed as a linguistic process and must be taught with the following implications in mind:

- 1) The language of initial reading materials should represent the child's speech patterns (36, p. 4).
- 2) Reading should be built upon the relationship between spoken and written language (36, p. 4).
- 3) Reading experiences are taught as communication experiences even in the beginning stages (36, p. 4).
- 4) Reading instruction must be related to the total language programs (36, p. 4).

In the linguistic language experience program, according to Hall (36, p. 4), the child's speech determines the language patterns of the



reading materials and his experiences determine the content. The procedure for the communication sequence is that through speech the child expresses his thoughts, encoding takes place when the child or the teacher writes the child's thoughts, reading occurs when the child reads the written record, and in all three steps, there is a communication of meaning. In this method it is important that the teacher accept the child's speech as it is and not try to change it, faulty as it may be. Lefevre (50, p. 128) stated that if teachers insist on instant correction of every mistake the child makes in speech, reading and writing, the child will soon refuse to communicate and hate to recite and write in school. Lefevre further felt that the child should learn to read and write the language he already speaks and understands upon entering school and that these immaturities be endured and more mature habits left to normal maturation.

Hall (36, p. 32) suggests the following procedure for individual experience stories:

- 1) Oral language discussions precede the development of individual stories.

- 2) The story is recorded by the teacher by manuscript or by use of the typewriter.

- 3) In initial stages the story is read to the child; later after the initial reading stage, the child reads his own stories. The teacher reads the story with the child, and later the child reads it alone.

- 4) The child recognizes and identifies individual words he knows.

- 5) These words are written on a card for his word banks. This procedure is also recommended by Stauffer (74, p. 60). The child can

use these words for visual discrimination practice and for word recognition as he matches these to words he does not know and places them in the word bank.

6) Books are then made from the individual stories.

This basic procedure has also been suggested by Stauffer (74) and Lee and Allen (49). Following initial instruction, word recognition techniques are utilized. One basic concept the child should learn about words is that words express our thoughts--words we say can be written and read by ourselves and others. Another concept is that the meaning of the word is dependent upon its use in context. Vocabulary study must be in connection with the language patterns in which the words occur. According to Lefevre, the sentence is the smallest meaning bearing unit in our language, not the word. Multiple meanings also illustrate to the child the importance of the context in which it is used. A third concept is to understand that some meanings can be expressed by more than one word or synonym. And last, there are specific functions of words in the syntactical patterns of the language. There are full and empty words according to Lefevre; full words have specific meanings, whereas empty words are without concrete referents such as the, which, and an. The understanding of the four word classes (noun, verb, adjective, adverb) is accomplished only through sentence patterns. The discussion of sentences used in children's writing and sentence building activities is important to illustrate language structure and word functions in sentence patterns.

Specific activities related to word recognition techniques are as follows:

1) The use of individual word banks (36, 74). Words are placed in banks after they are used by the child to serve as a record of reading vocabulary and as a reference for creative writing and spelling. They also provide reinforcement for repeated exposure to words, provide stimulus words for skill instruction, provide words for independent activities (word games, matching exercises, sentence building), and provide examples for group language study.

2) The use of group word banks (36, 74). Examples of group word banks would be in the classification of words; naming words; action words; interesting words, words for sounds, colors or animals; opposites; compound words; words for the term said; words with prefixes or suffixes; synonyms; homonyms; science and social studies words; three and four syllable words.

3) The use of auditory discrimination (74, p. 182). An example would be words which sound alike such as Bill, bell, book.

4) The use of auditory-visual discrimination (74, p. 823). As soon as one word is learned in print, it becomes a sight word, which can be used in auditory-visual training. An example can be seen in the known word snow which is compared to the unknown word throw.

5) The use of letter substitution or word families (74, p. 188). An example would be to substitute the initial or final letters such as: Bill--fill, will, hill, kill, mill or can--cab, cap, car, cat.

6) The use of vowel keys (74, p. 191). Vowel keys are used to learn about vowels and their variability by changing word beginnings

and then endings or by keeping the medial vowel constant and then changing both ends.

7) The use of structural variations (74, p. 194). An example of structural variations would be the following: run, runs, running.

8) The use of the dictionary (74, p. 195). The alphabet is introduced and used in word banks. This provides a basis for further dictionary skills.

9) The use of root words (74, p. 197).

The language experience method, in summary, emphasizes the sentence or phrase as the main unit in reading. Meaning in reading is emphasized from the beginning as the words chosen are based upon the experiences of the learner. The child learns that his speech sounds are represented with symbols--not to assign a sound or sounds to a specific symbol as in the auditory-visual method. He also learns that reading is not just saying words or sounds, but rather, it is expressing one's thoughts.

Data in Table II reveals the test results on the Ray-McCoy Reading Prognosis Test. Scores are given for twenty-four hours, and seventy-two hour time limits for all twelve experimental students. Students scoring within acceptable limits for the different methods have these preferences indicated with the instructional method employed for this study also noted.

The Gates-McKillop Reading Diagnostic Tests, Form I and II

The Gates-McKillop Reading Diagnostic Tests (35) consisted of the following subtests: oral reading, words--flash presentation, words--untimed presentation, phrases--flash presentation, recognizing and

TABLE II

RAY-MCCOY READING PROGNOSIS TEST RESULTS  
FOR TWELVE EXPERIMENTAL STUDENTS

Pupil	Trial	Visual-Auditory				Auditory-Visual			
		20 Minutes	60 Minutes	24 Hours	72 Hours	20 Minutes	60 Minutes	24 Hours	72 Hours
A	5	5/5	5/5	5/5		5/5	5/5	5/5	
	10	10/10	8/10	8/10	9/10	10/10	10/10	9/10	9/10
B	5	5/5	4/5	5/5		4/5	3/5	5/5	
	10	10/10	9/10	8/10	5/10	6/10	9/10	7/10	4/10
C	5	4/5	5/5	5/5		5/5	5/5	5/5	
	10	10/10	10/10	10/10	8/10	10/10	10/10	10/10	6/10
D	5	5/5	5/5	5/5		4/5	2/5	4/5	
	10	9/10	10/10	10/10	7/10	6/10	4/10	7/10	7/10
E	5	5/5	5/5	4/5		5/5	5/5	5/5	
	10	10/10	10/10	10/10	9/10	10/10	10/10	10/10	9/10
F	5	5/5	5/5	5/5		4/5	5/5	4/5	
	10	9/10	10/10	8/10	4/10	6/10	7/10	8/10	5/10
G	5	5/5	4/5	5/5		4/5	4/5	5/5	
	10	10/10	10/10	10/10	5/10	6/10	4/10	4/10	3/10
H	5	3/5	5/5	5/5		2/5	3/5	2/5	1/5
	10	9/10	9/10	10/10	8/10	---	---	---	
I	5	3/5	3/5	5/5		5/5	3/5	3/5	
	10	10/10	9/10	9/10	8/10	5/10	7/10	8/10	7/10
J	5	4/5	4/5	4/5		4/5	4/5	4/5	
	10	9/10	10/10	10/10	8/10	7/10	7/10	8/10	5/10
K	5	5/5	3/5	5/5		5/5	5/5	5/5	
	10	8/10	8/10	10/10	7/10	8/10	8/10	8/10	7/10
L	5	5/5	5/5	5/5		3/5	3/5	2/5	2/5
	10	10/10	10/10	7/10	9/10	---	---	---	
Mean				7.25				5.41	
Median				8				5.5	
Range				4 to 9				1 to 9	

TABLE II (Continued)

Pupil	Linguistic Word Structure				Linguistic Language Experience				Preference+
	20 Minutes	60 Minutes	24 Hours	72 Hours	20 Minutes	60 Minutes	24 Hours	72 Hours	
A	5/5 9/10	5/5 9/10	5/5 10/10	7/10	5/5 10/10	5/5 10/10	5/5 9/10	10/10	VA,AV*, LING,LE
B	5/5 10/10	5/5 10/10	4/5 10/10	7/10	5/5 10/10	5/5 10/10	5/5 10/10	5/10	LING*
C	5/5 10/10	5/5 10/10	5/5 10/10	9/10	4/5 10/10	4/5 10/10	4/5 10/10	10/10	VA,LING*, LE
D	5/5 6/10	5/5 10/10	5/5 8/10	5/10	5/5 9/10	5/5 9/10	5/5 9/10	7/10	VA,AV*, LE
E	5/5 10/10	5/5 10/10	5/5 10/10	9/10	4/5 10/10	5/5 10/10	5/5 10/10	9/10	VA,AV, LING*,LE
F	5/5 10/10	5/5 8/10	5/5 10/10	5/10	4/5 9/10	4/5 10/10	5/5 10/10	6/10	(AV*)
G	5/5 9/10	5/5 10/10	5/5 9/10	4/10	5/5 9/10	5/5 9/10	5/5 9/10	5/10	(VA*)
H	2/5 ---	5/5 ---	2/5 ---	2/5	5/5 9/10	3/5 10/10	5/5 9/10	10/10	VA*,LE
I	5/5 10/10	5/5 10/10	5/5 10/10	8/10	4/5 10/10	5/5 9/10	5/5 10/10	10/10	VA,AV, LING,LE*
J	4/5 8/10	5/5 7/10	5/5 9/10	7/10	5/5 8/10	5/5 10/10	5/5 10/10	10/10	VA,LING, LE*
K	4/5 10/10	5/5 10/10	5/5 10/10	6/10	5/5 9/10	5/5 10/10	4/5 10/10	9/10	VA,AV, LE*
L	3/5 ---	4/5 ---	2/5 ---	2/5	5/5 10/10	3/5 10/10	5/5 10/10	8/10	VA*,LE
Mean				5.91				8.25	
Median				6.5				9.0	
Range				2 to 9				5 to 10	

+Method Preference

AV=Auditory-visual; VA=Visual-auditory; LING=Linguistic word structure;  
LE=Linguistic language experience

\*Indicates method of instruction used

blending common word parts, giving letter sounds, naming capital letters, naming lower-case letters, four scores for recognizing the visual form of sounds (nonsense words, initial letters, final letters, vowels), and auditory blending, spelling, oral vocabulary, syllabication, and auditory discrimination.

Results were tabulated in two ways. In one, the grade score was given by converting raw scores into grade score norms rated as high, medium, low or very low when compared with the person's actual grade. In the other through use of the interpretation tables, raw scores were converted directly to ratings of normal, low or very low. This rating compared the pupil's ability in a given aspect of reading with his general reading ability.

#### Durrell Analysis of Reading Difficulty, New Edition

The Durrell Analysis of Reading Difficulty, New Edition (26) consisted of a series of tests and situations in which detailed observation was made regarding various aspects of a child's reading ability. The test ranged from the non-reader to sixth grade ability. No standardization population was cited by the author of the test.

The test's primary purpose was to discover weaknesses and faulty habits in reading which may be corrected in a remedial program. The test consisted of the following parts: Oral Reading, Silent Reading Tests, Word Recognition and Word Analysis, Visual Memory of Words, Hearing Sounds in Words, Learning to Hear Sounds in Words, Sounds of Letters, and Spelling Tests.



## Statistical Design

It was hypothesized that the reading growth of the experimental group receiving tutoring based on method preference was to be significantly higher than the reading growth of a comparison group receiving instruction reflecting teacher method preference. Another hypothesis submitted for further study was to evaluate the rate of reading growth of the experimental group after receiving tutoring based on method preference in comparison to the rate of reading growth prior to instruction based upon learning strengths.

The Mann-Whitney U test (71, 62) was used to test the significance on all matched pre-tests and on the matched pre-post Gates-MacGinitie for the experimental and comparison groups. An analysis of covariance was used on the pre- and post-tests of the Gates-MacGinitie to determine all possible significance levels (62) and to verify findings resulting from the data with the Mann-Whitney U test. Bleisner's (9) formula was used to determine the rate of reading growth based on past performance for the experimental group.

## Summary

This chapter presented the design of the study, the population, the instruments used and the statistical design.

Twelve children in the public schools of Stillwater, Oklahoma, and ten children enrolled in various schools throughout Kay County, Oklahoma, comprised the experimental and comparison populations for this study. Groups were matched on grade level, IQ and reading level. Members of the experimental group were sub-divided into instructional

groups based upon specific method preference scores indicated by the Ray-McCoy Reading Prognosis Test. After approximately thirty-five hours of instruction, both the experimental and comparison groups were re-evaluated. The Mann-Whitney U test, an analysis of covariance, and Bleismer's formula for determining reading gains based on past performance were used to measure statistical significance.

## CHAPTER IV

### TREATMENT OF DATA AND ANALYSIS OF RESULTS

#### Introduction

The following chapter is an account of the statistical treatment of the data. This chapter will indicate the degree to which the hypotheses are found to be correct within recognized limitations.

The data discussed will deal with the statistical treatment of the data through the application of the Mann-Whitney U test, an analysis of covariance, and the application of Bleisner's formula to determine the amount of reading growth.

The basic purpose of this study, as stated in Chapter I, was to compare the reading growth of two matched groups where the experimental group received instruction based on method preference and the comparison group received instruction based on teacher selection of the method. Thus, the following hypothesis was advanced for testing in the study: There is no significant difference between the reading growth of an experimental group of students receiving tutoring based on method preference and that of a comparison group of students receiving instruction determined by teacher preference.

#### The Mann-Whitney U Test

The Mann-Whitney U test is used to test whether two independent groups have been drawn from the same population. The Mann-Whitney U

test can be used with numerical data even though the two samples do not consist of matched pairs.

The U test is a powerful non-parametric technique and may be used in lieu of the parametric  $t$  test with little loss in power efficiency.

The U test is based on the idea that, if two similar groups were ranked together as if they were one group, there would be intermingling of the two groups. If one group significantly exceeds the other, the superior group's rankings will be higher than the other group. The U value is computed after the combined ranking by concentrating on the lower ranked group and noting the number of ranks of the higher group which fall below the lower ranked group. Thus the lower the statistical yield, the more significant it is. The advantage of the Mann-Whitney U test is that it can be used with samples of small sizes (62, pp. 280-281).

For samples with an  $n_2$  between nine and twenty, the U is computed by assigning a rank of one to the lowest score in the combined group of scores. The next score receives a rank of two and so on until all scores receive a ranking. The formula for calculating U is:

$$U = n_1 n_2 + \frac{n_1 (n_1 + 1)}{2} - R_1$$

or

$$U = n_1 n_2 + \frac{n_2 (n_2 + 1)}{2} - R_2$$

$R_1$  is the sum of the ranks assigned to the group whose sample size is  $n_1$ , and  $R_2$  is the sum of the ranks assigned to the group whose sample size is  $n_2$ . The formulas yield the two U's, and it is the smaller U that is used.

If an observed U for a particular  $n_1 \leq 20$  and  $n_2$  between nine and

twenty is equal to or less than the tabled value, the null hypothesis is rejected at that level of significance indicated by the table (71, pp. 119-120).

The null hypotheses tested were as follows:

- 1) There is no significant difference between the post-test vocabulary scores on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.
- 2) There is no significant difference between the post-test comprehension scores on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.

The post-test vocabulary and comprehension scores for the Gates-MacGinitie are noted in Tables III and IV.

The calculated U for the post-test vocabulary scores was 57.0 and the post-test comprehension scores was 56.5. Therefore, when based on the U's calculated by the Mann-Whitney U, the null hypotheses cannot be rejected with the probability of any true difference due to chance being greater than .10. Thus the writer can conclude the post-test scores of the experimental and comparison groups are not significantly different from each other.

#### Analysis of Covariance

An analysis of covariance (62) was run on the pre- and post-test, Gates-MacGinitie Reading Test, for both the experimental and comparison groups at the Computer Center at Oklahoma State University. The hypothesis to be tested was: When the differences in the pre-test scores are controlled, do the experimental and control groups have a significant difference in the post-test scores.

TABLE III

U SCORES AND VOCABULARY RAW SCORES OF TWELVE EXPERIMENTAL  
AND TEN COMPARISON STUDENTS ON THE GATES-MACGINITIE  
READING TESTS

Experimental Group ( $n_2$ )		Comparison Group ( $n_1$ )	
Score	Rank	Score	Rank
38	18.0	28	9.5
30	11.5	30	11.5
43	21.5	38	18.0
19	4.0	21	5.0
43	21.5	15	1.5
24	7.0	40	20.0
26	8.0	28	9.5
18	3.0	36	16.0
34	14.0	35	15.0
32	13.0	22	<u>6.0</u>
38	18.0		$R_1 = 112.0$
15	<u>1.5</u>		
	$R_2 = 141.0$		

U = 57 Null hypothesis cannot be rejected,  $p > .10$ .

TABLE IV

U SCORES AND COMPREHENSION RAW SCORES OF TWELVE EXPERIMENTAL  
AND TEN COMPARISON STUDENTS ON THE GATES-MACGINITIE  
READING TESTS

Experimental Group ( $n_2$ )		Comprehension Group ( $n_1$ )	
Score	Rank	Score	Rank
29	20.5	20	11.0
19	9.0	23	14.0
27	18.0	21	13.0
15	7.0	20	11.0
30	22.0	7	1.0
11	3.0	24	16.0
11	3.0	20	11.0
11	3.0	17	8.0
28	19.0	29	20.5
24	16.0	13	<u>6.0</u>
24	16.0		$R_1 = 111.5$
12	<u>5.0</u>		
	$R_2 = 141.5$		

U = 56.5 Null hypothesis cannot be rejected,  $p > .10$ .



An analysis of covariance was run comparing the comprehension post-test scores with the comprehension pre-test scores and also comparing the vocabulary post-test scores with the vocabulary pre-test scores. All pre-test scores were given the same scores. Results can be noted in Tables V and VI.

The null hypothesis tested was that there was no difference among treatments after adjusting with covariates on the vocabulary sections of the Gates-MacGinitie. The calculated F, with 1 and 19 degrees of freedom was 3.290. The computed value of 3.290 was less than the tabled critical value of 4.38 at the .05 level and 8.18 at the .01 level; thus the null hypothesis cannot be rejected.

The null hypothesis tested was when the comprehension scores were used, there was no difference among treatments after adjusting with covariates. An F of 4.38 at the .05 level and an F of 8.18 at the .01 level were needed to accept the null hypothesis. A calculated F of 0.270 with 1 and 19 degrees of freedom was obtained. The null hypothesis again cannot be rejected.

#### Summary of Statistical Tests

The foregoing paragraphs have presented a statistical analysis of the data. A summary of this statistical treatment is as follows:

- 1) When applying the Mann-Whitney U test, there was no significant difference between the post-test vocabulary scores on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.

- 2) When applying the Mann-Whitney U test, there was no significant difference between the post-test comprehension scores on the Gates-

TABLE V

ANALYSIS OF COVARIANCE FOR ACHIEVEMENT DIFFERENCES ON THE VOCABULARY SECTION OF THE GATES-MACGINITIE FOR TWO GROUPS OF EXPERIMENTAL AND COMPARISON STUDIES

Source	DF	YY (Total Sum of Squares)	Sum of Squares (Due)	Sum of Squares (About)	DF	Mean Square
Treatment (Between)	1	84.3867				
Error (Within)	20	1720.5703	1082.4297	638.1406	19	33.5863
Treatment and Error (Total)	21	1804.9570	1056.3245	748.6326	20	
Difference for Testing Adjusted Treatment Means				110.4919	1	110.4919

$$F = (1, 19) = 3.290*$$

\*Null hypothesis cannot be rejected,  $p > .05$ .

TABLE VI

ANALYSIS OF COVARIANCE FOR ACHIEVEMENT DIFFERENCES ON THE COMPREHENSION SECTION OF THE GATES-MACGINITIE FOR TWO GROUPS OF EXPERIMENTAL AND COMPARISON STUDENTS

Source	DF	YY (Total Sum of Squares)	Sum of Squares (Due)	Sum of Squares (About)	DF	Mean Square
Treatment (Between)	1	12.5469				
Error (Within)	20	1229.8203	956.9180	272.9023	19	14.3633
Treatment and Error (Total)	21	1242.3672	965.5825	276.7847	20	
Difference for Testing Adjusted Treatment Means				3.8823	1	3.8823

$$F = (1, 19) = 0.270*$$

\*Null hypothesis cannot be rejected,  $p > .05$ .

MacGinitie Reading Test of an experimental group of students and those of a comparison group.

3) When applying an analysis of covariance, there was no significant difference between the post-test vocabulary scores after adjusting with covariates on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.

4) When applying an analysis of covariance, there was no significant difference between the post-test comprehension scores after adjusting with covariates on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.

#### Bleismer's Formula for Skill Improvement

Bleismer's formula for evaluation of skill improvement in terms of the child's past performance employs the following procedure. The number of years the child has attended school is determined. His average yearly gain before remediation is calculated by subtracting 1.0 (because all children start with a reading level of 1.0 in first grade) from the score obtained before remediation is begun. The gain during tutoring is obtained by subtracting the pre-test from the post-test scores. The growth attributed to tutoring is then calculated by subtracting the average yearly gain before tutoring from the gain evidenced during the tutoring sessions.

The formula for calculating improvement in terms of past performance is:

$$\frac{\text{Pre-test score minus 1.0}}{\text{Number of years in school}} = \text{Average Yearly Gain Before Tutoring}$$

$$\text{Post-test score minus pre-test score} = \text{Gain During Tutoring}$$

$$\begin{array}{rcc} \text{Gain During} & - & (\text{minus}) \text{ Average Yearly Gain} = \text{Growth Attributed} \\ \text{Tutoring} & & \text{Before Tutoring} \quad \quad \quad \text{to Tutoring} \end{array}$$

It must be noted that the results are hopefully greater than was expected from previous efforts on the part of the child. Evaluation of this type is limited by the assumption that past performance was evenly distributed. However, it is also noted that the older, seriously handicapped child in reading is less likely to score significantly in other aspects of evaluation while making significant progress. This procedure provides an indication of this improvement, however small.

Bleisner recommends that alternate forms of the same tests be used due to the fact that if different tests are used it is difficult to determine if differences are due to skill improvements or to differences in norms on the two tests. It was also recommended that one not use the same form of the same test because the acquaintance with the test might be reflected. Based on these facts, only two tests were evaluated, namely, the Gates-McKillop Reading Diagnostic Tests, Forms I and II (35) and the Gates-MacGinitie Reading Tests, Primary B, Forms 1 and 2 (34).

The data is presented in Table VII.

Evaluation of Table VII reveals a decided gain in reading growth for the experimental group when pre-test scores were compared to the post-test scores. The mean gains for the Gates-McKillop Reading Diagnostic Tests were as follows: an average gain of .86 of a year in Oral Reading, an average gain of .47 of a year in the Flash Presentation of Words, an average gain of .15 of a year in Untimed Presentation of Words, an average gain of .99 of a year in Phrases, an average gain of .26 of a year in Spelling and an average gain of .129 of a year in

TABLE VII

BLEISMER'S FORMULA APPLIED TO THE MEAN READING SCORES OF TWELVE EXPERIMENTAL STUDENTS

		Number of Years in School at Time of Pre-test	Grade on Pre-test	Grade Minus 1.0	Average Yearly Grade Before Tutoring	Grade on Post-test	Gain During Tutoring	Growth Attributed to Tutoring
Gates-McKillop:	Oral	3.14	1.96	.96	.334	3.158	1.1958	.8624
Reading								
Gates-McKillop:	Flash	3.14	2.49	1.49	.5245	3.48	.991	.466
Presentation								
Gates-McKillop:	Untimed	3.14	2.608	1.608	.559	3.304	.695	.1535
Presentation								
Gates-McKillop:	Phrases	3.14	2.46	1.46	.5568	4.016	1.55	.993
Presentation								
Gates-McKillop:	Spelling	3.14	2.48	1.48	.5165	3.275	.775	.2585
Gates-McKillop:	Oral	3.14	3.708	2.708	.929	4.76	1.058	.1289
Vocabulary								
Gates-MacGinitie:		3.516	2.416	1.416	.427	2.783	.35	.106
Vocabulary								
Gates-MacGinitie:		3.516	2.4	1.4	.432	2.816	.416	.0805
Comprehension								

Oral Vocabulary. On the Gates-MacGinitie Reading Test an average gain of .08 of a year and .106 of a year respectively on the Vocabulary and Comprehension sections of the tests occurred.

#### Summary

This chapter has presented a detailed analysis of the statistical treatment of the data. There was no evidence in this study to reject the following hypotheses:

Hypothesis I: There is no significant difference between the reading growth of an experimental group of students receiving tutoring based on method preference and that of a comparison group of students receiving instruction determined by teacher preference.

Hypothesis II: There is no significant difference between the post-test vocabulary scores on the Gates-MacGinitie Reading Test of an experimental group of students than those of a comparison group.

Hypothesis III: There is no significant difference between the post-test comprehension scores on the Gates-MacGinitie Reading Test of an experimental group of students and those of a comparison group.

The following hypothesis was rejected:

Hypothesis IV: There is no difference in the rate of reading growth of an experimental group of students prior to instruction based upon method preference and the rate of reading growth during instruction based upon method preference.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### General Summary of the Investigation

This investigation was concerned with attempting to identify a method of instruction to be used with the remedial reader. Two different problems were investigated: 1) determining whether one group of students reading gains would be significantly higher than those of another group of students when one group received instruction based on each individual's method preference and the other group received instruction based upon teacher selection of the method, and 2) determining the rate of reading growth of one group of students when instruction was based upon learning strengths and comparing this rate of growth with previous reading growth.

Twelve children in the Stillwater Public Schools were selected as the experimental group for the study. Ten students in schools in Kay County, Oklahoma, were members of the comparison group. These groups were matched according to reading level based on scores on the Durrell Analysis (26) and the Ray Informal (64), on grade placement, and on intelligence. The two groups were matched by the Gates-MacGinite Reading Test (34), a silent reading test, on a pre-test and post-test measure at the beginning and end of an equivalent thirty-five hours of reading instruction. Initially, a complete case study diagnosis was made on the twelve experimental students. Method of



instruction was selected for each child in the experimental group from the test results of the Ray-McCoy Reading Prognosis Test (65). The comparison groups' instruction in reading was not based on method preference.

Information collected was statistically treated by use of the Mann-Whitney U test and an analysis of covariance where possible. Further analysis of reading growth was made by comparing the rate of reading growth made during tutoring to that amount of growth evidenced during previous years in school. Bleismer's formula was used for this analysis.

#### Conclusions

The results of the study which compared the reading growth of two matched groups where the experimental group received instruction based on method preference and the comparison group received instruction not based on method preference cannot be statistically supported at this time.

The student's scores on the Gates-MacGinitie Reading Tests were treated by the Mann-Whitney U test. The obtained U values indicated that the post-test scores (Vocabulary and Comprehension) were not significantly different from each other.

Analysis of covariance was applied to the Gates-MacGinitie Reading Tests. Pre-test scores were controlled in the treatment of the data in order to determine any significant difference between the two groups. The obtained F values indicated that there was not a significant difference between the two groups on Vocabulary and Comprehension scores when pre-test scores were controlled. The analysis of covariance was

selected to test the validity of the findings of the Mann-Whitney U test.

A summary of the computed U and F values may be seen in Table VIII.

TABLE VIII

A SUMMARY OF COMPUTED U AND F VALUES RESULTING FROM THE MANN-WHITNEY U TEST AND THE ANALYSIS OF COVARIANCE ON THE SAMPLE

	U Value	F Value (1, 19)
Gates-MacGinitie Reading Tests		
Vocabulary (Post-test)	57.0*	3.290**
Comprehension (Post-test)	56.5*	0.270**

\*Null hypothesis cannot be rejected,  $p > .10$ .

\*\*Null hypothesis cannot be rejected,  $p > .05$ .

The Mann-Whitney U test and the analysis of covariance did not support the null hypotheses. Despite the fact that no significant differences were found between groups, the Ray-McCoy Reading Prognosis Test might still be an adequate indicator of method preference. A replication of this study should include a complete matching on all individual pre- and post-tests administered for the experimental and comparison groups in order to determine statistical significance. On the basis of one test, the Gates-MacGinitie (pre and post matching),

not enough data was collected to test the null hypothesis; other data indicated positive and significant gains for the experimental group. The small sample might have also limited the thorough testing of the hypotheses. It is recommended that this study be replicated using a larger population.

Bleisner's formula for evaluating skill improvement in terms of past performance was used, and it supported the theory that significant reading growth when compared to previous reading growth would occur when instruction was based on method preference.

On the basis of Bleisner's formula, one might conclude that reading growth did occur. Although the growth was not supported by the statistical tests, it was evidenced by use of the Bleisner formula which indicates the rate of accelerated reading growth, however small. A probable cause for no statistical difference was the inadequate matching of pre-post tests for both groups. One might also conclude from the results indicated by use of the Bleisner formula that the Ray-McCoy Reading Prognosis Test can quickly determine the methodology of reading instruction to be used with the child.

#### Implications and Recommendations

The results of this investigation emphasize the great need for further research in the area of reading disability and method preference. It is recommended that this study be replicated to include the following expansion of design: 1) having both experimental and comparison groups matched on criterion referenced tests rather than on normative referenced tests, 2) increasing the population size in order to utilize a stronger test of significance, and 3) increasing the

duration of instruction beyond thirty-five hours of instruction.

#### Concluding Statement

This research has been exploratory in nature. Methods preference may in effect eliminate reading disability. Although this research does not support the use of a methods preference test for the determination of instructional procedure, the writer feels that such a test may eventually be used to identify the method of instruction best suited for the child. Problems of controlling nontutoring experiences of the groups, problems related to the duration of the tutoring, and problems related to the instruments involved make generalizing from this study difficult. This study was intended to deepen knowledge in the area of the disabled reader and to give some insight as to the factors relating to the child's inability to read. In this way, it is hoped this investigation will serve a useful purpose.

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VITA

Betty Kalscheuer Morgans

Candidate for the Degree of

Doctor of Education

Thesis: MEASURING READING GROWTH BASED ON METHOD PREFERENCE

Major Field: Elementary Education

Biographical:

Personal Data: Born at Sherman, Texas, December 9, 1938, the daughter of Mr. and Mrs. Hans A. Kalscheuer.

Education: Attended grade and high school in McGregor, Texas. Graduated from McGregor High School in 1957; received Bachelor of Science in Music Education from Texas Lutheran College, Seguin, Texas, in May, 1961; received the Master of Science Degree in Reading from Oklahoma State University in August, 1967; completed requirements for the Doctor of Education Degree in Elementary Education from Oklahoma State University at Stillwater, Oklahoma, in May, 1971.

Professional Experience: Taught first through sixth grades and special education classes public school music at San Jacinto Elementary School, Galveston, Texas, 1961-1963; taught first through sixth grades and primary and intermediate special education classes public school music at Jones Elementary and Washington Elementary, Springdale, Arkansas, 1963-1965; taught elementary through junior high public school music, high school glee club, third, seventh and eighth grade reading at Morrison Public Schools, Morrison, Oklahoma, 1965-1966. Taught college reading improvement course, fall semester, 1966; worked in the Reading Clinic at Oklahoma State University, 1966-1969; taught Reading Workshop in Remedial Reading at the University of Arkansas at Little Rock, August, 1970.

Recipient of NDEA Fellowship, 1966-1969.