INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeeb Road
Ann Arbor, Michigan 48106

Downloaded from SHAREOK. Persistent Handle URL: https://hdl.handle.net/11244/4441

7817922

WAAG, SUELLEN
DIFFERENCES IN RESPONSES OF HEARING IMPAIRED CHILDREN TO THE PENCIL-PAPER AND OBJECT FORMS OF THE LEE-CLARK READING READINESS TEST.

THE UNIVERSITY OF OKLAHOMA, PH.D., 1978

University Microfilms International 300 N. ZEEB ROAD, ANN ARBOR, MI 48106

THE UNIVERSITY OF OKLAHOMA

GRADUATE COLLEGE

DIFFERENCES IN RESPONSES OF HEARING IMPAIRED CHILDREN TO THE PENCIL-PAPER AND OBJECT FORMS OF THE LEE-CLARK READING READINESS TEST

A DISSERTATION

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

DOCTOR OF PHILOSOPHY

BY

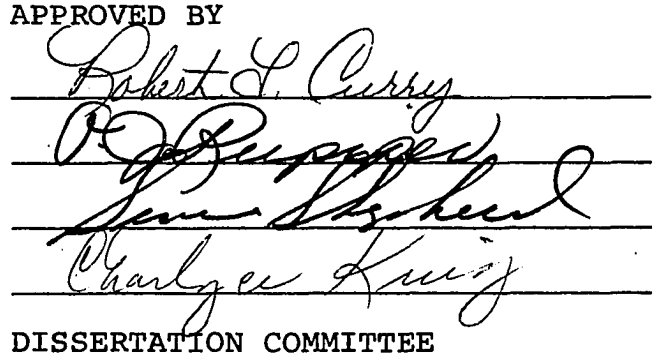
SUELLEN WAAG

Norman, Oklahoma

1978

DIFFERENCES IN RESPONSES OF HEARING IMPAIRED CHILDREN TO THE PENCIL-PAPER AND OBJECT FORMS OF THE LEE-CLARK READING READINESS TEST

APPROVED BY



DISSERTATION COMMITTEE

ACKNOWLEDGMENTS

It is with gratitude that I thank those people who assisted me with this study and the degree program. Feelings of appreciation and affection must be expressed to Dr. Robert L. Curry, chairman of the doctoral committee. He offered not only academic guidance but also support and encouragement when they were most needed on this study and throughout the doctoral program. Dr. Omer Rupiper also offered advice, support and encouragement throughout the program. His assistance is gratefully acknowledged. Appreciation is also extended to Dr. Gene Shepherd and Dr. John Pulliam for their advice and support.

Gratitude is expressed to the administration and teachers in the Moore Public Schools, Putnam City Schools, Oklahoma City Public Schools, Tulsa Public Schools, Jane Brooks School and the University of Oklahoma Department of Communication Disorders for their efforts on my behalf. A very special thanks to those children who labored with me to provide the data for this study.

My warmest feelings of love and affection are expressed to my sister, Harriet, and my mother, Lucille, who had faith in me and gave me confidence. A loving special thanks is expressed to Jeanette Wilson, a beautiful and exceptional child, who first introduced me to the world of the hearing impaired. She offered inspiration that can never be adequately repaid.

For my husband, Kurt, there must be more than acknowledgment. He provided not only the financial support necessary to allow me to pursue this degree, he also offered the psychological support I so often needed. Large quantities of my time and effort went into the doctoral program, but he is the reason I was able to complete it. With gratitude, love and affection, this study is dedicated to my best friend, W. Kurt Waag.

TABLE OF CONTENTS

		Page
LIST OF TABLES		vi
CHAPTER		
I.	INTRODUCTION	1
	Statement of the Problem Purpose of the Study Hypothesis Definitions Limitations of the Study Assumptions	
II.	REVIEW OF THE RELATED LITERATURE	9
	Reading and Readiness Readiness Tests as Predictors of Reading Achievement Sex Differences and Reading Readiness Concrete Examples and Beginning Reading Form of Presentation of Reading Readiness Tests Language and Reading Reading Achievement of the Hearing Impaired Methods of Instruction of the Hearing Impaired Summary	
III.	METHOD AND PROCEDURE	40
	Design of the Study Subject Selection Instruments Procedures	
IV.	ANALYSIS AND INTERPRETATION OF DATA. . .	46
V.	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	53
	Summary Conclusions Recommendations	
BIBLIOGRAPHY		56
APPENDICES		62

LIST OF TABLES

Table		Page
1	Pencil-Paper and Object Form Total Raw Scores from the Lee-Clark Reading Readiness Test for Moderate Hearing Loss Subjects	47
2	Pencil-Paper and Object Form Total Raw Scores from the Lee-Clark Reading Readiness Test for Severe Hearing Loss Subjects	48
3	Pencil-Paper and Object Form Total Raw Scores from the Lee-Clark Reading Readiness Test for Profound Hearing Loss Subjects	49
4	Means and Standard Deviations of Male Subjects' Scores on Pencil-Paper and Object Forms of the Lee-Clark Reading Readiness Test	50
5	Means and Standard Deviations of Female Subjects' Scores on Pencil-Paper and Object Forms of the Lee-Clark Reading Readiness Test.	50
6	Analysis of Variance of Pencil-Paper - Object Form Test Performance Scores of Three Groups by Subjects by Gender .	52

DIFFERENCES IN RESPONSES OF HEARING IMPAIRED CHILDREN TO THE PENCIL-PAPER AND OBJECT FORMS OF THE LEE-CLARK READING READINESS TEST

CHAPTER I

INTRODUCTION

In most public and private schools, children become involved in the formalized reading process toward the end of kindergarten or at the very beginning of first grade. Children in these age ranges vary greatly in size, intellectual and emotional maturity, experiences, verbal facility and ability. For this reason, they bring with them to the formalized reading program a wide variety of skills. Research has demonstrated that many of these children will fail to make satisfactory progress in learning to read (Learner, 1971).

Piaget and others stressed the important fact that children do not possess a miniature version of the adult mind that is primarily less informed. The child does possess a mind that is different, lacking some abilities

that adults quite readily take for granted. In order for a child to reach the cognitive level of the adult, he must pass through basic stages of development. There are those, as Boney (1961), who accept this developmental process but suggest the best way to determine if a child is ready for the reading process is to simply commence instruction. If the child is successful, continue instruction. If the child is not successful, the teacher should discontinue instruction and begin again in several weeks following this procedure until the child does achieve success. Though not stated, the idea appears to be that some maturation will take place in the interim and the child will then be prepared to begin reading. To most teachers, this built-in failure for children who are not ready to read is obvious. Unfortunately, according to Durkin (1970), this method of evaluating reading readiness is still used within some classrooms. "With some children, a particular opportunity will result in reading ability, and so, quite obviously, these children were ready. With others, however, the same opportunity will not 'take'" (p. 524). This method of evaluation of reading readiness is done at the expense of the child's positive view of his ability to learn to read.

Generally, learning theorists agree that children learn new experiences based on past ones. This implies that our learning experiences organize into some patterns based on all prior experiences. It becomes important then

to evaluate what experiences these children have and build on these in order to establish a set of reading readiness skills. Spache (1977) categorized reading readiness skills into five large areas that are in general agreement with many reading specialists. These areas include: development of language skills in speaking and listening, motor development, auditory and visual discrimination, ability to attend and concentrate on activities, ability to work independently or in groups. Before a child is exposed to formalized reading, it is necessary to evaluate his acquisition of these prereading skills.

Reading readiness tests can assist the teacher in identifying children who have acquired the necessary related skills in order to begin reading. This evaluation allows the teacher to set appropriate goals for the individual children and provide a sound beginning reading program. Typical reading readiness tests are group administered pencil-paper tests made with various combinations of subtests. Poor scores on one section of a reading readiness test can produce a low total score. A low composite score does not necessarily demonstrate a lack of readiness to learn to read, but could suggest the possibility that the child was unable to deal for some, or many, reasons with that particular task.

In 1975, Exendine conducted a study using the Lee-Clark Reading Readiness Test. In this study, 210 children were administered the pencil-paper form of the Lee-Clark Reading Readiness Test and an object form of the same test. The object form was made to match the pencil-paper form in detail though on a larger scale. The object forms were made of materials that provided a three-dimensional representation of each test item. Exendine's findings indicated that with her research group there were statistically significant differences between the mean scores for each test form with the object form providing higher scores. Communication about this testing procedure from the International Reading Association states: "This study is very interesting and useful. It could be a breakthrough in the reliance upon standardized testing." (Appendix A) Exendine's study, however, was limited to only those children with normal hearing.

According to Witty, Freeland and Grotberg (1966), hearing impaired children must depend primarily on concrete examples in learning. These children are generally deficient in language development and do not have a background of concepts comparable to that of hearing children. When teaching these children to read, the problem of their hearing loss is sometimes complicated by personality, home situation, early reading experiences and failures, school environment, physical factors and mental health (Rudloss, 1966). Whether reading difficulties of the hearing im-

paired are the result of one or a combination of problems as these, a defect in hearing is known to cause a marked delay in acquiring good reading skills (Chall, 1967). The amount of hearing loss sufficiently great to interfere with learning is unfortunately, not yet known though it has been demonstrated again and again that children with hearing impairment are behind hearing children in reading achievement. (McGinnis, 1953; Land and Bake, 1976)

Since some evidence exists which indicates that hearing impaired children are better able to comprehend the concrete due to their heavy dependence on visual analysis (Karlson, 1965), it is important to examine the difference in their responses on a pencil-paper form of a reading readiness test versus an object form of the same testing instrument. The assumption here is that the hearing impaired child might be limited in providing answers to some questions on some tests due to the presentation of materials rather than lack of knowledge of the appropriate response.

Statement of the Problem

The problem was to determine whether there were statistically significant differences in mean scores among hearing impaired children on the Lee-Clark Reading Readiness Test when presented in pencil-paper form and an object form of the same test.

Purpose of the Study

The purpose of using two forms of this test was to determine whether hearing impaired children can more easily demonstrate their reading readiness skills through an object form test rather than a pencil-paper form. This study investigated the traditional assumption that pencil-paper forms of testing materials are the most satisfactory method of determining reading readiness skills.

Hypothesis

There is no statistically significant difference in mean scores between hearing impaired children on either form of the Lee-Clark Reading Readiness Test by sex and hearing loss.

Definitions

Pencil-Paper form: the traditional test booklet of the Lee-Clark Reading Readiness Test (1962 Revision) in two-dimensional form.

Object form: three-dimensional representation of each item of the traditional form (1962 Revision) made to a scale several times larger than the original form.

Moderate hearing impairment: a hearing loss in the 40-60 decibel range.

Severe hearing impairment: a hearing loss in the 60-80 decibel range.

Profound hearing impairment: a hearing loss in the 80+ decibel range.

Limitations of the Study

1. This study is limited to hearing impaired children in the moderate, severe and profound ranges. Ranges will be determined from school records.

2. Subject will be selected based on teacher identification of their readiness for reading and not on their chronological age.

3. The measuring instruments will be limited to the Lee-Clark Reading Readiness Test (1962 Revision) and an object form of this instrument prepared to scale.

4. The independent variables controlled in the study are the students' sex and hearing impairment level.

5. The subjects will be students in public or private programs for the hearing impaired in the State of Oklahoma.

Measuring Instruments

Two forms of the Lee-Clark Reading Readiness Test will be the instruments used to evaluate the children's reading readiness skills. The test contains four subtests which evaluate ability to match symbols, select appropriate letter symbols, vocabulary and following directions and identification of letter and word symbols. The test-retest reliability coefficient of the Lee-Clark Reading Readiness Test is .92 for the entire test. Reliability never falls below .83 on any of the subtests. The validity of this instrument has been measured against success at the end of the school year in reading. A coefficient of .88 was obtained (Buros, 1972).

The test was constructed in a three dimensional object form. Objects were made to scale of the eight page reading readiness test and color is consistent between the two forms. The letters and figures were made of ceramic and mounted on sheets of 22 inch by 33 inch white painted masonite.

Assumptions

1. Readiness to read can be measured with a reading readiness instrument.

2. The Lee-Clark Reading Readiness Test provides scores that are valid and reliable measures of reading readiness.

3. The object form representation of the Lee-Clark Reading Readiness Test provides valid and reliable scores.

4. The subjects participating in this study are representative of hearing impaired beginning readers.

CHAPTER II

REVIEW OF RELATED LITERATURE

Reading and Readiness

Society places a wide variety of expectations on our schools. The school must provide experiences in social interaction, discipline for the unruly, sex education and hot lunches. The subject of school responsibility comes up often and produces many different opinions. If one looks, however, for the overall most common expectation placed on the school, it is that the school will produce children who can read. This is not only society's goal, but the goal of parents, administrators and particularly teachers. The evidence for this is that a large portion of the elementary school day is spent in reading and reading related or language arts activities. From the time children arrive at school in kindergarten, a great quantity of activities are aimed at acquiring reading skills. Educators and parents illustrate to children from the beginning that reading is of utmost importance.

McLuhan (1974) brought to our attention again and again how ours is a technological society where much is learned from nonprint media. While there is truth here, Lerner (1971) provided a message as to why the inability to read is such a debilitating handicap.

> A few generations ago, people managed to get along quite well in the business and social world without the ability to read but this is no longer true. Longer periods of compulsory education, the requirement of diplomas and degrees for jobs, more comprehensive school testing programs, the necessity of filling out application forms and taking licensing examinations--all make life for nonreader uncomfortable and full of closed doors. Indeed, reading is the basic tool for all subjects in school, and failure in a school subject is frequently due to inadequate reading skills. With the increase of automation and computerized technology, there is a demand for trained manpower. Old jobs have become obsolete, and it is predicted that all individuals in every occupational area will have to retrain themselves to prepare for new jobs many times during their work careers. Reading is a key tool for retraining and maintaining employable skills. (p.172)

Jeffrey and Samuals (1970) conducted a study to determine the subskills necessary in order to read. Reading was defined as the ability to independently decode a set of four words. In 1970, Venezky conducted a similar study with the goal to determine which skills were most necessary for successful beginning reading performance. The two studies concluded that the minimum readiness skills needed for beginning reading were: 1) left-to-right visual scan; 2) grapheme perception; 3) grapheme-phoneme relationship; 4) phonome blending. As Rude (1973) determined, however, not all reading readiness test authors agree as to what constitutes read-

ing readiness skills. There are some investigations underway and some data available to help better understand the reading process (Gibson, 1970). In the interim, however, educators are left to define reading readiness as best they can.

When to begin a child in a formalized reading program is a crucial decision to be made by the classroom teacher. Dechant (1968) contended that a child who is started in a reading program before he is ready continues to fall farther and farther behind his classmates as well as developing a serious aversion to reading in general. "He actually learns not to read. This is quite different and far more serious than not learning to read." (p. 65) Bond and Tinker (1973) went even farther in their predictions of the problems that can develop if a child is placed in a reading program before he is ready. If the child does not possess the necessary reading skills to contend with assignments, frustration, feelings of inferiority and insecurity are likely to develop. Children in these situations often develop an indifference to reading. Dislike for reading and those connected with it can occasionally lead to a situation where the child refuses to participate in any reading related activity.

A current educational concern has then become to determine when young children are ready to learn to read. Screening and assessment programs for determining reading readiness tests are the basis for most screening programs (Monteith, 1976).

In 1972, Maitland, Nadeau and Nadeau conducted a survey of sample school districts in the United States regarding their screening of pupils entering the first grade. The authors had observed increased emphasis on early detection of possible reading problems based on the listings of reading readiness tests cited by Buros in the 1972 Seventh Mental Measurement Yearbook. There had been only eight reading readiness tests mentioned in the Sixth Mental Measurement Yearbook (1965) while twenty-nine appeared in the 1972 version. Of the almost 1,000 school districts surveyed in this study, 581 returned the questionnaire sent by the researchers. Fifty-five percent of those school districts responding to the questionnaire used some form of reading readiness evaluation. Of this group who used a measurement evaluation, ninety percent used some type of reading readiness test for all or part of their evaluation.

Hillerich (1974) stated that these identification procedures (use of readiness tests) are successful attempts at predicting future reading failure. Those children who are identified by the reading readiness instruments as poor risks often demonstrate failure on later reading achievement batteries.

Readiness Tests as Predictors of Reading Achievement

Classroom teachers are expected to follow the common practice of not introducing formal reading instruction until children are judged ready. It is imperative, then, that the teacher have reliable and valid methods of determining children's readiness for reading. This process of evaluating reading readiness takes on even more importance when the reading readiness instrument can be counted on to provide some reasonable prediction of future reading success.

A study done by Lowell (1971) provided evidence of the predictive validity of several factors of reading readiness at two stages of first grade, preprimer level and end of first grade. The Murphy-Durrell Reading Readiness Analysis (1965), the Lee-Clark Reading Readiness Test (1962 Revision), the Tests of General Ability (Form A, 1960), and the visual subtest of the Murphy-Durrell Diagnostic Reading Readiness Test (1949) were instruments Lowell used to measure reading readiness factors. Reading achievement was measured at the preprimer level by a word recognition test based on seventy-eight words present in the four preprimers (Harper Row Basal Reading Series) used for the instruction of all subjects participating in the study (N=200). The Diagnostic Reading Scales was used to measure reading achievement at the conclusion of first grade. The subjects were grouped for reading instruction based on teacher judgment and the results of the reading readiness tests.

The reading readiness subtests were categorized into four factors: 1) Knowledge of Alphabet Letter Names; 2) Word Learning Ability; 3) Mental Ability--Reasoning; and 4) Visual Discrimination of Letters and Words. Coefficients of correlation were determined at the end of the preprimer instructional level between readiness test scores and word recognition achievement. Knowledge of Alphabet Letter Names emerged as the best single predictor of those used in this study with correlation coefficient of .65. Another factor, Word Learning Ability, was of borderline value (r=.51). The remaining factors Mental Ability--Reasoning and Visual Discrimination of Letters and Words appeared to have much less predictive value (r=.36 and r=.35 respectively). The various factors were then considered in combination and the Multiple R demonstrated an increase in predictive value. Knowledge of Alphabet Letter Names and Word Learning Ability in combination increased to .67, adding Mental Ability--Reasoning to the first two factor scores increased the correlation to .68. When the fourth factor, Visual Discrimination of Letters and Words, was added in combination with the first three factors the correlation increased to .69. The conclusions of the study were that though the combinations were statistically significant, prediction from the first factor, Knowledge of Alphabet Letter Names, is almost as good of a predictor as the combination. The small increase given to the predictive value by the in-

clusion of all subtest scores does not merit the time necessary to administer all subtests.

The patterns found from the end of the first grade assessment were primarily the same as the preprimer findings. Knowledge of Alphabet Letter Names had a correlation with achievement testing of .63. Correlations of Word Learning Ability, Mental Ability--Reasoning and Visual Discrimination of letters and Words were consistent with preprimer level findings. Multiple R correlations indicated an increase of prediction ability to .69 using all factors in combination.

The overall conclusions for the study were that of the four factors evaluated, only Knowledge of Alphabet Letter Names is desirable for inclusion in reading readiness evaluations. It appears that skills involved in knowing letters by names includes auditory and visual discrimination in an integrated process that is more valuable in predicting reading success than discrete measures of auditory and visual discrimination.

Thackray's study of 1964 was done in Britain and so the measures of reading achievement are not as familiar. The conclusions, however, supported those of Lowell. The measures used were the Harrison-Stroud Reading Readiness Profiles (anglicised by the researcher) and the Southgate Group Reading Test. The reading readiness test was administered during the second term of the school year and the achievement test was administered at the end of five more school terms.

The highest correlation between reading readiness skills and the Southgate Group Reading Test score was with the visual discrimination subtest (r=.50) and the auditory discrimination subtest (r=.52). The combination of these subtest scores gave an overall correlation with achievement of .59. Also important to note is that this study determined that on several subtests of the reading readiness instrument, as well as overall scores, girls performed significantly better than boys when mean scores were used for comparison. The girls also surpassed the boys with significantly higher total mean scores on the reading achievement instrument.

Kapelis (1975) did a study to determine if reading readiness screening devices could predict future reading failure. The instruments used were the Meeting School Screening Test, the Slingerland Prereading Screening Procedures and teacher judgments for forecasting reading achievement at the end of the first grade. The Metropolitan Achievement Test (MAT) was used to determine end-of-year reading achievement. Of the 100 subjects tested in this study, fourteen failed to reach a 1.7 reading grade level which was the appropriate level for the time of the year the MAT was administered. Ten of these students had fallen in the high-risk category based on reading readiness scores, the remaining four had been in the moderate-risk category. All children who had scored above the sixtieth

percentile on reading readiness measures read at a 1.7 grade or higher as measured by the converted total score on the MAT. Fifteen children in the sample who had been identified as high-risk for achievement by reading readiness measures performed satisfactorily on the end-of-year reading tests. All but one, however, read at the lowest acceptable passing level.

Bilka (1972) did a study to evaluate the predictive value of other reading readiness tests. The reading readiness measures used were the Metropolitan Readiness Test, Form A (1964 Edition) and the Murphy-Durrell Diagnostic Reading Readiness Test (1964 Edition). Three other instruments were also administered to the subjects participating in the study: Banham Checklist - Maturity Level for School Interest (1960), Thurstone-Jeffery Identical Forms and Pattern Copying Test and the intelligence measure of the Pintner-Cunningham Primary Test, Form A (1964). The Stanford Achievement Test was used to assess reading achievement at the end of the first, second and third grades. The sample consisted of 353 children enrolled in the Pittsburgh Public Schools.

In order to analyze the data using the canonical model, the scores from the six measures were analyzed in two sets. Set I consisted of the Murphy-Durrell Reading Readiness Test total score, Thurstone-Jeffery Identical Forms Test and the Thurstone-Jeffery Pattern Copying Test. Set II included the

Metropolitan Readiness Test, the intelligence section of the Pintner-Cunningham Primary Test and the Banham Checklist. Canonical correlations using total test scores revealed statistically significant relationships at the .001 level between the predictor variables and the criterion of reading achievement at each grade level. Set I had correlations with achievement of .63, .64 and .60 for grades one, two and three. Set II had correlations of .56, .53 and .54 for grades one, two and three respectively. The factor loadings indicated that the Murphy-Durrell Reading Readiness Test and the Metropolitan Reading Test were the strongest contributors to prediction. They provided .98 and .97 respectively in grade one, .97 and .92 at grade two and .96 and .97 at grade three. Tests of significance demonstrated correlations did not drop significantly from grade to grade. The ability, then, to predict reading achievement based on those reading readiness scores remains nearly as accurate for grade three as for grade one.

Clutts did a study in 1969 using 235 first grade subjects in Fairbanks, Alaska. The instruments used were a teacher rating scale, the Metropolitan Readiness Test and the Stanford Achievement Test. The purpose of the study was to determine which readiness evaluation was the best predictor of future reading achievement. Pearson product-moment coefficients of correlation between predictor variables and criterion variable were computed. The teacher rating scale

produced a .67 correlation with the achievement measure, while the Metropolitan Readiness Test produced a correlation of .74. Multiple R was utilized to determine the relative predictive values of the teacher scale and the Metropolitan Readiness Test in combination. Clutts concluded that a combination of reading readiness scores and teacher evaluation was a better predictor of future reading achievement than either measurement alone.

Intelligence tests and reading readiness tests are both often used in early school years to predict future reading success. In a study done by Hopkins and Sitkei in 1969, first graders (N=157) were administered the Lee-Clark Reading Readiness Test (1962 Revision) and the California Test of Mental Maturity (1957) with the CTMM always being administered first. Performance on these two measures was correlated with two independent criteria that were obtained at the end of the first grade year. The end of the year criteria were scores obtained from a standardized reading test, the Lee-Clark Reading Test and a rating scale completed by teachers. The predictive validity coefficients for the reading readiness test (r=.61) proved greater than the intelligence measure (r=.54) for both end-of-year measures though the difference was not significant. When IQ scores were added to reading readiness scores, the multiple correlation increased to .67. By further adding father's occupation as well as sex and age of the child, the multiple R

increased to .68, failing to significantly increase the accuracy of prediction of future reading achievement.

The conclusion of the Hopkins and Sitkei study was that the reading readiness measure was at least as good a predictor of reading performance as the intelligence tests. The readiness test was concluded to be the more desirable alternative as this type of testing requires less time and expense, is more easily interpreted and the effects of improper interpretation, while damaging, are less serious to the student.

The conclusions of Hopkins and Sitkei that reading readiness measures are as good a predictor of future reading success as intelligence measures is consistent with the Mattick (1963) study using the Metropolitan Readiness Test and the Lorge-Thorndike Intelligence Test. The Hahn (1966) study which compared the Murphy-Durrell Reading Readiness Analysis and the Metropolitan Readiness Test with the Pintner-Cunningham General Ability Test also reached similar conclusions.

Livo (1970) did a study to determine which of a number of instruments could best predict future reading achievement. The instruments used were the Wechsler Preschool and Primary Scale of Intelligence, the Sartain Reading Readiness Test and an oral language sample. The Metropolitan Achievement Test was used to measure midyear success in reading.

Reading achievement was categorized into four factors: 1) Word Knowledge; 2) Word Discrimination; 3) Reading (Comprehension) and 4) Total Reading. Livo found, as have others, that intelligence and reading are correlated. The overall correlation between reading achievement and intelligence was .45. The relationship, however, of intelligence with some factors (Word Discrimination) showed a correlation of .70. The readiness test alone offered a correlation of r=.60 with the total reading achievement score. The total reading readiness score and the Full Scale Intelligence Quotient proved to be the best combination for prediction success in Word Knowledge and Word Discrimination; multiple R equaled .76 and .77, respectively. The conclusions of this study were that for total reading achievement, a good reading readiness assessment is essential for accurate prediction. Also, intelligence was shown to be a factor in reading success.

Evaechko, Ollila, Downing and Braun (1973) conducted a study focused on the use of reading readiness tests as predictors of future reading success. Their concern was to include some traditional forms of reading readiness measurement as well as some of their own choosing. The researchers selected thirteen subtests to complete their own version of a reading readiness test. Kuder-Richardson Reliability Coefficients, to determine internal consistency, were computed on their instrument to provide an index of reliability.

KR-20 computations ranged from a low of .50 to a high of .94. The lower reliability coefficients were on subtests dealing with syntax (.52) and morphology (.50). The higher coefficients were on the subtests that appear on most popular reading readiness tests: letter recognition (.94) and word match (.77). The final conclusions of these researchers agreed with many pieces of research, reading readiness testing is an important procedure. The information derived from this testing can be used to reasonably predict the future achievement of beginning readers.

Sex Differences and Reading Readiness

According to Moccoby (1966), through the preschool years girls exceed boys in most aspects of verbal performance. Girls generally speak earlier, use more complete sentence structure and are more fluent at an earlier age. Girls learn to read earlier and there are significantly more boys who need remedial assistance in reading throughout their school careers. Research indicates that by about age ten the reading achievement of boys more closely resembles that of girls. Girls, however, continue to surpass boys in tests of grammar and word meaning throughout the school years.

Gates (1961) conducted an extensive study on reading achievement of children from grades one through eight (N=13,000). The Gates Reading Survey was used which included three factors: 1) Speed of Reading; 2) Reading

Vocabulary; 3) Level of Comprehension. The test was given in twelve schools in ten states and students were randomly selected for participation. Mean raw scores were used for comparison and the girls in each grade level group obtained consistently higher scores. The differences in mean scores for each grade level group ranged from 1.29 to 1.59 for Speed, 2.2 to 2.7 for Vocabulary and 1.0 to 1.4 for Comprehension. The mean score differences within groups was significant except at the second grade level. Grade two data were omitted from the remainder of the study.

To further evaluate the differences found, raw scores were converted into grade level norms. On the Speed and Vocabulary scores combined, the girls were superior to the boys by 0.2 at Grade Three and increased to being superior by 0.4 by Grade Eight. Grade norms for the Comprehension scores showed the girls to be superior by 0.2 in Grades Three and Four, by 0.3 in Grades Five and Six and by 0.2 in Grades Seven and Eight. The average for all grades (excluding Grade Two) and all tests demonstrated a superiority of slightly less than 0.2 for the girls.

Dwyer (1973) did an evaluation of the theories on sex differences in reading. She arrived at the same basic conclusions as did Gates. Girls characteristically learn to read earlier and score higher on standardized reading tests. There is a wealth of research which indicates that on reading

readiness tests and reading achievement tests, girls generally score significantly higher than boys on these standardized instruments. (Spache, 1966; Weintraub, 1966, Stauffer and Durkin, 1968; and Stanchfield, 1971).

Balow (1963) did a study to determine if high readiness scores appeared to predict higher reading achievement. He used a randomly selected sample of 302 first grade children. Each child was administered the Gates Reading Readiness Test and later in the school year, the Gates Primary Reading Test. The mean raw score for girls on the readiness evaluation was 64.3 compared to a mean of 58.6 for the boys. In the later testing of reading achievement, girls again produced mean raw scores superior to the boys. Balow points out that these findings are nothing new but provide support to prior research. His conclusions, while not determining cause, demonstrate that those children, boys or girls, who scored higher on readiness measures consistently scored higher on later reading achievement assessments.

Concrete Examples and Beginning Reading

When Getman addressed the Claremont Reading Conference in 1976, his message concerned preparing our children to be effective readers. Getman's main point was that children must experience actual motor participation in reading related tasks to maximize their learning. The child needs to be more involved than simply passively observing a picture. The

child needs to interact with real objects to increase his ability to internalize what he is expected to learn. Active participation with concrete objects is the beginning so that later a child can effectively deal with abstract concepts.

During the period of transition from preoperational functioning to concrete operational functioning, the child is asked to undertake the highly complex task of learning to read. A child is in the concrete operational stage of development from approximately ages seven to eleven. In this period, logical problem solving abilities expand quickly. The child, however, still operates best with concrete objects during his transition from preoperational to concrete operational. The child's mind at this stage is really quite different from the adult, lacking some abilities that adults take for granted. According to Piaget, a teacher can train a child at this stage of transition in a consistency of volume exercise. After much instruction and example, the child can agree that the tall glass holds the same amount of liquid as the short one. Pour one glass of liquid into a huge container where the liquid barely covers the bottom, however, and the child reverts to his prior misconceptions. Until the child has reached the necessary level of cognitive development, he cannot effectively deal with this type of consistency of volume task. (Lavatelli, 1970; Roberts, 1976)

In beginning reading instruction, teachers ask children to use mental operations that allow them to actively interact

and manipulate their own environment. Educators ask children to form systems and assimilate concepts that are quite complicated. As an example, children must understand the class properties of letters such as "a". The letter receives different pronunciations in many words, there is certainly no consistent one-to-one relationship with many letters. The child must form classes and subclasses and then make associations between these classes. These tasks require logical thinking and until appropriate levels of cognitive development are reached, some beginning reading tasks are beyond the capabilities of some children. (Elking, 1974; Waller, 1977)

Mason (1975) divides the process of learning to read into stages. The first stage, pre-literate, is the period when children are acquiring beginning reading skills. The reading of children in this stage is strongly bound by familiarity and context. Mason did a study to ascertain the kinds of words children learn first. According to questionnaires completed by parents, children begin by reading food labels and street and store signs. These same words are not recognized in books but only in real situations. The words the children read are, in fact, pictures and can be recognized only in familiar context. Words at this stage, according to Mason, are objects and not symbols. Once the child can handle symbols, physical and environmental clues are no longer important and the child moves into another stage of reading.

Form of Presentation of Reading Readiness Tests

In 1974, Webb completed a study to determine if method of presentation of reading readiness materials made a significant difference in performance. She used two forms of the Metropolitan Readiness Test (Form A) to test her randomly selected sample of first graders (N=180). One form of the test was the traditional pencil-paper form of the Metropolitan Readiness Test, the other form was a three dimensional mock-up of the same testing instrument. The subjects were categorized into groups by sex, and by socioeconomic status. The status was determined by Questionnaire By Which Socioeconomic Information Was Secured From Parents.

Webb found statistically significant differences between total scores across all socioeconomic levels. The subjects performed significantly better on the mock-up form. For the upper socioeconomic level the pencil-paper total score mean was 66.71 while the mean on the mock-up for the same group was 73.47. The t-value was 8.204 which was significant at the .05 level. The middle socioeconomic level had a pencil-paper total score mean of 69.54 and a mock-up total score mean of 75.48. The t-value was 5.198 and also was significant at the .05 level. The lower socioeconomic level had a total score mean on the pencil-paper form of 71.97 and a total score mean of 80.07 on the mock-up version. This produced a t-value of 7.358 and was significant at the .05 level.

When comparing total score means of all males on both forms of the instrument, their scores were significantly higher on the mock-up presentation. This was also true of female scores. Females consistently attained higher scores than males on both forms of the readiness test except the middle socioeconomic status females. They had a slightly lower total score mean than the males on the mock-up form. Webb concluded that the presentation of testing materials in a three dimensional form gives subjects an advantage over pencil-paper presentations.

Exendine (1975) did a study using two forms of the Lee-Clark Reading Readiness Test (1962 Revision). She used the traditional pencil-paper form of the instrument and then a three dimensional object form of the same test material. Her sample included 210 children attending kindergarten in an Oklahoma public school. The Two-Factor Index of Social Position was used to categorize the subjects into lower, middle or upper socioeconomic classes. Thirty-five boys and thirty-five girls were then randomly selected from each socioeconomic class. Comparisons were made between total raw scores on each form of the instrument.

Results of the study indicated that both sexes at each socioeconomic level performed better on the object form than on the pencil-paper form. The lower socioeconomic group demonstrated the greatest difference in scores, 4.27 total points. The second greatest difference was demonstated by

the upper socioeconomic group, 2.70 total points, and the least difference was demonstrated by the middle socioeconomic group, 1.84 total points. The differences of all groups were significant. Across all three socioeconomic groups, the males experienced the greatest increase in overall scores on the object form presentation, 3.42 total points, while the females had an increase of 2.45 total points. Both sexes demonstrated significant gains on the object form presentation. The conclusion of the study was that some students are quite possibly limited in performance on a reading readiness test due to the method of presentation.

Hutsell (1977) did a study using 210 first graders attending another Oklahoma public school district. The Four Factor Index of Social Position was used to classify children into three socioeconomic groups: lower, middle and upper. Thirty-five boys and thirty-five girls were randomly selected in each of the three groups. The Lee-Clark Reading Readiness Test was administered in three different presentations to each subject: group pencil-paper form, individual pencil-paper form and individual object form. The testing methods were used on a rotation so that one-third of the children were administered the group pencil-paper form first, one-third were administered the individual pencil-paper form first and one-third were administered the individual object form first. In determining the rotation, children were selected at random from the entire test sample.

The mean and standard deviation were computed for both the group and the individual pencil-paper presentations. The group presentation had a mean of 53.84 and a standard deviation of 8.37. The individual presentation had a mean of 54.93 and a standard deviation of 7.61. The t-value at the .05 level was not significant so group presentation scores were eliminated and further comparison of data was computed only on the individual presentations of both test forms.

The conclusions of the study were that both boys and girls did somewhat better on the pencil-paper presentation of the Lee-Clark Reading Readiness Test. Also, each socio-economic group performed somewhat better on the pencil-paper presentation. Though there were differences and the scores on the pencil-paper presentation were somewhat higher, no statistically significant differences were obtained.

Language and Reading

Fontenot (1974) presented a model which identifies the basic prerequisites for the development of reading skills and suggests a heirarchy of acquisition. This model is in agreement with many other reading experts. The prerequisites in order are: 1) language development and verbal meaning; 2) perceptual skills; 3) attending skills; 4) listening skills; 5) thinking skills. The language and verbal meaning that each learner acquires and the degree of its equivalence

with school language and verbal meaning will determine how easily or slowly the child learns to read.

> Learning studies of hearing children have brought to light some sobering facts: These children have mastered a great deal of the structure of English, including basic sentence patterns and inflections, by the age of three; their language is fairly stable by age six and language habits are extremely difficult to modify after the age of puberty . . . Children, in short, learn the language of their environment. Deaf children, on the other hand, have specific areas of weakness in their grasp of English. They omit necessary words and use wrong words. These errors comprise approximately half of their syntax errors. They use sentence structures simpler and more rigid than those of hearing children, those of 17-year-old deaf students comparable to those of 8-year-old hearing children. They learn lexical meanings more easily than structural meanings indicating their inability to deduce meaning from context. (p. 3 and 4; Gustason, Pfetzing and Zawolkow, 1975)

The language learning problems of hearing impaired children and their effect have long been recognized. Teachers have tried a wide variety of different procedures to teach hearing impaired children, but national surveys continue to report seriously retarded achievement for these children expecially in reading (Lane and Bake, 1976). The reading achievement of the deaf is very low overall. This signifies language difficulties as well as reading difficulties (Furth, 1966).

Piaget (1969) states that language plays only a very small role in the sensorimotor stage of development. Best and Roberts (1976) did a study of sixteen deaf children to investigate their progress through the sensorimotor stage

to determine if their development matched that of hearing children. The sample was selected from the subjects attending a preschool program for the hearing impaired. The children were screened for secondary handicaps with the Denver Developmental Screening Test. The only developmental delay evidenced was language, so all were judged to have no secondary handicaps. The sample included ten boys and six girls. The mean hearing loss in the speech ranges for the better ear of each child was 97 db. The subjects were matched with a group of sixteen normal hearing children who established the control group.

The measure used to evaluate all subjects of the study was the Infant Psychological Development Scale (IPDS) which is an instrument based on Piagetian theory and measures sensorimotor development. The t-test was used to evaluate the significance of the differences between scores on the IPDS. It was determined that hearing impaired subjects performed as well on all subtests except the one that measured vocal imitation where they achieved lower scores that were significant at the .01 level. Conclusions were that young hearing impaired children progress normally through the sensorimotor developmental stage. Due, however, to the significant difference in vocal imitation which is controlled by aural input, the results suggest that later development which depends on aural input will also be delayed. This suggestion has been proven by prior research (Pettifor, 1966;

Best, 1973). The research by Best and Roberts indicates that language development and so, in turn, the acquisition of reading skills will be delayed for hearing impaired children.

Reading Achievement of the Hearing Impaired

Wrightstone, Aronow and Muskowitz (1962) did a study using the Metropolitan Achievement Test with over 5,000 deaf students in the United States and Canada. The subjects were from ten to sixteen years old. The results of the test indicated that the average gain in reading over this entire age group was only eight months. The mean reading achievement grade level was 3.5 for the sixteen-year-old subjects.

The Office of Demographic Studies at Gallaudet College published a survey of hearing impaired children using the Stanford Achievement Test. In the age range of eleven to twenty-one years, only twelve percent of the subjects achieved reading scores of fifth grade or better.

Lane and Baker (1974) reviewed the Wrightstone, et al., data and completed another similar study. They tested ten through sixteen-year-old hearing impaired subjects on the Metropolitan Achievement Test. Rather than a single administration of the instrument, however, these researchers conducted a longitudinal study. Lane and Baker used 132 students and tested them on five tests over a four year period. Their conclusions indicate that the average child in their study improved 2.5 grade levels in reading over

the testing period. The mean reading grade level for the fifteen-year-old subjects was 5.8. While this study demonstrated more improvement than the Wrightstone, et al., study would indicate, the hearing impaired children participating in the study still demonstrated a serious delay in reading achievement.

Rudnick, Sterritt and Flax (1967) produced evidence that visual perceptual skills are basic to reading success for hearing children. At the time, there was little information as to the visual perceptual skills of the hearing impaired child. In 1970, Hartung did a study to evaluate visual perceptual skills of beginning hearing impaired readers versus normal hearing beginning readers. The performance of these children on visual perception tasks was then correlated with their reading achievement. The subjects of the study were thirty hearing impaired children with a mean hearing loss greater than 80 db for the speech frequencies, 500-2000 Hz. The hearing impaired subjects were matched in age with thirty hearing children. The ages for the entire group ranged from 7-5 to 9-0. The subjects were exposed to three-letter nonsense syllables (trigrams), some in traditional English letters and some in Greek symbols and two tasks were performed. Task I: identification of a particular symbol. For example, the subjects wrote an "a" when they saw it in a trigram or drew a line on the answer sheet if no "a" was present. For the Greek (Task IA), the

subjects wrote a particular Greek symbol if it was present and drew a line if it was not. Task II: reproduction of English trigrams from memory after brief exposure.

> The variability in the performance of the deaf children and their poor performance on Task II (reproducing trigrams) relative to their hearing peers were two outstanding features of the results of this investigation. Noteworthy also was the finding that both deaf and hearing groups had similar percent correct scores on the identification of the Greek symbols in the Greek trigrams (Task IA); thus it appeared that there was no difference between deaf and hearing subjects in the visual perceptual skill itself. (p. 610)

Reading scores from the Gates-MacGinitie Reading Test, Primary C correlated for the hearing impaired, .55, and for the hearing subjects, .68, with the scores obtained on the task of reproducing trigrams. Hartung concludes that differences in the reproduction of English trigrams are not a real function of visual perceptual skills, but are instead a function of the competence, or lack of it, of dealing with a specific code.

Methods of Instruction for the Hearing Impaired

Schiff and Dytell (1971) conducted a study to determine if hearing children performed significantly better than hearing impaired children in identifying alphabet letters given a tactile presentation. The subjects of the study included 172 hearing impaired children from a state school for the deaf and 121 hearing students from a public school district. The hearing impaired subjects had a minimum

hearing loss of 73 db though most were in the 100 db range. Ages of all subjects ranged from 7-5 to 19-5 years old. The subjects were asked to feel a concealed letter with their index finger and then point out on a list of letters the letter that they felt. The researchers concluded that the ability to identify tactually presented letters accurately improves with age and independently of any specific experience with this method of presentation. The hearing impaired children performed similarly to the hearing control group giving evidence that processing of tactile information about letters is done with equal facility by hearing impaired and hearing children.

Karlsen (1965) quoted figures to support the already known fact that the average reading achievement scores for hearing impaired children upon the completion of high school are dramatically lower than the scores for hearing children. He states that in a sample of hearing impaired children with a mean CA of 17-2, the average reading achievement test scores were: Comprehension--4.4 grade level; Vocabularly--4.2 grade level. The consensus among many experts in the field of deaf education is that at the completion of high school very few deaf children have reading achievement scores that approach the average for hearing students of the same age (Trybus and Karchmer, 1977).

Karlsen has done research on a method of teaching reading that has shown some promise in improving reading skills in hearing impaired children. The technique involves the use of a machine that maximizes the use of the visual mode for instruction. It is a complex program that uses extensive vocabulary, sentence structure, multiple meanings and idioms in the later stages. For the beginning reader some special techniques have been used. The program (HUMID--Honeywell University of Minnesota Instructional Device) developers have color coded some letters so that spelling can remain normal but phonetic consistencies can be noted. Another advantage offered the beginning reader is that letters are introduced in a three-dimensional appearing form.

Karlsen concluded that some equipment revisions were necessary and the need for more research indicated. Based on the improved achievement of four and five-year-olds, however, the HUMID system is the possible beginning of a major contribution in reading education for the hearing impaired.

Hart (1975) demonstrated success with a functional method of teaching reading to the hearing impaired child. These children do not have the background in language with which to associate new ideas. Hart, then, uses such techniques as labeling children's pieces of clothing, storage areas, work tools, artistic creations; thus offering many

direct experiences with language. This not only increases the child's language usage, but gives him a sense of what reading is about. Hart made an important difference between identifying pictures of objects and the use of actual concrete objects. She finds significant differences with greater success, measured by later spontaneous usage of the concepts, by using concrete materials. She emphasizes that educators must continue to find more efficient ways to instruct the hearing impaired in reading skills.

Summary

A goal of educators instructing young children is to teach them effective reading skills. Research indicated that to acquire these reading skills, children must have a number of prerequisite or reading readiness skills. There was some inconsistency in exactly which reading readiness skills are most important; however, there was agreement that such skills as visual and auditory discrimination, knowledge of letter names and attention span are some of the necessary reading readiness skills.

Reading readiness testing as well as intelligence testing have proven to be reasonable predictors of future reading achievement. Readiness testing was often the preferred method of prediction due to its relative ease of administration and interpretation. That prediction of future reading success is necessary is agreed upon by many experts

in the field of reading. The children who are in the high-risk category for reading success must be identified. Early identification can allow for some methods of intervention so that these students do not become reading failures.

Available research indicated that males and females score differently on measurements of reading readiness and reading achievement. This would suggest that when assessing reading readiness and achievement, the scores of males and females should be examined separately as well as collectively.

Some facility with language is necessary if students are to become successful readers. Hearing impaired children are consistently behind their peers in language development as well as reading skills. The methods of reading instruction for the hearing impaired have generally paralleled the methods used for hearing children. There is some research in progress that is seeking to determine more effective methods for teaching reading skills to hearing impaired students. The success of these children in reading achievement, however, continues to be low in comparison to hearing children.

There has been limited research done on the method of presentation of testing materials on reading readiness tests. Of the research that is available, there is some indication that hearing children perform significantly better on a three-dimensional form of a testing measure than they do on the traditional form. There is the possibility, then, that an advantage would be offered as well to hearing impaired students by this alternative method of presentation.

CHAPTER III

METHOD AND PROCEDURE

Design of the Study

The group of children from which the sample was selected was attending five public or private institutions in the Oklahoma City and Tulsa areas. The schools included: Jane Brooks School, Moore Public Schools, Oklahoma City Public Schools, Putnam City Schools, Tulsa Public Schools and the University of Oklahoma Speech and Hearing Clinic. The subjects were all hearing impaired children who were at the threshold of formalized reading. They were categorized into levels of hearing loss: moderate, severe and profound. A random selection was made of those children who proved to be eligible for the study and sixty children were tested. The Lee-Clark Reading Readiness Test was administered individually in two forms to each of the sixty children participating and all testing was done by the researcher. The subjects included ten boys and ten girls in each category of moderate, severe and profound hearing losses. The total raw score obtained on each form of the testing instrument

was used to test the hypothesis of this study. The purpose of the study was to determine if the boys and girls performed differently on either form of the testing instrument.

Subject Selection

As is often true in programs for hearing impaired children, the children in this study were not assigned to any specific grade placement. Any child who was hearing impaired and identified by the classroom teacher, reading specialist or team leader as a beginning reader was eligible for this study. Children with only mild hearing loss were eliminated from the sample for two primary reasons. Research indicated that children with mild loss do not experience the same dependence on concrete examples in learning as their more severely impaired peers due to their increased facility with language (Witty, Freeland and Grotberg, 1966). The language development and reading skills of the mildly hearing impaired child more nearly follow that of the hearing child. Also, there are fewer of these children, of mild loss, in programs for the hearing impaired. Many of these children remain unidentified in regular classrooms.

The hearing loss of each eligible child was determined from a current audiogram present in the child's permanent school record. In compliance with Public Law 93-380, the FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT OF 1974, no private records were examined by the researcher. A person

of authority within the school reviewed the records of each child and based on the records, identified each child as having a moderate, severe or profound hearing impairment. The researcher used this information to classify each child. Also in compliance with Public Law 93-380, a parental permission form (Appendix B) was sent home with each eligible child. Seventy-three completed forms were returned and from this number ten boys and ten girls were randomly selected from each of the moderate, severe and profound ranges of hearing loss.

Instruments

The instruments used for testing were two forms of the Lee-Clark Reading Readiness Test (1962 Revision). The test consists of four subtests: 1) Matching Letter Symbols; 2) Crossing Out Letter Symbols; 3) Vocabulary and Following Directions; 4) Identification of Letters and Word Symbols. A raw score for each subtest and a total raw score were obtained for each testing form. The test score tables also provide a verbal categorization for each subtest and total score ranging from high, high average, low average to low. The categorization for each child was provided to each participating school upon request. For the purposes of this study, however, only the total raw scores were used for analysis.

For the traditional pencil-paper form of this instrument a split-half reliability, corrected by the Spearman-

Brown formula, ranges from .83 to .94 on all of the subtests with an overall correlation of .92. The validity of the test has been reported against a criterion of success at the end of the first grade. On the 1962 Revision, a correlation of .88 was obtained (Buros, 1972).

The three dimensional object form of this instrument was available from prior research (Exendine, 1975). This form of the readiness test consists of eight pages, each one reproduced on twenty-two by thirty-three-inch white masonite. Attention was given to coloring, facial expression and scale in preparing the reproduction. In 1975, Exendine established a reliability for this form of the reading readiness test of .57.

Procedures

The Lee-Clark Reading Readiness Test (1962 Revision) is designed for group administration. Research has demonstrated, however, that no significant difference exists between the group raw scores and the individual presentation raw scores (Hutsell, 1977). Individual rather than group administration was preferred in this research situation due to the needs of the children for different methods of communication. Some of the children in the sample attend schools where oral communication is the appropriate method of communication. In these cases, the child was placed where he could easily speech read the examiner and oral

communication was used. Many of the children, however, were in school situations where total communication was the acceptable form and in these cases total communication was used.

Total communication is the use of normal oral language and the simultaneous use of manual expression or sign language. Though there are several forms of sign language, the one form used by the subjects of this study and the researcher was Signing Exact English (SEE). This method is "the consistent, logical, rational and practical use of signs to represent as specifically as possible the basic essentials of the English language." (Gustason, 1975) The recommended language of the manual for the Lee-Clark Reading Readiness Test was adhered to in both oral and total communication presentations. Signing Exact English (Gustason, Pfetzing and Zawolkow, 1975), which provides drawings of signs, and a certified member of the National Registry of Interpreters for the Deaf were used as reference to assure accurate signs.

Selltiz, Wrightsman and Cook (1976) provided specific information about the research procedure used in this study:

> The very process of remeasurement may intensify differences in transient factors; for example, anxiety, interest, and motivation may be lower during the second administration of the test simply because the individual is already familiar with it. To the extent that such changes occur, the test which is given on the second administration, although objectively identical with the earlier one, may actually be a part of a quite different testing situation. Moreover, the subjects may remember the responses they gave to the first test (particularly if the time interval between the two tests is short) and, in the second

> test, may give again the responses they remember (or misremember) having made earlier rather than responses which are spontaneous or thought through anew in the second situation...When there are both the possibility that the initial measure may affect the results of the second measurement and the possibility of genuine changes brought about by other factors, the common practice is to try to steer a course between waiting long enough for the effects of the first testing to wear off and not long enough for a significant amount of real change to take place. If the second measurement is administered before the effects of the first have worn off, the estimate of stability will not be trustworthy because the results of the two measurements will not be independent; the error is likely to be in the direction of an overestimate of stability. On the other hand, if genuine changes have occurred, the resulting coefficient will be an underestimate of stability of the instrument itself. No hard and fast rules can be offered for judging the optimal interval; much depends on the specific nature of the test. Fortunately, one can expect the effects to wear off most rapidly at the beginning, with a decreasing rate as time goes on. In other words, there are diminishing returns for waiting over longer and longer periods of time. Two weeks to one month is commonly considered to be a suitable interval. (p. 185-6)

In summary of test-retest procedure, the authors stated that increased stability is achieved when the personnel administering and scoring the test remain the same throughout the procedure.

By random selection, the sixty subjects of this study were placed into a rotation where half received the pencil-paper form of the test first and the other half of the sample received the object form first. All testing and scoring was done by the researcher. The recommended interval of two weeks between testing situations was followed as closely as possible.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

The purpose of this study was to determine whether hearing impaired children can more easily demonstrate their reading readiness skills through an object form rather than a pencil-paper form of a reading readiness test. Total raw scores (Tables 1-3) from the two forms of the Lee-Clark Reading Readiness Test were used for statistical analysis.

Descriptive statistics were computed for the male and female groups in their appropriate hearing loss category. These data are included in Tables 4 and 5.

An ANOVA was computed to compare variances among hearing loss, gender and the interaction between hearing loss and gender. The .05 level of significance was adopted for acceptance of the null hypothesis. The critical value of F for 2 degrees of freedom (based on a sample size of 60) is 3.15 and for 1 degree of freedom, 4.00. (Minium, 1970) Across the levels of hearing loss, the F ratio was 1.057. Between gender the F ratio was 2.443 and the interaction of gender and hearing loss produced an F ratio of 1.020. All

Table 1

PENCIL-PAPER AND OBJECT FORM TOTAL RAW SCORES
FROM THE LEE-CLARK READING READINESS TEST
FOR MODERATE HEARING LOSS SUBJECTS

Males			Females		
Subject Number	Pencil Paper	Object Form	Subject Number	Pencil Paper	Object Form
1	60	60	11	59	58
2	63	60	12	58	58
3	51	51	13	64	61
4	49	47	14	53	53
5	53	47	15	55	56
6	55	54	16	57	56
7	52	52	17	60	59
8	47	47	18	57	58
9	54	56	19	57	54
10	48	47	20	57	58

Table 2

PENCIL-PAPER AND OBJECT FORM TOTAL RAW SCORES FROM THE LEE-CLARK READING READINESS TEST FOR SEVERE HEARING LOSS SUBJECTS

Males			Females		
Subject Number	Pencil Paper	Object Form	Subject Number	Pencil Paper	Object Form
21	45	47	31	62	58
22	51	43	32	61	57
23	62	59	33	61	60
24	56	53	34	59	54
25	60	59	35	61	58
26	58	59	36	59	58
27	55	57	37	44	47
28	49	53	38	46	45
29	56	58	39	55	51
30	47	52	40	59	58

Table 3

PENCIL-PAPER AND OBJECT FORM TOTAL RAW SCORES FROM THE LEE-CLARK READING READINESS TEST FOR PROFOUND HEARING LOSS SUBJECTS

Males			Females		
Subject Number	Pencil Paper	Object Form	Subject Number	Pencil Paper	Object Form
41	58	58	51	60	56
42	37	39	52	49	53
43	55	54	53	56	56
44	57	60	54	56	56
45	56	52	55	53	54
46	38	47	56	55	51
47	44	52	57	53	53
48	53	58	58	45	41
49	63	62	59	48	50
50	59	55	60	58	53

Table 4

MEANS AND STANDARD DEVIATIONS OF MALE SUBJECTS' SCORES ON PENCIL-PAPER AND OBJECT FORMS OF THE LEE-CLARK READING READINESS TEST

Group	Number of Subjects	Pencil-Paper Mean	Pencil-Paper S.D.	Object Form Mean	Object Form S.D.
Moderate	10	53.20	5.11	52.10	5.25
Severe	10	53.90	5.66	54.00	5.53
Profound	10	52.00	9.07	53.60	6.71

Table 5

MEANS AND STANDARD DEVIATIONS OF FEMALE SUBJECTS' SCORES ON PENCIL-PAPER AND OBJECT FORMS OF THE LEE-CLARK READING READINESS TEST

Group	Number of Subjects	Pencil-Paper Mean	Pencil-Paper S.D.	Object Form Mean	Object Form S.D.
Moderate	10	57.70	2.94	57.10	2.37
Severe	10	56.70	6.48	54.60	5.21
Profound	10	53.30	4.71	52.30	4.47

ratios failed to be significant at the .05 level. For the correlated data, object form and pencil-paper form, the F ratio between hearing loss was 1.036, between gender the F ratio was 3.155 and the interaction of hearing loss and gender produced an F ratio of 1.455. These ratios also failed to be significant at the .05 level. (Table 6)

There were slight differences in mean scores by gender and between hearing losses. The results of the analysis of variance of the mean scores of the three groups, however, indicated that the performance of students of different hearing losses on the object form and the pencil-paper form of the reading readiness instrument did not differ significantly at the .05 level. Therefore, the hypothesis: There was no statistically significant difference in mean scores between hearing impaired children on either form of the Lee-Clark Reading Readiness Test, was accepted. Children of different gender and hearing losses do not perform differently when the mode of presentation of testing materials varies from the traditional pencil-paper form to the object form.

Table 6

ANALYSIS OF VARIANCE OF PENCIL-PAPER--OBJECT FORM TEST PERFORMANCE SCORES OF THREE GROUPS OF SUBJECTS BY GENDER

Source of Variance	Sum of Sq.	df	Mean Sq.	F*	Prob.
Between Hearing Loss	120.004	2	60.002	1.057	0.355
Between Gender	138.680	1	138.680	2.443	0.124
Interactions: Loss x Gender	115.851	2	57.926	1.020	0.367
Error within groups across tests	3065.733	54	56.773		
Repeated Measures	8.008	1	8.008	1.640	0.206
Between Loss within trials	10.116	2	5.058	1.036	0.362
Between Gender within trials	15.408	1	15.408	3.155	0.081
Interaction: Loss x Gender	14.216	2	7.108	1.455	0.242
Error within groups within tests	263.748	54	4.884		

*no significant F ratios were obtained

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The problem of the study was to determine if there were significant differences in the means of the total raw scores obtained on two forms of a reading readiness test between hearing losses and gender. The purpose was to determine if a three-dimensional object form of a testing measure offered hearing impaired children an advantage in demonstrating reading readiness skills.

The testing measure utilized in the study was the Lee-Clark Reading Readiness Test (1962 Revision) in two forms: the traditional pencil-paper form and a larger three-dimensional object form. The two forms were administered individually to hearing impaired beginning readers. The subjects included an equal number of boys and girls (N=60) in the moderate, severe and profound ranges of hearing loss. All subjects attended public or private schools in the State of Oklahoma. Subjects were identified as beginning readers by classroom teachers, reading specialists and/or team leaders

and age was not a factor considered in the identification procedure. Each child's hearing loss was determined by school personnel based on school records. Oral or total communication was used for testing purposes and all testing and scoring was done by the researcher.

Total raw score means were used for comparison of data. While there were slight differences in means, there were no significant mean score differences by gender or hearing loss between the two forms of the Lee-Clark Reading Readiness Test.

Conclusions

From the statistical analysis of the data, some conclusions can justifiably be drawn. (1) The male and female subjects performed equally well on both forms of the Lee-Clark Reading Readiness Test. (2) No hearing loss group experienced an advantage due to the form of presentation of the testing material. (3) Either form of the reading readiness instrument could be administered with comparable results being obtained. (4) As with any testing measure, the possibility exists that this instrument did not tap differences that possibly do exist within the population of hearing impaired beginning readers.

Recommendations

Several recommendations can result from this study. (1) There are differences in the results of this study and

studies that have been performed within the last several years. This demonstrates some need for further investigation to clarify the issue of the possible advantages of alternative presentations of reading readiness testing materials.

(2) Language and concept development have been demonstrated by prior research to be delayed in hearing impaired children. The use of testing measures concerned primarily with these two areas, administered in pencil-paper and object form, could possibly offer more insight into the question of whether method of presentation offers a significant advantage in demonstrating skills for hearing impaired children.

(3) Since comparable results can be expected on each form of the Lee- Clark Reading Readiness Test, it is recommended that the educators responsible for testing children use the pencil-paper form of the instrument to test hearing impaired populations. The pencil-paper form is cheaper, easier to manipulate and lends itself to either group or individual administration.

BIBLIOGRAPHY

Balow, I. Sex differences in first grade reading. Elementary English, 1963, 40 (3), 303-320.

Best, B. Classificatory development of deaf children: Research in language and cognitive development. Minneapolis: Research, Development and Demonstration Center in Education of Handicapped Children, 1973.

Best, B. & Roberts, G. Early cognitive development in hearing impaired children. American Annals of the Deaf, 1976, 121 (6), 560-564.

Bilka, L. An evaluation of the predictive value of certain readiness measures. Some persistent questions on beginning reading. Newark, Delaware: International Reading Association, 1972, 43-49.

Boney, C. A new problem for the late reader. Elementary English, 1961, 38, 316-319.

Bond, G. & Tinker M. Reading difficulties: Their diagnosis and correction. New York: Meredith Publishing Co., 1973.

Buros, O. (Ed.). The seventh mental measurement yearbook. Highland Park, New Jersey: Gryphon Press, 1972.

Chall, J. Learning to read: The great debate. New York: McGraw Hill Book Co., 1967.

Clutts, J. Predicting reading success for the first grade child. Unpublished dissertation, University of Missouri, 1969.

Dechant, E. Diagnosis and remediation of reading disability. West Nyack, New York: Parker Publishing Co., 1968.

Durkin, D. Reading readiness. The Reading Teacher, 1970, 23 (6), 534-536.

Durkin, D. Teaching them to read (2nd edition). Boston: Allyn and Bacon Inc., 1974.

Durkin, D. & Stauffer, R. Do sex differences affect reading? Instructor, 77, 1968.

Dwyer, C. Sex differences in reading: An evaluation and a critique of current theories. Review of Educational Research, 1973, 43 (4), 455-467.

Elkind, D. Cognitive development and reading. Claremont Reading Conference, 1974, 10-20.

Evanechko, P., Ollila, L., Downing, J. & Braun, C. An investigation of the reading readiness domain. Research in the Teaching of English, 1973, 7 (1), 61-78.

Exendine, L. An investigation of readiness test results with kindergarten children using object form and paper-pencil methods. Unpublished dissertation, University of Oklahoma, 1975.

Fontenot, R. Developing prerequisites for reading: A search for a rationale. Paper presented at the Annual Convention of the International Reading Association, New Orleans, 1974.

Furth, H. A comparison of reading test norms of deaf and hearing children. American Annals of the Deaf, 1966, 3 (2), 461-462.

Furth, H. Thinking without language: Psychological implications of deafness. New York: Free Press, 1966.

Getman, G. Where is reading readiness? Claremont Reading Conference, 1976, 122-127.

Gibson, E. Learning to read. Theoretical models and processes of reading. Newark, Delaware: International Reading Association, 1970.

Gustason, G. Signing Exact English. Galluadet Today, 1974-5, 5 (2), 11-14.

Gustason, G., Pfetzing, D. & Zawolkow. Signing Exact English. Silver Spring, Maryland: Modern Signs Press, 1975.

Hahn, H. Three approaches to beginning reading instruction -- i/t/a/, language arts and basic readers. The Reading Teacher, 1966, 19, 590-594.

Hart, B. Learning to read begins at birth. Volta Review, 1975, 168-172.

Hartung, J. Visual perceptual skill, reading ability and the young deaf child. Exceptional Children, 1970, 36 (8), 603-610.

Hillerich, R. Kindergarten screening procedures: Early identification or merely early labeling. Paper presented at the Annual Meeting of the International Reading Association, New Yrok, 1975.

Hopkins, K. & Sitkei, E. Predicting grade one reading performance: Intelligence versus reading readiness tests. The Journal of Experimental Education, 1969, 37 (3), 31-33.

Hutsell, M. Differences in performance on the traditional and object form of a reading readiness test. Unpublished dissertation, University of Oklahoma, 1977.

Jeffery, W. & Samuals, S. The effect of method of reading training on initial learning and transfer. Journal of Verbal Learning and Verbal Behavior, 1967, 6, 354-358.

Kapelis, L. Early identification of reading failure: A comparison of two screening tests and teacher forecasts. Journal of Learning Disabilities, 1975, 8 (10), 39-42.

Karlsen, B. A research basis for reading instruction of deaf children. American Annals of the Deaf, 1965, 110 (5), 535-540.

Laird, A. & Cangemi, J. When are children ready to learn to read? Reading Improvement, 1973, 12, 47-49.

Lane, H. & Baker, D. Reading achievement of the deaf: Another look. Volta Review, 1974, 76 (8), 489-499.

Lavatelli, C. Piaget's theory applied to an early childhood curriculum. Boston: American Science and Engineering, Inc., 1970.

Lerner, J. Children with learning disabilities. New York: Houghton Mifflin Co., 1971.

Livo, N. Reading readiness factors and beginning reading success. The Reading Teacher, 1970, 24 (2), 124-129.

Lowell, R. Reading readiness factors as predictors of success in first grade reading. Journal of Learning Disabilities, 1971, 4 (10), 24-28.

Maccoby, E. (Ed.). Sex differences in intellectual functioning. The development of sex differences. Stanford: Stanford University Press, 1966.

Maitland, S., Nadeau, J. & Nadeau, G. Early school screening practices. Journal of Learning Disabilities, 1974, 7, 645-649.

Mason, J. The acquisition of reading skills: A developmental stage processing model. Reading Improvement, 1975, 12 (4), 195-202.

Mason, J. Suggested relationships between the acquisition beginning reading skills and cognitive development. Journal of Educational Research, 1977, 195-198.

Mattick, W. Predicting success in the first grade. Elementary School Journal, 1963, 63, 273-276.

McGinnis, C. Learning to read. New York: McGraw Hill, 1953.

McLuhan, M. Understanding media: The extension of man (2nd ed.). New York: Signet New American Library, 1964.

Minium, E. Statistical reasoning in psychology and education. New York: John Wiley and Sons, Inc., 1970.

Monteith, M. Screening and assessment programs for young children: Reading readiness and learning problems. Language Arts, 1976, 53 (8), 920-924.

Naiden, N. Ratio of boys to girls among disabled readers. The Reading Teacher, 1976, 29 (5), 439-442.

Office of Demographic Studies. Annual survey of hearing impaired children and youth, Series D, No. 19. Washington D.C.: Gallaudet College, 1971.

Pettifor, J. The role of language in the development of abstract thinking: A comparison of hard-of-hearing and normal-hearing children on levels of conceptual thinking. Canadian Journal of Psychology, 1966, 22, 139-156.

Piaget, J. & Inhelder, B. The psychology of the child. New York: Basic Book Inc., 1969.

Roberts, K. Piaget's theory of conservation and reading readiness. The Reading Teacher, 1976, 30 (3), 246-250.

Rude, R. Readiness tests: Implications for early childhood education. The Reading Teacher, 1973, 27, 572-580.

Rudloff, J. The hearing handicapped retarded reader. Volta Review, 1966, 68, 567-571.

Rudnick, M., Sterritt, G. & Flax, M. Auditory and visual rhythm perception and reading ability. Child Development, 1967, 38, 581-587.

Sawyer, D. Readiness factors for reading: A different view. The Reading Teacher, 1975, 28 (7), 620-624.

Schiff, W. & Dytell, R. Tactile identification of letters: A comparison of deaf and hearing children's performances. Journal of Experimental Psychology, 1971, 11, 150-164.

Selltiz, C., Wrightman, L. & Cook, S. Research methods in social relations (3rd ed.). New York: Holt Rinehart and Winston, 1976.

Spache, G. A longitudinal first grade reading readiness program. The Reading Teacher, 1966, 19, 121-127.

Spache, G. & Spache, E. Reading in the Elementary School (4th ed.) Boston: Allyn and Bacon, 1977.

Stanchfield, J. The sexual factor in language development and reading. Language, reading and the communication process. Newark, Delaware: International Reading Association, 1971.

Thackray, D. The relationship between reading readiness and reading progress. British Journal of Educational Research, 1965, 35, 252-254.

Trybus, R. & Karchmer, M. School achievement scores of hearing impaired children: National data on achievement status and growth patterns. American Annals of the Deaf, 1977, 122 (2), 62-69.

Venezky, R. The prereading skills program. Unpublished manuscript, Wisconsin Research and Development Center for Cognitive Learning, 1970.

Waller, T. Think first, read later. Piagetian prerequisites for reading. Newark, Delaware: International Reading Association, 1977.

Webb, S. A comparison of three-dimensional mock-up and pencil-paper presentations of reading test material to first-grade students from different socioeconomic levels. Unpublished dissertation, University of Oklahoma, 1974.

Weintraub, S. Sex differences in reading achievement. The Reading Teacher, 1966, 20, 167-169.

Witty, P., Freeland, M. & Grotberg, A. The teaching of reading. Boston: D. C. Heath, 1966.

Wrightstone, J., Aronow, M. & Muskowitz, S. Developing reading test norms for deaf children. American Annals of the Deaf, 1963, 108, 311-316.

APPENDIX A

COMMENTS BY SUBJECT MATTER EXPERTS

INTERNATIONAL READING ASSOCIATION, 800 Barksdale Road, Newark, Delaware 19711 U.S.A.
ASSOCIATION INTERNATIONALE POUR LA LECTURE Telephone: 302 731 1600
ASOCIACION INTERNACIONAL DE LECTURA Cable: Reading Newark, Delaware

May 14, 1976

63

Robert L. Curry
College of Education
820 Van Vleet Oval
Norman, Oklahoma 73069

Dear Dr. Curry:

We are returning your manuscript since we will not be placing it in either of our journals. Thank you very much for thinking of the International Reading Association journals as potential outlets.

Both advisors who reviewed this manuscript commented that it was very well written and urged you to consider revision based on the following suggestions: "Two major problems with the study: 1) Though the results were 'significant' statistically the differences between the raw scores of the two administrations were very small in most cases. I question whether the results have any practical significance--for example, how much effect have they on transformed scores? 2) The method for administering the two forms of the test also differed. The regular readiness test was administered in a group while the modified form was administered individually. This difference might have had an influence on the results. In order to be safe it would seem to me that both forms should have been administered individually. The study deserves to be repeated with modification. The important implication is that it would seriously question the so-called 'item analysis' of readiness tests as a way of determining skills and concepts possessed by young children. This idea should be stressed more if the manuscript is resubmitted."

The other advisor commented that "This study is very interesting and useful. It could be a great breakthrough in the reliance upon standardized testing." If you are interested in submitting a revision, we will be glad to send it to our advisors for further consideration.

Again, thank you for sharing your work with us. We wish you the best of luck with your manuscript and hope you will think of our journals in the future.

Yours,

Janet R. Binkley, Editor
THE READING TEACHER
JOURNAL OF READING

JRB/nw

Enclosure

President
Vice President
Vice President-elect
Past President
BOARD OF DIRECTORS
Term expiring Spring 1976
Ira E. Aaron
University of Georgia
Athens, Georgia
Lynette Saine Gaines
University of South Alabama
Mobile, Alabama
Tracy F. Tyler, Jr.
Robbinsdale Area Schools
Robbinsdale, Minnesota
Term expiring Spring 1977
Roger Farr
Indiana University
Bloomington, Indiana
Grayce A. Ransom
University of Southern California
Los Angeles, California
Harry W. Sartain
University of Pittsburgh
Pittsburgh, Pennsylvania
Term expiring Spring 1978
Rosemma Iantosca
Boston University
School of Education
Boston, Massachusetts
Elinor R. Reid
Exemplary Center for Reading Instruction
Salt Lake City, Utah
Robert B. Ruddell
University of California, Berkeley
Berkeley, California
Executive Director
Ralph C. Staiger
European Office
Association Internationale pour la Lecture
54 rue de Varenne
75007 Paris, France
Telephone: 222 71 71
Cable: Reading Paris
Latin American Office
Av. de Mayo 749
Piso 3 Of. 32
Buenos Aires, Argentina

APPENDIX B

PARENTAL PERMISSION FORM

The University of Oklahoma 820 Van Vleet Oval Norman, Oklahoma 73069

College of Education

Dear Parents:

I am a doctoral candidate in Education at the University of Oklahoma. In order to receive a Ph.D. degree, I must complete a research project. My project involves testing hearing-impaired children on two forms of the Lee-Clark Reading Readiness Test. One form of the test is in traditional pencil-paper form while the other is a much larger format with the letters and pictures in a three dimensional form. The point of this research project is to determine if the three dimensional form gives hearing-impaired children an advantage in demonstrating reading readiness skills.

I am seeking your permission to test your child on each form of this instrument. Each form will take approximately 30 minutes. One form will be administered and then the other form will be administered about two weeks later. The total time of your child's involvement will be approximately one hour. The testing will be done at your child's school on school time.

A copy of the University approved prospectus will be available at your child's school. Also, the school will receive a copy of the results of the project upon completion. If you have any questions, please do not hestitate to call me at the University, 325-4842 or at home, 478-0458 (in Edmond). If you are willing to allow your child to participate in this research project, please detach and sign the slip below and return it to the school.

Sincerely,

Suellen Waag

Suellen Waag
Graduate Teaching Associate

Suellen Waag has my permission to test my child, _____,
child's name

on two forms of the Lee-Clark Reading Readiness Test.

_____
Parent's signiture