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A STUDY OF THE READING ACQUISITION
PROCESS OF EARLY READERS

By

Stephanie Lea Brown

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Elementary and Special Education

College of Education

1979

ABSTRACT

A STUDY OF THE READING ACQUISITION PROCESS OF EARLY READERS

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Purpose of the Study

The purpose of this study was to determine among children who had demonstrated an ability to read prior to first grade entrance:

- a. whether they had acquired any of the reading acquisition skills considered to be prerequisites to learning to read,
- b. the extent of this skill acquisition within each individual and of the sample as a whole,
- c. which of these skills were crucial components contributing to the early reading ability of these children, and
- d. whether the acquisition of these essential components might be hierarchical in nature.

Procedures

The theories of five prominent educators were examined to identify skills considered essential to learning to read. Twenty-nine skills were identified and categorized into the areas of visual discrimination, auditory perception, sound-symbol association, blending and letter substitution, and word knowledge. A variety of standardized and non-standardized measuring instruments were selected and developed to assess the skill acquisition of the subjects.

The sample consisted of twenty pre-first grade children who were selected from communities in Michigan and Ohio. Great care was taken in selecting children who had received minimal, if any, formal reading instruction from their parents or school personnel.

Each child was individually tested in two testing periods, of two hours each. Two screening measures which assessed both sight vocabulary and reading comprehension were administered to determine whether the child could easily read and understand words found in typical mid-year first grade level reading materials and be classified as an early reader. Children who were unable to pass the initial screening procedure were not included as subjects. A parental questionnaire was discussed with one or both of each child's parents to gather information concerning aspects of the home environments, family reading practices, and emphasis on education.

The data were analyzed to answer each of the thirty-four research questions. Raw scores were transformed into percentages of correct response which were compared across the subtests. Rank-order correlation coefficients and mean scores were also computed.

Conclusions

The majority of parents of the subjects placed a high value on educational accomplishment and occupational or professional success. The number of female subjects outnumbered the males by more than two to one. Nearly all of the subjects were Caucasian and were enrolled in kindergarten at the time of the data collection.

The subjects engaged regularly in reading a wide variety of both fictional and nonfictional materials but, for the most part, had not developed specific reading preferences. All of the parents read to their children on a regular basis and viewed reading as a contributing factor to success in life. Reading was a frequent leisure-time activity of the parents.

All of the subjects substantially exceeded the criterion scores for classification as able readers on both screening measures. The majority of subjects demonstrated knowledge of word meanings greater than that of the average pupil entering grade two. The mean verbal score, the mean performance score, and the mean full scale score earned by the subjects on the WPPSI fell within the Superior intelligence classification.

The investigator was unable to determine the existence or non-existence of a reading acquisition hierarchy. However, a distinct difference in the levels of mastery of the skill components was evident.

Sixteen of the twenty-nine skills were acquired by the subjects. This acquisition supports the position that certain reading skills must be mastered before reading can occur. Whether these components were acquired as prerequisites to the reading act or as concomitants is not conclusive.

The remaining thirteen skills were not demonstrated by the subjects with sufficient mastery to be considered requisite to the beginning stages of reading acquisition; however, their acquisition may contribute to the attainment of higher ordered reading skills.

ACKNOWLEDGMENTS

The writer wishes to express appreciation to Dr. Byron H. Van Roekel, the chairman of her doctoral committee, for his encouragement, support, counsel and demand for academic excellence throughout the completion of her graduate program and doctoral dissertation. His compassion for and dedication to children are qualities which she admires greatly.

Appreciation is also extended to each of the doctoral committee members: Dr. Patricia J. Cianciolo, Dr. Robert L. Ebel, and Dr. Timothy H. Little. Each one has provided the writer with intellectual stimulation as well as personal support, enthusiasm, and encouragement.

Without the cooperation of administrators in the East Lansing, Lansing, and Painesville Township school systems, this research could not have been completed.

The writer especially expresses her thanks to the children who served as subjects. Each brought a unique sparkle and enthusiasm to the testing sessions, which made the data collection phase a very enjoyable part of the dissertation. The support and encouragement from these children's parents was also greatly appreciated.

Appreciation is extended to Mrs. Grace Rutherford, who shared her creativity, expertise, and time in the typing of this dissertation.

Finally, a very special appreciation is expressed to the writer's parents, who encouraged her with unwavering support, confidence, and a sense of humor throughout her graduate work.

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CHAPTER I

STATEMENT OF THE PROBLEM

Educational theorists and researchers historically have been interested in the nature of the reading process.¹ These earlier investigators and their resulting hypotheses have stimulated contemporary

¹W. S. Gray reported documentation that as early as 1844 the nature of the perceptual processes in reading was investigated in the laboratories in Europe. In 1907, Edmund Huey hypothesized that the reading process mirrored the thinking process. Joseph Taylor complemented this viewpoint in 1913 in describing reading as a form of mental association involving the creation of a visual image and a subsequent meaning association. In 1917, E. L. Thorndike conceptualized reading as a reasoning process in a classic article examining the process involved in paragraph reading.

More than three decades later, Paul McKee devoted a unit of his reading text to the nature of the reading process. He highlighted the reader's identification and recognition of printed words, attainment of an adequate understanding of the meaning intended by the writer, and use of meanings gained through reading as crucial elements of the process. In 1949, David Russell described reading as both a perceptual and conceptual process involving sensation, perception, comprehension, and utilization.

During the 1950s, Emmett Betts described research supporting the view that reading was a thinking process. Burton, Baker, and Kemp extended this view by describing the reading process as a form of thinking, reasoning, and problem solving.

During the 1960s, Peter L. Spencer suggested reading was a process in which the individual makes discriminative responses. He specified three stages in this process: Stimulation--involving sensory reception and activation; Perception--involving cognition, recognition, and mental association; and Expression--involving the performance of an adaptive response. Strang, McCullough, and Traxler identified similar psychological stages in the reading process: Visual Reception, Perception, Conceptualization, and High Levels of Mental Association.

During the 1970s, Albert J. Harris examined the nature of the reading process by illustrating its development as an individual gains proficiency in reading. Robert L. Thorndike examined E. L. Thorndike's earlier position and identified research data supporting the view that reading is a thinking and reasoning process.

researchers to develop theoretical models describing how aspects of this process function in an individual human being. In many of the models, theorists have examined the manner in which elements inherent in language, affect, cognition, and perception function in the reading process. Researchers, in some instances, have concentrated on the interaction of these elements in the acquisition of the rudimentary skills of reading while others have focused on this interaction in fluent reading.

It is a matter of record that a number of children have acquired the rudiments of reading before entering elementary school. Lewis Terman noted in his Genetic Studies of Genius (1959) that more than 50 percent of the children he studied learned to read before starting school; that among these, 20 percent learned before the age of five years, and 6 percent learned before the age of four years.

Children who demonstrated the ability to read before school entry were the subjects of two longitudinal studies undertaken by Dolores Durkin (1966). Both studies compared "early-readers" to "non-early-readers" as they progressed through the elementary school grades. Her first study was primarily interested in the effect early reading had on subsequent reading performance and school achievement. She found,

that the average achievement of early readers who had either five or six years of school instruction in reading, was significantly higher than the average achievement of equally bright classmates who had six years of school instruction but were not early readers.²

²Dolores Durkin, Children Who Read Early: Two Longitudinal Studies (New York: Teachers College Press, 1966), p. 41.

Her second study was an attempt to replicate the findings of the initial study, to gather more information about non-early-readers, and to determine, as in the initial study, which factors in the home environment influenced the acquisition of reading skill prior to school entry. The results of this study concur with the findings of her previous study that following six years of elementary school instruction, the level of reading achievement of early readers exceeded that of non-early-readers of the same mental age. In addition, her data revealed significant differences for both groups of subjects in home environments and parental attitudes toward reading. Concerning instruction specifically related to the acquisition of reading, more parents of early readers helped their children with printing, identifying written words, understanding the meaning of words, spelling, and learning the sounds of letters than did parents of the non-early-readers.

More recently, Ethel M. King and Doris T. Friesen (1972) compared the familial backgrounds, preschool experiences, and achievement in selected reading variables among early and non-early-readers during kindergarten attendance and again one year later in grade one. Several differences in the home backgrounds of both groups of children were found to concur with the 1966 findings of Durkin. Visual discrimination, letter recognition, listening to directions, following directions, and word recognition were skills identified as being significantly related to reading success.

The three studies previously described are representative of research involving children who have acquired some degree of skill in

reading before attending elementary school. That these researchers restricted their investigations to an examination of the characteristics of gifted children, the aspects of the home environment which have affected reading success in the elementary grades or have encouraged reading prior to grade one, and the general characteristics of children who learned to read before entering grade one was singular to the development of the rationale for this research, for one must eventually ask, "What is the substance of these findings?"

One might reason that knowledge concerning the characteristics of children, gifted or otherwise, who learned to read before school entry might provide a means for selecting children for whom early reading instruction might prove advantageous. Or, it seems feasible to consider the possibility of providing a model that embodies the features which, according to the previously mentioned investigations, characterized those environments which fostered early acquisition of the rudiments of reading. Or, one might even reason that such information might provide guidelines for the publication of materials especially suited for nurturing the intellect of such children. However, a search of the literature has not revealed that any of the above have received critical attention.

Since no information was uncovered to suggest that the information from the previously described studies had been subjected to any pragmatic endeavors, it appeared profitable to look at other aspects associated with children who learned to read before school entry. One such approach might be to identify the psychological or

mental processes employed by these children in the acquisition of reading or the specific components of the reading process they have acquired. This might provide a means for identifying some of the essential components of the reading acquisition process and their hierarchical structure. Or, it might provide insight into procedures to facilitate the acquisition of the essentials of the reading act. It might even provide some insight into the most constructive form of reading instruction for children who often learn painstakingly and thus experience frustration and disappointment in learning situations.

Identification of the psychological and mental processes employed by these children (the first proposition mentioned above) might be investigated by examining some of the theoretical processes or models of reading to determine the skills believed to be essential to the acquisition of reading. Because it seemed logical that word recognition is prerequisite to performing the reading act, it therefore seemed appropriate to examine models which described in detail the various learning tasks necessary to facilitate the initial stages of reading.

To facilitate the identification of skills essential to reading, the theories of five prominent educators, who developed theories of word recognition during the interval 1956-1976, were chosen as representative. This particular time interval was chosen so that both traditional and current hypotheses about the reading process would be included. The theories selected include those of Donald D. Durrell (1956), William S. Gray (1960), Lillian Gray (1963), Richard L.

Venezky (1975), and S. J. Samuels (1976). The following set of skills are considered by these educators to be prerequisite to the acquisition of the reading act.³

The child must be able to:

1. Maintain attention to the task.
2. Visually discriminate letters and word parts.

He must attend to:

- a. The orientation of letters.
- b. Letter differentiations.
- c. The order of letters within a word.
- d. The specific details of a word.

He must be able to:

- e. Visually match letters.
- f. Visually match words.
- g. Name all of the lower case letters.
- h. Name all of the upper case letters.
- i. Recognize all of the lower case letters named.
- j. Recognize all of the upper case letters named.
- k. Recognize known for unknown words.
- l. Identify root words.
- m. Identify the inflectional endings: -s, -es, -'s,
-ed, and -ing.

³See Chapter II, Review of Research.

3. Auditorily perceive word elements.

He must be able to:

- a. Hear separate sounds in words.
- b. Identify consonant sounds in the initial position of a word.
- c. Identify consonant sounds in the medial position of a word.
- d. Identify consonant sounds in the final position of a word.
- e. Identify rhyme.

4. Associate a specific sound with a letter or letter cluster.

He must know the sound-symbol correspondence for:

- a. The vowel letters.
- b. The consonant letters.
- c. The most common consonant sounds and blends found in the initial position of words: ch, sh, th, wh, br, dr, fr, gr, tr, cl, fl, pl, st, sw, tw, sp, and sm.
- d. The most common consonant sounds and blends found in the final position of words: ch, sh, al, on, ck, nk, lk, rk, by, ty, nt, and se.
- e. The following phonograms found in high frequency in grade one level materials: am, an, ap, as, at, ay, ed, ee, en, id, ig, in, is, it, og, op, ot, ow, oy, un, up, ut, ack, ake, all, ame, and, ank, ell, ike, ill, ing, oke, oll, ook, ool, ome, own, and ouse.

5. Match sounds.

6. Blend sounds.

He must be able to:

- a. Blend the initial consonant sound(s) with the remaining phonemes in a word.
 - b. Blend the final consonant sound(s) with the remaining phonemes in a word.
 - c. Substitute initial consonant letters in words.
 - d. Substitute final consonant letters in words.
 - e. Substitute medial vowel letters in words.
7. Master an initial stock of sight words.
8. Translate a word into an idea.

Since the purpose of this investigation was to determine the psychological or mental processes employed by children who have learned to read prior to receiving any formal reading instruction in grade one, it was necessary to identify the specific skill components of the reading act which they had acquired. Through a careful investigation of the set of skills noted above, it was apparent that several of these skills, such as maintaining attention to the task and attending to letter differentiations, are not easily measurable by standardized tests or other instruments. Secondly, a set of norms or means of evaluating several of these skills has not been created. Thirdly, it appeared that several specific skills, such as attending to the specific details of a word, are dependent on the acquisition of other skills within the composite set for attainment and cannot be demonstrated independently as isolated skills. For these three reasons,

the following skills were selected from the initial set for investigation:

- A. In terms of visual discrimination, the child must be able to:
 1. Visually discriminate the order of letters in a word.
 2. Visually match letters and words.
 3. Name all of the lower and upper case letters of the alphabet.
 4. Recognize all of the lower and upper case letters when named.
 5. Identify root words.
 6. Identify the inflectional endings: -s, -es, -'s, -ed, and -ing.
- B. In terms of auditory perception, he must be able to:
 1. Identify consonant sounds in the initial, medial, and final position of words.
 2. Identify rhyming sounds.
- C. He must know the sound-symbol correspondence for:
 1. The vowel and consonant letters.
 2. The common consonant sounds and blends frequently found in the initial position of words (ch, sh, th, wh, br, dr, fr, gr, tr, cl, fl, pl, st, sw, tw, sp, sm) and in the final position of words (ch, sh, al, on, ck, nk, lk, rk, by, ty, nt, se).
 3. High frequency phonograms (am, an, ap, as, at, ay, ed, ee, en, id, ig, in, is, it, og, op, ot, ow, oy, un, up, ut, ack,

ake, all, ame, and, ank, ell, ike, ill, ing, oke, oll,
ook, ool, ome, own, ouse).

D. In terms of blending and letter substitution, he must be able to:

1. Blend the initial and final consonant sound(s) with the remaining phonemes in a word.
2. Substitute initial and final consonant letters in words.
3. Substitute medial vowel letters in words.

E. In terms of word knowledge, he must be able to:

1. Learn an initial stock of sight words.
2. Translate a word into an idea or, more specifically, associate meaning with a word.

This investigator was interested in determining the extent to which children who had exhibited an inclination to read before first grade entrance had acquired these skills and more importantly, in determining which of these skills were crucial components which contributed to the early reading ability of these children. As previously mentioned, this knowledge concerning the characteristics of children who learned to read before school entry might provide a means for selecting children for whom early reading instruction would prove advantageous and for determining their entry level for reading instruction. Secondly, this information could be used to provide guidelines for the design and publication of reading materials created specifically for nurturing the intellect of early readers. Thirdly, this knowledge could be used to determine the interrelatedness of the

specific components of the reading acquisition process; and fourthly, it could be used to determine the existence or nonexistence of a skill acquisition hierarchy. The manner in which this investigation was conducted is described in Chapter III.

CHAPTER II

REVIEW OF RESEARCH

Three major areas of research and theory are pertinent to the nature of this investigation. The first area includes the reading acquisition theories which were combined to create the composite set of word analysis skill components described in Chapter I. The second area includes research involving prereaders and first graders, examining reading factors related to reading ability or success in reading. The third area includes research relating directly to various characteristics of early readers.

Reading Acquisition Theory

The reading acquisition theories of five prominent educators were examined to determine which components of the reading act these educators considered essential for a child to acquire in order to learn to read and to determine the type of first grade reading instruction they recommended for these components to be acquired. Highlights of their theories are summarized in the following paragraphs.

Donald D. Durrell (1956) proposed that a child must be able to visually discriminate word elements and auditorily perceive these elements, have an interest in printed words, and maintain attention to the reading task in order to learn to read. He suggested a child

learns to analyze words by learning to hear sounds through ear training, to identify differences in printed symbols through learning the letter forms and corresponding names, to associate specific sounds with individual letters and letter clusters, to analyze words by applying phonics, to use context clues, to refine and develop phonic abilities, and finally to translate words directly into ideas.

Durrell suggested that first grade reading instruction should enable the child to identify consonant sounds and blends in the initial and final position of a word; name the lower and upper case letters of the alphabet; recognize the suffixes -s, -es, -'s, -ed, -ing, and -y; know the sounds associated with all of the vowel and consonant letters; know the sounds associated with the consonant blends and letter clusters frequently found in the initial position of words (th, st, wh, sh, br, ch, dr, tr, cl, fr, gr, pl, sm, tw, fl, sw, sp) and in the final position of words (sh, ch, al, on, ck, ty, nk, lk, by, nt, rk, se); and know the sounds associated with the following phonograms frequently found in first grade reading materials: in, and, ike, is, ake, oke, ook, own, ed, oy, ay, as, ed, ig, ouse, at, an, un, am, it, ome, ack, ank, ut, un, ell, all, ill, ame, og, ee, up, id, ool, en, oll, ot, ap, ing, and ow.

William S. Gray (1960) also proposed a phonetic approach to teach the initial stages of word analysis. In order for a child to be able to attack single syllable words, Gray claimed the child must be able to:

- (1) hear accurately the sounds that single consonant letters (p, b, d, t, etc.), that consonant blends (bl, pr, st, etc.), and that two-letter consonant symbols (ch, sh, th, ng) stand for in words;
- (2) associate appropriate sound with a consonant letter or letters;
- (3) apply their understanding of the relationship between consonant sounds and letters in attacking new words;
- (4) blend sounds into word wholes.⁴

Following readiness and preprimer instruction, Gray contended the child should be able to identify rhyme, hear and discriminate between the initial, medial, and final consonant sounds in a word; and associate the initial and final consonant sounds in a word with their corresponding letter(s).

At the first stage of progress proposed for the primary grades, he suggested the child should learn readiness and preprimer skills; how to analyze single-syllable words using consonant substitution; to identify root words and the inflectional endings -s, -es, -'s, -ed, and -ing; and to combine structural and phonetic analysis.

Lillian Gray (1963) specified seven basic steps in word recognition instruction which she felt should occur in grade one. These steps included teaching recognition of rhyming sounds through experiences in ear training and picture reading; recognition of beginning sounds in words through ear training and picture reading; recognition of words at sight through repeated experiences in looking at and saying a variety of words; letter-sound associations; initial consonant letter substitution; medial vowel and final consonant letter

⁴William S. Gray, On Their Own In Reading (Chicago: Scott, Foresman and Co., 1960), p. 67.

substitution, and structural analysis skills. She proposed introducing specific vowel rules in grade two as the child progressed toward independent word attack abilities.

Richard L. Venezky (May 1975) proposed that decoding a word involves the following abilities: letter differentiation, sound-symbol (letter) association, sound blending, identification of specific sounds within words, and sound matching within words. Following several research studies, Venezky (June 1975) concluded that three major skill abilities are significantly related to the reading ability and reading success of children at the end of grade one. These areas include (1) visual matching of letters and words ("the ability to compare two letters or letter strings and determine whether or not they are the same"),⁵ (2) sound matching (the "ability to compare two words on the basis of a component sound"),⁶ and (3) sound blending (which "requires that separate sounds or sound sequences be used to produce words. . . . It requires memory for meaningless sounds, plus an understanding of how the sounds are to be united to form meaningful words").⁷

S. J. Samuel (1976) described initial reading acquisition in a five stage information processing model. The first stage involves

⁵Richard L. Venezky, "The Prereading Skills of Israeli Kindergarteners" (Technical Report No. 332. Wisconsin University, Madison, Research and Development Center for Cognitive Learning. National Institute of Education (DHEW), Washington, D.C., June 1975), p. 1.

⁶Ibid.

⁷Ibid.

stimulus presentation during which the child examines some form of printed stimuli such as that in a book or on a screen. The second stage involves cue selection and discrimination learning where the child learns to select and differentiate appropriate and inappropriate cues such as a letter, letter cluster, or word shape. Stage three involves visual recognition memory; stage four involves response availability; and stage five involves the hookup or associative stage during which the child associates a cue with its appropriate response. In order to transfer existing word knowledge in learning to recognize new words, Samuels suggested the child needs to know letter sounds, be able to recognize such higher order units as consonant digraphs and blends and their corresponding sounds, and be able to blend these sounds into words.

Factors Related to Reading Ability--Reading Success

Several investigators have examined preschoolers and beginning first graders to determine factors related to reading success or reading ability in the primary grades. Nila Banton Smith (1928) presented various letter matching tasks to beginning first graders to determine whether the visual discrimination ability involved in matching letters and word forms was related to later success in reading. She found the correlation between matching ability measured during the first week of school and reading ability measured by the Detroit Word Recognition Test during the twelfth week of school was 0.87. She felt this high correlation suggested several important possibilities. It suggested a measure of letter and word matching might be used to predict which

children entering grade one were ready to receive and experience success with reading instruction, and secondly, it suggested that increased matching activities in kindergarten might provide children with a stronger preparatory background for reading instruction when they entered grade one.

Smith determined that the most difficult lower case letters for these children to match were b, p, q, and d; the most difficult upper case letters to match were Q, B, D, J, Y, Z, R, and U; the most difficult lower case letters to match with their corresponding upper case letters were q-Q, r-R, g-G, b-B, and f-F; and the task requiring matching lower case to corresponding upper case letters was more difficult than matching either lower or upper case letters separately.

Alice Nicholson (1957) examined perceptual, auditory, and kinesthetic abilities in relation to letters and words in first grade entrants. She also attempted to relate these abilities to variables such as chronological age, mental age, sex, and learning rate. She found a wide range of abilities across her sample. Children were more familiar with capital than lower case letters; identification of letters following a flash stimulus was an easier task than letter identification following an oral pronunciation of the letter name; few children had any knowledge of letter sounds; the girls in the sample were superior to the boys on a majority of abilities measured; chronological age appeared to have a low relationship with the abilities measured; and the ability to write letters and identify lower and upper case letters increased as mental age increased.

Several of her findings did not support Smith's earlier hypotheses. Nicholson found that the order of difficulty of letter knowledge was not consistent across all of her subtests. She reported,

On the basis of the high scores achieved by 96 per cent of the population, it would appear that much of the matching of pictures and geometric forms as found in many reading readiness programs is a waste of time for most children.⁸

Edward E. Paradis (1970) examined the appropriateness of three different types of visual discrimination exercises in reading readiness materials designed for preschoolers and kindergarteners. His subjects consisted of 119 preschoolers and 91 kindergarteners who were randomly assigned to one of three experimental treatment groups. The first treatment group received visual discrimination training consisting of sequential presentations of object, letter, and then word stimuli. The second treatment group received visual discrimination training with letter followed by word stimuli, and the third treatment group received training only with word stimuli, progressing from easier to more complex words.

Paradis determined that none of the instructional treatments was superior to the other treatments; exercises utilizing objects or letters as stimuli were less difficult for the subjects to perform than exercises involving words as stimuli; there was little difference in success between exercises involving objects and exercises involving letters; and the visual discrimination exercises found in reading

⁸Alice Nicholson, "Background Abilities Related to Reading Success In First Grade" (Ph.D. dissertation, Boston University, 1957), p. 156.

readiness materials were more appropriate for preschoolers from middle socioeconomic families than for kindergarteners from comparable socioeconomic backgrounds.

Robert Calfee (1972) examined skills presumed to relate to reading instruction in 138 first graders and 276 kindergarteners. The skill areas Calfee examined and considered related to reading instruction include alphabet recognition, visual word matching, phonetic segmentation, phoneme identification, and vocabulary distinctions. He found that the ability to identify phonemes, especially final consonants, in words was an important skill and noted, "measures of auditory-phonetic ability contribute much more substantially to reading achievement than do visual matching skills."⁹

Miriam E. Hochstetler (1975) examined a variety of factors considered to be related to the reading ability of beginning kindergarteners. Specifically, she investigated the relationships between her Set I variables (word call and comprehension) and her Set II variables (letter naming, visual discrimination, oral language, chronological age, and mental age); the relationships between reading ability and socioeconomic status; and the relationships between reading ability and environmental-developmental characteristics of these kindergarteners. She selected her subjects by testing 1,858 kindergarteners with her own word call and comprehension measure and then using stratified random sampling to obtain seventy-one subjects

⁹Robert Calfee, "Diagnostic Evaluation of Visual, Auditory, and General Language Factors in Prereaders" (paper presented at the meeting of the American Psychological Association, Hawaii, September 1972), p. 4.

who, as a group, represented a continuum of reading abilities. She gathered information about her subjects using the visual discrimination subtest of the Gates MacGinitie Readiness Skills Test; the Wepman Auditory Discrimination Test; the Minnesota Scale for Paternal Occupation; and her own letter naming measure, child interview questionnaire, and parental interview questionnaire.

Using canonical correlation analysis, Hochstetler found:

substantial relationships (1.00-.93) between word call and comprehension in Set I. Variables letter naming (.83 and .70), visual discrimination (.66 and .61), and mental age (.70 and .61) in Set II obtained a substantial relationship with word call and comprehension in Set I. Of those variables in Set II, letter naming showed the largest observed relationship with word call and comprehension in Set I.¹⁰

She also found that children with the greatest reading ability tended to come from higher socioeconomic families than did children with lesser reading ability, and children from homes containing a lot of reading materials tended to have greater reading skills than children from homes containing few reading materials. Hochstetler noted,

The five most influential factors that seemed to encourage children to take an interest in reading were: being read to; seeing others read; having reading materials available; viewing television; and being curious.¹¹

In terms of the relationship between oral language ability and reading ability, she found "the data suggest that greater proficiency

¹⁰ Miriam E. Hochstetler, "A Study of Factors Related to the Reading Ability of Beginning Kindergarten Children" (Ph.D. dissertation, Ball State University, 1975), p. 89.

¹¹ Ibid., p. 147.

in oral language measured by T-units result in greater negative relationships with reading."¹²

Characteristics of Early Readers

Several investigators have examined reading achievement and various other characteristics of children who learned to read in or prior to kindergarten. Gus P. Pleassas and Clifton R. Oakes (1964) examined the prereading experiences of 20 selected first graders who were early readers to identify experiences which might relate to early reading success. Early readers were identified as those pupils who scored above 2.0 on the California Reading Test which was administered in December of grade one. The mean full scale WISC I.Q. was 126 for the entire group, indicating that the group had superior intelligence. The questionnaires administered to the parents revealed that these early readers had received some form of reading instruction from a sibling or parent prior to grade one; the majority of fathers were in clerical or professional occupations; the home environments encouraged reading; these children had displayed an early interest in letters, numbers, words, and road signs; and all 20 children could print their own names before entering grade one.

Majorie H. Sutton (1967) examined reading achievement throughout grades one-three of 46 children who had earned a grade equivalent score equal to or greater than 1.3 on the Gates Primary Reading Achievement Test administered in April of their kindergarten year. Their reading

¹² Ibid., p. 149.

performance was compared to that of 59 children who had not reached the specified criterion level of 1.3 and to the performance on 24 children who moved into the school district during the first grade year. Twenty matched pairs were created from the first two groups of children described above by matching the subjects on the variables sex, age, and I.Q. Sutton noted that the existence of a cluster of scores around the cut-off score of 1.3 might have contaminated her results. She measured the subjects' reading progress each semester using the Gates Reading Achievement Tests.

Sutton found that the children who scored greater than or equal to 1.3 had a higher mean I.Q., a higher mean mental age, a higher socioeconomic status in terms of the father's level of education, and a higher level of reading achievement during grades one through three than children who did not reach the cut-off score. She noted, "The study showed that children who achieve a measure of reading ability in kindergarten had a continuing and increasing reading advantage over their classmates throughout the primary grades."¹³

She also found no significant difference between any of the three groups on the variables sex and early reading ability; a correlation coefficient of .054 between chronological age and third grade reading scores, suggesting that no significant relationship between these two variables existed; and a significant positive correlation of .564 between mental age and third grade reading success.

¹³Marjorie H. Sutton, "Children Who Learned To Read in Kindergarten: A Longitudinal Study," The Reading Teacher 22 (April 1969): 602.

Dolores Durkin (1966) completed two longitudinal studies comparing reading achievement and selected variables of early and non-early readers. Her initial study, in Oakland, California, started in 1958, was an exploratory study attempting to determine:

How many children learn to read at home and, as a result, enter first grade already reading?

What is the effect of this early ability on a child's future achievement in reading?

What kinds of factors promote early reading, and do they have implications for school instruction in reading?¹⁴

Forty-nine early readers were identified from 5,103 first graders through an initial screening as described below:

For the purposes of this research, an "early reader" was initially defined as a beginning first-grade child who was able to identify at least 18 words from a list of 37, and who had not received school instruction in reading. Standardized reading tests would be given to the children who met this requirement. Those children who could not achieve a raw score of at least 1 on the standardized tests would be eliminated from the study.¹⁵

Standardized reading achievement tests and parental questionnaires were administered throughout the six-year duration of the study. Durkin determined that 13 of the 49 early readers first received some form of home reading instruction at the chronological age of 3.5 years, 22 received this at the age of 4.5 years, and 14 received this at the age of 5.5 years. Comparisons of their reading progress during a five-year period revealed, "the children who started to read at an earlier age entered first grade with superior achievement in reading; and they also maintained their lead over a

¹⁴Durkin, p. 13.

¹⁵Ibid., p. 15.

five-year period."¹⁶ Comparisons of the reading achievement of the early readers with that of equally bright non-early-readers following five or six years of school instruction revealed that the average achievement of the early readers was significantly higher.

Family interviews and parental questionnaires revealed many parents felt the preschool reading instruction they had given their children might cause learning difficulties when the children entered school. In terms of the socioeconomic levels of the early readers' families, 14 percent were classified as upper-middle class, 31 percent were classified as lower-middle class, 53 percent were classified as upper-lower class, and 2 percent were classified as lower-lower class. Many early readers expressed an early interest in scribbling and learning to print.

Durkin's second longitudinal study was an attempt to provide more information about non-early-readers and to validate the reading achievement and intelligence data collected in the initial study through the use of better testing procedures. The second study was started in 1961 and located in New York City. One hundred fifty-six early and 156 non-early-readers were identified through the same initial screening used in the California study. Thirty matched pairs of early and non-early-readers were created for comparison purposes. The achievement of both types of readers was measured in the same manner as in the initial study. Durkin's achievement findings concurred with those of the initial study: "the average reading achievement of the early

¹⁶ Ibid., p. 29.

readers was significantly higher than that of the non-early-readers, over a three year period. . . ."¹⁷

Her family interview and questionnaires revealed a variety of characteristics of both types of readers and their respective home environments. For example, Durkin noted:

More mothers of early readers were college graduates. . . .
 More mothers of early readers said they read more often
 than the average adult. . . .
 More early readers were read to at home, prior to entering
 school. . . .
 More mothers of early readers said parents should give
 help with skills like reading to preschool children. . . .
 Fewer early readers played with toys. . . .
 As a result of watching television, more early readers
 developed a curiosity about written words. . . .
 More early readers showed a preschool interest in learning
 to read. . . .
 More parents of early readers gave preschool help with
 . . . printing, . . . identification of written words, . . .
 the meaning of words, . . . spelling, . . . the sounds of
 letters. . . .¹⁸

Ethel M. King and Doris T. Friesen (1972) also compared various characteristics of selected early and non-early readers. Thirty-one early and 31 non-early-readers were selected from 4,282 kindergartners in Calgary, Canada, based on scores on a standardized oral reading test. Comparisons between the two types of readers indicated that the group of early readers was more intelligent than the group of non-early-readers; the mothers of early readers tended to have a higher level of education than the mothers of the non-early-readers; the socio-economic index was higher for the families having early readers; and there appeared to be no significant difference between the ages the early and non-early-readers learned to walk and to talk.

¹⁷ Ibid., p. 84.

¹⁸ Ibid., pp. 94-101.

In terms of specific differences in reading skills, King and Friesen stated,

On the variables analyzed by a multiple discriminant analysis, the readers and non-readers in the kindergarten formed two distinct groups. Intelligence, visual discrimination, letter recognition, word recognition, and rate of learning to read new words were the variables most important in differentiating between the two groups. In the intercorrelation matrix for early readers, the reading level attained by the subjects at the end of the kindergarten year . . . correlated significantly with word recognition and rate of learning to read new words, the two factors that were found to be the best indicators of early reading achievement.¹⁹

Chari Briggs and David Elkind (1973) assessed perceptual, cognitive, motor, and personality characteristics of 16 matched pairs of five-year-old readers and non-readers. Using factor and discriminant analysis, they found:

that only in their performance on an "operativity" factor (derived from some Piagetian conservation tasks and an reflection-impulsivity measure) were the early readers significantly superior to their nonreader controls.²⁰

They also found, as did Durkin, that mothers of the readers had more education than mothers of the control children. Fathers of the readers read more often to their children than did the fathers of the controls.

Briggs and Elkind (1977) studied 33 matched pairs of early and non-early-readers as an extension and replication of their earlier research. The subjects were selected from 2,700 beginning

¹⁹E. M. King and D. T. Friesen, "Children Who Read in Kindergarten," Alberta Journal of Educational Research 18 (September 1972): 158-159.

²⁰C. Briggs and D. Elkind, "Cognitive Development in Early Readers," Developmental Psychology 9 (1973): 279.

kindergarteners using Durkin's 1966 screening procedure. Pairs were matched by race, sex, chronological age, and, if possible, by classroom. Test data revealed that the early readers scored significantly higher than the controls on a measure of conservation and on two subtests of the Illinois Test of Psycholinguistic Abilities: Auditory Closure and Sound Blending. In terms of socioeconomic status, the data supported Durkin's 1966 findings: more parents of the early readers were in professional occupations and had attained higher educational levels than parents of the non-early-readers. Briggs and Elkind also noted,

We had assumed that early reading was the consequence of an interaction between parents' achievement orientation and the spontaneous interest in reading on the part of the child. Our results suggest, however, that this may not be the case and that parents' rather than children's interest may be the main motivational determinant of early reading.²¹

Diann J. W. Ellis (1975) also examined the ability of early readers to perform various Piagetian tasks. The purpose of her research study was to:

explore the relationship between the reading achievement of early readers and their degree of accomplishment on the tasks of conservation, classification, decentration, and language development as well as findings of oral reading abilities and biographical information on the subjects.²²

Her 20 subjects were four to six years of age, were able to read at least at the preprimer level, did not attend elementary school, and were classified as of middle socioeconomic status according to the

²¹C. Briggs and D. Elkind, "Characteristics of Early Readers," Perceptual and Motor Skills 44 (1977): 1236.

²²Diann J. W. Ellis, "The Cognitive Development of Early Readers" (Ed.D. dissertation, Northern Illinois University, 1975), p. 39.

father's professional occupation and educational attainment. Ellis found no significant positive correlation between the subjects' degree of accomplishment on the selected Piagetian tasks and chronological age; word recognition; or independent, instructional, and frustration reading levels. Several of her other findings include the following: there were positive correlations between the subjects' total Piagetian scores and mental age-intelligence scores; between the degree of accomplishment on the language tasks and mental age; between the degree of accomplishment on the decentration task and mental age-intelligence scores; and between the independent reading level scores and the degree of accomplishment on the total Piagetian tasks.

Joanne Ruth Carlson (1975) examined the reading perceptions of 15 kindergarten children who were early readers. The purposes of her study were the following:

- (a) to analyze the early reading kindergartner's understanding and utilization of linguistic terminology used by teachers.
- (b) to formally investigate the application and utilization of selected phonic generalizations by kindergarten children who were early readers.
- (c) to investigate the extent of the utilization of semantic and syntactic systems in the oral reading of kindergarten children who were early readers.²³

Carlson defined an early reader as a kindergarten child who, in the spring of 1973-74, earned a grade equivalent score greater than or equal to 2.0 on the total reading section of the Metropolitan Achievement Test. Her sample was selected from children in Omaha,

²³ Joanne R. W. Carlson, "A Study of Selected Reading Perceptions of Kindergarten Children Who Were Early Readers" (Ph.D. dissertation, University of Nebraska--Lincoln, 1975), p. 5.

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Nebraska, who were tested following recommendations from their teacher(s). Her subjects were presented with various stimuli in three distinct stages. During the first stage, the subjects examined stimuli to determine:

- (a) recognition of the reading act.
- (b) utilization of the word "reading."
- (c) recognition and distinctions between sounds.
- (d) utilization of the word "sound."
- (e) recognition and distinction of the word "word."
- (f) utilization of the word "word."
- (g) recognition and distinction of groups of words.
- (h) recognition and distinction of sentences.²⁴

During the second stage, the subjects pronounced a nonsense syllable or word and a primary sight word; and during the third stage, the subjects orally read stories to demonstrate utilization of specific semantic and syntactic generalizations. Carlson found that the early readers were aware that they could read and that reading involved sounds; they were familiar with the terms "sentences" and "groups of words"; they had a good phonics sense; they used grammatical cues when reading orally; and they were able to correct oral miscues. Related to the subjects' comprehension abilities, Carlson noted, "The findings revealed that the early reader's comprehension levels were enhanced by their ability to utilize their syntactic and semantic systems."²⁵

²⁴ Ibid., p. 10.

²⁵ Ibid., p. 113.

CHAPTER III

RESEARCH DESIGN

In Chapter I, the investigator listed specific word analysis skills which five prominent educators considered to be essential components of the reading acquisition act. A variety of published materials are available for primary teachers to use in the classroom to teach these components. These materials are generally in the form of a basal reader and an accompanying skill workbook designed for reading readiness, preprimer, primer, and more advanced levels of reading ability.

An examination of this type of material created an interest in determining how children who learn to read before attending first grade acquire these essential skill components. Secondly, it raised the question, "Have these children necessarily acquired any or all of the essential components prior to first grade entry?" One would assume that if, indeed, the specified skills are essential components of the reading acquisition act, that these children will have acquired them. It is conceivable, however, that these children are able to demonstrate an ability to read but have not acquired these specific skills. It is also conceivable that the acquisition of these skills is hierarchical in nature, suggesting that children acquire them in a particular order, and that the extent of skill acquisition may vary among individuals.

The purpose of this investigation was to determine among children who had demonstrated an ability to read prior to first grade entry:

- a. whether they had acquired any of the specified essential skill components,
- b. the degree of skill acquisition within each individual and of the sample as a whole, and
- c. whether the acquisition of these essential components might be hierarchical in nature.

The following research questions were designed to meet this purpose.

Research Questions

Visual Discrimination

1. *To what degree are preschool readers able to visually match letters?*
2. *To what degree are preschool readers able to identify the lower case letters of the alphabet when each letter is named?*
3. *To what degree are preschool readers able to identify the upper case letters of the alphabet when each letter is named?*
4. *To what degree are preschool readers able to name the lower case letters of the alphabet?*
5. *To what degree are preschool readers able to name the upper case letters of the alphabet?*
6. *To what degree are preschool readers able to visually discriminate the order of letters in a word?*

7. *To what degree are preschool readers able to visually match words?*
8. *To what degree are preschool readers able to identify root words?*
9. *To what degree are preschool readers able to identify the inflectional endings: -s, -es, -'s, -ed, and -ing in words?*

Auditory Perception

1. *To what degree are preschool readers able to identify consonant phonemes heard in the initial position of words?*
2. *To what degree are preschool readers able to identify consonant phonemes heard in the medial position of words?*
3. *To what degree are preschool readers able to identify consonant phonemes heard in the final position of words?*
4. *To what degree are preschool readers able to identify rhyming phonemes?*

Sound-Symbol Association

1. *To what degree are preschool readers able to produce the "short" phonemic value for each of the following: a, e, i, o, and u?*
2. *To what degree are preschool readers able to produce the "long" phonemic value for each of the following: a, e, i, o, and u?*
3. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each*

of the following consonant letters when found in the initial position of words: b, d, f, h, j, k, l, m, n, p, q, r, s, t, v, w, and z?

4. To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant blends frequently found in the initial position of words: br, dr, fr, gr, tr, cl, fl, pl, st, sw, tw, sp, and sm?
5. To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant digraphs frequently found in the initial position of words: ch, sh, and wh?
6. To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant blends frequently found in the final position of words: lk, nk, rk, and nt?
7. To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant digraphs frequently found in the final position of words: ch, sh, and ck?
8. To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following phonograms frequently found in the final position of words: al, by, ty, and se?

9. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following frequently occurring phonograms: am, an, ay, ed, ee, en, id, ig, in, it, op, ot, oy, un, up, ack, ake, ame, ank, ell, ike, ill, ing, oke, and ouse?*

Blending and Letter Substitution

1. *To what degree are preschool readers able to blend an initial consonant phoneme(s) with the remaining phonemes in a word?*
2. *To what degree are preschool readers able to blend a final consonant phoneme(s) with the remaining phonemes in a word?*
3. *To what degree are preschool readers able to substitute initial consonant letters in words?*
4. *To what degree are preschool readers able to substitute final consonant letters in words?*
5. *To what degree are preschool readers able to substitute medial vowel letters in words?*

Word Knowledge

1. *To what degree have preschool readers developed an initial stock of sight words?*
2. *To what degree are preschool readers able to associate meaning with words?*

Total Skill Acquisition

1. *What is the rank order, based on the degree of skill attainment, of the specified reading acquisition components acquired by preschool readers?*

2. *Is there a significant number of preschool readers who have acquired all of the specified reading acquisition components?*
3. *Is there a significant number of preschool readers who have acquired none of the specified reading acquisition components?*
4. *Is there a significant difference in the degree of word recognition skill acquisition by preschool readers according to intelligence?*
5. *Is there a significant difference in the degree of word recognition skill acquisition by preschool readers according to sex?*

This data provided an answer to the question, "To what degree have children acquired the skills and knowledges believed to be essential to the acquisition of reading as specified by the educators previously mentioned?" However, it did not answer the very practical question of whether children in beginning reading instruction are actually taught these skills and knowledge. Since basal readers are widely used by primary teachers to teach beginning reading skills, the investigator examined the scope and sequence charts of five recently published basal reading series. Although the investigation revealed no complete consensus of skills, these series did incorporate a majority of the skills specified by the theorists.

The investigator eliminated any grapheme or set of graphemes found in the original set of skills specified for investigation in Chapter I which did not have independent regular representation. The reference work, Word Patterns, by Lucille Batchelor, was used to

identify the graphemes which were eliminated. The criterion of independent regular representation was considered necessary to minimize the confusion a child might face when presented with a grapheme or set of graphemes which had more than one phonemic value in English spellings. Secondly, this simplified and added a measure of precision to the collection and interpretation of the data.

The Sample

The sample consisted of 20 pre-first grade children, whose names were obtained from a number of organizations in the Lansing area which had access to or could identify children who had not yet entered grade one. Among these were child care centers, nursery schools, the State of Michigan Department of Education, the Lansing Office for Young Children, the Lansing Program for Gifted Children, and the Institute for Family-Child Study at Michigan State University. Administrators in the Lansing and East Lansing public school systems were also contacted to determine if any kindergarten pupils might qualify as subjects.

Since the majority of subjects were obtained from communities located in close proximity to Michigan State University, several subjects were selected from a community in Ohio to obtain representation from a small rural and industrial area.

Great care was taken in selecting children who had received minimal, if any, formal word analysis skill instruction from either their classroom teachers, supervisors, or parents. At least five children were eliminated from the sample because extensive instruction had been provided in the type of reading skills investigated in this

study. Because of the limited number of subjects available, the exercise of random selection was not feasible.

Measuring Instruments

The following instruments were selected to assess the skill acquisition of the subjects:

Dolch Basic Sight Word List

This list contains 220 service words which frequently occur in primary level materials. These words are common to three other word lists containing words understood or used by primary grade children. Dolch determined, based on 1,000 word samplings from elementary level readers, that 70 percent, 66 percent, and 65 percent of the running words in first, second, and third grade readers, respectively, were on the Dolch List.²⁶ The 220 words were presented on two sheets, each containing 110 words. The child's task was to pronounce each word, within a five second time limit.

Durrell Analysis of Reading Difficulty-- Subtests

The test materials for the next three subtests consist of a set of 28 upper case and a set of 28 lower case letters printed in a random order.

²⁶Miles V. Zintz, The Reading Process (Dubuque, Iowa: Wm. C. Brown Co. Publishers, 1970), p. 147.

Matching Letters. The child's task was to identify each of the 26 upper and 26 lower case letters by pointing on the answer sheet to the letter the examiner exposed briefly by means of a tachistoscope.

Identifying Letters Named. The child's task was to point to the letter the examiner named.

Naming Letters. The child's task was to name each upper and lower case letter.

Visual Memory of Words--Primary. This subtest consists of 20 items, each containing five to seven letters or words. The child's task was to encircle the same letter or word exposed for two to three seconds by means of a tachistoscope.

Hearing Sounds in Words--Primary. This subtest consists of 29 items, each containing three words. The child's task was to encircle the word which began and/or ended with the same consonant phoneme(s) as a word pronounced by the examiner.

Iowa Tests of Basic Skills, Level 7,
Form 5--Subtests

Vocabulary. This subtest consists of 30 items. The first 17 items contain a picture followed by four words. The child was to choose the word that best told about or described the picture. The remaining 13 items consist of sentences in a cloze format, followed by four words. The child's task was to choose the word that best completes each sentence. The items include a reasonable combination of nouns, verbs, and adjectives.

Word Analysis. This subtest consists of 49, three choice items, measuring the following word analysis skills: recognition of initial, rhyming, and ending sounds; substitution of initial and ending letters; and recognition of silent letters.

Non-Standardized Measures

Durkin's Initial Screening Measure. This measure consists of 37 typed words arranged in columns and 27 words arranged in sentences. The child's task was to read the words and sentences orally.

Identification of Consonant Sounds in the Medial Position of Words. This test consists of 17 items, each containing three choices. The child's task was to encircle the word that contains in the medial position of the word the phoneme articulated by the examiner.

Identification of Inflectional Endings. This test consists of 20 items. The child's task was to encircle the inflectional ending in each word.

Identification of Root Words. This test consists of 20 words. The child's task was to encircle the root of each word.

Medial Vowel Letter Substitution. This test consists of 10 items, each containing three choices. The child's task was to substitute the vowel letter in the medial position of each word with the vowel letter designated by the examiner and to encircle the resulting new word.

Sound-Symbol Association--Vowels. This test consists of 20 nonsense words. The child's task was to pronounce the phoneme represented by the vowel letter in each word.

Consonants. This test consists of 34 words. The child's task was to pronounce the phoneme represented by the consonant letter at the beginning of each word.

Consonant Blends. The first part of this test consists of 26 words. The child was to pronounce the phonemes represented by the consonant letters at the beginning of each word. The second part of this test consists of eight words. The child was to pronounce the phonemes represented by the consonant letters at the end of each word.

Consonant Digraphs. The first part of this test consists of six words. The child was to pronounce the phoneme represented by the compound grapheme at the beginning of each word. The second part of this test consists of six words. The child was to pronounce the phoneme represented by the compound grapheme at the end of each word.

Phonograms. The first part of this subtest consists of 25 phonograms. The child's task was to pronounce the phonemes. The second part of this subtest consists of eight words. The child's task was to pronounce the phonemes represented by each of the underlined word parts.

Wechsler Preschool and Primary Scale of Intelligence

This test consists of five verbal and five performance subtests designed to measure a variety of intellectual abilities. The composite score can be interpreted as a measure of global intellectual capacity. The subtests include Information, Animal House, Vocabulary, Picture Completion, Arithmetic, Mazes, Geometric Design, Similarities, Block Design, and Comprehension.

The standardized measures were selected after a thorough examination of information concerning their reliability, validity, and standardization procedures and of reviews of these tests in Buros' Mental Measurement Yearbooks. This investigator feels that each of the standardized measures satisfied the requirements for a well-constructed test.

Procedure

Seventeen of the 20 subjects were individually tested by this investigator at the Michigan State University Reading Center in a special testing room. Each child was seated across from the examiner at a rectangular table. The parents were invited to observe the testing sessions through a one-way vision strip.

The testing of the three children from the Ohio community was done in an empty classroom in one of the elementary schools in the Painesville Township school system. Each child was tested individually and was seated across from the examiner at a rectangular table. The parents of these children were not invited to observe the testing because an isolated observation area was not available. An attempt was made to keep the testing in Ohio parallel in as many respects as possible to that done in Michigan.

Two testing periods, of two hours each, were necessary to administer the complete battery of tests to each subject. The two testing sessions for each subject were scheduled on different days. Each two-hour session included several short recess periods for relaxation.

Each potential subject was administered two screening measures to determine whether the child could easily read and understand words found in typical mid-year first grade level reading materials. The first screening measure was identical to that developed by Dolores Durkin for her 1966 study. It consists of 37 typed words arranged in columns and 27 words arranged in sentences. Each child was asked to orally read these words to the examiner. Recognition of a minimum of 18 words was the criterion for passing the first screening measure.

The second screening measure was the comprehension subtest from the Harper and Row Preprimer Achievement Test. The test consists of 22, four-choice items, each of which contains a short passage followed by four pictures. The child was asked to carefully read each item and to choose the picture which best corresponds with the passage. A raw score of 11 was the criterion for qualifying as an able reader.

Instruments to measure both sight vocabulary and reading comprehension were selected to insure that the children who could pass the initial screening procedure could be classified as fairly fluent readers. At least two children were unable to pass the initial screening measures and, therefore, were not included as subjects for this study.

The order for administering the 20 measuring instruments proceeded according to the order in which the tests are listed in Appendix B. Following the testing session, a parental questionnaire was discussed with one or both of each child's parents.

Statistical Analysis

Since the nature and purpose of this study was descriptive, rather than experimental, the statistical analysis was kept as simple and comprehensible as possible. The data was analyzed to answer each of the 34 research questions specified earlier in this chapter (in italics). Since the subtests did not contain a uniform number of items, raw scores were transformed into percentages so that the percentages of correct response could be compared across the subtests. Both charts and graphs were created to simplify the interpretation of the data. Rank-order correlation coefficients were also computed to answer several of the research questions.

CHAPTER IV

RESULTS

The questionnaire to which the parents of each of the 20 subjects responded provided data which formed a basis for characterizing the children who participated in the study. These data are included in summary Table 1.

The Sample

General Description

Fourteen of the 20 subjects were female and six were male. The age of the subjects, at the time of testing, ranged from four years-eight months to six years-four months. Figure 1 provides a pictorial representation of the distribution of ages.

Seventeen subjects were attending kindergarten for the first time, one was attending nursery school, one was attending Michigan State University Laboratory Preschool, and one was attending a private Montessori ungraded school. The child attending the Montessori school was of kindergarten age but not old enough to be enrolled in a public school first grade classroom. Eighteen subjects were Caucasian, one was Black, and one was East Indian.

The birth order and number of siblings were studied to determine if these characteristics appeared to influence the subjects' early interest in reading. Two subjects were from families having only one

Table 1. Descriptive Data

Subject	Sex	Age ^a	Grade ^b	Race ^c	No. of Siblings	Birth _d Order	Mother's Education	Father's Education	Mother's Occupation	Father's Occupation	Community Type ^e
1	F	5-11	K	B	1	2	Under-graduate student	N.A.	Clerical aide	N.A.	Sm. city. univ.
2	F	5-11	K	C	2	2	B.A.	Ph.D.	Adminis-trator	College professor	Sm. city. univ.
3	M	5-2	NS	C	1	1	B.A.	Ph.D. student	Housewife/ex-teacher	College professor/student	Sm. city. univ.
4	M	6-0	K	C	0	1	B.A.	Ph.D. student	Teacher	Graduate student	Sub. res.
5	M	5-9	K	C	1	2	B.A.	Ph.D.	Housewife/ex-teacher	College professor	Sm. city. univ.
6	F	5-6	K	C	2	1	M.A.	B.S.	College instructor	Manager	Sm. city. univ.
7	M	5-5	K	C	1	2	M.S.	Ph.D.	Housewife/teaches part-time	College professor	Sm. city. univ.
8	F	6-2	K	C	0	1	High school	High school	Housewife	Letter carrier	Sm. city. univ.
9	F	5-9	K	C	1	2	B.S.	J.D.	Legislative proof-reader	Attorney	Sm. city. univ.
10	M	4-10	LPS	EI	1	1	Under-graduate student	Ph.D.	Housewife	College professor	Sm. city. univ.
11	F	5-0	M	C	1	1	B.A.	B.A.	Writer	TV producer	Sm. city. univ.
12	F	5-9	K	C	1	1	R.N.	B.A.	Nurse	Plant manager	Sm. city. univ.

Table 1--Continued

Subject	Sex	Age ^a	Grade ^b	Race ^c	No. of Siblings	Birth ^d Order	Mother's Education	Father's Education	Mother's Occupation	Father's Occupation	Community Type ^e
13	F	6-3	K	C	1	1	B.A.	B.S.	Housewife/ ex-teacher	Electrical engineer	Sm. city. rur.-ind.
14	F	6-0	K	C	1	1	R.N.	B.S.	Psychiatric nurse	Systems analyst	Sm. city. rur.-ind.
15	M	5-10	K	C	1	2	B.S.	Graduate student	Lab. research technician	Graduate student	Sm. city. univ.
16	F	5-11	K	C	1	1	B.S.	B.A.	Medical technol- ogist	Insurance agent/ ex-teacher	Lg. city. govt.-ind.
17	F	5-7	K	C	1	1	B.A.	B.A.	Works for stock broker/ ex-teacher	Manager	Lg. city. govt.-ind.
18	F	5-7	K	C	1	1	B.A.	B.A.	Housewife/ ex-teacher	Teacher	Lg. city. govt.-ind.
19	F	5-6	K	C	1	1	B.A.	B.S.	Teacher	Engineer	Lg. city. govt.-ind.
20	F	5-11	K	C	2	3	High school	B.S.	Housewife/ teacher aide	C.P.A.	Lg. city. govt.-ind.

^aAge is described in years-months.^bGrade: NS = Nursery school; LPS = Lab preschool; K = Kindergarten; M = Montessori (ungraded)^cC = Caucasian; EI = East Indian; B = Black. ^dOrder of birth: 2 means the second oldest.^eCommunity type: Lg. city., govt.-ind. = Large city, government-industrial;
Sm. city., rur.-ind. = Small city, rural-industrial;
Sm. city., univ. = Small city, university; Sub.-res. = Suburban-residential.

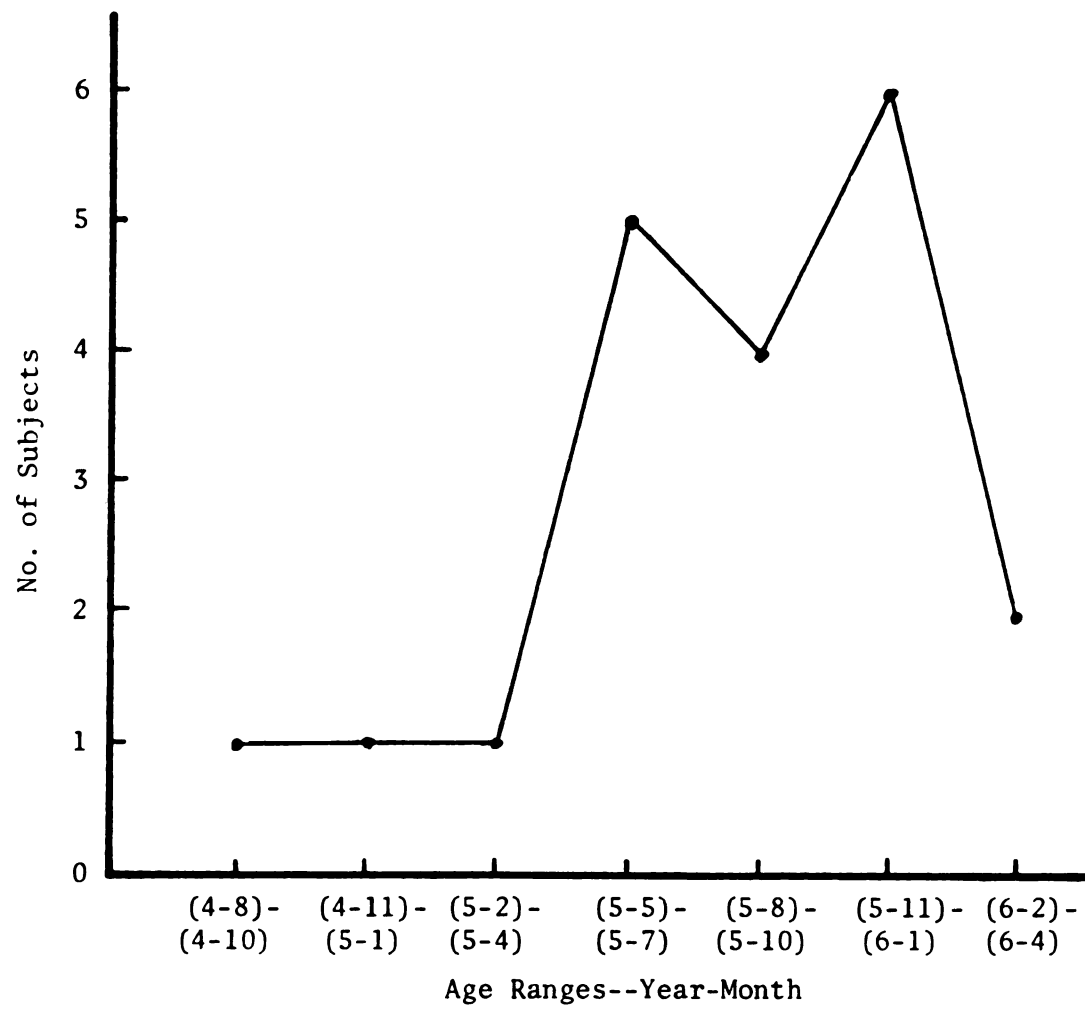


Figure 1. Age Distribution of Subjects.

child, fifteen subjects were from families having two children, and three subjects were from families having three children. Eleven of the subjects having siblings were first born, six were last born, and one was the second of three children.

The level of education and occupational status of the parents were examined because a relationship between these two factors and the academic achievement and reading success of children has been reported in the literature. Sutton (1967) found a positive correlation (.471) between her subjects' fathers' level of schooling and the reading success of the children.²⁷ Durkin (1966) found that more of the mothers of the early-readers had received college degrees than had the mothers of the non-early-readers.²⁸

Because one subject was living with the mother in a single-parent home, information is reported on only 19 fathers.

The level of educational achievement ranged from high school graduate through the doctorate, with the majority of parents earning at least a college degree. Since 34 of the parents reported the completion of at least a bachelor's degree, it seemed reasonable to conclude that the majority of these parents place a high value on educational accomplishment.

Most of the parents are or had been engaged in professional occupations. Among the mothers, eight are housewives, six of whom had at one time worked in an educational setting; one is a college

²⁷ Sutton, p. 161.

²⁸ Durkin, pp. 94-101.

instructor; two are public school teachers; six are employed in the professions; and three are serving in clerical positions. Among the fathers, five are college professors, one is a public school teacher; two are pursuing graduate degrees; six are employed in the business world; four are engaged in professional pursuits; and one is employed in a nonprofessional governmental position. Approximately 56 percent of the parents were employed in some type of occupation other than education.

The residences of the children in the sample were distributed among the various community types as follows: eleven subjects were living in a small city, university community; five were living in a large city, governmental-industrial area; three were living in a small city, rural-industrial area; and one was living in a suburban-residential community.

Performance on Screening Measures

All of the children in the sample substantially exceeded the criterion scores for classification as an able reader. Ceiling scores on the two parts of the Durkin screening measure (Words in Isolation and Words in Sentences) were earned by thirteen and twelve children, respectively. Eighteen subjects (90 percent of the sample) achieved an accuracy score of at least 92 percent on both parts of the Durkin measure. The remaining two subjects exceeded the criterion by at least 28 raw scores. The subjects' performance when the words were presented in a contextual framework was superior to their performance when words were presented in isolation.

On the second screening measure, the comprehension subtest of the Harper and Row Preprimer Achievement Test, twelve subjects correctly answered at least 20 items (91 percent accuracy); three subjects correctly answered 19 items (86 percent accuracy); four subjects correctly answered 17 items (77 percent accuracy); and one subject correctly answered 14 items (64 percent accuracy). Successful performance on this measure involved the exercise of three operations: (1) recognition of the words in the items, (2) interpretation of the stem of the items, and (3) selection of the appropriate response. The complexity of the tasks required for successful performance on the comprehension measure may account for the discrepancy in the levels of achievement on both screening measures. The data from the screening measures is summarized in Table A.1 (Appendix A).

Intelligence Characteristics

A detailed array of each subject's performance on the Wechsler Preschool and Primary Scale of Intelligence is presented in Table A.2 (Appendix A). The mean verbal scale score earned by the subjects was 124.45; the mean performance scale score was 122.80; and the mean full scale score was 126.00. Significantly, all three mean scores fall within the Superior intelligence classification as specified in the examiner's manual. Significant, too, is the slight difference in the magnitude of the mean verbal and performance scores, suggesting that the subjects were equally facile in the abilities measured by the verbal and performance subtests.

The summary of intelligence test data in Table 2 reveals that seven subjects attained full scale scores which fell within the Very Superior classification (such classification requiring a performance which falls at least two standard deviations above the mean); six subjects attained full scale scores which fell within the Superior classification (such classification requiring a performance which falls at least one and one-third standard deviations above the mean); and seven subjects attained full scale scores which fell within the Bright Normal classification (such classification requiring a performance which falls at least two-thirds of a standard deviation above the mean).

Table 2. WPPSI Score Distributions According to Intelligence Classifications (n = 20)

I.Q. Range and Classification	Composite Scores		
	Verbal	Performance	Full Scale
Very Superior 130 and above	8	4	7
Superior 120-129	4	6	6
Bright Normal 110-119	6	8	7
Average 90-109	2	2	0

A more detailed analysis of the composite score distributions is presented in Table 3. One subject's performance scale score and full scale score exceeded the mean by three and one-half standard deviations and fell in the I.Q. range of 154-156. Six subjects' full scale scores exceeded the mean by more than two standard deviations and fell in the range of 132-140. These relationships are portrayed in Figures 2 and 3.

Table 3. WPPSI Score Distributions (n = 20)

I.Q. Score Ranges	Composite Scores		
	Verbal	Performance	Full Scale
154-159	--	1	1
148-153	--	--	--
142-147	1	--	--
136-141	3	3	3
130-135	4	--	3
124-129	2	3	3
118-123	3	8	6
112-117	3	2	2
106-111	3	2	2
100-105	1	1	--

The incidence of high scores on the Verbal Subtests, namely, Information, Vocabulary, Arithmetic, Similarities, and Comprehension, is evident in Tables 4 and 5. That the magnitude of the mean scores on the Vocabulary and Comprehension subtests is less than those on the other verbal subtests would ordinarily not be expected of good readers if one may generalize from other studies dealing with the

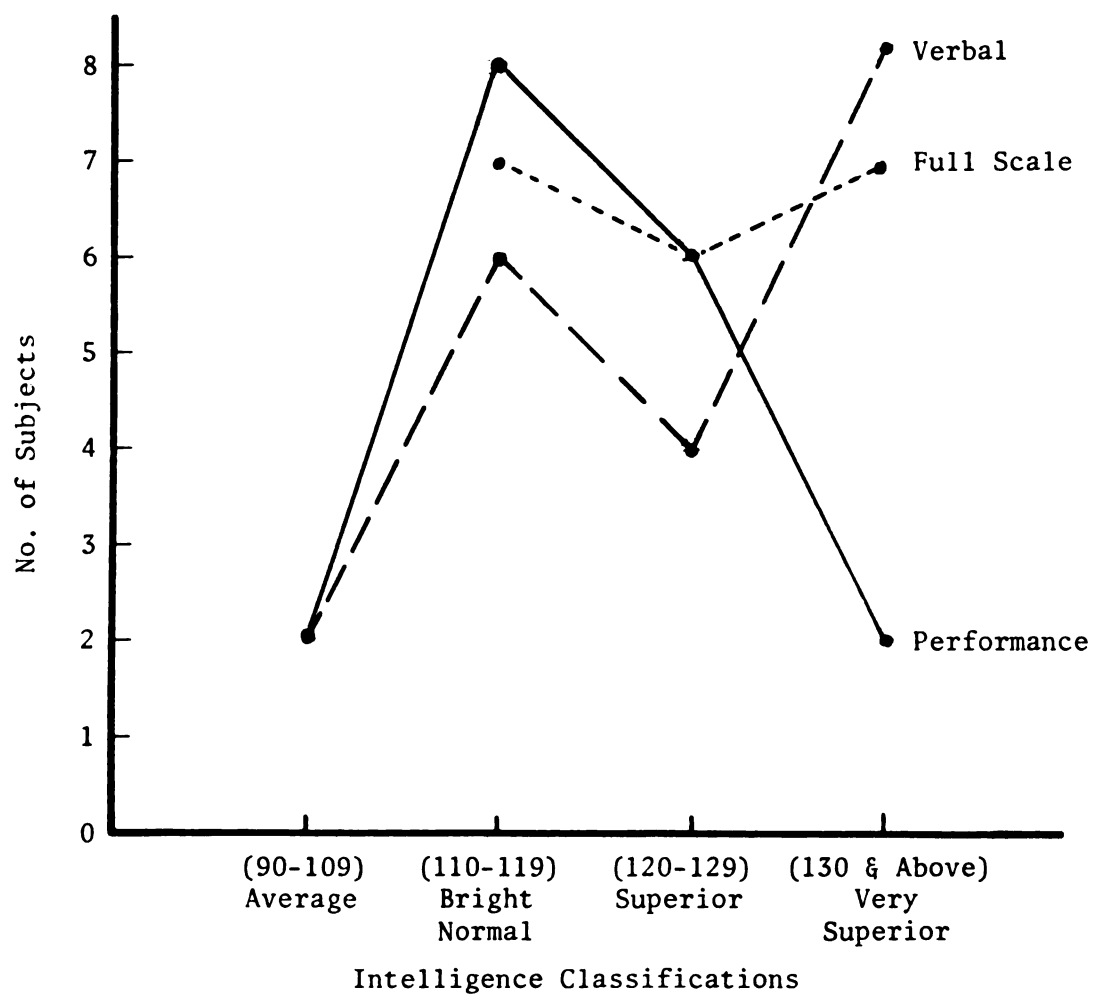


Figure 2. WPPSI Score Distributions According to Intelligence Classifications.

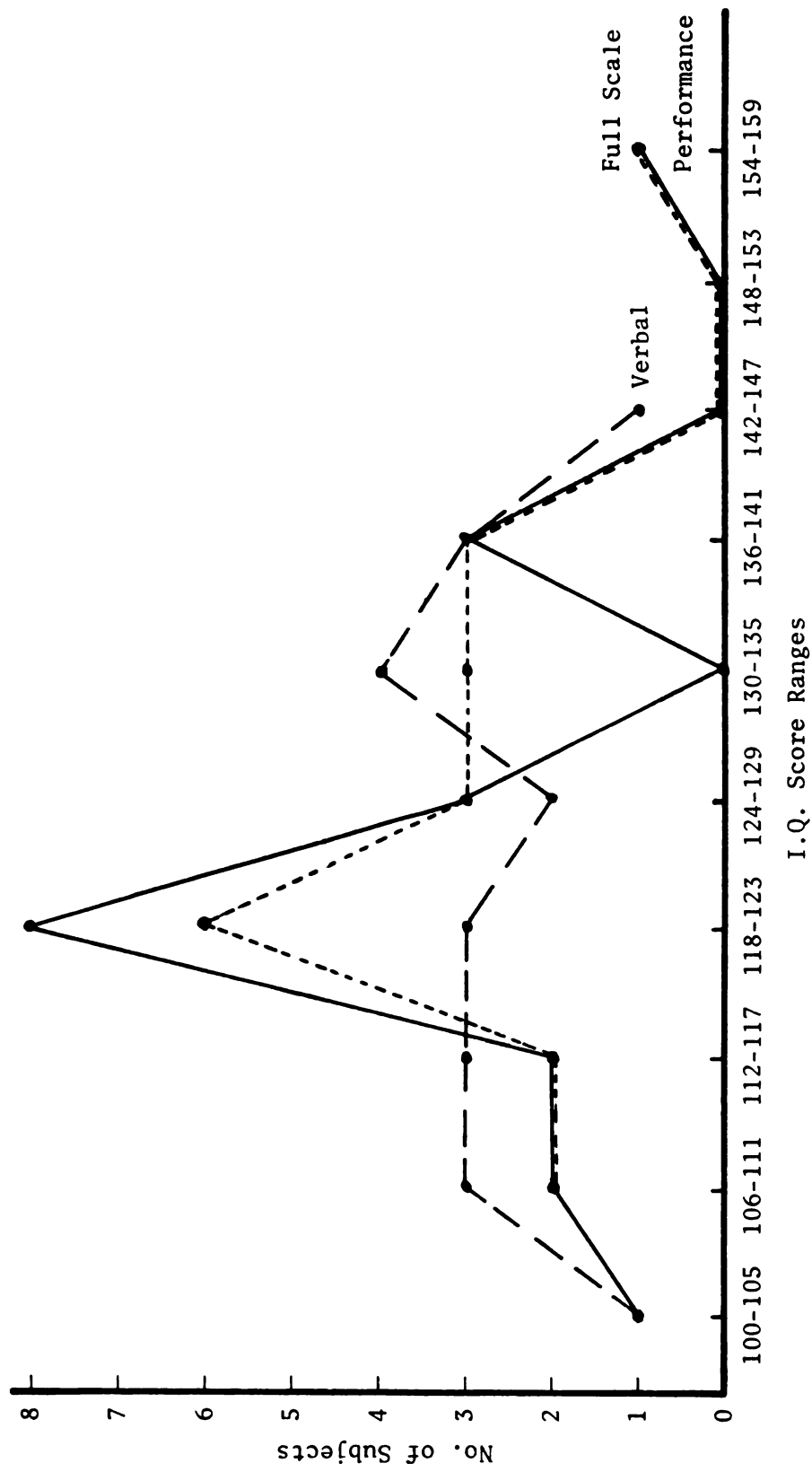


Figure 3. WPPSI Verbal, Performance, and Full Scale Score Distributions

Table 5. Mean Scaled Scores for the Verbal and Performance Subtests

Verbal Tests	Mean Scaled Score	Performance Tests	Mean Scaled Score
Information	15.10	Animal House	13.95
Vocabulary	13.45	Picture Completion	12.65
Arithmetic	14.70	Mazes	14.10
Similarities	13.80	Geometric Design	13.10
Comprehension	12.55	Block Design	13.15

relationships between achievement in reading and intelligence test scores. It has been held by other researchers that accuracy in reading comprehension "is much more dependent on ability to associate word meanings correctly than on any other mental ability. Second in importance is ability to weave ideas together and make inferences about them."²⁹

A careful analysis of the subjects' behavior failed to provide a feasible explanation for why this data appear to be somewhat contrary to what has been reported previously. Perhaps the magnitude of the discrepancy among the subtest scores is not particularly significant. The fact that all of the scaled scores are quite high suggests that the subjects demonstrated strengths in each of the verbal and performance abilities measured by these subtests.

²⁹F. B. Davis and C. C. Davis, "Development of the Test," Davis Reading Test (New York: The Psychological Corporation, 1962), p. 28.

Analysis of the Data

The purpose of this investigation was to determine among children who had demonstrated an ability to read prior to first grade entry:

- a. whether they had acquired any of the essential components of the reading acquisition act,
- b. the degree of skill acquisition within each individual and of the sample as a whole, and
- c. whether the acquisition of these essential components appeared hierarchical in nature.

Accordingly, the children were administered measures to provide data for assessing the level of achievement in the acquisition of components of the reading act.

Visual Discrimination

The various measures which were used to assess the components of visual discrimination provided data to answer the questions which follow. The distributions of scores for each of these subtests are presented in Table A.3 (Appendix A).

1. *To what degree are preschool readers able to visually match letters?*

On the letter matching subtest, the range of scores was 53-54 items (98-100 percent accuracy). All but two subjects earned a ceiling score.

2. *To what degree are preschool readers able to identify the lower case letters of the alphabet when each letter is named?*

On the lower case letter identification subtest, the range of scores was 24-26 items (92-100 percent accuracy). Nineteen subjects correctly identified all of the lower case letters, and one subject identified i for l and p for q.

3. *To what degree are preschool readers able to identify the upper case letters of the alphabet when each letter is named?*

All of the subjects correctly identified each of the upper case letters.

4. *To what degree are preschool readers able to name the lower case letters of the alphabet?*

The scores on this subtest ranged from 24-26 (92-100 percent accuracy). Eighteen subjects correctly named all of the lower case letters; one subject correctly named 25 letters (96 percent accuracy); and another subject correctly named 24 letters (92 percent accuracy). The errors made by the latter two subjects involved naming p for q and d for b.

5. *To what degree are preschool readers able to name the upper case letters of the alphabet?*

All of the subjects named each of the upper case letters correctly.

6. *To what degree are preschool readers able to visually discriminate the order of letters in a word? And,*
7. *To what degree are preschool readers able to visually match words?*

The first visual discrimination subtest which presented any difficulty for the subjects involved the matching of words and remembering the order of letters in words. The scores on this subtest

ranged from 7 to 18 (39-100 percent accuracy). Two subjects attained ceiling scores; two correctly answered 17 items (94 percent accuracy); three correctly answered 16 items (89 percent accuracy); and eight correctly answered 13-15 items (72-83 percent accuracy). Five subjects performed in the range of 7-12 correct responses (39-67 percent accuracy). The mean score was 14 (78 percent accuracy).

8. *To what degree are preschool readers able to identify root words?*

The subjects' performance on the identification of root words subtest revealed some diversity. The scores ranged from 8 to 18 (40-90 percent accuracy). The highest scores were attained by two subjects who correctly identified 18 root words (90 percent accuracy); three who correctly identified 17 root words (85 percent accuracy); and three who correctly identified 16 root words (80 percent accuracy). Eight subjects scored in the range of 14-15 items (70-75 percent accuracy). Four subjects correctly answered no more than 11 items (55 percent accuracy). The mean score was 15 (75 percent accuracy).

9. *To what degree are preschool readers able to identify the inflectional endings: -s, -es, -'s, -ed, and -ing in words?*

The subjects' performance on the identification of inflectional endings subtest revealed even more diversity than was demonstrated on the root word subtest. The scores on this subtest ranged from 1-20 (5-100 percent accuracy). The highest performances were achieved by one subject who earned a ceiling score; three subjects who correctly answered 19 items (95 percent accuracy); three who correctly answered 18 items (90 percent accuracy); and three who correctly answered 17

items (85 percent accuracy). Six subjects scored in the range of 12-16 items (60-80 percent accuracy). The dispersion of scores is especially evident at the lower range of the scale where four subjects correctly answered 25 percent of the items or less. The mean score was 14 (70 percent accuracy).

Auditory Perception

The various measures which were used to assess the components of auditory perception provided data to answer the questions which follow. The distributions of scores for each of these subtests are presented in Table A.4 (Appendix A).

1. *To what degree are preschool readers able to identify consonant phonemes heard in the initial position of words?*

The scores on the identification of initial consonant phonemes subtest ranged from 20 to 30 (67-100 percent accuracy). The mean score was 26 (87 percent accuracy). The highest performances were achieved by one subject who earned a ceiling score; two subjects who correctly answered 29 items (97 percent accuracy); two subjects who correctly answered 28 items (93 percent accuracy); two who correctly answered 27 items (90 percent accuracy); and five who correctly answered 26 items (87 percent accuracy). Five subjects scored in the range of 23-25 items (77-83 percent accuracy), and three subjects correctly answered 73 percent of the items or less.

2. *To what degree are preschool readers able to identify consonant phonemes heard in the medial position of words?*

The range of scores on the identification of medial consonant phonemes was somewhat less than that on the previous subtest: 14-17 items (82-100 percent accuracy), and the mean score was 16 (94 percent accuracy). A ceiling score was earned by nine subjects; four subjects correctly answered 16 items (94 percent accuracy); four correctly answered 15 items (88 percent accuracy); and three correctly answered 14 items (82 percent accuracy).

3. *To what degree are preschool readers able to identify consonant phonemes heard in the final position of words?*

The scores on the identification of final consonant phonemes subtest ranged from 9-14 (64-100 percent accuracy). The mean score was 13 (93 percent accuracy). This subtest had the highest mean score of the four tests of auditory perception. Fourteen subjects earned ceiling scores; three subjects correctly answered 13 items (93 percent accuracy); two correctly answered 11 items (78 percent accuracy); and one correctly answered 9 items (64 percent accuracy).

4. *To what degree are preschool readers able to identify rhyming phonemes?*

The range of scores on the rhyming phonemes subtest was 4 to 9 (44-100 percent accuracy), and the mean score was 7 (78 percent accuracy). Six subjects earned ceiling scores; six correctly answered 8 items (89 percent accuracy); three correctly answered 7 items (78 percent accuracy); three correctly answered 6 items (67 percent accuracy); and two correctly answered 4 items (44 percent accuracy).

Sound-Symbol Association

The various measures which were used to assess the components of sound-symbol association provided data to answer the questions which follow. The distributions of scores for each of the sound-symbol association subtests are presented in Table A.5 (Appendix A).

1. *To what degree are preschool readers able to produce the "short" phonemic value for each of the following: a, e, i, o, and u?*

The range of performance on the first sound-symbol association subtest was 0-8 items (0-80 percent accuracy), and the mean score was 4 (50 percent accuracy). The highest performances were achieved by four subjects who correctly answered 8 items (80 percent accuracy); two subjects who correctly answered 7 items (70 percent accuracy); three who correctly answered 6 items (60 percent accuracy); and one who correctly answered 5 items (50 percent accuracy). Six subjects scored in the range of 1-4 items (10-40 percent accuracy). Four subjects were unable to determine the "short" phonemic value of the vowel letters in any of the items.

2. *To what degree are preschool readers able to produce the "long" phonemic value for each of the following: a, e, i, o, and u?*

The range of performance on this subtest was 0-8 items (0-80 percent accuracy). The mean score was 2 (20 percent accuracy). The highest performances were achieved by one subject who correctly answered 8 items (80 percent accuracy); two who correctly answered 6 items (60 percent accuracy); and one who correctly answered 5 items (50 percent accuracy). Six subjects scored in the range of 1-3 items

(10-30 percent accuracy). Ten subjects were unable to determine the "long" phonemic value of the vowel letters in any of the items.

3. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant letters when found in the initial position of words: b, d, f, h, j, k, l, m, n, p, q, r, s, t, v, w, and z?*

The range of performance on the initial consonant phonemes subtest was 26-33 items (76-97 percent accuracy), and the mean score was 30 (88 percent accuracy). The highest performances were achieved by three subjects who correctly answered 33 items (97 percent accuracy); two who correctly answered 32 items (94 percent accuracy); two who correctly answered 31 items (91 percent accuracy); and seven who correctly answered 30 items (88 percent accuracy). Six subjects scored in the range of 26-29 items (76-85 percent accuracy).

4. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant blends frequently found in the initial position of words: br, dr, fr, gr, tr, cl, fl, pl, st, sw, tw, sp, and sm?*

The range of performance on the initial consonant blend phonemes subtest was 6-26 (23-100 percent accuracy), and the mean score was 14 (54 percent accuracy). The highest performances were achieved by two subjects who earned ceiling scores; one who correctly answered 25 items (96 percent accuracy); and two who correctly answered 23 items (88 percent accuracy). Two subjects scored in the range of 15-18 items (58-69 percent accuracy); nine scored in the range of 9-11 items (35-42 percent accuracy); and four scored in the range of 6-8 items (23-31 percent accuracy).

5. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant digraphs frequently found in the initial position of words: ch, sh, and wh?*

The subjects demonstrated a range of performance of 0-33 (0-100 percent accuracy), and the mean score was 4 (67 percent accuracy) on the initial consonant digraphs subtest. Three subjects earned ceiling scores; five correctly answered 5 items (83 percent accuracy); six correctly answered 4 items (67 percent accuracy); five subjects scored in the range of 1-3 items (17-50 percent accuracy); and one subject was unable to correctly answer any items.

6. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant blends frequently found in the final position of words: lk, nk, rk, and nt?*

The range of performance on the final consonant blends subtest was 0-8 (0-100 percent accuracy), and the mean score was 5 (63 percent accuracy). Five subjects achieved ceiling scores; five correctly answered 6 items (75 percent accuracy); six scored in the range of 3-5 items (38-63 percent accuracy); two scored in the range of 1-2 items (12-25 percent accuracy); and two were unable to correctly answer any items.

7. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following consonant digraphs frequently found in the final position of words: ch, sh, and ck?*

The range of performance on the final consonant digraphs subtest was 1-6 items (17-100 percent accuracy), and the mean score was 4 (67 percent accuracy). Seven subjects earned ceiling scores;

three correctly answered 5 items (83 percent accuracy); three scored in the range of 3-4 items (50-67 percent accuracy); and seven scored in the range of 1-2 items (17-33 percent accuracy).

8. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following phonograms frequently found in the final position of words: al, by, ty, and se?*

The range of performance on the final phonograms subtest was 0-8 (0-100 percent accuracy), and the mean score was 4 (50 percent accuracy). Four subjects earned ceiling scores; one correctly answered 7 items (88 percent accuracy); three correctly answered 6 items (75 percent accuracy); six correctly answered 4 items (50 percent accuracy); four scored in the range of 2-3 items (25-38 percent accuracy); and two were unable to correctly answer any items.

9. *To what degree are preschool readers able to produce the phonemes having independent regular representation by each of the following frequently occurring phonograms: am, an, ay, ed, ee, en, id, ig, in, it, op, ot, oy, un, up, ack, ake, ame, ank, ell, ike, ill, ing, oke, and ouse?*

The range of performance on the last sound-symbol association subtest, phonograms in isolation, was 6-25 (24-100 percent accuracy), and the mean score was 18 (72 percent accuracy). Two subjects earned ceiling scores; two correctly answered 24 items (96 percent accuracy); five correctly answered 23 items (92 percent accuracy); seven scored in the range of 15-22 items (60-88 percent accuracy); and four scored in the range of 6-12 items (24-48 percent accuracy).

Blending and Letter Substitution

The various measures which were used to assess the components of blending and letter substitution provided data to answer the questions which follow. The distributions of scores for each of these subtests are presented in Table A.6 (Appendix A).

1. *To what degree are preschool readers able to blend an initial consonant phoneme(s) with the remaining phonemes in a word? And,*
2. *To what degree are preschool readers able to substitute initial consonant letters in words?*

The range of performance on the substitution and blending of initial consonant phonemes in words subtest was 39-45 items (87-100 percent accuracy), and the mean score was 44 (98 percent accuracy). Nine subjects earned ceiling scores; eight subjects scored in the range of 42-44 items (93-98 percent accuracy); and three scored in the range of 39-41 items (87-91 percent accuracy).

3. *To what degree are preschool readers able to blend a final consonant phoneme(s) with the remaining phonemes in a word? And,*
4. *To what degree are preschool readers able to substitute final consonant letters in words?*

The range of performance on the substitution and blending of final consonant phonemes in words subtest was 2-5 items (40-100 percent accuracy), and the mean score was 4 (80 percent accuracy). Nine subjects earned ceiling scores; eight subjects correctly answered 4 items (80 percent accuracy); one correctly answered 3 items (60 percent accuracy); and two correctly answered 2 items (40 percent accuracy).

5. *To what degree are preschool readers able to substitute medial vowel letters in words?*

The range of performance on the substitution of medial vowel letters in words subtest was 8-10 items (80-100 percent accuracy), and the mean score, rounded off to the nearest whole number, was the highest of the three subtests in this area: 10 (100 percent accuracy). Seventeen subjects earned ceiling scores; two correctly answered 9 items (90 percent accuracy); and one correctly answered 8 items (80 percent accuracy).

Word Knowledge

The two measures which were used to assess the components of word knowledge provided data to answer the questions which follow. The distributions of scores for the word knowledge subtests are presented in Table A.7 (Appendix A).

1. *To what degree have preschool readers developed an initial stock of sight words?*

The Dolch List was administered to the subjects to measure the extent of their sight vocabularies. The range of performance on the first half of this list was 48-110 (44-100 percent accuracy), and the mean score was 98 (89 percent accuracy). Four subjects earned ceiling scores; twelve subjects scored in the range of 100-109 (91-99 percent accuracy); and four subjects scored in the range of 48-92 (44-84 percent accuracy).

The range of performance on the second half of the Dolch List was 3-110 (3-100 percent accuracy), and the mean score was 85 (77 percent accuracy). One subject earned a ceiling score; thirteen subjects

scored in the range of 100-109 (91-99 percent accuracy); two scored in the range of 92-96 (84-87 percent accuracy); and four subjects identified less than 13 words (12 percent accuracy).

The range of performance on both lists combined was 53-219 (24-99 percent accuracy), and the mean score was 183 (83 percent accuracy). Fifteen subjects recognized a minimum of 199 words (90 percent accuracy). The remaining five subjects scored in the range of 53-192 (24-87 percent accuracy).

2. *To what degree are preschool readers able to associate meaning with words?*

The vocabulary subtest of the Iowa Tests of Basic Skills, Level 7, was administered to assess the meaning vocabularies of the subjects. The first seventeen items measure isolated word comprehension. The range of performance on this part of the subtest was 2-17 items (12-100 percent accuracy), and the mean score was 12 (71 percent accuracy). One subject earned a ceiling score; three subjects correctly answered 16 items (94 percent accuracy); three correctly answered 15 items (88 percent accuracy); seven subjects scored in the range of 11-14 items (65-82 percent accuracy); and six subjects scored in the range of 2-10 items (12-59 percent accuracy).

The range of performance on the remaining thirteen items, which measure sentence comprehension using a cloze format, was 0-12 items (0-92 percent accuracy); and the mean score was 8 (62 percent accuracy). Five subjects correctly answered 12 items (92 percent accuracy); two correctly answered 11 items (85 percent accuracy); eight scored in the range of 8-10 items (62-77 percent accuracy);

three subjects scored in the range of 3-6 items (23-46 percent accuracy); and two subjects scored in the range of 0-1 items (0-8 percent accuracy).

The range of performance on both parts combined was 2-28 items (7-93 percent accuracy), and the mean score was 20 (67 percent accuracy). Five subjects correctly answered 27-28 items (90-93 percent accuracy); nine scored in the range of 21-26 items (70-87 percent accuracy); two scored in the range of 16-19 items (53-63 percent accuracy); and four subjects correctly answered less than 11 items (37 percent accuracy).

Total Skill Acquisition

All of the measures which were used to assess components of the reading acquisition act provided data to answer the questions which follow. The rank order of scores for each subject is presented in Table A.8 (Appendix A).

1. *What is the rank order, based on the degree of skill attainment, of the specified reading acquisition components acquired by preschool readers?*

The degree of skill attainment by the subjects is presented in Table 6. It is evident that the acquisition of five of the twenty-nine components was demonstrated by all of the subjects with at least 91 percent accuracy. These include the following:

1. Matching Letters,
2. Identifying Lower Case Letters When Named,
3. Identifying Upper Case Letters When Named,

Table 6. Total Skill Acquisition: Rank Order and Degree of Skill Attainment by Subjects
(n = 20)

Skill ^a	Percent of Skill Items Answered Correctly									
	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100
A	--	--	--	--	--	--	--	--	--	20
B	--	--	--	--	--	--	--	--	--	20
C	--	--	--	--	--	--	--	--	--	20
D	--	--	--	--	--	--	--	--	--	20
E	--	--	--	--	--	--	--	--	--	20
F	--	--	--	1	2	1	1	5	5	5
G	--	--	--	1	2	1	1	5	5	5
H	--	--	--	2	--	2	2	9	3	2
I	1	2	1	--	--	1	1	3	6	5
J	--	--	--	--	--	--	2	4	9	5
K	--	--	--	--	--	--	--	--	7	13
L	--	--	--	--	--	--	1	2	--	17
M	--	--	--	--	2	--	3	3	6	6
N	8	--	--	2	1	3	2	4	--	--
O	12	3	1	--	1	2	--	1	--	--
P	--	--	--	--	--	--	--	2	11	7
Q	--	--	3	8	2	1	1	--	2	3
R	1	2	2	--	1	6	--	--	5	3
S	2	1	1	3	1	2	--	5	--	5
T	--	2	--	5	1	--	2	--	3	7
U	2	--	3	1	6	--	--	3	1	4
V	--	--	2	1	1	3	1	--	3	9
W	--	--	--	--	--	--	--	--	1	19
X	--	--	--	2	--	1	--	8	--	9
Y	--	--	--	--	--	--	--	--	1	19
Z	--	--	--	2	--	1	--	8	--	9
AA	--	--	--	--	--	--	--	1	2	17
BB	--	--	3	--	1	--	--	--	2	14
CC	1	--	2	1	--	1	4	4	4	3

^aKey to skills:

- A = Matching Letters,
- B = Identifying Lower Case Letters When Named,
- C = Identifying Upper Case Letters When Named,
- D = Naming Lower Case Letters,
- E = Naming Upper Case Letters,
- F = Remembering the Order of Letters in Words,
- G = Matching Words,
- H = Identifying Root Words,
- I = Identifying Inflectional Endings,
- J = Identifying Initial Consonant Phonemes,
- K = Identifying Medial Consonant Phonemes,
- L = Identifying Final Consonant Phonemes,
- M = Identifying Rhyming Phonemes,
- N = Producing the Short Phonemic Value of Vowel Letters,
- O = Producing the Long Phonemic Value of Vowel Letters,
- P = Producing Phonemes Corresponding to Initial Consonant Letters,
- Q = Producing Phonemes Corresponding to Initial Consonant Blends,
- R = Producing Phonemes Corresponding to Initial Consonant Digraphs,
- S = Producing Phonemes Corresponding to Final Consonant Blends,
- T = Producing Phonemes Corresponding to Final Consonant Digraphs,
- U = Producing Phonemes Corresponding to Final Phonograms,
- V = Producing Phonemes Corresponding to Isolated Phonograms,
- W = Blending Initial Consonant Phonemes in Words,
- X = Blending Final Consonant Phonemes in Words,
- Y = Substituting Initial Consonant Letters in Words,
- Z = Substituting Final Consonant Letters in Words,
- AA = Substituting Medial Vowel Letters in Words,
- BB = Development of Sight Vocabulary, and
- CC = Associating Meaning with Words.

4. Naming Lower Case Letters, and
5. Naming Upper Case Letters.

The subjects demonstrated acquisition of three of the following components with a minimum accuracy of 81 percent, of two with a minimum of 71 percent accuracy, and of two with a minimum of 61 percent accuracy. These components, ranked in order of the degree of attainment, include the following:

1. Blending Initial Consonant Phonemes in Words,
2. Substituting Initial Consonant Letters in Words,
3. Identifying Medial Consonant Phonemes,
4. Producing Phonemes Corresponding to Initial Consonant Letters,
5. Substituting Medial Vowel Letters in Words,
6. Identifying Initial Consonant Phonemes, and
7. Identifying Final Consonant Phonemes.

One, five, and three of the components were demonstrated with at least 41, 31, and 21 percent accuracy, respectively. These components, ranked in order of the degree of attainment, include the following:

1. Identifying Rhyming Phonemes,
2. Remembering the Order of Letters in Words,
3. Matching Words,
4. Identifying Root Words,
5. Blending Final Consonant Phonemes in Words,
6. Substituting Final Consonant Letters in Words,

7. Producing Phonemes Corresponding to Initial Consonant Blends,
8. Producing Phonemes Corresponding to Isolated Phonograms, and
9. Development of Sight Vocabulary.

On the measure assessing the ability to produce phonemes corresponding to final consonant digraphs, the accuracy of the scores ranged from 11-100 percent.

The accuracy of the scores earned by the subjects on the following five components ranged in accuracy from 0-100 percent:

1. Identifying Inflectional Endings,
2. Producing Phonemes Corresponding to Initial Consonant Digraphs,
3. Producing Phonemes Corresponding to Final Consonant Blends,
4. Producing Phonemes Corresponding to Final Phonograms, and
5. Associating Meaning with Words.

The subjects demonstrated the lowest level of competence on two measures dealing with the phonemic value of the vowel letters. The scores earned on these measures ranged from 0-80 percent accuracy. These two measures assessed the following components:

1. Producing the "Short" Phonemic Value of Vowel Letters, and
2. Producing the "Long" Phonemic Value of Vowel Letters.

The latter two measures are the only ones on which even a single subject failed to earn a ceiling score. Of the twenty-seven other measures of reading acquisition, at least two subjects demonstrated 100 percent accuracy.

The degree of skill attainment for each subject is presented in Table 7.

Table 7. Number of 29 Skills Performed by Each Subject According to Degree of Accuracy

Subject	Percentage of Correct Response						Less than 50
	100	99-90	89-80	79-70	69-60	59-50	
1	9	7	4	3	2	1	3
2	16	4	5	--	--	--	4
3	9	7	2	2	4	1	4
4	13	2	8	3	1	--	2
5	12	2	5	3	2	3	2
6	12	5	7	2	1	1	1
7	6	9	--	--	--	3	11
8	13	5	7	2	--	--	2
9	8	7	3	3	3	--	5
10	7	6	4	4	3	2	3
11	15	7	3	--	--	1	3
12	9	3	2	2	3	3	7
13	12	6	5	3	1	--	2
14	8	6	4	5	1	1	4
15	14	4	6	2	2	--	1
16	3	4	3	2	3	1	13
17	14	3	5	3	2	--	2
18	16	2	6	--	1	1	3
19	7	1	6	4	2	--	9
20	6	3	4	4	--	1	11

2. *Is there a significant number of preschool readers who have acquired all of the specified reading acquisition components? And,*
3. *Is there a significant number of preschool readers who have acquired none of the specified reading acquisition components?*

One subject demonstrated attainment of the twenty-nine reading acquisition components with 38-100 percent accuracy; another subject demonstrated this attainment with 25-100 percent accuracy; and three subjects demonstrated this attainment with 10-100 percent accuracy.

An examination of the number of components acquired by each subject with at least 90 percent accuracy revealed some interesting characteristics of the sample. A mastery level was arbitrarily defined as attainment of at least 90 percent accuracy on a particular subtest.

The number of components mastered by the total sample ranged from 7-22. One subject attained a mastery level with 22 components, one subject with 20 components, eight subjects with 16-18 components, five subjects with 13-15 components, and five subjects with 7-12 components.

4. *Is there a significant difference in the degree of word recognition skill acquisition by preschool readers according to intelligence? And,*
5. *Is there a significant difference in the degree of word recognition skill acquisition by preschool readers according to sex?*

The subjects' performance on the word analysis subtest of the Iowa Tests of Basic Skills, Level 7, was examined to determine the degree of word recognition acquisition. The relationship between the degree of word recognition skill attainment, intelligence, and sex is presented in Table 8.

Table 8. Relationship Between Degree of Word Recognition Skill Attainment, Intelligence, and Sex

Subject	Word Analysis ^a Score (ITBS)	Intelligence Scores			Sex
		Verbal Scale	Performance Scale	Full Scale	
15	3.8	136	137	140	M
11	3.2	146	154	155	F
2	3.0	131	138	138	F
4	3.0	119	122	122	M
6	3.0	134	137	139	F
1	2.7	117	103	111	F
8	2.7	117	118	119	F
18	2.7	109	127	119	F
5	2.6	129	118	126	M
7	2.6	135	120	134	M
13	2.5	110	126	119	F
3	2.4	136	116	129	M
9	2.4	134	129	134	F
17	2.4	111	110	111	F
10	2.0	140	118	132	M
14	2.0	121	123	124	F
16	1.8	124	116	122	F
12	1.6	120	118	121	F
20	1.6	116	107	113	F
19	1.3	104	119	112	F

^aExpressed as a grade equivalent score.

Since the number of subjects was less than thirty and the data for the word recognition and intelligence variables could be ranked, rank difference correlation coefficients were calculated. This particular method was selected due to its ease in calculation and the similarity of results yielded with this method compared to those resulting from the product moment correlation method with a small sample size.

The correlation between the degree of word recognition skill and verbal intelligence was .33, between the degree of word recognition skill and performance abilities was .59, and between the degree of word recognition skill and full scale intelligence was .50.

It has long been assumed that sexual differences in the acquisition of reading and language skills has favored females. Since the sample size was quite small, attempting to find sexual differences in performance using statistical analysis was not feasible. Since the number of females in the sample outnumbered the males by more than 2 to 1, one might conclude that this supports the assumption previously mentioned.

Additional Findings

Discussion with parents of the parental questionnaire revealed a number of qualities and practices common to all of the subjects in the sample. Because these findings did not relate specifically to any of the research questions they are included as additional findings.

1. The subjects engaged regularly in reading a wide variety of both fictional and nonfictional materials but, for the most part, had not developed a specific reading preference.
2. It was customary practice for the parents to read to their children.
3. All of the parents viewed reading as a contributing factor to success in life.
4. Reading was a frequent leisure-time activity of the parents.
5. All of the subjects had access in their homes to a wide variety of reading material published for children.
6. All of the subjects visited the local or school library regularly to withdraw books.
7. "Electric Company," "Sesame Street," "Mr. Rogers," and other academically oriented television programs were viewed regularly by the subjects.

CHAPTER V

DISCUSSION AND CONCLUSIONS

In Chapter I of this dissertation, the writer stated the problem to be investigated and listed skill components which five educators considered prerequisite to acquiring the ability to read. Pertinent research involving theories of reading acquisition, influences which affect reading ability and reading success, and characteristics of children who learned to read prior to school entry was discussed in Chapter II. In Chapter III, the writer discussed the procedure employed in selecting the sample, selecting and constructing the measuring instruments, collecting the data, and analyzing the data. The data collected from the parental questionnaires and the data collected by means of the measuring instruments were presented and discussed in Chapter IV.

In Chapter V, the data have been summarized to identify characteristics common to the subjects in the sample, to discuss and interpret data pertinent to the research questions, and to posit generalizations about the acquisition of the components of the reading act.

The Sample

The majority of parents of the subjects placed a high value on educational accomplishment and occupational or professional success.

More than one-half of the sample lived in a small city and university environment. The number of females outnumbered the males by more than two to one. The majority of subjects came from families having more than one child. Nearly all of the subjects were Caucasian, and most of the subjects were enrolled in kindergarten at the time of the data collection. This background information concurs with that found by Durkin (1966) and Sutton (1967).

All of the subjects substantially exceeded the criterion scores for classification as able readers on both of the screening measures. Scores of the magnitude earned by these subjects are typically expected of children who have received at least a half year of formal reading instruction. On the Durkin screening measure, the subjects demonstrated a higher performance on the identification of words presented in a contextual framework than on words presented in isolation. That a differential of this magnitude should obtain would be supported by some of the proponents of recently developed linguistic models of the reading process, such as Ruddell and Goodman.³⁰

On the comprehension screening measure, 75 percent of the sample correctly answered at least 86 percent (19) of the items, a level of performance that exceeded the mean performance (17.41 items) of the first grade children in the norm group.³¹

³⁰Robert Ruddell and Kenneth S. Goodman, Theoretical Models and Processes of Reading, eds. Harry Singer and Robert Ruddell (Newark: International Reading Association, 1976), pp. 452-508.

³¹Byron H. Van Roekel, "Teacher's Guidebook," Harper and Row Preprimer Achievement Test (New York: Harper & Row, Publishers, Inc., 1968), p. 7.

The mean verbal score, the mean performance score, and the mean full scale score earned by the subjects on the WPPSI fell within the Superior intelligence classification (which requires a performance that exceeds the mean by at least one and one-third standard deviations). The nearness in magnitude of the mean verbal scale scores and the mean performance scale scores suggests that on the average, the subjects can handle both verbal and nonverbal tasks with equal facility.

Implications of the Results

The research questions were categorized according to six general areas of reading acquisition. The implications of the results are discussed in reference to these six areas.

Visual Discrimination

The mean scores for the subjects' performance on the visual discrimination subtests are presented in Table 9. The acquisition of five of the skill areas was demonstrated by the entire sample with nearly perfect performances. The mastery of these skills, namely, identification of upper and lower case letters, matching letters, and naming upper and lower case letters, supports the position, held primarily by Donald Durrell, William S. Gray, and Richard Venezky, that these skills are prerequisites for learning to read.

The subjects' performance on the subtests measuring remembering the order of letters in a word, matching words, identifying root words, and identifying inflectional endings was less accurate than their performance on the five subtests previously mentioned. That the

Table 9. Mean Scores on the Visual Discrimination Subtests

Subtest	Mean Score Expressed as a Percentage
Matching Letters	100
Identification of Lower Case Letters Named . . .	100
Identification of Upper Case Letters Named . . .	100
Naming Lower Case Letters	100
Naming Upper Case Letters	100
Remembering the Order of Letters in a Word . . .	.78
Matching Words	.78
Identification of Root Words	.75
Identification of Inflectional Endings	.70

acquisition of these four skills requires a more complex processing of information than that required for the first five skills possibly accounts for this lower level of performance.

To illustrate, successful performance on the subtest measuring remembering the order of letters in a word and matching words requires visual discrimination of the individual letters in a word, remembering the order of those letters, and correct identification of the initial gestalt stimulus through differentiation of several similarly configured words. Successful performance on naming upper case letters, one of the first skills discussed above, requires only two processes: viewing each letter and associating a correct name with it.

When the subjects attempted the final two visual discrimination subtests, the terms "root word" and "inflectional ending" were defined for them and several practice exercises were modeled. This was done so that the subjects' performance would not be hindered by an unfamiliarity with the terminology or with the task.

The extensive scatter amongst the scores on these two subtests indicates significant differences in the levels of mastery of the ability to identify root words and the ability to identify inflectional endings. The wide differential in the level of mastery of these two skills raises the question whether this knowledge is a prerequisite to reading or if its usefulness is ancillary and useful only in extending an individual's ability to recognize new words after an initial sight vocabulary has been established.

Auditory Perception

The degree of skill attainment achieved by the sample on the auditory perception subtests is presented in Table 10. The most uniform performance among the subjects occurred on the identification of medial consonant phonemes subtest, and the most diversified performance occurred on the identification of rhyming phonemes subtest.

The mean scores earned by the subjects on each of these subtests is presented in Table 11. The nearly perfect scores by all of the subjects on the subtests measuring identification of medial consonant phonemes and identification of final consonant phonemes demonstrate a high degree of mastery. A more diverse yet high degree of performance was demonstrated on the subtests measuring identification of initial consonant phonemes and identification of rhyming phonemes.

Table 10. Identification of Consonant and Rhyming Phonemes: Percentage of Sample Answering Items Correctly^a (n = 20)

Percentage of Items Correctly Answered	Position of Consonant Phonemes in Words			Rhyming Phonemes
	Initial	Medial	Final	
100-91	25	65	85	30
90-81	45	35	--	30
80-71	20	--	10	15
70-61	10	--	5	15
Less than 61	--	--	--	10

^aThe number in each cell represents the percentage of the sample scoring in each range.

Table 11. Mean Scores on the Auditory Perception Subtests

Subtest	Mean Score Expressed as a Percentage
Identification of Medial Consonant Phonemes	.94
Identification of Final Consonant Phonemes	.93
Identification of Initial Consonant Phonemes	.87
Identification of Rhyming Phonemes	.78

High level mastery in the identification of medial consonant phonemes and final consonant phonemes and slightly less mastery in the identification of initial consonant phonemes supports the position held by the five prominent educators presented in Chapter I. The more diverse performance on the subtest measuring identification of rhyming phonemes leads one to question whether this skill is a prerequisite for learning to read. This, however, does not imply a denial of the efficacy of this skill in learning to read, but it may suggest that the purpose for incorporating this skill into reading instruction may differ from that proposed by traditional educators.

Sound-Symbol Association

The mean scores earned by the subjects on each of the sound-symbol association subtests are presented in Table 12. Since the average scores earned by the subjects do not reflect an exceptionally high degree of accuracy for any of the subtests, it seems reasonable to assume that these skills are acquired with varying degrees of accuracy by children who learn to read before entering grade one and may very well be acquired by these children at different stages in their individual reading acquisition processes.

The skills most readily acquired appear to be the ability to produce the phonemes represented by: (1) initial consonant letters, (2) phonograms in isolation, (3) initial consonant digraphs, and (4) final consonant digraphs.

The difficulty the subjects encountered on the two subtests measuring the ability to produce the long and short phonemic values

Table 12. Mean Scores on the Sound-Symbol Association Subtests

Subtest	Mean Score Expressed as a Percentage
Produce Initial Phonemes: Consonant Letters	.88
Produce Phonograms in Isolation	.72
Produce Initial Phonemes: Consonant Digraphs	.67
Produce Final Phonemes: Consonant Digraphs	.67
Produce Final Phonemes: Consonant Blends	.63
Produce Initial Phonemes: Consonant Blends	.54
Produce Final Phonemes: Phonograms	.50
Produce Short Vowel Phonemes	.40
Produce Long Vowel Phonemes	.20

of the vowel letters may be attributed to the format of the items which consisted of three and four letter nonsense words. The nonsense words were formed according to the CVC pattern (consonant letter-vowel letter-consonant letter) or according to the CVCe pattern (consonant letter-vowel letter-consonant letter-final e).

The format of nonsense words was selected for this subtest so that the subjects would be required to sound out each word rather than to recall it (and its related vowel phoneme) from an established sight vocabulary. Unfamiliarity with nonsense words may have increased the difficulty level of these tasks.

Blending and Letter Substitution

The mean scores earned by the subjects on the blending and letter substitution subtests are presented in Table 13. The subjects demonstrated a high degree of accuracy and mastery of three of the five skills in this category, namely, medial vowel letter substitution, substitution of initial consonant phonemes in words, and blending initial consonant phonemes in words. This high degree of mastery does not necessarily provide confirmation that these skills are prerequisite to the acquisition of reading, but it may be construed to support the position of those who argue that these skills are significant contributors to the decoding process.

Table 13. Mean Scores on the Blending and Letter Substitution Subtests

Subtest	Mean Score Expressed as a Percentage
Medial Vowel Letter Substitution	100
Substitution and Blending of Initial Consonant Phonemes	.98
Substitution and Blending of Final Consonant Phonemes	.80

On measures assessing the ability to substitution and blend of final consonant phonemes in words, the degree of accuracy varied across the subjects. Although nine subjects demonstrated mastery of these skills with 100 percent accuracy, the scatter among the remaining scores indicates significant differences in the levels of mastery

of these two skills. This diversity in mastery does not support those who contend that substituting and blending final consonant phonemes in words is prerequisite to word recognition.

Word Knowledge

The mean scores earned by the subjects on the subtests measuring sight vocabulary and knowledge of word meanings is presented in Table 14. Sixteen subjects recognized a minimum of 191 words (87 percent) on the Dolch List which was used to assess the subjects' sight vocabularies. The McBroom-Sparrow-Eckstein scale of known sight words was used to interpret this score.³² A score of this magnitude indicates these subjects are able to read and comprehend at least at the second reader level and possibly at a more difficult reading level. The remaining four subjects earned scores which predict ability to comprehend written discourse at the preprimer-primer reading level.

If the range of the subjects' scores on the vocabulary subtest were expressed as grade equivalent scores rather than as percentages of correct responses as indicated in Table A.7 (Appendix A), the subjects' performances would fall in the range of 0.3 to 3.2. The eight subjects who achieved at least 80 percent accuracy demonstrated a knowledge of word meanings comparable to at least that of the average pupil in the eighth month of second grade. Sixteen subjects demonstrated a knowledge of word meanings greater than that of the average pupil entering grade two.

³²Miles V. Zintz, The Reading Process (Dubuque, Iowa: Wm. C. Brown Company Publishers, 1970), p. 60.

Table 14. Mean Scores on the Word Knowledge Subtests

Subtests	Mean Score Expressed as a Percentage
Dolch Words I	.89
Dolch Words I and II	.83
Dolch Words II	.77
Word Comprehension (Vocabulary Subtest)	.71
Total Comprehension (Vocabulary Subtest)	.67
Sentence Comprehension (Vocabulary Subtest) . .	.62

The mean score (20 items--67 percent accuracy) attained by the subjects on the vocabulary subtest falls at the 55th percentile on the year-end norms for first grade pupils. It falls at the 47th percentile on the beginning of the year norms for second grade pupils and at the 34th percentile on the year-end norms for second grade pupils. A mean score of this magnitude suggests that the average performance by the subjects on the vocabulary subtest was better than that of one-half of the year-end first grade pupils in the norm group.

Total Skill Acquisition

One of the questions of interest to the investigator was whether a correlation existed between the subjects' acquisition of word recognition skills and their intelligence. A low to moderate degree of relationship was found between these two variables. The correlation between word recognition skill, measured with the word

analysis subtest of the Iowa Tests of Basic Skills, Level 7, and verbal intelligence abilities, measured with the WPPSI, was .33. The correlation between word recognition skill and performance intelligence abilities was .59, and the correlation between word recognition skill and full scale intelligence was .50.

A correlation coefficient of the magnitude of .59 indicates more than a chance relationship between the abilities measured by the word recognition subtest and the performance subtests of the WPPSI. It is difficult to account for a correlation of this magnitude because we usually expect a higher correlation between reading and verbal intelligence abilities. A careful examination of the tasks involved in the word analysis test and in the performance subtests of the WPPSI suggests certain abilities are common to the performance of both sets of tasks.

Another objective of this study was to determine the existence or nonexistence of a reading acquisition skill hierarchy. The investigator was unable to determine whether the reading components mastered by the subjects were acquired in a hierarchical manner. However, a distinct difference in the levels of mastery of these components by the subjects was evident.

The educators, previously mentioned in Chapter I, proposed that specific components of the reading acquisition process were prerequisite skills for demonstration of the ability to read. That all of the subjects met the criterion for mastery of twelve of the twenty-nine reading acquisition components and near mastery of four

of the other components supports the views held by the proponents of the position that certain of these skills must be mastered before reading can occur. The following skills had been acquired by children who learn to read prior to receiving formal reading instruction. Whether these are acquired as prerequisites to the reading act or as concomitants is not conclusive. These components include the ability to:

1. Match Letters,
2. Identify the Lower Case Letters When Named,
3. Identify the Upper Case Letters When Named,
4. Name the Lower Case Letters,
5. Name the Upper Case Letters,
6. Identify Medial Consonant Phonemes in Words,
7. Identify Final Consonant Phonemes in Words,
8. Substitute Medial Vowel Letters in Words,
9. Substitute Initial Consonant Phonemes in Words,
10. Blend Initial Consonant Phonemes in Words,
11. Develop a Substantial Sight Vocabulary,
12. Associate Meaning with Words,
13. Identify Initial Consonant Phonemes in Words,
14. Produce the Phonemic Value of Consonant Letters in
the Initial Position of Words,
15. Substitute Final Consonant Phonemes in Words, and
16. Blend Final Consonant Phonemes in Words.

As mentioned previously, the subjects demonstrated on the comprehension screening measure that they could read at least as well as average pupils in mid-year first grade classrooms. The scatter of scores on the measures used to assess the remaining thirteen components indicates significant differences in the levels of mastery of these skills. This range of performance and the subjects' demonstration of the ability to read does not support the contention that these thirteen components are prerequisites to the reading act. These include the ability to:

1. Identify Rhyming Phonemes,
2. Produce the Phonemic Value of Isolated Phonograms,
3. Remember the Order of Letters in Words,
4. Match Words,
5. Identify Root Words,
6. Identify Inflectional Endings,
7. Produce the Phonemic Value of Consonant Digraphs in the Initial Position of Words,
8. Produce the Phonemic Value of Consonant Digraphs in the Final Position of Words,
9. Produce the Phonemic Value of Consonant Blends in the Final Position of Words,
10. Produce the Phonemic Value of Consonant Blends in the Initial Position of Words,
11. Produce the Phonemic Value of Phonograms in the Final Position of Words,

12. Produce the "Short" Phonemic Value of the Vowel Letters, and
13. Produce the "Long" Phonemic Value of the Vowel Letters.

It appears significant that eight of the thirteen components not mastered by the subjects involved the association of sounds with single letters or letter clusters. That the subjects could correctly articulate words containing these sounds but could not isolate these self-same sounds heard at the beginning or ending of words may suggest that these sound-symbol associations should be taught within the framework of words rather than from single letters or letter clusters presented in isolation.

The wide scatter of scores on the subtests measuring these components does not provide prima facie evidence that these skills do not facilitate the acquisition of reading. However, it is entirely plausible that these skills may not be requisite to the beginning stages of reading instruction but the acquisition thereof does generate positive transfer in the attainment of higher ordered skills.

The findings of this study should be useful to educators and other professionals who work closely with children. One possibility would be to use the results to develop instruments and procedures for identifying and selecting beginning kindergarten or first grade pupils for whom early reading instruction might prove advantageous.

This could be accomplished by following a two-part screening procedure. Since all of the early readers examined in this study were bright, it would seem useful to identify pupils of above average intelligence. The Wechsler Preschool and Primary Scale of Intelligence

would be an appropriate screening instrument for this purpose.

Secondly, a test could be developed to assess the sixteen components described previously which were acquired by the subjects and appear to be rudimentary skills in the reading acquisition process. This measure could then be used as a screening instrument to identify children who have acquired these skills and are ready to receive advanced reading instruction.

The research findings could also be used to develop reading materials for early readers. In view of the fact that the subjects in the sample had developed fairly substantial sight vocabularies and were able to identify many of the one and two-syllable words frequently found in primary level reading materials, traditional reading materials which include highly controlled vocabularies and a great deal of repetition appear to be inappropriate for early readers. A more appropriate type of reading material might incorporate more multisyllabic words and a variety of content area terminology for the purpose of broadening and expanding the children's knowledge of words and word meanings.

APPENDIX A

SUMMARY TABLES

APPENDIX A

SUMMARY TABLES

Table A.1 Screening Measures: Percentage of Correct Response^a

Subject	Sight Vocabulary		Comprehension
	Words in Isolation	Words in Sentences	
1	100	96	100
2	97	100	100
3	97	100	77
4	100	100	100
5	97	100	95
6	100	100	91
7	70	85	86
8	100	100	91
9	100	100	100
10	100	96	86
11	100	100	100
12	100	96	91
13	100	100	100
14	100	100	91
15	100	100	77
16	65	81	64
17	100	100	86
18	100	96	100
19	92	93	77
20	95	93	77
No. of Items	37	27	22

^aThe screening instruments used were Durkin's measure for measuring sight vocabulary and the Harper and Row Preprimer Achievement Test, Comprehension subtest.

Table A.2 Wechsler Preschool and Primary Scale of Intelligence

Subject	Verbal Tests ^a				Performance Tests ^b				Composite Scores ^c	
	Inf.	Voc.	Arith.	Sim. Comp.	An. Hou.	Pic. Com.	Mazes	Geo. Des.	Blo. Des.	V.S. P.S. F.S.S.
1	13	13	14	15	9	11	9	10	11	117 103 111
2	13	17	14	18	13	18	18	16	13	131 138 138
3	18	15	19	17	10	10	13	12	12	136 116 129
4	18	11	14	10	12	10	18	13	14	119 122 122
5	16	12	18	12	15	12	12	13	13	129 118 126
6	19	15	16	14	13	14	15	18	16	134 137 139
7	16	18	14	19	11	14	15	13	14	135 120 134
8	12	14	12	12	14	12	15	12	12	117 118 119
9	16	14	17	15	15	15	15	15	13	134 129 134
10	19	13	18	18	14	15	12	15	8	140 118 132
11	19	16	18	16	18	19	19	17	19	146 154 155
12	14	16	12	12	12	15	12	13	12	120 118 121
13	12	11	12	12	11	15	14	12	15	110 126 119
14	17	11	14	15	10	15	16	9	11	121 123 124
15	19	15	19	14	12	16	15	14	17	136 137 140
16	13	16	13	14	13	14	14	12	14	124 116 122
17	10	12	13	11	13	11	11	10	13	111 110 111
18	15	8	12	11	11	12	15	16	14	109 127 119
19	13	12	12	3	13	17	12	13	12	104 119 112
20	10	10	13	18	12	14	12	9	10	116 107 113

^aAll ten subtest scores are presented as scaled scores. Verbal tests: Inf. = Information; Voc. = Vocabulary; Arith. = Arithmetic; Sim. = Similarities; Comp. = Comprehension.

^bPerformance Tests: An. Hou. = Animal House; Pic. Com. = Picture Composition; Geo. Des. = Geometric Design; Blo. Des. = Block Design.

^cComposite Scores: V.S. = Verbal Scale; P.S. = Performance Scale; F.S.S. = Full Scale Score.

Table A.3 Visual Discrimination: Percentage of Correct Response^a

Subject	Letters										Words		
	Indent. L.C.		Ident. U.C.		Name L.C.		Name U.C.		Order of Letters in Word		Match Words	Ident. Root Words	Infl. Endings
	Letters	Letter Name	Letter Name	Letter Name	Letters	Letters	Letters	Letters	Letters	in Word			
1	100	100	100	100	100	100	100	100	78	78	78	75	5
2	100	100	100	100	100	100	100	100	94	94	94	80	85
3	98	92	100	100	100	100	100	100	67	67	67	85	25
4	100	100	100	100	100	100	100	100	89	89	89	75	80
5	100	100	100	100	100	100	100	100	56	56	56	75	75
6	100	100	100	100	100	100	100	100	89	89	89	90	70
7	100	100	100	100	96	100	100	100	39	39	39	40	20
8	100	100	100	100	100	100	100	100	78	78	78	80	85
9	100	100	100	100	100	100	100	100	83	83	83	70	90
10	100	100	100	100	100	100	100	100	78	78	78	40	95
11	100	100	100	100	100	100	100	100	100	100	100	90	95
12	100	100	100	100	100	100	100	100	50	50	50	75	20
13	100	100	100	100	100	100	100	100	94	94	94	80	90
14	100	100	100	100	100	100	100	100	72	72	72	55	90
15	100	100	100	100	100	100	100	100	89	89	89	75	85
16	98	100	100	100	92	100	100	100	44	44	44	70	60
17	100	100	100	100	100	100	100	100	100	100	100	85	100
18	100	100	100	100	100	100	100	100	83	83	83	85	80
19	100	100	100	100	100	100	100	100	72	72	72	75	95
20	100	100	100	100	100	100	100	100	83	83	83	55	80
No. of Items	54	26	26	26	26	26	26	26	18	18	18	20	20

^aL.C. = Lower Case; U.C. = Upper Case; Ident. = Identify; Infl. = Inflectional.

Table A.4 Auditory Perception: Identification of Consonant and Rhyming Phonemes--Percentage of Correct Response

Subject	Position of Consonant Phonemes in Words			Rhyming Phonemes
	Initial	Medial	Final	
1	97	82	100	89
2	87	100	100	100
3	90	94	100	78
4	73	82	100	100
5	83	88	100	100
6	93	100	100	89
7	87	88	100	89
8	100	100	100	89
9	77	94	93	89
10	87	100	93	67
11	87	94	100	100
12	77	88	100	44
13	93	100	100	78
14	83	94	93	67
15	97	100	100	100
16	70	88	64	67
17	87	100	100	89
18	90	100	100	100
19	67	82	78	44
20	80	100	78	78
No. of Items	30	17	14	9

Table A.5 Sound-Symbol Association: Percentage of Correct Response

Subject	Vowel Phonemes		Phonemes in the Initial Position				Phonemes in the Final Position				Phonograms in Isolation
	Short	Long	Consonant Letters	Consonant Blends	Consonant Digraphs	Consonant Blends	Consonant Digraphs	Phonograms			
1	40	20	97	96	100	63	100	50	60		
2	40	0	88	38	100	38	83	100	100		
3	80	0	91	35	67	38	67	50	92		
4	70	0	88	38	100	63	100	100	96		
5	70	80	82	35	67	100	83	25	60		
6	80	50	88	38	67	75	100	100	96		
7	50	30	88	58	50	0	33	0	48		
8	0	0	97	88	83	100	100	88	92		
9	10	20	76	69	67	38	17	25	64		
10	0	0	88	88	83	75	50	50	92		
11	10	20	97	42	83	100	83	50	92		
12	0	0	91	35	17	12	67	50	60		
13	60	0	94	38	83	100	100	75	88		
14	80	0	88	42	33	75	33	75	84		
15	80	60	94	100	67	0	100	100	92		
16	10	10	82	31	17	50	33	38	32		
17	60	0	88	23	67	75	100	75	84		
18	10	60	85	100	83	25	17	50	100		
19	60	10	82	23	0	100	33	25	24		
20	0	0	76	27	33	75	33	0	24		
No. of Items	10	10	34	26	6	8	6	8	25		

Table A.6 Blending and Letter Substitution: Percentage of Correct Response

Subject	Blending Consonant Phonemes		Substituting Letters in Words		
	Initial Position	Final Position	Consonant Letters Initial Final	Medial Vowel Letters	
1	93	80	93	80	100
2	100	100	100	100	100
3	100	100	100	100	100
4	100	80	100	80	100
5	100	100	100	100	90
6	100	80	100	80	100
7	93	80	93	80	100
8	98	100	98	100	100
9	98	100	98	100	100
10	96	60	96	60	100
11	100	100	100	100	100
12	91	100	91	100	100
13	100	80	100	80	100
14	93	100	93	100	100
15	100	80	100	80	100
16	91	40	91	40	80
17	98	100	98	100	100
18	100	80	100	80	100
19	87	80	87	80	100
20	96	40	96	40	90
No. of Items	45	5	45	5	10

Table A.7 Word Knowledge: Percentage of Correct Response

Subject	Sight Vocabulary				Meaning Vocabulary			Total
	Dolch I	Dolch II	Dolch I & II		Word Comprehension	Sentence Comprehension	Comprehension	
1	98	95	97		88	92		90
2	100	98	98		100	85		93
3	95	93	94		82	62		73
4	96	96	96		88	85		87
5	94	87	90		59	46		53
6	100	99	99		94	92		93
7	52	7	30		35	31		33
8	99	97	98		94	77		87
9	100	97	99		94	92		93
10	97	98	98		65	77		70
11	99	100	99		88	92		90
12	91	84	87		65	62		63
13	98	98	98		76	77		77
14	94	95	95		65	77		70
15	95	97	96		59	92		73
16	44	5	25		12	0		7
17	100	91	95		76	62		70
18	97	94	95		82	77		80
19	55	3	29		41	8		27
20	84	11	47		29	23		27
No. of Items	110	110	220		17	13		30

Table A.8 Total Skill Acquisition: Rank Order and Degree of Skill Attainment^a

Subject		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Rank Order According to the Degree of Skill Acquisition	A-100	A-100	C-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	A-100	B-100	A-100	A-100	A-100	A-100
	B-100	B-100	D-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100	B-100
	C-100	C-100	E-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100	C-100
	D-100	D-100	L-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100	D-100
	E-100	E-100	M-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100	E-100
	L-100	K-100	X-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100	L-100
	R-100	L-100	Y-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100	M-100
	T-100	M-100	Z-100	R-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100	S-100
	AA-100	R-100	AA-100	T-100	M-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100	W-100
	J-97	U-100	A-98	U-100	X-100	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89	M-89
	P-97	V-100	K-94	W-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100	Y-100
	BB-97	W-100	BB-94	Y-100	Z-100	AA-100	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88	P-88
	Q-96	X-100	B-92	AA-100	BB-99	J-87	AA-100	I-93	V-92	Y-100	K-88	BB-99	Y-93	Y-100	M-67	Z-100	V-100	X-80	J-80	J-80	J-80
	W-93	Y-100	V-92	V-96	BB-90	V-96	X-80	W-98	CC-93	P-88	Z-100	BB-87	F-94	I-90	AA-100	L-64	AA-100	W-100	Z-80	L-78	L-78
	Y-93	Z-100	P-91	BB-96	K-88	J-93	Z-80	Y-98	I-90	Q-88	AA-100	J-77	G-94	P-88	J-97	I-60	W-98	Y-100	L-78	M-78	M-78
	CC-90	AA-100	J-90	F-89	J-83	CC-93	Q-58	BB-98	M-89	J-87	BB-99	H-75	P-94	V-84	BB-96	S-50	Y-98	AA-100	H-75	P-76	P-76
	M-89	BB-98	H-85	G-89	T-83	H-90	N-50	P-97	F-83	R-83	P-97	T-67	J-93	J-83	P-94	F-44	BB-95	BB-95	F-72	S-75	S-75
	K-82	F-94	N-80	P-88	P-82	F-89	R-50	V-92	G-83	F-78	I-95	CC-63	I-90	N-80	V-92	G-44	M-89	J-90	G-72	H-55	H-55
	X-80	G-94	M-78	CC-87	O-80	G-89	V-48	M-89	J-77	G-78	K-94	V-60	V-60	V-88	S-75	F-89	X-40	P-88	H-85	J-67	BB-47
	Z-80	CC-93	CC-73	K-82	H-75	M-89	H-40	Q-88	P-76	S-75	V-92	F-50	F-50	R-83	U-75	G-89	Z-40	J-87	P-85	N-60	X-40
	F-78	P-88	F-67	I-80	I-75	P-88	F-39	U-88	H-70	CC-70	H-90	G-50	G-50	H-80	F-72	I-85	U-38	H-85	R-83	M-44	Z-40
	G-78	J-87	G-67	X-80	N-70	N-80	G-39	CC-87	Q-69	M-67	CC-90	U-50	U-50	X-80	G-72	N-80	T-33	V-84	X-80	T-33	R-33
	H-75	I-85	R-67	Z-80	R-67	X-80	T-33	I-85	R-67	X-60	J-87	M-44	M-44	Z-80	CC-70	X-80	V-32	S-75	Z-80	BB-29	T-33
	S-63	T-83	T-67	H-75	V-60	Z-80	CC-33	R-83	V-64	Z-60	R-83	Q-35	Q-35	M-78	M-67	Z-80	Q-31	U-75	CC-80	CC-27	Q-27
	V-60	H-80	U-50	J-73	F-56	S-75	O-30	H-80	S-38	T-50	T-83	I-20	CC-77	II-55	H-75	BB-24	CC-70	O-60	U-25	CC-27	CC-27
	U-50	N-40	S-38	N-70	G-56	I-70	BB-30	F-78	U-25	U-50	U-50	U-50	U-50	U-75	Q-42	CC-73	R-17	R-67	U-50	V-24	V-24
	N-40	Q-38	Q-35	S-63	CC-53	R-67	I-20	G-78	O-20	H-40	Q-42	S-12	S-12	N-60	R-33	R-67	N-10	N-60	S-25	Q-23	N-0
	O-20	S-38	I-25	Q-38	Q-35	O-50	S-0	N-0	T-17	N-0	Q-20	N-0	N-0	Q-38	T-33	O-60	O-10	Q-23	T-17	O-10	O-0
	I-5	O-0	O-0	O-0	U-25	Q-38	U-0	O-0	N-10	O-0	N-10	O-0	O-0	O-0	O-0	S-0	CC-7	O-0	N-10	R-0	U-0

^aSee page 70, Table 6, footnote "a" for key to skills. Each number represents a percentage of correct response of the items measuring that particular skill.

APPENDIX B

MEASURES

APPENDIX B

MEASURES

Order of Presentation

Screening Instruments:

1. Durkin's Measure: Criterion--18 words minimum
2. Preprimer Test: Criterion--11/22 items correct

Specific Measures:

1. WPPSI
2. Dolch I & II
3. ITBS--Vocabulary Subtest
4. ITBS--Word Analysis Subtest
5. Durrell Analysis Subtests
 - a. Matching Letters
 - b. Identifying Letters Named
 - c. Naming Letters
 - d. Visual Memory--Primary
 - e. Hearing Sounds in Words--Primary
6. Own Measures
 - a. Identification of Consonant Sounds in the Medial Position of Words
 - b. Identification of Root Words
 - c. Identification of Inflectional Endings
 - d. Medial Vowel Letter Substitution
 - e. Sound-Symbol Association: Vowels
 - f. Sound-Symbol Association: Consonants
 - g. Sound-Symbol Association: Consonant Blends
 - h. Sound-Symbol Association: Consonant Digraphs
 - i. Sound-Symbol Association: Phonograms

Parental Questionnaire--to be administered to a parent

Durkin's Initial Screening Measure

Name: _____ Date: _____

said	to	down	jump
mother	for	big	house
red	it	in	blue
want	father	here	we
can	is	work	away
help	stop	little	ball
get	and	funny	you
the	come	play	see
look	make	me	go
			not

The ball is red.

Come and look.

Come and see the ball.

It is not big.

It is little and red.

Mother said it is for me.

From: Dolores Durkin, Children Who Read Early (New York: Teachers College Press, 1966), p. 151.

Dolch Words I

a	_____	ride	_____	under	_____	give	_____
I	_____	red	_____	go	_____	going	_____
the	_____	ran	_____	of	_____	good	_____
if	_____	run	_____	one	_____	green	_____
it	_____	has	_____	eat	_____	help	_____
its	_____	had	_____	and	_____	here	_____
so	_____	is	_____	up	_____	have	_____
no	_____	his	_____	who	_____	him	_____
know	_____	he	_____	on	_____	jump	_____
in	_____	be	_____	her	_____	like	_____
to	_____	me	_____	but	_____	look	_____
into	_____	we	_____	get	_____	may	_____
do	_____	she	_____	big	_____	make	_____
not	_____	too	_____	are	_____	play	_____
don't	_____	two	_____	over	_____	said	_____
old	_____	you	_____	after	_____	some	_____
cold	_____	your	_____	black	_____	stop	_____
see	_____	put	_____	blue	_____	soon	_____
saw	_____	out	_____	brown	_____	ten	_____
was	_____	am	_____	can	_____	that	_____
carry	_____	an	_____	did	_____	this	_____
funny	_____	as	_____	down	_____	three	_____
little	_____	at	_____	for	_____	with	_____
yellow	_____	my	_____	fly	_____	will	_____
all	_____	by	_____	five	_____	what	_____
call	_____	yes	_____	from	_____	went	_____
come	_____	away	_____	fast	_____		
came	_____	around	_____	find	_____		

Dolch Words II

please	_____	both	_____	hurt	_____	round	_____
sleep	_____	buy	_____	just	_____	read	_____
start	_____	bring	_____	keep	_____	sit	_____
show	_____	better	_____	kind	_____	six	_____
shall	_____	best	_____	let	_____	say	_____
thank	_____	been	_____	long	_____	seven	_____
think	_____	could	_____	laugh	_____	sing	_____
these	_____	cut	_____	live	_____	small	_____
there	_____	clean	_____	light	_____	tell	_____
then	_____	drink	_____	made	_____	today	_____
those	_____	draw	_____	many	_____	take	_____
them	_____	does	_____	much	_____	together	_____
their	_____	done	_____	must	_____	us	_____
they	_____	eight	_____	myself	_____	use	_____
try	_____	every	_____	now	_____	upon	_____
why	_____	far	_____	new	_____	very	_____
when	_____	full	_____	never	_____	warm	_____
which	_____	fall	_____	own	_____	wash	_____
where	_____	first	_____	only	_____	want	_____
white	_____	four	_____	open	_____	walk	_____
any	_____	found	_____	or	_____	well	_____
ask	_____	got	_____	off	_____	were	_____
ate	_____	goes	_____	our	_____	work	_____
again	_____	gave	_____	once	_____	would	_____
about	_____	grow	_____	pretty	_____	write	_____
always	_____	hot	_____	pull	_____	wish	_____
before	_____	how	_____	pick	_____		
because	_____	hold	_____	right	_____		

Identification of Consonant Sounds in the
Medial Position of Words

Name: _____ Date: _____

Read the directions orally to the child for each item.

1. Circle the word that has the /b/ sound in the middle of the word.
bad table stab
2. Circle the word that has the /d/ sound in the middle of the word.
hidden bad dog
3. Circle the word that has the /f/ sound in the middle of the word.
sniff far lift
4. Circle the word that has the /g/ sound in the middle of the word.
begged good bag
5. Circle the word that has the /j/ sound in the middle of the word.
magic bridge jar
6. Circle the word that has the /k/ sound in the middle of the word.
can backyard lake
7. Circle the word that has the /l/ sound in the middle of the word.
landing willow ball
8. Circle the word that has the /m/ sound in the middle of the word.
milk Jim swimmer
9. Circle the word that has the /n/ sound in the middle of the word.
mailman sunny no
10. Circle the word that has the /p/ sound in the middle of the word.
petting tap stopper
11. Circle the word that has the /r/ sound in the middle of the word.
car staring running

Name: _____

12. Circle the word that has the /s/ sound in the middle of the word.
fancy Sunday cans
13. Circle the word that has the /t/ sound in the middle of the word.
fat ten battle
14. Circle the word that has the /v/ sound in the middle of the word.
stove cover vote
15. Circle the word that has the /w/ sound in the middle of the word.
water cow tower
16. Circle the word that has the /x/ sound in the middle of the word.
boxing desk kiss
17. Circle the word that has the /z/ sound in the middle of the word.
zoo fuzzy snooze

Identification of Root Words

Name: _____

Date: _____

Read the directions orally to each child.

Directions: Circle the root of the following words:

- | | |
|--------------|--------------|
| 1. cups | 11. balls |
| 2. wishes | 12. Dad's |
| 3. wanted | 13. wanting |
| 4. cats | 14. swimming |
| 5. running | 15. dresses |
| 6. Bill's | 16. fished |
| 7. dishes | 17. Sue's |
| 8. dogs | 18. jumped |
| 9. traded | 19. playing |
| 10. churches | 20. John's |

Identification of Inflectional Endings

Name: _____ Date: _____

Read the directions orally to each child.

Directions: Circle the ending added to each root word.

- | | |
|--------------|--------------|
| 1. cups | 11. balls |
| 2. wishes | 12. Dad's |
| 3. wanted | 13. wanting |
| 4. cats | 14. swimming |
| 5. running | 15. dresses |
| 6. Bill's | 16. fished |
| 7. dishes | 17. Sue's |
| 8. dogs | 18. jumped |
| 9. traded | 19. playing |
| 10. churches | 20. John's |

Medial Vowel Letter Substitution

Name: _____ Date: _____

Read the directions for each item orally to the child. The directions for the subsequent items are the same.

1. Look at the first word in #1. It is "bad." Take away the a and put an e in its place. This makes a new word. Circle the new word.

bad:
(a-e)

bed

bid

bead

2. pet:
(e-a)

pot

pat

put

3. hot:
(o-i)

hit

hate

hut

4. put:
(u-o)

pit

pout

pot

5. bid:
(i-u)

bed

bud

bad

6. pan:
(a-e)

pin

pen

pane

7. bed:
(e-a)

bad

bud

bid

8. hit:
(i-u)

hut

hot

hat

9. cup:
(u-o)

cap

cop

cape

10. son:
(o-i)

sun

sin

soon

Sound-Symbol Association: Vowels

Name: _____ Date: _____

Read directions orally to each child.

Directions: The following words are nonsense words. Pronounce the vowel sound in each of these words.

1. rad _____
2. fude _____
3. moge _____
4. des _____
5. bip _____
6. mibe _____
7. gof _____
8. deme _____
9. rafe _____
10. gud _____
11. raf _____
12. gude _____
13. gofe _____
14. dem _____
15. mib _____
16. bipe _____
17. mog _____
18. dese _____
19. rade _____
20. fud _____

Sound-Symbol Association: Consonants

Name: _____ Date: _____

Read the directions orally to each child.

Directions: Pronounce the consonant sound at the beginning of each of these words:

- | | | | |
|----------|-------|-----------|-------|
| 1. bad | _____ | 18. bet | _____ |
| 2. quit | _____ | 19. pin | _____ |
| 3. pet | _____ | 20. dip | _____ |
| 4. no | _____ | 21. quiet | _____ |
| 5. mom | _____ | 22. fed | _____ |
| 6. run | _____ | 23. red | _____ |
| 7. dog | _____ | 24. hen | _____ |
| 8. say | _____ | 25. sand | _____ |
| 9. fog | _____ | 26. jam | _____ |
| 10. to | _____ | 27. ten | _____ |
| 11. hat | _____ | 28. vet | _____ |
| 12. van | _____ | 29. kind | _____ |
| 13. jar | _____ | 30. law | _____ |
| 14. we | _____ | 31. win | _____ |
| 15. keg | _____ | 32. mud | _____ |
| 16. zoo | _____ | 33. nod | _____ |
| 17. lake | _____ | 34. zebra | _____ |

Sound-Symbol Association: Consonant Blends

Name: _____ Date: _____

*Read the directions orally to the child.*Part I. Pronounce the consonant sounds at the beginning of each of these words.

- | | |
|-----------------|-----------------|
| 1. bring _____ | 14. plan _____ |
| 2. drag _____ | 15. bread _____ |
| 3. frog _____ | 16. flow _____ |
| 4. trap _____ | 17. draw _____ |
| 5. clown _____ | 18. clip _____ |
| 6. fly _____ | 19. fry _____ |
| 7. play _____ | 20. try _____ |
| 8. stone _____ | 21. sting _____ |
| 9. swing _____ | 22. grass _____ |
| 10. twig _____ | 23. smoke _____ |
| 11. green _____ | 24. swim _____ |
| 12. spy _____ | 25. spin _____ |
| 13. smile _____ | 26. twin _____ |

Part II: Pronounce the consonant sounds at the end of each of these words.

- | | |
|---------------|---------------|
| 1. milk _____ | 5. pant _____ |
| 2. bank _____ | 6. bark _____ |
| 3. dark _____ | 7. silk _____ |
| 4. punt _____ | 8. sink _____ |

Sound-Symbol Association: Consonant Digraphs

Name: _____ Date: _____

Read the directions orally to each child.

Part I. Pronounce the consonant sound at the beginning of each of these words.

1. church _____

4. shut _____

2. shoe _____

5. chow _____

3. who _____

6. why _____

Part II. Pronounce the consonant sound at the end of each of these words.

1. much _____

4. lock _____

2. sash _____

5. such _____

3. back _____

6. mush _____

Sound-Symbol Association: Phonograms

Name: _____ Date: _____

Read the directions orally to each child.

Part I. Pronounce the following letter clusters:

- | | | | |
|--------|-------|----------|-------|
| 1. am | _____ | 14. un | _____ |
| 2. an | _____ | 15. up | _____ |
| 3. ay | _____ | 16. ack | _____ |
| 4. ed | _____ | 17. ake | _____ |
| 5. ee | _____ | 18. ame | _____ |
| 6. en | _____ | 19. ank | _____ |
| 7. id | _____ | 20. ell | _____ |
| 8. ig | _____ | 21. ike | _____ |
| 9. in | _____ | 22. ill | _____ |
| 10. it | _____ | 23. ing | _____ |
| 11. op | _____ | 24. oke | _____ |
| 12. ot | _____ | 25. ouse | _____ |
| 13. oy | _____ | | |

Part II. Pronounce the sounds made by the underlined letters at the end of each of these words.

- | | | | |
|-----------|-------|----------|-------|
| 1. Sal | _____ | 5. tubby | _____ |
| 2. chubby | _____ | 6. moose | _____ |
| 3. nutty | _____ | 7. pal | _____ |
| 4. loose | _____ | 8. Patty | _____ |

APPENDIX C

PARENTAL QUESTIONNAIRE

APPENDIX C

PARENTAL QUESTIONNAIRE

1. Subject

- a. Child's Name: _____
- b. Sex: _____ Male _____ Female
- c. Race: _____
- d. Birthdate: _____
- e. Date(s) Tested: _____
- f. Age: _____
- g. Is this child adopted: _____
- h. Were there any unusual circumstances associated with this
child's birth? _____

2. Parents:

- a. Name: _____
- b. Address: _____

- c. Occupation: Father: _____
Mother: _____
- d. Is either parent divorced? _____
- e. Is there a step-parent in the family? _____

3. Siblings in the Family

a. Number: _____

b. Names and Ages: _____

4. Information Concerning Reading

a. When did this child start reading? _____
_____b. Did this child receive any intentional reading instruction from
either the parent(s) or sibling(s)? _____

1) If yes, what type of instruction did the child receive?

2) If yes, how frequently did this child receive instruction?

c. Does the child visit the local library? _____

1) If yes, how frequently? _____

d. Does the child have books of his/her own at home? _____

1) If yes, approximately how many does s/he have? _____

e. Is the child interested in reading? _____

f. What type of books or reading material does the child prefer?

5. Preschool Instruction:

- a. Did the child attend nursery school? _____
- b. Did the child attend kindergarten? _____
- c. What type of reading instruction did s/he receive in nursery school or kindergarten? _____

6. Television Viewing

- a. Approximately how many hours does the child spend watching television each day? _____
- b. What type of programs does s/he watch? _____

7. Does either parent have any concerns about this child's reading ability or achievement in future schooling? _____

APPENDIX D

INITIAL LETTER TO PARENTS AND
RESEARCH CONSENT FORM

MICHIGAN STATE UNIVERSITY

COLLEGE OF EDUCATION
DEPARTMENT OF ELEMENTARY AND SPECIAL EDUCATION

EAST LANSING • MICHIGAN • 48824

Dear Parent:

As a Ph.D. candidate in Reading Instruction at Michigan State University, I am conducting a research study, for my dissertation requirement, which examines the extent of acquisition of a specified set of word recognition skills by pre-first grade children who are able to demonstrate an ability to read and comprehend, at least at the primer level. Specifically, I am interested in determining the extent to which these children have acquired the specified skills; secondly, in determining which of these skills are crucial components of the reading acquisition process; and thirdly, in determining whether the acquisition of these skills is hierarchical in nature.

I feel this information will be useful in providing guidelines for the design and publication of reading instruction materials created specifically for early readers. Secondly, it could be used to determine the interrelatedness of the components of the reading acquisition process; and thirdly, it could be used to determine whether these skills are acquired by children in a hierarchical manner.

The research study has been approved by the Department of Elementary and Special Education in the College of Education. This research will be conducted at the Michigan State University Reading Center (250 Erickson Hall) and at various day care centers in the Lansing area. I would like to have your permission for your child to participate in this study.

Each potential subject will be given two screening measures to determine whether s/he is able to read at the primer level or higher. Each child who passes the screening measures will individually be given a variety of short tests which measure aspects of general intelligence and various word recognition and reading comprehension skills. The total amount of time required for each child is approximately four hours, which will be divided into several different sessions, preferably into two, 2-hour sessions.

Parents of participating children will be asked to verbally complete a brief questionnaire either in person or over the phone with me. The questionnaire examines aspects of the home and preschool environments which may have contributed to the early reading ability of these children.

All of the information collected for this study will be described anonymously and will remain confidential during the study and following the completion of the study.

If you have any questions about this research study, please feel free to contact me at my campus office (355-1755) or at my home (351-0237). At the conclusion of this study, a summary of the test results and a general description of each child's degree of skill acquisition will be sent to his/her respective parents. This information should be useful in planning that child's future educational experiences. Thank you very much for your cooperation.

Sincerely,

Stephanie Lea Brown

Stephanie Lea Brown

Clinical Reading Diagnostician - MSU Reading Center

RESEARCH CONSENT FORM

(developed by the MSU Department of Psychology)

1. I have freely consented to take part in a scientific study being conducted by Stephanie Lea Brown under the supervision of Dr. Byron H. Van Roekel, Professor of Education.
2. The study has been explained to me and I understand the explanation that has been given and what my participation will involve, as well as what my child's participation will involve.
3. I understand that I am free to discontinue my participation in the study at any time without penalty.
4. I understand that the results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be sent to me at the conclusion of the study, regardless of whether my child is still enrolled at the school or not.
5. I understand that my participation in the study will not guarantee any beneficial results to me or my child.
6. I understand that, at my request, I can receive additional explanation of the study after my participation is completed.

Signed _____

Signed _____

Date _____

APPENDIX E

CLOSING LETTER AND
TEST RESULTS

MICHIGAN STATE UNIVERSITY

COLLEGE OF EDUCATION

EAST LANSING • MICHIGAN • 48824

DEPARTMENT OF ELEMENTARY AND SPECIAL EDUCATION

May 22, 1979

Dear Parents:

I would like to thank all of you for permitting me to use your children as subjects for my dissertation. Each one came to see me with a unique sparkle and enthusiasm which made the data collection phase a very enjoyable one for me.

I would like to caution all of you when interpreting your child's test results. These results were indicative of the child's performance on the day s/he was tested and could have been influenced by a variety of factors such as the weather, the child's health, his or her particular mood that day, his or her experience with taking tests, and his or her degree of ease in working with a stranger.

The tests I chose to administer were designed to measure a variety of reading skills which are usually taught in grade one. Since I was attempting to prove that early readers may be able to read fluently without mastering all of these skills, please don't be concerned if your child did not perform as well as you expected on each test!

I will attempt to give you as much information as possible in terms of a proportion of correct responses, percentage, classification, and percentile rank, if available.

At the completion of my study, I will send you a brief summary of my findings in case this would be of interest to you.

Again, thank you for all of your cooperation and assistance.

Sincerely,

Stephanie Lea Brown

Stephanie Lea Brown
Reading Center - 250 Erickson Hall
Michigan State University
East Lansing, MI 48824

Name: _____

4. Durrell Analysis of Reading Difficulties

- a. Matching Letters: _____
- b. Identifying Letters Named: _____
- c. Naming Letters: _____
- d. Visual Memory--Primary: _____
- e. Hearing Sounds in Words: _____

5. My Own Measures

- a. Identification of Consonant Sounds in the Medial Position
of Words: _____
- b. Identification of Root Words: _____
- c. Identification of Inflectional Endings: _____
- d. Medial Vowel Letter Substitution: _____
- e. Sound-Symbol Association: Vowels: _____
- f. Sound-Symbol Association: Consonants: _____
- g. Sound-Symbol Association: Consonant Blends: _____
- h. Sound-Symbol Association: Consonant Digraphs: _____
- i. Sound-Symbol Association: Phonograms: _____

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