

A VALIDITY STUDY OF THE RAY READING

METHODS TEST

By

MILDRED INEZ MANWARREN

Bachelor of Arts
Sterling College
Sterling, Kansas
1964

Master of Science
Fort Hays Kansas State College
Hays, Kansas
1967

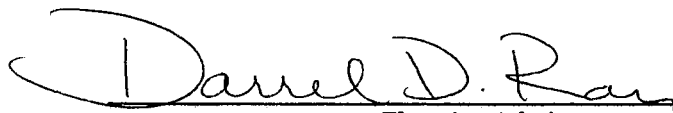
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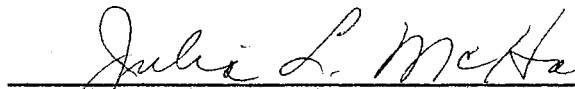
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Thesis Approved:


Thesis Adviser








Dean of the Graduate College

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CHAPTER I

PRESENTATION OF THE PROBLEM

Learning to read print is essentially a matter of learning to perceive the potential meaning in written messages and then relating the perceived potential meaning to cognitive structure so as to comprehend it (Ausubel, 1969). The beginning reader who is already able to perceive the potential meaning in spoken messages must now acquire the same ability in relation to written messages.

The most salient psychological characteristic of learning to read, therefore, is the dependence of the learning process on the previously acquired mastery of the spoken language and on the use of this mastery as a medium of perceiving the potential meaning in written messages. In fact, the child learns to read his native language by reconstructing written into spoken messages. He tries to establish representational equivalence between written words and their already meaningful spoken counterparts.

Learning to reconstruct written into spoken messages involves at least two major component steps. First, there is the problem of converting written words into spoken words. This problem is rendered less difficult, however, by the alphabetic basis of structuring most written languages. Thus, written words are not just configurations of visual symbols that arbitrarily represent their auditory counterparts. Rather, there is a more or less lawful relationship between the combination of

distinguishable sounds (phonemes) constituting the spoken word and the analogous combination of letters (graphemes) constituting the written word. The beginning reader must, therefore, learn how to convert graphemes and combinations of graphemes into their phonemic equivalents and then learn how to coalesce several graphemic combinations and reconstruct them into spoken words. In this latter process of word recognition he is aided by such cues as knowledge of commonly occurring graphemic combinations and awareness of the wider context in which the written message is presented.

The second step in reconstructing the written message is learning how to combine and convert groups of written words into spoken phrases and sentences. In this way knowledge of the syntactic code of the spoken language can be utilized in perceiving the potential meaning of the written message. The beginning reader, in other words, is unable to apprehend directly the syntactic functions of the words in the written message; in order to perceive its potential propositional meaning, therefore, he reconstructs it into a spoken message and relies on his intuitive knowledge of the syntax of the spoken language.

One of the most notable differences between methods of teaching beginning reading is the relative emphasis placed on the steps in the beginning reading process. Some methods place greater emphasis on decoding with comprehension subservient to decoding while others place greater emphasis on comprehension with decoding subservient to comprehension. Ray (1970) analyzing the multitude of approaches to reading instruction, states that there appear to be four methods of reading instruction in use. These methods of instruction are: a visual-auditory approach that concentrates first on the development of a vocabulary of

instantly recognized whole words before a slower introduction of phonics principles begins; an auditory-visual, or phonics, approach where early teaching concentrates on developing sound-symbol relationships; linguistic, a structural whole word approach which emphasizes the spelling patterns of words rather than sound-symbol relationships in teaching decoding skills; and a language experience approach which concentrates on using the natural language patterns of children in teaching basic decoding skills. The auditory-visual and linguistic approaches place greater emphasis on decoding skills in beginning reading with comprehension subservient to decoding, while the visual-auditory and language experience approaches place greater emphasis on comprehension with decoding skills subservient to comprehension.

The reading literature is constantly emphasizing the point that all children do not learn to read at the same time nor do they learn in the same way. One reliable conclusion that can be drawn from the recently completed First Grade Studies (1967) is that no one approach to reading instruction is best for all children. Regardless of the approach used or the competency of the teachers, all approaches shared the weakness of allowing some children to fail in reading instruction.

Ray (1970) states that the most appropriate approach to the selection of a suitable method of instruction is to evaluate the response of the reader to the process of learning to read. "Behaviors exhibited during the diagnosis of the response will identify the strengths of the learner" and "the most appropriate method of instruction." To test learner strengths for the different methods, the Ray Reading Methods Test was devised.

Can the Ray Reading Methods Test identify the most appropriate

method of instruction? This study is concerned with investigating the predictive validity of this test.

Need for the Study

This study is designed to determine the relationship between learner response to teaching-learning experiences and achievement for individuals scoring below the 30 percentile on a readiness measure at the end of the first grade.

The ability to read is important not only for the individual but for his family, his schools, and for his total society. Realizing the importance of reading, educators have for many years devoted much attention to finding ways to help children learn to read and to overcome problems which have developed. Durrell (1958) said that success in the initial classroom instruction is more important than providing remedy after failure had already occurred. He maintained that this is particularly true in learning to read since reading is the essential base for later school development.

Although studies (Bing, 1961; Hirsch, 1961) indicate that scores on reading readiness tests are not completely accurate predictors of reading achievement, Dechant (1964) cautions against summarily discarding them. He states that the tests identify children with the same basic deficiencies (p. 165). Hildreth, Griffiths, and McGauvran (1965) state that the chances of failure are high under ordinary instructional conditions for those pupils who score below the 30th percentile on the Metropolitan Readiness Tests.

Recognizing the inadequacy of present methods for measuring the readiness of a child in the first grade, Ilg and Ames (1965) conducted

a massive research investigation in an effort to find other possible measures of determining readiness. Other researchers had previously stated a need existed for more adequate ways to determine readiness for beginning reading (Smith, 1950). If this be true for the general population, how much more true it is for the population scoring below the 30th percentile on a readiness measure.

Boney (1961) suggests that perhaps the best way to determine readiness is to try reading instruction at intervals until the child responds with progress. Boney suggests the response indicates readiness while Harris and Roswell (1953) suggest that the response to informal lessons in different methods indicate the best method for a particular child. The Ray Reading Methods Test was devised in an effort to standardize the testing and teaching steps in informal lessons in order that direct comparisons could be made with some degree of reliability. As of now, no research (except for test standardization) has been undertaken to discover whether the test is a valid predictor. This study attempts to fulfill this need.

Statement of the Problem

The purpose of this study is to establish a measure of predictive validity for the Ray Reading Methods Test (1970) using first grade students' test results.

More specifically, this study will attempt to answer the following questions:

1. Can the Ray Reading Methods Test identify a method that will facilitate learning for pupils who score below the 30th percentile on a readiness test?

2. Do pupils who score below the 30th percentile on a readiness test differ significantly in their success with reading when reading instruction is based on an indicated methods preference?
3. Do pupils who score below the 30th percentile on a readiness test and are taught by a preferred method differ significantly in their success with reading according to the method of instruction?

Hypotheses

The statistical significance of all hypotheses will be evaluated at the 5 percent level of significance. In order to fully examine the questions, the following hypotheses were stated:

H₀₁. The Ray Reading Methods Test will not identify a method that will facilitate achievement of pupils who score below the 30th percentile on a readiness test.

H₀₂. There will be no significant differences in reading achievement between below average readiness pupils who are taught by a method indicated as preferred and below average readiness pupils taught by some method other than the method indicated as preferred.

H₀₃. There will be no significant differences between the methods of teaching reading to below average readiness pupils when pupils are taught by a method indicated as preferred.

Definitions of Terms

The following are definitions of terms as they are used throughout this report:

Auditory-Visual method--The Auditory-Visual method of reading instruction has the letter as the basic unit of instruction. Initially, the learner must accumulate a number of sound-symbol associations and use these in synthesizing, and thus decoding words. Skill transfer is accomplished through the use of known sound-symbol associations applied to unknown words.

Visual-Auditory method--The Visual-Auditory method of reading instruction has the word as the basic unit of instruction. In the initial stage of learning the configuration of a total word with pictures and verbal context clues provide the vehicle of instruction. The skill development program is dependent upon an accumulation of right words from controlled vocabulary reading material to be utilized later in an analytical approach to decoding.

Linguistic-Word Structure method--The Linguistic-Word Structure method of reading instruction has the word pattern as the basic unit of instruction where letter names are taught and spelling patterns are accumulated. A learner generalized minimum contrast to decoding is used. Utilization of skill in early application is restricted to words having consistent spelling patterns.

Language-Experience method--The Language-Experience method of reading instruction utilizes the meaningful structure of the learners' own language to provide the basic unit of instruction where the oral communication patterns of the learner are recorded as stories to be visually recognized. Basic decoding skills are primarily the anticipation of language units and the context of the material written.

Preferred method--The teaching method that the learner demonstrated through delayed recall scores as the most effective method of teaching

words as measured by the Ray Reading Methods Test. Any delayed recall score for a particular method that deviated 2.3 from a pupil mean of all words taught indicated the most effective method. The procedure for determining this criteria is explained on page 43 of this text.

Delimitations

Scope of the Study

This study is an analysis of test scores of first-grade children who were taught by a method designated as preferred or not preferred, and who attended first grade in thirteen school districts in central Oklahoma, in 1970-71, and were administered the Metropolitan Achievement Tests, Primary I Battery, Form A, in April, 1971.

The children in this study were randomly selected from a larger population which were taught by a method indicated as preferred or not preferred by the Ray Reading Methods Test administered in September and October, 1970. This larger population consisted of all students scoring below the 30th percentile on the Metropolitan Readiness Tests administered in April, 1969, to all children in thirteen districts in central Oklahoma who would be first-graders in September, 1970.

Limitations of the Study

This study is limited by the population which is representative of the school districts. Though the sample included a wide range of socio-economic levels, it covers a relatively small geographic area.

This study may also be limited by unknown conditions within the school beginner which can not be taken into account in this report and which may be factors contributing to a child's lack of readiness for

formal learning.

Assumptions of the Study

A major assumption underlying this study is that the instruments used in this investigation actually measure the factors they are designed to measure and are pertinent to this study.

A second assumption is that test administrations by the teachers are not detrimental to the study.

A final assumption is that relatively uniform quantity of school furnished reading materials are available for all subjects in this study.

Significance of the Study

It would appear that this study will be useful in determining the most appropriate method of teaching word recognition for the particular individual. Individual differences has been theorized for decades and an indication of method preference would aid in the application of this theory to teaching practices. Significant results from this study would give further direction in planning of the instructional program.

It would appear that significant results from this study would have far-reaching implications for all those interested in how children learn to recognize words. Hopefully, the results can add to the small body of empirical evidence supporting the need for the concentration of energies on finding out "which" method is best for "which" children rather than developing a recipe or "a best method" that will serve for all children all the time.

Organization of the Study

Chapter I has presented the background of this study, a statement of the problem to be explored and the hypotheses to be tested, the delimitations of the study, and the significance of this study to teachers, clinicians, and researchers.

Chapter II will present a review of the literature which is related to the problem being investigated.

Chapter III will describe the design of the study, the population, the selection of the sample, and the testing instruments. It will also describe the training program and the statistical methods used in treatment of the data collected to test the hypotheses of this study.

Chapter IV will contain a statistical analysis of the data. This chapter will indicate the degree to which the hypotheses are found to be correct.

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

CHAPTER II

REVIEW OF THE LITERATURE

The literature reviewed in this chapter will be organized into three sections for convenience in presentation: (1) literature dealing with methods of teaching beginning reading that place greater emphasis on decoding with comprehension subservient to decoding; (2) literature dealing with methods of teaching beginning reading that place greater emphasis on comprehension with decoding subservient to comprehension; and (3) a general summary of this literature. The first two sections will be subdivided by the basic unit of instruction emphasized in the different approaches with a short summary following each of the sub-divisions of the two sections.

Literature Dealing with Beginning Reading Methods Emphasizing Decoding

One of the central tasks for early readers is that of discovering the nature of the correlation between printed units and their oral counterparts. Instructional approaches have placed varying degrees of emphasis on a variety of decoding units. These include careful control of "regularities" and "irregularities" in grapheme-phoneme correspondences, notably vowels; spelling sound units which are related to an intermediate level unit known as the morphophoneme; and a phonologically based unit known as the vocalic-center group which closely approximates the syllable and in certain instances the smallest significant meaning-

ful language unit or morpheme (Ruddell, 1970).

Most reading programs place some degree of emphasis on these various units at some point in the program although the exact structure and sequencing of these units may not always be obvious. Nevertheless, decoding skills have been taught successfully by placing emphasis on one or a combination of these units. Perhaps a more scientific statement would be that children have learned to decode while being instructed through these various approaches. The latter statement leaves open the possibility that in some manner children are independently able to arrive at an optimal decoding approach used.

The Grapheme-Phoneme Unit

Jastak (1945) and Bloomfield and Barnhart (1961) have clearly and emphatically pointed to the distinction between (a) reading as a process of converting letters to sounds and (b) the ultimate goal of this process, which is to obtain meaning from the resultant sounds. Bateman (1967) urges that reading be taught as a "rote, conditioned, mechanical process" of converting letters to sounds and that the comprehension of many symbols (including sounds combined into words) be taught as a separate process. Bliesmer and Yarborough (1965) also state that it is first necessary to teach certain letter-sound relationships or word elements before beginning to read.

To determine which cues nonreaders and beginning readers use in word recognition, Marchbanks and Levin (1965) had kindergarteners and first graders select the one word from a set of alternatives which was similar to a standard. The selection would be on the basis of word shape or letter cues. The results indicated that children preferred to

use first letters, final letters, middle letters, and word shape (in that order of preference) as cues to word identification.

Blumberg, Williams, and Williams (1969) did the same type of study with disadvantaged urban children to see what true non-readers would do. Their kindergarten sample had had no formal reading training and had little or no knowledge of the alphabet. They found that these children showed no preference for any of the cues. Gibson (1962) has suggested that improvement of visual discrimination depends on learning the distinctive features of the forms to be discriminated, i.e., those dimensions of differences that distinguish the stimuli.

Bond and Dykstra (1967) found in the first grade studies that reading achievement was highly correlated with letter name knowledge; in fact, it was the single best predictor of first grade reading success. Some ten years earlier, Nicholson (Durrell, 1958) reported that the correlation between ability to identify lowercase letters upon entrance to first grade and the rate of learning to read words was $r = .51$, which was higher than the correlation between IQ ($r = .36$) and the rate of learning these words. In the same report, Linehan stated that letter name and letter sound training seemed to facilitate first grade reading achievement. Since the group that received letter name and sound training received auditory discrimination training as well, it is impossible to determine from this study if the facilitating effect was produced by the name, sound, or auditory discrimination training. Durrell (1958) concluded, however, that reading difficulties could be prevented if, among other things, training in letter names and sounds were given.

Ohnmacht (1969) used a classroom setting to study the effect of letter name and sound training on reading. One group was given early

training in letter names. A second group was given training in names and sounds, and a third group served as a control. She found that the group getting training on names and sounds was superior to the other groups in word knowledge and word discrimination. The group getting training in letter names was no better than the control on these reading measures. It appears, then, that letter name training in an experimental study does not facilitate reading acquisition.

Samuels was interested in the same question. He did a laboratory study (1970) to determine what component of letter name knowledge, if any, facilitates reading acquisition. One of the explanations offered by educators as to why they believe letter name knowledge facilitates learning to read is that many letter names are similar to the letter sounds. It is possible, however, that reading acquisition may be influenced by the ability to visually discriminate one letter from another and not by knowledge of the letter names. To answer these questions, three groups of children midway through first grade were used. The visual discrimination group was given a paired-association task with the same four letters but subjects had to learn letter names for each of the letters (S, M, E, A). The control group received an irrelevant paired-associate task. Then, the same transfer task was given to all the groups. This task consisted of learning to say the appropriate English word for words constructed out of the artificial letters (SE - SEE, SA - SAY, ME - ME, MA - MAY). Surprisingly, no significant differences were found among any of the groups. Since this finding ran counter to the correlational findings, the study was replicated twice, with different first grade subjects, but always with the same results, i.e., no difference among the groups.

Results from the Shnmmacht and Samuels studies suggest that letter name knowledge has no positive effect on reading acquisition and that the correlational findings between letter name knowledge and reading may be a product of some other factor. There is evidence (Stevenson, 1968) that paired-associate learning ability is significantly correlated with intelligence. Letter naming is a paired-associate task. Another explanation is that the kind of home background which enables a child to enter first grade already knowing many of the letters of the alphabet would be the kind of home in which academic achievement would be emphasized.

Although letter name knowledge does not seem to have any beneficial effect on reading, there is evidence that letter sound training does have a positive effect. The Linehan and Ohnmacht studies both suggested this, and a study by Jeffrey and Samuels (1966) gives further evidence of this. In this study kindergarten children were given phonic blend training and then were randomly assigned to a look-say, phonic, or control group. Look-say training consisted of learning to read a list of words. The letters of these words were used in new combinations to form the words used in the transfer list. Phonic training consisted of learning letter sounds. These letters were used in the transfer list of words. The control group received an irrelevant task to perform. Following training, all the subjects were given the same list of transfer words. First the subjects were shown the words and were asked to read them without any help. Then they were given instruction and the number of trials required for learning the entire list was computed. The results indicated that the phonic trained group was significantly better than the other two groups in number of words read without any

help and speed of learning the entire list. There was no significant difference between the look-say and control groups on either of these measures.

In a later study the same researchers (1967) replicated aspects of the above study with similar findings. However, they attributed their results in part to one aspect of the experimental treatment which taught the subjects to blend phonemes represented by the psuedo letters into words. These findings are similar to those of Silberman (1964) in that subjects were unable to transfer correspondence information to new words unless they had received phonic-blend instruction. The findings suggest that sound blending places the phonemes in a natural sound-unit context constituting a more elaborate decoding unit which is of value in transferring sound-letter correspondence information to new letter patterns and words.

McCarthy (1971) in a study to determine the effect of selected patterns of visual and auditory memory abilities on kindergarteners' word recognition success under the Visual-Auditory and the Auditory-Visual methods of teaching reading found that teaching sound-letter correspondence and phonic-blending enhanced any instruction that followed. In his study he followed the procedures for teaching the two methods as outlined in the Ray Reading Methods Test and found no significant differences between groups having selected patterns of memory abilities on recall measures with the Visual-Auditory or the Auditory-Visual method.

Taken together, the preceding studies give strong support to the notion that knowledge of letter sound correspondence is an important basis for transfer to reading new words. The recommendation that initial words be introduced on the basis of grouped grapheme-phoneme con-

sistencies has been proposed by Soffiretti (1955), Fries (1963), Smith (1959), and Bloomfield (1933). These individuals have expressed the opinion that the inconsistencies of the English orthography place a limitation on the acquisition of sound-symbol correspondences as presently developed in widely used reading textbooks. Although the results have been inconsistent in investigations varying the degree of emphasis on sound-symbol correspondences and related generalizations, some early studies have revealed superior results for phonic emphasis at early grade levels, particularly in word recognition (Bear, 1958; Kelly, 1958; Sparks, 1957; Grimes, 1958; Henderson, 1959). More recently the work of Hayes (1966), Ruddell (1968), Hahn (1966), Tanzer and Alpert (1966), Mazurkiewicz (1966), Downing (1965), and Bateman (1968) have lent support to the value of greater consistency in the introduction of sound-letter correspondences. Additionally, the consistent replication of research findings discussed by Chall (1967) also supports the logical expectation that an approach to decoding which helps the child grasp the nature of the English writing code would be of value.

A closely related factor which might be pertinent is the capacities of youngsters among the studies. Several investigators found that the auditory-visual approach was more effective with children with high ability (Sparks, 1957; Bateman, 1967; Grimes, 1958; Chall, 1967). Hahn found the capacity-achievement relationship was strongest in Word Study while Tanzer and Alpert found intelligence was not a major factor in distinguishing probable chances for success in auditory-visual programs.

Grimes found not only higher IQ children did better than lower IQ children but highly anxious children did better than less anxious

children in auditory-visual programs. Ruddell found achievement at the end of grade one a function of the control which the subjects exhibit over designated aspects of (a) their morphological language system and (b) their syntactical language system at the beginning of grade one.

The Spelling Pattern Unit

Linguists such as Venezky (1962), Wardhaugh (1968), and Reed (1966) have strongly recommended that it is necessary to consider letter patterns beyond the simple sound-letter correspondence level if a more consistent relationship between oral and written language forms is to be realized. This recommendation is based on the linguistic unit known as the morphophoneme, or the intermediate (between phoneme and morphoneme) sound-spelling unit. For example, a higher order unit might be GH in words like ROUGH or TOUGH.

In order to study how beginning readers learn higher order units, Gibson, Farber, and Shepela (1967) gave kindergarteners and first graders a task in which it was possible for them to learn patterns of spelling. The child was given a set of eight cards. Four of the cards has words with a higher order unit such as LACK, MUCK, DECK, and SOCK. The other four cards had words such as LAKE, MUCH, DEEK, and SOAK with no higher order unit. The cards were presented in pairs (e.g., LACK and LAKE), and the child simply had to point to one of the cards. If he pointed to the card with a higher order unit, that is, a word having CK, he was told that he was correct. In order to be able to consistently point to the correct card, the child had to learn a strategy for discriminating the higher order units. Although the task was difficult, Gibson found that for some of the children performance improved, indi-

cating that they were learning how to discriminate and abstract the common spelling pattern.

The research of Levin and Watson (1963) has demonstrated the possible value of simultaneous introduction of contrasting letter patterns representing different but consistent vowel values (e.g., bat, bate) in contrast to sequencing grapheme-phoneme correspondences on the basis of "consistent" vowel correspondences (e.g., bat, mat). Greater transfer was found when multiple correspondences of similar language units were taught than when only one correspondence for a letter or a group of letters was taught. The results suggest dual-association learning. Fries (1963) similarly advocates a contrasting spelling-pattern approach to teaching reading.

Skailand (1970) compared the effects of four different language units (grapheme/phoneme or synthetic, morphophoneme/morphographeme of contrasting spelling pattern, morpheme or similar spelling pattern, and whole word or sight) to teach kindergarten children to read a limited number of words and syllables. The conclusions drawn from the results was that children taught by one of the two spelling pattern methods surpassed those taught by an individual letter/sound approach. There was also a trend toward superiority of the spelling pattern methods over the whole/sight method. Children of low (IQ 79 or below) measured intelligence were able to read more words on the transfer list if they had been taught by the similar spelling pattern method while children of middle and high intelligence showed no differences between spelling patterns.

Studies to test the effectiveness of typical basal reading (visual-auditory) programs and linguistic oriented reading programs produced

mixed results. Sheldon and Lashinger (1966) reported no significant differences on the Stanford Achievement Test. Schneyer (1966) reported significant differences favoring the linguistic group on the linguistic reading test and favoring the typical group on four of five subtests of the Stanford Achievement Test. However, these differences were not consistent at all ability levels. The significant interaction was characterized by significantly higher adjusted mean scores: (1) for the linguistic group at all ability levels on the linguistic reading test; (2) for the basal reader group at the high and low ability levels on the Stanford subtests for Word Reading, Spelling, and Word Study Skills and on the Philadelphia Reading Test (PRT) total score; (3) for the basal reader group at the high ability level on the Stanford Paragraph Meaning subtest; (4) for the basal reader group at the high and average ability levels on the Stanford Vocabulary subtest. On five of the seven criterion measures, the girls scored significantly higher than the boys. These measures were the linguistic reading test, the PRT, and the Stanford subtests for Paragraph Meaning, Spelling, and Word Study Skills.

Chall (1967) states that the best results probably come from using some control of spelling patterns and directly teaching their sound values. In an early study Winch (125) compared the effect of using a look-say and a synthetic sounding-blending phonic approach on success in reading such sentences as "A fat cat sat on a mat." He found the phonics-trained children superior to the look-say group. In other words, direct teaching of the sound values of letters helped these children read even regularly spelled words controlled on common spelling patterns.

More recently, Sister Mary Edward (1964) reported on a study involving an experimental "modified linguistic" (spelling patterns, letter-sounds, blending) group and a conventional basal-reader group. Her experimental group tested significantly higher than her control group on standardized silent reading tests of vocabulary, comprehension, and rate.

Wyatt (1966) used the same type of approach as Winch and Edward for her "electic linguistic" approach. A comparison of this approach with the typical basal reader approach indicated that the children using the linguistic approach read as rapidly and with as much comprehension as children using the basal approach. They also developed significantly greater interest in reading and significantly greater skill in word reading and word study skills.

Taken together, the preceding studies give some indication that directly teaching sound symbol association and blending facilitates the learning of spelling patterns.

It would appear that the learning of a spelling pattern as presented in most linguistic programs is a difficult task for most children and yet Skailand found that spelling patterns as a language unit was more readily learned than whole words or sound-symbol association with necessary blending instruction. She also found that similar spelling patterns were particularly effective with children with low intelligence.

There appears to be an indication that girls tend to do better than boys in the linguistic approach (Skailand, 1970; Schneyer, 1966).

Literature Dealing with Beginning Reading
Methods Emphasizing Comprehension

The Whole Word Unit

The whole word as the basic unit of meaningful discrimination has dominated American beginning-reading practices during the first half of this century. Methodological practices derived from this view conceived the beginning stages of reading essentially as a more generalized, visually oriented perceptual process of learning to recognize whole words and their meanings before or in conjunction with learning to differentiate their parts specifically. William S. Gray acknowledged leader of, and spokesman for, reading experts for four decades gave his endorsement to the "meaning-first, word-analysis later" approach that was adopted by his own and most other basal-reading series.

Karsen (1967) in stating the rationale for whole words first says,

the word pattern allots each letter in a word its specific pronunciation or function. Until a letter combination is perceived as a word, and in the particular word what the combination stands for, it is impossible to determine which functions the individual letters have. Without a framework no letter as such has a definite action. (p. 138)

He goes further to state that the analytical approach precedes the synthetic one and that the starting point must be whole words.

Broerse and Zwaan (1966) set out to determine the comparative effects of initial and final letters in the identification of nouns and to determine if the sequential order of speech and the information value of initial letters have comparable effects on word identification. Forty-eight adults served as subjects for the study in which the basic task was to identify seven-letter Dutch words after having been given

either the first or the last occurring letters. The conclusion was that the initial letters of a noun appear to carry more information than the final letters even when the amount of information in the final letters is equal to that in the initial letters.

Postman and Greenbloom (1967) used paired-associate lists and found little letter selection when the stimulus portions were easy to pronounce but a substantial amount when they were hard to pronounce. That is the subjects responded to the whole stimulus when it was easily pronounceable and to the first letter only when it was hard to pronounce.

Bakker (1967) found a relationship between perception and retention of temporal order and reading ability. His purpose was to determine whether boys from two reading levels (two years below average and four years below average) would differ in the number of errors in recalling the temporal order of meaningless figures and meaningful figures, letters, and digits.

Harbin and Wright (1967) reported a series of studies in which they examined the role of connotative meaning in verbal learning. Their first step was to have 106 trigrams from the middle range of association values rated for evaluation, potency and activity through the use of the semantic differential technique. In the subsequent studies, then, the subjects learned paired-associate or serial lists that differed in connotative meaning. The general finding was that trigrams high in connotative activity were more difficult to learn than trigrams potent or neutral in connotative meaning. Perhaps the implication is that meaningfulness is not the sole determiner of the ease with which certain words are learned.

Jones and Spreen (1967) studied the effects of meaningfulness, abstractness and ear of presentation upon word recognition among thirty-six educable retarded children in the 6-0 to 13-8 age range. They presented fifty-two one-syllable nouns that had been scaled for meaningfulness and abstractness in a left-right or right-left ear sequence with a wide band masking noise. Meaningfulness and abstractness were both positively related to the recognition of individual words, but the sequence of presentation by ear had no significant effect.

In a related study, Spreen and others (1967) studied the effects of variations in word meaningfulness, abstractness and phonetic structure upon auditory word recognition. Auditory word recognition was found to be a function of meaningfulness and abstractness; and there was evidence that certain initial phonemes (e.g., d, l, k) are more closely associated with successful word recognition than others (e.g., m, p. w).

James and Greeno (1967) did a series of studies to determine how stimulus selection takes place at different stages of stimulus selection. They had their subjects learn paired-associates with compound stimuli--i.e., word with high association value and trigram with low association value. In general there was no transfer to the nonsense components until the subjects had been given a number of post-mastery, "overlearning," trials; and when other items were added after mastery, there was no transfer to nonsense components during the extended trials. The author's preferred interpretation was that subjects attend to stimuli in a selective manner during learning and then relax the "selective mechanism" after mastery. An important implication seems to be that if overlearning results in more than one stimulus being connected

with a response, then long-term retention ought to be enhanced due to the decreased probability that items with multiple stimuli would be forgotten.

Houston (1967) showed, in a series of studies, that (a) amount of selection did not vary as a function of degree to learning; but he stopped short of post-mastery or "overlearning" trials; (b) the effectiveness of the components of a compound stimulus can be varied by controlling the amount of attention given to them during learning; and (c) experiences with a given component leads to selection of that component when it is combined with others in a compound stimulus.

Taken together, the preceding studies give strong support to the notion that other clues as well as meaningfulness are an important basis for ease in learning new words.

Kendrick (1966) compared the effectiveness of the language experience approach with the visual-auditory approach and found significant differences in favor of the visual-auditory approach. The traditional method appeared more effective for developing the skill of deriving meaning from the written paragraph for males of all socio-economic levels and for middle-class females, for developing the listening ability of lower-class males, and for developing speaking competence of both males and females in all three socio-economic levels.

Mazurkiewicz (1966), Fry (1966), and Hahn (1966) reported significantly higher scores in spelling for children in traditional programs than for children in atypical orthographic programs. Mazurkiewicz and Hahn reported significantly higher scores on word reading for children taught with different orthography and no significant differences in paragraph meaning, word study and vocabulary. Fry reported no

significant differences in word reading, paragraph meaning, word study and vocabulary.

McCanne (1966) found that for children from Spanish-speaking homes the visual-auditory approach developed higher achievement in reading skills than the language-experience approach. In comparing a visual-auditory approach with an auditory-visual approach Bordeaux and Shope (1966) reported significant differences in favor of the former with negro boys and girls on word reading, paragraph meaning, and spelling. There were no significant differences between the approaches for white boys and girls. In their study Bordeaux and Shope also combined the visual-auditory and the auditory-visual approaches for a third group and added "sensory experiences." In comparing this approach with the other two they found it significantly superior for both negro and white subjects.

Bond and Dykstra (1967) in an evaluation of the first grade studies state that the visual-auditory program was somewhat less often in a position of superiority but cautions against the Hawthorne effect since the visual-auditory program was often placed in the role of a traditional control. They state that the visual-auditory programs held up better in the areas of comprehension and spelling, but a visual-auditory program coupled with a strong word-recognition program fared better in the area of word recognition. They found the approaches that appeared consistently in a superior position were visual-auditory programs with an added phonetic emphasis or an added modified linguistic emphasis.

The studies reviewed give some indication that the visual-auditory approach is particularly effective with children below average in

morphological and syntactical language development.

The Sentence Unit

The sentence unit is proposed as the basic unit of meaningful discrimination by advocates of the language-experience approach. Recent psycholinguistic research has sought to explore the psychological reality of surface structure constituents or the way in which language patterns tend to "chunk" into syntactic categories. Glanzer (1962) has shown that pseudosyllable-word-pseudosyllable patterns are more easily learned when the connecting word is a function word (e.g., of, and) than when it is a content word (e.g., food). This finding supports the view that the resulting constituent group is a more natural word group and thus more easily processed.

The work of Johnson (1965) dealing with a paired associate learning task has shown that adult subjects make a larger number of recall errors between phrases (e.g., The valiant canary . . . ate the mangy cat.) than within phrases (e.g., The . . . valiant . . . canary, etc.). This finding suggests that phrases may operate as psychologically real units. The experiment of Fodor and Bever (1965) also supports this contention. In their investigation, a clicking noise of brief duration was made as a sentence was read. Regardless of the placement of the click (e.g., during a word occurring immediately before or after a phrase boundary), the subjects indicated that the click occurred at the phrase boundary. Thus their conclusion supports the viewpoint that perceptual units correspond to sentence constituents as designated by the linguist.

The recent work of Ammon (1970) has revealed that third grade and

adult subjects require more time to process and respond to phrases. Suci et al (1967) reported similar findings, thus providing additional support for sentence constituents as meaningful processing units.

The transformational theory has proposed that sentences are processed from the surface structure level to an underlying or deep structure for comprehension purposes. This deep structure is realized through transformational and rewrite rules and is then integrated with the semantic component to convey meaning.

The work of Miller (1965) has demonstrated that when subjects are asked to transform sentences from one form into another (e.g., active affirmative to passive or active affirmative to passive negative), a positive relationship is present between transformation time and the complexity of the transformation. This finding supports the contention that transformations possess psychological reality in that the greater the number of transformations the greater is the distance between the surface and deep structure of a sentence.

Mehler (1963) has shown that after subjects have been asked to memorize a series of complex sentences varying in grammatical type, they tend to recall the sentence but in a simpler grammatical form. For example, a sentence in the passive may be recalled in its active form. These findings suggest that a recoding of the sentence has occurred and that the semantic form is maintained but the deep syntactic marker indicating the passive form has been forgotten.

The role of transformations in sentence comprehension has also been demonstrated in the research of Gough (1965) and Slobin (1966). These researchers have shown that sentence comprehension varies in increasing difficulty (speed in determining truth value of a sentence) in the

following order--active affirmative, passive, negative, and passive negative. Thus, the available evidence does give support to the reality of deep sentence structure.

In examining the process of comprehension lexical meaning as well as relational meaning is of primary concern. Some evidence is present in the previously discussed work of Gough and Slobin to suggest the importance of this language component. It is of interest to note, for example, that passive sentences are easier to process than negative sentences even though the former are thought to be syntactically more complex. This unexpected finding may be attributed in part to the semantic difference between the passive and the negative and to the semantic similarity between the passive and the active. In instances requiring a true or false determination, negative sentences seem to be difficult to comprehend. Slobin has emphasized that not only is syntax important in comprehending sentences but semantic considerations must also be accounted for. His research has shown that in differentiation in difficulty between active and passive can largely be eliminated by clarifying the role of nouns in the subject and object positions. This clarification can be accomplished by reducing the possibility of semantic reversibility (e.g., Reversible: The girl struck the boy. The boy was struck by the girl. Nonreversible: The boy picked the apple. The apple was picked by the boy.) Such findings suggest that much more is involved in sentence understanding than relational meaning.

One would expect structure words to play an important role in narrowing possible semantic alternatives in the sequence of a sentence context. For example, the word not only cues a noun which follows but may also clarify or emphasize the semantic nature of the noun (e.g.,

The dog was in our yard versus some dog was in our yard). Miller (1962) and Miller et al (1951), demonstrated that words in context following a similar grammatical pattern are perceived more accurately than when in isolation. These findings suggest that the contextual constraint serves to narrow the possible range of appropriate words. Additional support for the importance of context in narrowing semantic possibilities is found in the research of Goodman (1965). He has shown that although children may be unable to decode words in isolation, they deal successfully with the same words in a running context. Research by Ruddell (1965) has shown that reading comprehension of fourth grade children is significantly higher on passages utilizing basic high-frequency patterns of their oral language structure in contrast to passages using low-frequency and more elaborated construction. These findings may be interpreted to support the importance of contextual associations which provide sufficient delimiting information to enable a child to determine the semantic role of a word and further to recognize and comprehend it in the sentence.

The language-experience approach concentrates on using the natural language patterns of children utilizing their experiences to provide the meaning or concept base for reading instruction. Significant differences in favor of language experience approach was reported by Stauffer (1966) and Stauffer and Dorsey (1967). The first grade population of 232 subjects included a segregated group of seventy-one Negro children in the experimental language arts program and 201 subjects in the control based reader program. Although the segregated population did not do as well as the unsegregated population, it did not materially lower the performance of the total experimental group whose total per-

formance at the end of grade 1 exceeded that of the control group at the .01 level of confidence or better in Word Reading, Paragraph Meaning, and Spelling on the Stanford Achievement Test. Further, the unsegregated population was significantly better on all tests, including Vocabulary, Word Study Skills, and Arithmetic, than the control population. When the study was extended through grade 2 with a slightly smaller population, the generally favorable advantage of the language arts group was supported by significantly higher scores on the Gates Primary Tests of Word Recognition, Sentence Reading and Paragraph Meaning as well as on the Kuhlman-Anderson Test of Intelligence. On the Stanford Achievement Test, the scores of the language arts group were likewise significantly higher in Word Meaning, Science and Social Studies Concepts, Spelling, Word Study Skills, and Language, but not in Paragraph Meaning. On the basis of these and other data reported in some detail, the authors concluded that the language arts approach in general produced better reading performance.

Harris and Serwer (1966), McCanne (1966), and Kendrick (1966) found the traditional approach more effective with disadvantaged children than the language-experience approach. McCanne recommends the visual-auditory approach with Spanish speaking first grade children because of (1) unwillingness of teachers to initiate original expression contrary to culturally determined thinking and behavior patterns in a formal school setting, (2) the attitudes and provision for developmental activities in kindergarten reflect the socio-economic level of the community and favor children from that socio-economic level, and (3) the observation that the amount of time spent on supplementary phonics instruction with an incidental method in contrast to a sequential method

was not sufficient for these children.

The studies reviewed give some indication that the degree of a child's morphological and syntactical development would appear to be a significant variable in the degree of success achieved in the language experience approach.

Summary

This section has included references to several language units for use in teaching beginning reading: the grapheme-phoneme unit, the spelling pattern unit, the whole-word unit, and the sentence unit. These four units were utilized in the present study.

The review of the studies dealing with the grapheme-phoneme unit indicate that knowledge of letter sound correspondence is an important basis for transfer to reading new words (Jeffrey and Samuels, 1966, 1967). The findings, also, suggest that sound blending places the phonemes in a natural sound-unit context constituting a more elaborate decoding unit which is of value in transferring sound-letter correspondence information to new letter patterns and words (Silberman, 1964). Several investigators recommended that initial words be introduced on the basis of grouped grapheme-phoneme consistencies.

The review of the studies dealing with the spelling pattern unit indicate that (1) the spelling pattern unit is more consistent in relationship between correspondences than the phoneme-grapheme (Reed, 1966), (2) greater correspondences of similar language units were found when multiple correspondencies (contrasting spelling patterns) were taught (Levin and Watson, 1963), and (3) direct teaching of the sound values of letters facilitated the learning of spelling patterns (Chall,

1967, Edward, 1964, Wyatt, 1966).

The review of the studies dealing with the whole-word unit indicate that the function of individual letters can not be determined without the frame work of the word (Broerse and Zwaan, 1966), meaningfulness is positively related to the recognition of the individual word (Jones and Spreen, 1967), and multiple stimuli connected with a response enhance retention (Jones and Greeno, 1967).

The review of the studies dealing with the sentence unit indicate that (1) the sentence unit is a more natural unit and more easily processed (Glanzer, 1967), (2) sentences are processed from the surface structure level to an underlying or deep structure for comprehension purposes (Miller, 1965), (3) contextual constraints serve to clarify, emphasize, and narrow semantic possibilities (Miller, 1962), and (4) passages utilizing basic high-frequency patterns of children's oral language structure significantly enhanced comprehension (Ruddell, 1965).

The review of literature included studies designed to compare the effectiveness between methods of teaching beginning reading. No one method could be considered equally effective for all children. Differences among and within learners appear to contribute to the degree of achievement with any method. Some methods appear to be more effective in promoting specific reading skills for different learners when specific learner variables are considered. A consideration of the individual's response to a particular method would appear paramount to the assignment of any individual to a particular method. More research needs to be undertaken to evaluate the significance of the response in relation to achievement over a specific period of time and to develop

and standardize testing instruments to adequately measure this significance.

CHAPTER III

METHODOLOGY AND DESIGN

A discussion of the procedures and instruments used in this study is presented in this chapter. The design of the study, the population, and the methods of selection of the subjects are given. A description of the instruments used in selection of subjects and the instrument used to measure the achievement level are presented. The descriptions and purposes of the programs are also presented. Attention is drawn to the methods that were used to analyze the data.

Design of the Study

The basic purpose of this study was to determine the effectiveness of the Ray Reading Methods Test in predicting the most suitable method of reading instruction for first-grade children. Additionally, this study was concerned with children who were predicted to have little success in first grade. To accomplish this, all children who would be first graders in September in thirteen school districts were administered the screening instrument, the 1965 revision of the Metropolitan Readiness Tests, Form A, during the month of March, 1970. Those children who scored below the 30th percentile were selected for the study.

The Ray Reading Methods Test was administered during the last two weeks of September and the following two weeks of October. On the

basis of these test results the most suitable method of instruction for each individual was ascertained. All students remained in their assigned classrooms and were taught by the teacher assigned to that classroom. Twelve teachers taught all the students in their classrooms scoring below the 30th percentile by the method indicated as preferred. Ten teachers taught all the students in their classrooms including those who scored below the 30th percentile by the same method in the school-adopted basal series.

The Metropolitan Achievement Tests, Primary I Battery, Form A were administered during the third week in April, 1971, as the criterion to measure reading achievement of the students in this study. Analysis of variance designs were used to determine the significance of differences between the groups and between the methods.

Description of the Population

The original population before screening consisted of six hundred two children from thirteen school districts. The districts represented consisted of three school districts from towns larger than 8,000 population with eighteen first-grade classrooms, six school districts relatively small and rural in nature with twelve first-grade classrooms, and four dependent rural schools with four first-grade classrooms.

Two hundred eighty-two children scored below the 30th percentile on the screening instrument, the Metropolitan Readiness Tests. These students were selected as the basic population for the study.

The basic population was assigned to thirty-six first-grade teachers. Fourteen of these teachers did not volunteer to participate in the study. These teachers were assigned to five first grades in the

larger schools, five first grades in smaller schools, and the four first grades in the rural schools. The eighty-six children of the basic population assigned to these teachers were eliminated from the study. The remaining population (196) was administered the Ray Reading Methods Test. Excessive absences which prohibited the completion of all tests eliminated another thirty-three students. One hundred sixty-three students completed all tests.

Table I shows the number of students in the sample that completed the testing. The table provides additional information regarding the method indicated as most appropriate or preferred.

TABLE I
NUMBER OF STUDENTS INDICATING A PREFERENCE FOR EACH METHOD

	Methods of Instruction			
	Auditory- Visual	Linguistic	Visual- Auditory	Language- Experience
N =	15	1	114	33

Seventy per cent of the students indicated a preference for the Visual-Auditory method, twenty per cent indicated a preference for the Language Experience method, nine per cent indicated a preference for the Auditory-Visual method, and less than one per cent indicated a preference for the Linguistic method. These indicated method preferences are based on individual performance on the Ray Reading Methods

Test.

Twelve of the twenty-two teachers who volunteered to participate in the study preferred to work with the experimental group, while the remaining ten preferred to work with the control group. The twelve teachers working with the experimental group taught the different methods needed by the students in their room. The ten teachers working with the control group taught all the students in their room by the method of reading used in that school.

The teachers working with the control group taught one method in their classrooms but this one method was the method indicated as preferred by some students in that classroom. All students taught by the method indicated as preferred were considered part of the experimental group regardless of whether they were taught by experimental or control teachers.

Table II shows the number of students in the sample that were taught by the method indicated as preferred and the number of students taught by some method other than the preferred method.

TABLE II

NUMBER OF STUDENTS TAUGHT BY PREFERRED METHOD (x) AND METHOD OTHER THAN PREFERRED (y)

	Methods of Instruction			
	Auditory- Visual	Linguistic	Visual- Auditory	Language- Experience
x =	12		82	18
y =	3	1	32	15

Instruments Used and Their Application
In This Study

Metropolitan Readiness Tests, Form A (1965)

These tests were devised to measure the extent to which school beginners have developed in the skills and abilities which contribute to readiness for reading. It was designed to test pupils during the kindergarten year or the beginning of first grade. The purpose of the test was not to measure the effectiveness of kindergarten, but rather serve as a basis for classification of students. The six subtests which made up this test were:

- Test 1. Word Meaning, a 16-item picture vocabulary test. The pupil selects from three pictures the one that illustrates the word the examiner names.
- Test 2. Listening, a 16-item test of ability to comprehend phrases and sentences instead of individual words. The pupil selects from three pictures the one which portrays a situation or event the examiner describes briefly.
- Test 3. Matching, a 14-item test of visual perception involving the recognition of similarities. The pupil marks one of three pictures which matches a given picture.
- Test 4. Alphabet, a 16-item test of ability to recognize lowercase letters of the alphabet. The pupil chooses a letter named from four alternatives.
- Test 5. Numbers, a 26-item test of number knowledge. The pupil selects from three pictures the one which denotes size, time, and other number concepts.
- Test 6. Copying, a 14-item test which measures a combination of visual perception and motor control. The pupil reproduces a number of designs independently from a number of given designs.

(Harcourt, Brace & World, 1965, p. 3)

The normative population of the 1965 edition of the Metropolitan Readiness Tests included a total of 12,231 students in 299 schools. Reliability testing using an alternate form (Form B) for retest pro-

duced a correlation of .91 in a study consisting of 546 kindergarten pupils.

The Metropolitan Readiness Tests, Form A administered during the month of March, 1970 were used as a screening instrument for categorizing the sample into levels of pupil readiness status. This categorization was based upon total test score. Students scoring below the 30th percentile (total score 44 or below) are categorized as Low Normal indicating they are likely to have difficulty in first-grade work and Low indicating their chances of difficulty high under ordinary instructional conditions.

Ray Reading Methods Test

This test was designed by Ray (1970) to evaluate the performance of children by measuring their response to teaching-learning experiences utilizing each of four methods of reading instruction. These methods are Visual-Auditory, Auditory-Visual, Linguistic-Word Structure, and Language Experience. The purpose of the test is the selection of a suitable method of instruction based upon the learner's demonstration of a preference in the selection of recognition cues. The test is designed to be used with individuals or small groups consisting of six or less individuals. Basically, the procedure consisted of a series of teaching lessons accompanied by testing. Ten words were taught in two instructional periods for each method with a succession of post-tests administered following each instructional period to measure the retention of the words which were taught. Following are the six subtests with their accompanying descriptions.

Test I. Visual-Auditory, a ten item test based on the whole word unit of instruction utilizing visual (configuration, picture) and contextual clues emphasizing word meaning in isolation and in context. The ten words were presented in a story context utilizing story booklets with pictures, flash cards, and a chalkboard to draw attention to configuration clues. The story was read silently and orally with appropriate discussion. The words--look, see, Jack, run, play--were taught in the first instructional period and the words--come, said, Fluffy, and, ride--were taught in the second instructional period.

Test II. Auditory-Visual, a ten item test based on the phoneme-grapheme unit of instruction with specific blending instruction. The consonant sounds of "m", "t", "b", and the short vowel sounds of "a" and "o" were taught in the first instructional period. After mastery, the sounds were synthesized into the words--mat, bat, mob, tot, tam--with no emphasis on meaning. During the second instructional period the silent e was introduced and the rule explained using the long sound of "a" and "o" in the following words: mate, bate, mobe, tote, and tame.

Test III. Linguistic-Word Structure, a ten item test based on the spelling pattern unit of instruction utilizing consistent and contrasting spelling patterns. The letter names--d, f, p, n, m, a, i--were taught the first instructional period. After mastery, the letter names were presented in the words--din, fin, pin, pan, man--by spelling the words while pointing to each letter. During the second instructional period the letter "e" was introduced and the words--dine, fine, pine, pane, mane--mere taught using the same procedure as the first instructional period.

Test IV. Language Experience, a ten item test based on the sentence unit of instruction utilizing the language of the subjects. A toy horse was presented, described, named, and/or manipulated. A story of no more than four simple sentences was developed using the language of the subjects during the first instructional period. The story was recorded on the chalkboard or a chart. Five words were selected from the story to be learned and were taught in context. The use of verbal clues and matching sentences, phrases, and words were also part of the instruction. After mastery, the words were presented in isolation. The same procedure was followed during the second instructional period using the previous story and adding four additional sentences.

All words were tested in isolation at the end of each instructional period. Recall scores were recorded for 20 minute, 60 minute, 24 hour, and 72 hour periods. Re-instruction of unknown and mispronounced words was given at the end of the 20 and 60 minute testing periods. Seventy-two hour recall scores for each method provided the basis for comparisons of the effectiveness of the various methods.

The Ray Reading Methods Test administered during September and October, 1970 was used to determine the most suitable method of instruction for individuals in this study. The test was administered by classroom teachers to their assigned students in groups of six or less. The order of presentation of the methods was randomly selected for each group and only one method was taught in any given week to that particular group.

Each student had four delayed recall scores, one for each method. If all methods had been equally effective in teaching the child, then all the scores would have been the same. In actual practice, there

were variations in the four scores and some method of determining when these variations were of significance had to be developed. Seventy-five subjects were randomly selected to obtain data to formulate a method of interpreting the significance of these scores. A frequency distribution was made of the 300 deviation scores of these 75 subjects and the mean deviation score was obtained. These deviations ranged from -3.0 to 5.0 with a mean of 0. From the data, the standard deviation of these scores was computed. A standard deviation of 2.3 was obtained. For ease in interpretation, it was concluded that if one or more of a child's scores deviated in either direction by more than 2.3 from his own mean, this was a greater deviation than would be found in approximately 68 per cent of the cases and would probably be significant in a learning situation even though it was not statistically significant. If one or more of the child's scores deviated as much as 4.6 from his own mean, this was a greater deviation than occurs in approximately 95 per cent of the cases and would be statistically significant as well as significant in a learning situation. Any delayed recall score for a particular method that deviated 2.3 or greater from a pupil's own mean was considered the most effective method of instruction.

Metropolitan Achievement Tests, Primary I Battery, Form A, 1963.

These tests were devised to measure the level of pupil achievement in the important skill and content areas in the curriculum. They were designed to test pupils during the latter half of first grade. The purpose of the tests was to measure important reading skills and/or the effectiveness of first grade. The three subtests used from this test were:

- Test 1. Word Knowledge, is a 35-item test that measures the child's sight vocabulary, or word-recognition ability. This ability is measured by means of picture vocabulary items in which the child demonstrates his recognition and understanding of the stimulus words by correctly associating each word with a picture.
- Test 2. Word Discrimination, is a 35-item test that measures the child's ability to select an orally presented word from among a group of words of similar configuration.
- Test 3.. Reading, consists of two parts. A 13-item section measures the pupil's ability to comprehend sentences. The child demonstrates his ability to read and to understand sentences by choosing from among three sentences the one that correctly describes a picture.
- The second section is a 33-item measure of ability to comprehend materials of paragraph length. Each reading selection is followed by questions designed to measure various aspects of reading comprehension--obtaining specific information, making inferences, etc.

The normative population of the 1963 edition of the Metropolitan Achievement Tests included over 500,000 students in 225 schools. Reliability testing of the Primary I Battery using split-half coefficients produced a correlation of .90 in Word Knowledge, .87 in Word Discrimination, .92 in Reading, and .93 in Arithmetic. Each correlation is based on a random sample (N = 300) of grade 2.1 pupils chosen to typify high (N = 100), low (N = 100), and average (N = 100) performance on the test.

The Metropolitan Achievement Tests, Primary I Battery, Form A, were administered during the third week in April, 1971 to measure the level of achievement of the students in this study.

Training and Instructional Programs and Their Application in This Study

The Ray Reading Methods Test was unfamiliar to the teachers in this study, thus creating the necessity for providing instruction and training for the teachers who would administer the instrument. A

workshop was conducted during the third week of August to develop an understanding of the differences between the methods of instruction and the learner strengths required for each method; an understanding of the testing instrument and observe the procedure for the administration of the instrument with a group of children, and provide an opportunity to practice administering the instrument to children under supervision. Testing materials were provided for all teachers. All teachers in the thirteen school districts participated in the study.

Four in-service meetings were scheduled three weeks apart to assist and encourage the teachers. The first in-service was scheduled before the testing period began. The emphasis of this in-service was administrative techniques and procedures involved in administering the Ray Reading Methods Test to facilitate a smooth and reliable testing program.

The testing program began the third week of September and continued for four weeks. The investigator was available during the initial week of testing and visited and counseled with each teacher administering the instrument. At this time additional help was provided all first grade teachers in the thirteen school districts with their readiness programs.

The second in-service meeting was designed to aid the teacher in meeting the individual instructional needs in her classroom. The rationale and basic procedures for beginning instruction in each method (Visual-Auditory, Auditory-Visual, Linguistic, and Language Experience) was presented and group discussion followed. Instructional programs available to the districts in Visual-Auditory, Auditory-Visual, and Linguistic methods and resource books for Language Experience were

displayed, examined, and discussed.

The following two in-service sessions were designed to assure that participating teachers would teach effectively the different methods. Teachers of both treatment groups were given an equal amount of consultant time and help. During the experimental period coordinators visited the classrooms of teachers on a regularly scheduled basis to help the teachers stay within the design of the study.

The instructional programs used in the study were:

1. The Visual-Auditory Method. The Reading for Meaning texts (Houghton Mifflin Company) designed for first grade pupils and traditionally used supplementary materials were employed to teach all experimental pupils with an indicated preference for the visual-auditory method and all students in six classrooms of the teachers teaching the control group.

2. The Auditory-Visual Method. Phonetic Keys to Reading texts (Economy Company) and traditionally used supplementary materials were employed to teach all experimental pupils with an indicated preference for the auditory-visual method and all students in four classrooms of the teachers teaching the control group.

3. The Language Experience Method. The language experience teacher's resource books by Encyclopaedia Britannica were used as guides for all experimental pupils with an indicated preference for the language experience method and were not taught in any classrooms of the teachers teaching the control group.

The instructional programs as described in the teachers' manuals were followed faithfully in order to provide some measure of consistency in the teaching programs.

Statistical Design

The statistical procedure selected to calculate the reliability coefficient of the Ray Reading Methods Test was the product-moment correlation between the odd sums and the even sums, and then to correct the resulting coefficient for length of passage.

The one-way analysis of variance was used to compare treatments and variables. The F test was used in testing for significant F ratios among and between groups. The assumptions required for this test are:

1. Each parent population is normal in form or that the sample sizes are large enough to insure that the distribution of means is near normal in form.
2. The samples from each population are random samples.
3. The samples from each population are selected independently from each of the other samples.
4. The variances in each of the populations are equal.

When discussing the F-test for the equality of two variances, it was seen that sample variances could be quite discrepant and yet be nonstatistically different from one another. This suggests that assumption 4 can be relaxed to a moderate degree. The same is true for the normality assumption. The F-test is quite robust to moderate departures from these two assumptions. There is some evidence that the variances can be quite different provided that the sample sizes are equal (Marascuilo, 1969).

The test statistic is $F = S_B^2 / S_W^2$.

The single-classification analysis of covariance was used to compare treatments and variables when the readiness variable was significantly different between groups. The assumptions which must be satisfied for the proper interpretation of analysis of covariance are those of both linear regression and analysis of variance. The assumptions required from regression for this test are: (1) the relationship between variables is linear; and (2) homoscedasticity exists. Analysis

of variance dictates that: (3) measures must be randomly drawn; and (4) variances in the subgroups must be relatively homogeneous.

This powerful technique allows the researcher to statistically equate the independent variable groups with respect to one or more variables which are relevant to the dependent variable. . . These variables are statistically adjusted so that they do not confound the analysis of the independent-dependent relationship under investigation (Popham, 1967).

Scheffe's Contrasts were calculated as post hoc comparisons of the multiple possible contrasts.

While the rejection of the hypothesis of equal treatment effects may be statistically interesting, it is, in general, not of much practical utility. To know that the treatments differ in their effects upon the criterion variable does not say very much because one still does not know which treatments differ from one another nor to what degree they differ. . . This illustrates the great beauty and power of Scheffe's Theorem. It is possible to investigate as many intervals as desired and still control the probability of a Type I error at any alpha level (Marasuilo, 1969).

The null hypothesis would not be confirmed if the F ratio on the test was higher than the F score significant at the .05 level.

Summary

This chapter was concerned with providing information regarding the design of the study. Six hundred two children who would be first graders in September in thirteen school districts participated in this study. The criteria were presented for the selection of the subjects in the study. After the final screening, one hundred sixty-three students remained as the sample.

A discussion of the instruments used in testing was included. This involved a description of the Metropolitan Readiness Tests, the Ray Reading Methods Test, and the Metropolitan Achievement Tests as well as their uses in this study. Also described was the reading

program and the procedures in initiating and applying these programs.
A description of the statistical procedure was also included.

CHAPTER IV

PRESENTATION AND TREATMENT OF THE DATA

Introduction

This chapter is composed of a detailed account of the statistical treatment of the data and the analysis of the results. This chapter will indicate the degree to which the hypotheses are found to be correct within recognized limitations.

The data will be discussed under the following headings: (1) an analysis of the performance of students on the individual sub-tests when the students are categorized as low readiness and taught by a preferred method of learning; (2) an analysis of the differences in performance between students taught by a preferred method and those taught by some method other than the preferred method on the individual subtests; and (3) an analysis of the differences in performance on the individual sub-tests between students taught by a preferred method when compared as to the method of teaching.

Determination of Reliability

In order to determine the reliability of each sub-test of the Ray Reading Methods Test, odd-even split half correlation coefficients were calculated. The correlation for the Visual-Auditory was .79 which when corrected for length yields a reliability of .88. The correlation for the Auditory-Visual was .96 which when corrected for length yields a

reliability of .98. The Correlation for the Linguistic-Word Structure was .91 which when corrected for length yields a reliability of .95. The correlation for the Language Experience was .52 which when corrected for length yields a reliability of .68. The Auditory-Visual, Linguistic-Word Structure, and the Visual-Auditory subtests possess greater reliability than the Language-Experience subtest.

An Analysis of Student Performance When Taught by Preferred Method

An inadequate sample for the Linguistic method and an inadequate control sample for the Auditory-Visual method prohibited a comprehensive examination of the first and following hypothesis.

Ho₁. The Ray Reading Methods Test will not identify a method that will facilitate achievement of pupils who score below the 30th percentile on a readiness test.

The hypothesis as stated can not be rejected or accepted because of the previously cited reasons. The predictive validity of the two remaining subtests, Visual-Auditory and Language-Experience, will be examined under Hypothesis 2.

Differences in Student Performance Between Preferred Method and Method Other Than Preferred

An analysis of variance was applied to the readiness scores and the achievement scores of the groups taught by a preferred method and the groups taught by some method other than the preferred method to test the following hypothesis.

Ho₂. There are no significant differences in reading achievement between below average readiness pupils who are taught by a method indicated as preferred and below average readiness pupils taught by some method other than the method indicated as preferred.

In order to test Hypothesis 2, an analysis of variance was first applied to the total test scores of the Metropolitan Readiness Tests of the Visual-Auditory preferred and other than preferred groups and the Language-Experience preferred and other than preferred groups. In an effort to facilitate randomness and to facilitate comparisons if uneven readiness was found, a random selection of fifteen subjects per group was drawn following the procedure in Popham, 1967. Rejection of the null hypothesis at the .01 and .05 level of confidence with 1 and 28 degrees of freedom called for an F ratio greater than 7.65 and 4.20.

Table III shows the result of the analysis of variance between the Visual-Auditory preferred and other than preferred groups while Table IV shows the results of the analysis of variance between the Language-Experience preferred and other than preferred groups. No significant difference was found in the readiness levels of the Visual-Auditory preferred and other than preferred or the Language-Experience preferred and other than preferred groups.

The results of the analysis of variance on readiness indicated that readiness was not a significant variable and no adjustments were necessary. An analysis of variance was then applied to the criterion measure in order to identify the amount of variation resulting from differences between the groups. An analysis of variance was applied to the subtest (Word Knowledge, Word Discrimination, and Reading) scores of the Metropolitan Achievement Tests of the Visual-Auditory preferred and other than preferred groups and to the Language-Experience preferred and other than preferred groups. An analysis of variance was also applied to a total reading score which consisted of a composite of the three subtest scores.

TABLE III

ANALYSIS OF VARIANCE OF VISUAL-AUDITORY PREFERRED AND OTHER THAN
PREFERRED ON READINESS AS MEASURED BY THE
METROPOLITAN READINESS TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	4.03	1	4.03	0.08*
Within Groups	1268.26	28	45.29	
Total	1272.30	29		

*Non-significant; $F = 0.08 < .05 F_{1,28} = 4.20$

TABLE IV

ANALYSIS OF VARIANCE OF LANGUAGE-EXPERIENCE PREFERRED AND OTHER THAN
PREFERRED ON READINESS AS MEASURED BY THE
METROPOLITAN READINESS TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	0.03	1	0.03	0.00*
Within Groups	2018.26	28	72.08	
Total	2018.30	29		

*Non-significant; $F = 0.00 < .05 F_{1,28} = 4.20$

Tables V, VI, VII, and VIII show the results of the analysis of variance between the Visual-Auditory group taught by the preferred method and the Visual-Auditory group taught by some method other than the preferred method. An inspection of the tables reveals a significant difference in achievement at the .01 level in Word Knowledge, and at the .05 level in Reading, and Total Reading in favor of the Visual-Auditory group taught by the preferred method. No significant difference was found in the Word Discrimination sub-test. An analysis of the total performance between the group taught by a preferred method and the group taught by a method other than the preferred method indicates that the Visual-Auditory subtest of the Ray Reading Methods Test will identify a method that will facilitate achievement of pupils who score below the 30th percentile on a readiness test.

Tables IX, X, XI, and XII show the results of the analysis of variance between the Language Experience group taught by the preferred method and the Language-Experience group taught by some method other than the preferred method. It may be observed that there was a significant difference in achievement at the .01 level in Word Discrimination, and the .05 level in Total Reading in favor of the experimental group. No significant differences were found on the subtests, Vocabulary and Reading. An analysis of the total performance between the group taught by a preferred method and the group taught by a method other than the preferred method indicates that the Language-Experience sub-test of the Ray Reading Methods Test will identify a method that will facilitate achievement of pupils who score below the 30th percentile on a readiness test.

Analysis reveals that there were significant differences between

TABLE V

ANALYSIS OF VARIANCE OF VISUAL-AUDITORY PREFERRED AND OTHER THAN
PREFERRED ON WORD KNOWLEDGE SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	691.21	1	691.21	13.90*
Within Groups	1392.26	28	49.72	
Total	2083.47	29		

*Significant; $F = 13.90 > .01 F_{1,28} = 7.65$

TABLE VI

ANALYSIS OF VARIANCE OF VISUAL-AUDITORY PREFERRED AND OTHER THAN
PREFERRED ON WORD DISCRIMINATION SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	30.01	1	30.01	0.58*
Within Groups	1427.87	28	50.995	
Total	1457.88	29		

*Non-significant; $F = .58 < .05 F_{1,28} = 4.20$

TABLE VII

ANALYSIS OF VARIANCE OF VISUAL-AUDITORY PREFERRED AND OTHER THAN
PREFERRED ON READING SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	418.14	1	418.14	6.50*
Within Groups	1200.66	28	64.31	
Total	2218.80	29		

*Significant; $F = 6.50 > .05 F_{1,28} = 4.20$

TABLE VIII

ANALYSIS OF VARIANCE OF VISUAL-AUDITORY PREFERRED AND OTHER THAN
PREFERRED ON TOTAL READING SUBTESTS OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	2726.53	1	2726.53	6.61*
Within Groups	11546.66	28	412.38	
Total	14273.20	29		

*Significant; $F = 6.61 > .05 F_{1,28} = 4.20$

TABLE IX

ANALYSIS OF VARIANCE OF LANGUAGE-EXPERIENCE PREFERRED AND OTHER THAN
PREFERRED ON WORD KNOWLEDGE SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	294.53	1	294.53	3.80*
Within Groups	2168.93	28	77.46	
Total	2463.46	29		

*Non-significant; $F = 3.80 < .05 F_{1,28} = 4.20$

TABLE X

ANALYSIS OF VARIANCE OF LANGUAGE-EXPERIENCE PREFERRED AND OTHER THAN
PREFERRED ON WORD DISCRIMINATION SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	616.53	1	616.53	8.60*
Within Groups	2006.66	28	71.67	
Total	2623.20	29		

*Significant; $F = 8.60 > .01 F_{1,28} = 7.65$

TABLE XI

ANALYSIS OF VARIANCE OF LANGUAGE-EXPERIENCE PREFERRED AND OTHER THAN
PREFERRED ON READING SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	124.03	1	124.03	1.43*
Within Groups	2434.93	28	86.96	
Total	2558.96	29		

*Non-significant; $F = 1.43 < .05 F_{1,28} = 4.20$

TABLE XII

ANALYSIS OF VARIANCE OF LANGUAGE-EXPERIENCE PREFERRED AND OTHER THAN
PREFERRED ON TOTAL READING SUBTESTS OF THE
METROPOLITAN ACHIEVEMENT TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	2822.69	1	2822.69	4.49*
Within Groups	17592.26	28	628.29	
Total	20414.96	29		

*Significant; $F = 4.49 > .05 F_{1,28} = 4.20$

the Visual-Auditory group taught by the preferred method and the Visual-Auditory group taught by some method other than the preferred method in two of the three subtests and the total reading score in favor of the Visual-Auditory group taught by the preferred method. There were significant differences in achievement between the Language-Experience group taught by the preferred method and the Language-Experience group taught by some method other than the preferred method in one of the three subtests and the total reading score in favor of the Language-Experience group taught by the preferred method.

The F statistic tests the hypothesis that all possible comparisons among means of groups are equal to zero. The meaning of a significant F from an AOV in an experimental situation implies that something has produced a difference among groups which has a small probability of happening by chance. Thus, the second null hypothesis of the study, that there would be no significant differences between students taught by a preferred method and the students taught by some method other than the preferred method was rejected.

Differences in Student Performance When Compared as to Method of Teaching

An analysis of variance was applied to the readiness scores and an analysis of covariance was applied to the achievement scores of the groups indicating a preference for a method and taught by that method to test the following hypothesis.

Ho₃. There will be no significant differences between the methods of teaching reading to below average readiness pupils when pupils are taught by a method indicated as preferred.

In order to test Hypothesis 3, an analysis of variance was first applied to the total test scores of the Metropolitan Readiness Tests of

the Visual-Auditory preferred, the Language-Experience preferred and the Auditory-Visual preferred groups. Table XIII shows the result of the analysis of variance. It may be observed that there was a significant difference at the .01 level of confidence in the readiness levels between the groups.

TABLE XIII

ANALYSIS OF VARIANCE OF VISUAL-AUDITORY, LANGUAGE-EXPERIENCE, AND AUDITORY-VISUAL ON READINESS AS MEASURED BY THE METROPOLITAN READINESS TESTS

Source of Variance	Sum of Squares	DF	Mean Square	F-Ratio
Between Groups	389.56	2	194.78	5.24*
Within Groups	1412.52	38	37.17	
Total	1802.09	40		

*Significant; $F = 5.24 > .01 F_{2,38} = 5.21$

The results of the analysis of variance on readiness indicated that readiness was a significant variable and adjustments were necessary. An analysis of covariance was applied to the subtest scores and to the total reading score of the Metropolitan Achievement Tests of the Visual-Auditory, Language-Experience, and Auditory-Visual groups taught by the method indicated as preferred. Scheffe's Contrasts were calculated to determine which treatments differ from one another and the degree they differ.

Table XIV shows the control means and the adjusted criterion means. An inspection of the control means revealed that the Language-Experience group scored higher on the readiness measure than either the Auditory-Visual or the Visual-Auditory Group. The Auditory-Visual group scored higher on the readiness measure than the Visual-Auditory. The table also reveals the adjusted criterion means for the three groups.

TABLE XIV
CONTROL AND ADJUSTED CRITERION GROUP MEANS ON THE
METROPOLITAN READINESS TESTS

Group	Auditory- Visual	Language- Experience	Visual- Auditory
Readiness	36.16	38.16	33.50
Word Knowledge	60.66	52.91	53.91
Word Discrimination	59.13	52.48	54.88
Reading	55.67	48.46	47.78
Arithmetic	58.21	52.33	55.13
Total Reading	175.53	153.93	156.42

The results of the analysis of covariance on Word Knowledge are shown in Table XV. An inspection of the table reveals a significant difference at the .01 level of confidence. Table XVI shows the results of Scheffe's Contrasts. A significant difference at the .01 level of confidence was found between the Auditory-Visual group and the Language-

Experience group in favor of the Auditory-Visual group. A significant difference at the .05 level of confidence was found between the Auditory-Visual group and the Visual-Auditory group in favor of the Auditory-Visual group. No significant difference was found between the Language-Experience group and the Visual-Auditory group in Word Knowledge.

TABLE XV

ANALYSIS OF COVARIANCE OF VISUAL-AUDITORY, LANGUAGE-EXPERIENCE, AND AUDITORY-VISUAL ON WORD KNOWLEDGE SUBTEST OF THE METROPOLITAN ACHIEVEMENT TESTS

Sources	df	SSx	Sp	SSy	SS'y	DF	MS'y
A	2	131.55	-6.22	430.38	430.34	2	215.17
W	23	568.33	-0.83	899.25	899.24	32	28.10
Total	35	699.99	-5.38	1329.63	1329.59	34	
		F = 7.6570*					

*Significant; $F = 7.65 > .01 F_{2,32} = 5.34$

The results of the analysis of covariance on Word Discrimination are shown in Table XVII. The table shows a significant difference at the .05 level of confidence. Scheffe's Test was applied to determine which treatment differed from another and the degree they differed. Table XVIII shows the results of the Scheffe's Test. An inspection of

TABLE XVI
COMPARISON OF PAIRS OF WORD KNOWLEDGE GROUP MEANS BY SCHEFFE'S TEST

Comparisons	F-Ratio	Probability
Auditory-Visual vs. Language-Experience	5.61	p < .01 (S)
Auditory-Visual vs. Visual-Auditory	4.39	p < .05 (S)
Language-Experience vs. Visual-Auditory	0.07	p > .05 (NS)

TABLE XVII
ANALYSIS OF COVARIANCE OF AUDITORY-VISUAL, LANGUAGE-EXPERIENCE, AND
VISUAL-AUDITORY ON WORD DISCRIMINATION SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Sources	df	SSx	Sp	SSy	SS'y	DF	MS'y
A	2	131.55	-32.00	258.66	251.65	2	125.82
W	23	568.33	-89.99	1182.33	1168.08	32	36.50
Total	35	699.88	-122.00	1441.00	1419.73	34	
		F = 3.45*					
*Significant; $F = 3.45 > .05 F_{2,32} = 3.30$							

TABLE XVIII
COMPARISON OF PAIRS OF WORD DISCRIMINATION GROUP MEANS BY SCHEFFE'S TEST

Comparisons	F-Ratio	Probability
Auditory-Visual vs. Language-Experience	3.63	P < .05 (S)
Auditory-Visual vs. Visual-Auditory	2.12	P > .05 (NS)
Language-Experience vs. Visual-Auditory	0.47	P > .05 (NS)

the table reveals a significant difference at the .05 level of confidence between the Auditory-Visual group and the Language-Experience group in favor of the Auditory-Visual group. The Auditory-Visual group was not significantly different from the Visual-Auditory group. No significant differences were found between the Language-Experience group and the Visual-Auditory group.

The results of the analysis of covariance on Reading are shown in Table XIX. The table shows a significant difference at the .05 level

TABLE XIX

ANALYSIS OF COVARIANCE OF AUDITORY-VISUAL, LANGUAGE-EXPERIENCE
AND VISUAL-AUDITORY ON READING SUBTEST OF THE
METROPOLITAN ACHIEVEMENT TESTS

Sources	df	SSx	Sp	SSy	SS'y	DF	MS'y
A	2	131.55	41.11	458.38	454.92	2	227.46
W	33	568.33	9.16	1565.91	1565.76	32	48.93
Total	35	699.88	50.27	2024.30	2020.69	34	
F = 4.65*							

*Significant; $F = 4.65 > .05 F_{2,32} = 3.30$

of confidence. Table XX shows the results of Scheffe's Test. An inspection of the table reveals no significant difference between the Auditory-Visual group and the Language-Experience group. Significant differences at the .05 level of confidence were found between the Audi-

tory-Visual group and the Visual-Auditory group in favor of the Auditory-Visual group. No significant differences were found between the Language-Experience group and the Visual-Auditory group.

TABLE XX
COMPARISON OF PAIRS OF READING GROUP MEANS BY SCHEFFE'S TEST

Comparisons	F-Ratio	Probability
Auditory-Visual vs. Language-Experience	3.18	P > .05 (NS)
Auditory-Visual vs. Visual-Auditory	3.80	P < .05 (S)
Language-Experience vs. Visual-Auditory	0.02	P > .05 (NS)

The results of the analysis of covariance on Total Reading are shown in Table XXI. The table shows a significant difference at the .01 level of confidence. Table XXII shows the results of Scheffe's Test. An inspection of the table reveals a significant difference at the .01 level of confidence between the Auditory-Visual group and the Language-Experience group in favor of the Auditory-Visual group. Significant differences at the .05 level were found between the Auditory-Visual group and the Visual-Auditory group in favor of the Auditory-Visual group. No significant differences were found between the Language-Experience group and the Visual-Auditory group.

Analysis reveals that there were significant differences in achievement between the Auditory-Visual group and the Language-Experi-

TABLE XXI

ANALYSIS OF COVARIANCE OF AUDITORY-VISUAL, LANGUAGE-EXPERIENCE,
AND VISUAL-AUDITORY ON TOTAL READING SUBTESTS OF THE
METROPOLITAN ACHIEVEMENT TESTS

Sources	df	SSx	Sp	SSy	SS'y	DF	MS'y
A	2	131.55	2.88	3327.72	3330.48	2	1665.24
W	33	568.33	-80.00	7986.16	7974.90	32	249.21
Total	35	699.88	-77.11	11313.88	11305.39	34	
F = 6.68*							

*Significant; $F = 6.68 > .01 F_{2,32} = 5.34$

TABLE XXII

COMPARISON OF PAIRS OF TOTAL READING GROUP MEANS BY SCHEFFE'S TEST

Comparisons	F-Ratio	Probability
Auditory-Visual vs. Language-Experience	5.61	P < .01 (S)
Auditory-Visual vs. Visual-Auditory	6.39	P < .05 (S)
Language-Experience vs. Visual-Auditory	0.07	P > .05 (NS)

ence group in two of the three subtests and the total reading score. Significant differences were also found in achievement between the Auditory-Visual group and the Visual-Auditory group in two of the three subtests and the total reading score. Thus, the third null hypothesis of the study, that there would be no significant differences between the methods of teaching reading to below average readiness pupils when pupils are taught by a method indicated as preferred was rejected.

A pertinent factor in the findings of this study should not be obscured by the comparisons of the groups. All students scored below the 30th percentile. The students in this study would be expected to have little success in school. Yet all of the group means of the students taught by a preferred method were at or above grade level. Table XXIII shows the group means with the equivalent grade score.

TABLE XXIII

END OF YEAR ACHIEVEMENT SCORES OF PUPILS SCORING BELOW
THE 30TH PERCENTILE ON READINESS TEST
WHEN TAUGHT BY PREFERRED METHOD

	Auditory- Visual		Language- Experience-		Visual- Auditory	
	Group Means	Grade Score	Group Means	Grade Score	Group Means	Grade Score
Word Knowledge	60.6	2.8	52.9	2.0	53.9	2.2
Word Discrimination	59.2	2.8	52.8	2.3	54.5	2.4
Reading	55.6	2.3	48.5	1.9	47.7	1.9
Arithmetic	58.2	2.6	52.8	2.2	54.6	2.4
Total Reading	175.5	2.7	154.2	2.1	156.1	2.2

The table shows the mean level of achievement for the groups taught by a method indicated as preferred.

Summary

This chapter has presented the statistical results from the treatment of the data. An inadequate sample prohibited a comprehensive examination of the first hypothesis regarding the predictive validity of the Ray Reading Methods Test. The predictive validity of two of the subtests was examined under the second hypothesis.

Single classification analysis of variance techniques was used to test the readiness levels of the groups and the second hypothesis regarding student performance between preferred method and other than preferred method. The result was a rejection of the null hypothesis.

Single classification analysis of covariance techniques was used to test the differences between the methods. Scheffe's Contrasts were calculated as post hoc comparisons of the multiple possible contrasts. The result was a rejection of the null hypothesis.

CHAPTER V

SUMMARY AND CONCLUSIONS

General Summary of the Investigation

This investigation was concerned with determining the effectiveness of the Ray Reading Methods Test in predicting the most suitable method of reading instruction for first grade children. Additionally, this study was concerned with students who scored below the 30th percentile on a readiness measure.

Three hypotheses were presented. Hypothesis I states that the Ray Reading Methods Test would not identify a method that would facilitate achievement of pupils who score below the 30th percentile on a readiness test. Hypothesis II stated that there would be no significant difference in reading achievement between below average readiness pupils who are taught by a method indicated as preferred and below average readiness pupils taught by some method other than the preferred method. Hypothesis III stated that there would be no significant difference between the methods of teaching reading to below average readiness pupils when pupils were taught by a method indicated as preferred.

The Metropolitan Readiness Tests were used to measure readiness. The readiness tests were administered in the spring preceding the school year in which the study was done. The original population before screening consisted of six hundred two children from thirteen school districts. After screening, the final sample consisted of one hundred

sixty three students.

The Ray Reading Methods Test was administered early in the school year to determine the most suitable method of instruction. All students remained in their assigned classrooms and were taught by the teacher assigned to that classroom. Twelve teachers taught every student scoring below the 30th percentile in their classroom by the method indicated by the individual students as preferred. Ten teachers taught all students in their classrooms by a single method following the method of the adopted basal series of that school

The Metropolitan Achievement Tests were used as a measure of reading ability. These tests were administered in the spring of the first-grade year. Analysis of the data from the results of the readiness measure and the achievement measure were made with the following techniques--analysis of variance, analysis of covariance, and Scheffe's Test.

Conclusions

According to statistical evidence, the Visual-Auditory and the Language-Experience sub-tests of the Ray Reading Methods Test can identify a method that will facilitate achievement of pupils who score below the 30th percentile on the Metropolitan Readiness Tests. At the conclusion of the experiment there was a significant difference in achievement between the Visual-Auditory group taught by a preferred method and the Visual-Auditory group taught by some method other than the preferred method in favor of the Visual-Auditory group taught by the preferred method. Significant differences were found in achievement between the groups on Word Knowledge, Reading, and Total Reading.

Significant differences were also found between the Language-Experience group taught by the preferred method and the Language-Experience group taught by a method other than the preferred method in favor of the Language-Experience group taught by the preferred method. Significant differences were found between the groups on Word Discrimination, and Total Reading.

Further analysis revealed that there were also significant differences in achievement between the methods of teaching reading when pupils were taught by a method indicated as preferred. A significant difference in achievement was found between the Auditory-Visual group and the Language-Experience group in favor of the Auditory-Visual group. Significant differences were found between the groups on Word Knowledge, Word Discrimination, and Total Reading. A significant difference in achievement was found between the Auditory-Visual group and the Visual-Auditory group in favor of the Auditory-Visual group. Significant differences in achievement were found between the groups in achievement on Word Knowledge, Reading, and Total Reading. No significant differences were found between the Language-Experience group and the Visual-Auditory group.

The findings of this study should be interpreted in light of the scores on the readiness measure. The students in this study were expected to have little success in school and yet they scored at or above grade level. These findings are shown in Table XXIII in the preceding chapter.

Implications and Recommendations

Several interesting observations were made during the study concerning the indicated method preference. Seventy per cent of the students in this study indicated a preference for the Visual-Auditory method. These students also had a lower mean readiness score than either the Auditory-Visual group or the Language-Experience group. Twenty per cent of the students in this study indicated a preference for the Language-Experience method. These students had the highest group mean readiness score. Their readiness score was significantly greater than the Visual-Auditory readiness mean score. Nine per cent indicated a preference for the Auditory-Visual method and their readiness mean score was greater than the Visual-Auditory group mean score but less than the Language-Experience group mean score. Only one student in this sample indicated a strength for the Linguistic method. It would appear that the 30th percentile cut off point in this study was too low to obtain an adequate sample for the Auditory-Visual and Linguistic methods. Further study in this area would add needed information regarding readiness level and method preference.

It is recommended, then, that this study be replicated to include the following expansion of design: (1) extend the readiness criteria to include all readiness levels, (2) include an analysis of readiness factors in an effort to predict strength for a method.

Other questions raised by the study were: (1) do certain readiness activities build specific strengths for methods of teaching reading and influence the students' indication of a method preference? and (2) do method preferences change or are they a fairly stable measure? Further study is needed in the area of method preferences.

A SELECTED BIBLIOGRAPHY

- Ammon, P. R. "The Perception of Grammatical Relations in Sentences: A Methodological Exploration," Journal of Verbal Learning and Verbal Behavior, 4 (1965), 364-372.
- Ausubel, David P. "A 'Mentalistic' Conception of Word Meaning: Implications for Reading," Claremont Reading Conference: Thirty-Third Yearbook. Ed. Malcolm P. Douglass. Claremont, California: Claremont Graduate School, 1967, 17-38.
- Bakker, Dirk J. "Temporal Order, Meaningfulness, and Reading Ability," Perceptual and Motor Skills, 24 (June 1967), 1027-1030.
- Bateman, Barbara. "The Efficacy of an Auditory and a Visual Method of First Grade Reading Instruction with Auditory and Visual Learners," Perception and Reading, Proceedings of the Twelfth Annual Convention International Reading Association, 12 (1968), 105-112.
- Bear, D. E. "Phonics for First Grade: A Comparison of Two Methods," Elementary School Journal, 59 (1958), 394-402.
- Bing, Lois B. "Vision and Reading," The Reading Teacher, 14 (March 1961), 241-244.
- Bloomfield, L. Language. New York: Holt, Rinehart and Winston, 1933.
- Blumberg, E. L., D. V. Williams, and J. P. Williams. "What Cues Are Used in Visual Word Recognition?" Paper presented at meetings of the Eastern Psychological Association, April 1969.
- Bond, G. L., and R. Dykstra. Coordinating Center for First Grade Reading Instruction Programs. Final Report, HEW Project No. X 001. Minneapolis: University of Minnesota, 1967.
- Bond, Guy L. and Robert Dykstra. "Interpreting the First Grade Reading Studies." The First Grade Reading Studies: Findings of Individual Investigations. Ed. Russell G. Stauffer. Delaware: International Reading Association, 1967, 1-9.
- Boney, C. DeWill. "A New Program for the Late Reader," Elementary English, 38 (May 1961), 316-319.

- Bordeaux, Elizabeth Ann and N.H. Shope. "An Evaluation of Three Approaches to Teaching Reading in First Grade," The First Grade Reading Studies: Findings of Individual Investigations. Ed. Russel G. Stauffer. Delaware: International Reading Association, 1967, 14-19.
- Broerse, A. C., and D. J. Zwaan. "The Information Value of Initial Letters in the Identification of Words," Journal of Verbal Learning and Verbal Behavior, 5 (October 1966), 441-446.
- Chall, Jeanne S. Learning to Read: The Great Debate. New York: McGraw-Hill, 1967.
- Dechant, Emerald V. Improving the Teaching of Reading. Englewood Cliffs: Prentice-Hall, 1964.
- Downing, J. A. "The I. T. A. (Initial Reaching Alphabet) Reading Experiment," Reading Teacher, 18 (November 1965), 105-110.
- Durost, Walter N., et al. Manual for the Metropolitan Achievement Tests, Primary I Battery. New York: Harcourt, Brace and World, 1963.
- Durrell, Donald D. "First-Grade Reading Success Study: A Summary," Journal of Education, 140 (February 1958), 2-6.
- Fodor, J. A., and J. C. Bever. "The Psychological Reality of Linguistic Segments," Journal of Verbal Learning and Verbal Behavior, 4 (1965), 414-420.
- Fries, C. C. Linguistics and Reading. New York: Holt, Rinehart and Winston, 1963.
- Fry, E. B. "Comparing the Diacritical Marking System, ITA and A Basal Reading Series," Elementary English, 4 (1966), 51-54.
- Gibson, E. J., et al. "A Developmental Study of the Discrimination of Letter-Like Forms," Journal of Comparative and Physiological Psychology, 55 (1962), 897-906.
- Gibson, E., J. Farber, and S. Shepela. "Test of a Learning Set Procedure for the Abstraction of Spelling Patterns," Project Literacy Reports, No. 8. New York: Cornell University, 1967, 21-31.
- Glanzer, M. "Grammatical Category: A Rote Learning and Word Association Analysis," Journal of Verbal Learning and Verbal Behavior, 1 (1962), 31-41.
- Goodman, K. S. "A Linguistic Study of Cues and Miscues in Reading," Elementary English, 42 (1965), 639-643.
- Gough, P. G. "Grammatical Transformations and Speed of Understanding," Journal of Verbal Learning and Verbal Behavior, 4 (1965), 107-111.

- Grimes, J. "The Interaction of Certain Pupil Personality Characteristics with Methods of Teaching Reading in Determining Primary Grade Achievement," (Unpublished Doctor's dissertation, Harvard University, 1958).
- Hahn, Harry T. "Three Approaches to Beginning Reading Instruction--ITA, Language Arts and Basic Readers," The First Grade Reading Studies: Findings of Individual Investigations. Ed. Russell G. Stauffer. Delaware: International Reading Association, 1967, 31-35.
- Harbin, Susan Patton, and John H. Wright. "Connotative Meaning in Verbal Learning," Journal of Experimental Psychology, 74 (May 1967), 106-113.
- Harris, A., and Blanche Serwer. "Comparing Reading Approaches in First Grade Teaching Disadvantage Children," The Reading Teacher, 19 (1966), 631-635.
- Harris, Albert J. and Florence G. Roswell. "Clinical Diagnosis of Reading Disability," The Journal of Psychology, 36 (1953), 323-340.
- Hayes, R. B. "ITA and Three Other Approaches to Reading in First Grade," Reading Teacher, 19 (1966), 631-635.
- Henderson, Margaret. "A Six Year Experimental Study of Two Methods of Teaching Reading in the Elementary School," The Reading Teacher, 12 (1959), 234-237.
- Hildreth, Gertrude H., Nellie L. Griffiths, and Mary E. McGauvran. Manual for the Metropolitan Readiness Test. New York: Harcourt, Grace and World, 1965.
- Hirsch, Katriana De. "Reading and Total Language Disability," Changing Concepts of Reading Instruction. International Reading Association Conference Proceedings, Delaware: International Reading Association, 1961, 211-214.
- Houston, John P. "Stimulus Selection as Influenced by Degrees of Learning, Attention, Prior Associations, and Experience with the Stimulus Components," Journal of Experimental Psychology, 73 (April 1967), 609-616.
- Ilg, Frances L. and Louise Bates Ames. "Developmental Trends in Reading Behavior," Pedagogical Seminary and Journal of Genetic Psychology, 74 (May 1967), 75-83.
- Jeffrey, W. E., and S. J. Samuels. "Effect of Method of Reading Training on Initial Learning and Transfer," Journal of Verbal Learning and Verbal Behavior, 4 (1965), 350-361.
- Johnson, N. F. "The Psychological Reality of Phrase-Structure Rules," Journal of Verbal Learning and Verbal Behavior, 4 (1965), 350-361.

- Jones, David, and Otfried Spreen. "The Effects of Meaningfulness and Abstractness on Word Recognition in Educable Retarded Children," American Journal of Mental Deficiency, 71 (May 1967), 987-89.
- Kelly, Barbara Cline. "The Economy Method Versus the Scott, Foresman Method in Teaching Second Grade Reading in the Murphysboror Public Schools," Journal of Educational Research, 51 (1958), 465-469.
- Kendrick, William M. "A Comparative Study of Two First Grade Language Arts Programs," Reading Teacher, 20 (1966), 25-30.
- Levine, H., and J. Watson. "The Learning Variable Grapheme-to-Phoneme Correspondences," A Basic Research Program on Reading. Cooperative Research Project No. 639, Ithaca, New York: Cornell University, 1963.
- Larsen, Carl Aage. "Approaches to Beginning Reading in Denmark," Reading Instruction: An International Forum. Ed. Marion D. Kenkinson. Proceedings of First World Congress, Delaware: International Reading Association, 1967, 134-141.
- Marascuilo, Leonard A. "Introduction to Modern Statistics." Unpublished manuscript, University of California, 1969.
- Mazurkiewicz, A. J. "ITA and TO Reading Achievement When Methodology Is Controlled," Reading Teacher, 19 (May 1966), 606-610.
- McCarthy, Raymond G. "The Effects of Visual and Auditory Memory Abilities on Word Recognition Success Under Two Teaching Methods," (unpublished Doctor's dissertation, Oklahoma State University, 1971).
- McCanne, R. "Approaches to First Grade English Reading Instruction for Children from Spanish-speaking Homes," The Reading Teacher, 19 (1966), 670-675.
- Mehler, J. "Some Effects of Grammatical Transformation on the Recall of English Sentences," Journal of Verbal Learning and Verbal Behavior, 2 (1963), 346-351.
- Miller, G. A. "Some Psychological Studies of Grammar," American Psychologist, 17 (1962), 748-762.
- Miller, G. A., G. A. Heise, and W. Lichten. "The Intelligibility of Speech as a Function of the Context of the Test Material." Journal of Experimental Psychology, 41 (1951), 329-335.
- Ohnmacht, D. C. "The Effects of Letter Knowledge on Achievement in Reading in the First Grade," paper presented at American Educational Research Association in Los Angeles, February 7, 1969.
- Postman, Leo, and Rose Greenbloom. "Conditions of Cue Selection in the Acquisition of Paired-Associate Lists," Journal of Experimental Psychology, 73 (January 1967), 91-100.

- Ray, Darrel D. Manual for the Ray Reading Methods Test. Stillwater, Oklahoma: Diagnostic Publishing Co., 1970.
- Ray, Darrel D. "Specificity in Remediation," Learning Disorders, 4. Ed. Barbara Bateman, Seattle: Special Child Publications, Inc., 1971.
- Reed, D. W. "A Theory of Language, Speech and Writing," Linguistics and Reading. Ed. Priscilla Tyler, Highlights of the 1965 Pre-convention Institutes. Newar: International Reading Association, 1966, 4-25.
- Ruddell, R. B. "A Longitudinal Study of Four Programs of Reading Instruction Varying in Emphasis on Regularity of Grapheme-Phoneme Correspondences and Language Structure on Reading Achievement in Grades Two and Three." Supported by the USOE, Projects 3099 and 78085, Berkely: University of California, 1968.
- Ruddell, Robert B. Psycholinguistic Implications for a Systems of Communication Model," Psycholinguistics and the Teaching of Reading. Ed. Kenneth S. Goodman and James T. Fleming, Newark: International Reading Association, 1969, 61-78.
- Ruddell, Robert B. "The Effects of the Similarity of Oral and Written Patterns of Language Structure on Reading Comprehension," Elementary English, 42 (1965), 403-410.
- Samuels, S. Jay. "Modes of Word Recognition," Theoretical Models and Processes of Reading, Newark: International Reading Association, 1970.
- Schneyer, W. "Reading Achievement of First Grade Children Taught by a Linguistic Approach and a Basal Reader Approach," The Reading Teacher, 19 (1966), 647-652.
- Sheldon, W., and D. Lashinger. "Effect of First Grade Reading Instruction Using Basal Readers, Modified Linguistic Materials, and Linguistic Readers." The Reading Teacher, 19 (1966), 576-579.
- Silberman, H. F. Exploratory Research on a Beginning Reading Program, Technical Memorandum. No. TM-895/100/00. Santa Monica: System Development Corporation, 1964.
- Sister Mary Edward, P.B.B.M. "A Modified Linguistic versus a Composite Basal Reading Program," The Reading Teacher, 17 (1967), 511-515.
- Skailand, Dawn B. "A Comparison of Four Language Units in Teaching Beginning Reading," (unpublished Doctor's dissertation, University of California, 1970).
- Slobin, D. I. "Grammatical Transformations and Sentence Comprehension in Childhood and Adulthood," Journal of Verbal Learning and Verbal Behavior, 5 (1966), 219-227.

- Smith, H. L. Linguistic Science and the Teaching of English.
Cambridge: Harvard University Press, 1959.
- Smith, Nila B. "Readiness for Reading," Elementary English, 27 (January and February, 1950), 31-39, 91-106.
- Soffiatti, J. P. "Why Children Fail to Read: A Linguistic Analysis,"
Harvard Educational Review, 25 (Spring 1955), 63-84.
- Sparks, Paul E., and L. C. Fay. "An Evaluation of Two Methods of Teaching Reading," Elementary School Journal, 57 (April 1957), 386-390.
- Spreen, Otfried, John G. Borkowski, and Arthur L. Benton. "Auditory Word Recognition as a Function of Meaningfulness, Abstractness and Phonetic Structure," Journal of Verbal Learning and Verbal Behavior, 6 (February 1967), 101-4.
- Stauffer, R. "The Effectiveness of Language Arts and Basic Reader Approaches to First Grade Reading Instruction," The Reading Teacher, 20 (1966), 18-24.
- Stauffer, Russell G. The Language-Experience Approach to the Teaching of Reading. New York: Harper and Row, 1970.
- Stauffer, Russell G., and Hammond W. Dorsey. "The Effectiveness of Language Arts and Basic Reader Approaches to First Grade Reading Instruction--Extended into Second Grade." The Reading Teacher, 20 (1967), 740-746.
- Stevenson, H. W., et al. "Intercorrelations and Correlates in Children's Learning and Problem Solving," Monographs of the Society for Research in Child Development, 33 (1968), 1-68.
- Suci, G. J., P. R. Ammon, and P. Gamlin. "The Validity of the Probe-Latency Technique for Assessing Structure in Language," Language and Speech, 10 (1967), 69-80.
- Tanzer, H. J., and H. Alpert. "Three Different Basal Reading Systems and First Grade Reading Achievement," The Reading Teacher, 19 (May 1966), 626-642.
- Venezky, R. F. "English Orthography: Its Graphical Structure and Its Relation to Sound," Reading Research Quarterly, 2 (Spring 1967), 75-106.
- Wardaugh, R. "Linguistics-Reading Dialogue," Reading Teacher, 21 (February 1968), 432-441.
- Wyatt, Nita M. "The Reading Achievement of First Grade Boys Versus First Grade Girls." The Reading Teacher, 19 (1966), 661-665.

Winch, W. H. "Teaching Beginners to Read in England: Its Methods, Results, and Psychological Bases," Journal of Educational Research Monographs, No. 8, Bloomington: Public School Publishing Company, 1925.

APPENDIX

PUPIL RECORD FORM--RAY READING METHODS TEST

Name: _____ Date: _____
 School: _____ Age: _____
 Examiner: _____ IQ: _____

I. VISUAL-AUDITORY

List A		20	60	24	72	List B		20	60	24	72
		Min.	Min.	hrs.	hrs.			Min.	Min.	hrs.	hrs.
1.	look	_____	_____	_____	_____	1.	come	_____	_____	_____	_____
2.	see	_____	_____	_____	_____	2.	said	_____	_____	_____	_____
3.	run	_____	_____	_____	_____	3.	Fluffy	_____	_____	_____	_____
4.	Jack	_____	_____	_____	_____	4.	and	_____	_____	_____	_____
5.	play	_____	_____	_____	_____	5.	ride	_____	_____	_____	_____
Raw Score:		_____	_____	_____	_____	6.	look	_____	_____	_____	_____
						7.	see	_____	_____	_____	_____
						8.	run	_____	_____	_____	_____
						9.	Jack	_____	_____	_____	_____
						10.	play	_____	_____	_____	_____
						Raw Score:		_____	_____	_____	_____

II. AUDITORY-VISUAL Letter Sounds: m t b ä ö e / ā ō

List A		20	60	24	72	List B		20	60	24	72
		Min.	Min.	hrs.	hrs.			Min.	Min.	hrs.	hrs.
1.	mat	_____	_____	_____	_____	1.	mate	_____	_____	_____	_____
2.	bat	_____	_____	_____	_____	2.	bate	_____	_____	_____	_____
3.	mob	_____	_____	_____	_____	3.	mobe	_____	_____	_____	_____
4.	tot	_____	_____	_____	_____	4.	tote	_____	_____	_____	_____
5.	tam	_____	_____	_____	_____	5.	tame	_____	_____	_____	_____
Raw Score:		_____	_____	_____	_____	6.	mat	_____	_____	_____	_____
						7.	bat	_____	_____	_____	_____
						8.	mob	_____	_____	_____	_____
						9.	tot	_____	_____	_____	_____
						10.	tam	_____	_____	_____	_____
						Raw Score:		_____	_____	_____	_____

PUPIL RECORD FORM--RAY READING METHODS TEST

Name: _____ Date: _____

School: _____ Age: _____

Examiner: _____ IQ: _____

III. LINGUISTIC-WORD STRUCTURE

	List A	20	60	24	72		List B	20	60	24	72
	Min.	Min.	hrs.	hrs.		Min.	Min.	hrs.	hrs.		hrs.
1.	din	_____	_____	_____	_____	1.	dine	_____	_____	_____	_____
2.	fin	_____	_____	_____	_____	2.	fine	_____	_____	_____	_____
3.	pin	_____	_____	_____	_____	3.	pine	_____	_____	_____	_____
4.	pan	_____	_____	_____	_____	4.	pane	_____	_____	_____	_____
5.	man	_____	_____	_____	_____	5.	mane	_____	_____	_____	_____
	Raw Score:	_____	_____	_____	_____	6.	din	_____	_____	_____	_____
						7.	fin	_____	_____	_____	_____
						8.	pin	_____	_____	_____	_____
						9.	pan	_____	_____	_____	_____
						10.	man	_____	_____	_____	_____
							Raw Score:	_____	_____	_____	_____

IV. LINGUISTIC-LANGUAGE EXPERIENCE

	List A	20	60	24	72		List B	20	60	24	72
	Min.	Min.	hrs.	hrs.		Min.	Min.	hrs.	hrs.		hrs.
1.	_____	_____	_____	_____	_____	1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	4.	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	5.	_____	_____	_____	_____	_____
	Raw Score:	_____	_____	_____	_____	6.	_____	_____	_____	_____	_____
						7.	_____	_____	_____	_____	_____
						8.	_____	_____	_____	_____	_____
						9.	_____	_____	_____	_____	_____
						10.	_____	_____	_____	_____	_____
							Raw Score:	_____	_____	_____	_____

VITA

Mildred Inez Manwarren

Candidate for the degree of

Doctor of Education

Thesis: A VALIDITY STUDY OF THE RAY READING METHODS TEST

Major Field: Elementary Education

Biographical:

Personal Data: Born at Mounds Valley, Oklahoma, the daughter of Mr. and Mrs. Raymond A. Clayton.

Education: Attended public elementary schools in Oklahoma; graduated from Chase Rural High School, Chase, Kansas, in 1946; received Bachelor of Arts degree with a major in Elementary Education from Sterling College, Sterling, Kansas, in 1964; received Master of Science degree with a major in Elementary Administration Supervision from Fort Hays Kansas State College, Hays, Kansas, in 1967; completed requirements for the Doctor of Education degree at Oklahoma State University, Stillwater, Oklahoma in May, 1972.

Professional Experience: Third grade teacher at St. John Elementary School, St. John, Kansas, 1964-1968; junior high remedial reading teacher at El Dorado Junior High School, El Dorado, Kansas, 1968-1969; graduate assistant in the Reading Center at Oklahoma State University, 1969-1970, teaching Study Techniques for College Students and working as a clinician in the Reading Clinic; reading consultant for Canadian Valley Regional Education Laboratory, El Reno, Oklahoma, 1970-1971, serving as a consultant and conducting a workshop with follow through in-service meetings; Assistant Professor of Education at Kansas State Teachers College, Emporia, Kansas, 1970-1971, teaching undergraduate and graduate courses in reading and guidance of exceptional children, supervising student teachers, and serving as faculty sponsor for the student chapter of Council for Exceptional Children; Assistant Professor of Education at University of Arkansas, Fayetteville, Arkansas, 1971- , teaching graduate and undergraduate courses in reading and language arts.