A STUDY OF THE RELATIONSHIP OF INSTRUCTIONAL METHODS TO THE ORAL READING ERRORS MADE BY FIRST GRADE READERS

By

DONNA MAE OGLE

Bachelor of Arts
Macalester College
St. Paul, Minnesota
1964

Master of Education
University of Virginia
Charlottesville, Virginia
1970

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of the Oklahoma State University
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Thesis Approved:

Darrel D. Ray
Thesis Adviser

Charles L. Smith

Bill F Elsom

Larry M. Perkins

N N Durham
Dean of the Graduate College

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CHAPTER I

PRESENTATION OF PROBLEM

Introduction

Recent studies of children's reading performances have helped to increase understanding of the reading process and the ways children use both graphic and contextual information in reading. However, little attention has been given to the influence of particular instructional methods in determining what information and strategies children use as they read. An assumption in many of these studies is that instruction is not a significant factor in children's reading strategies.

This study is designed to explore the relationship between instructional emphases in reading and the actual reading behaviors of first grade readers in an attempt to provide additional information about the reading process and the way children read. Rather than compare standardized test results that provide little information about what the children do as they read, this study analyzes children's oral reading errors to determine what information the children utilize.

This approach was chosen because oral reading error analysis reveals what children do as they read and permits a comparison to

be made between reading approaches. By focusing on the correct aspects of children's errors it is possible to determine what cues are most important to readers and to follow the development of skills in reading. While traditional systems of error analysis have focused on the use of graphic information almost exclusively (Gates, Monroe) more recent studies of reading approach error analysis from a linguistic perspective that provides more information about what the reader is actually doing as he reads. Errors are evaluated in terms of their use of contextual information, both semantic and syntactic, as well as their use of graphic information. This linguistic approach to error analysis has demonstrated that children do not only attend to the graphic features of words but also deal with meaning and utilize their knowledge of language structures and patterns as they read.

Using a linguistic approach to error analysis Goodman and others have defined more clearly the importance of language cues in reading. Clay and McKinnon have focused attention on the importance of syntax in children's error patterns. Weber and Biemiller have investigated the interplay between utilization of graphic and contextual information by beginning readers. All of these studies have emphasized that there is more to be considered in analyzing children's oral reading errors than their match to the graphic configuration of the missed word. Children's errors also reflect their attention to meaning and grammatical cues.

The expanded scope of oral reading research has significantly increased the understanding of how children read and why they make

the particular errors they do in oral reading. However, the effect of classroom instruction on the way children utilize information in reading has not been considered in these studies. Clay's assertions about the children's use of syntax in reading come from a study of children in a reading program that stressed natural speech and reading for meaning. Biemiller reached his conclusions about stages in the beginning reading process from a study of children taught by a basal reading approach. Weber's conclusions about the high percentages of gramatically correct errors also came from a study of children in a basal program. Each of these studies is limited, therefore, because it has dealt with readers in only one type of instructional program.

Need for the Study

Although oral reading error analysis has not considered instructional approaches to reading, advocates of particular reading approaches expend a great deal of effort justifying one approach or another. The conflict between proponents of an early emphasis on phonics instruction as the basis of reading and the more traditional whole word orientation of basal reading programs has been a major concern in reading. In her book, The Great Debate, Jean Chall documents the preoccupation of many educators with differing reading approaches.

If differences in beginning reading methods significantly affect readers, then the oral reading performances of children can be expected to reflect the way they have been taught to read. It would follow that children who have learned sound-symbol correspon-

dences would apply that knowledge as they read, and children with a whole word orientation would respond to wholes and rely on their sight vocabulary and contextual clues to meaning. However, there has been little research addressed to the question of the relationship between instructional methods and the kinds of strategies children use as they read. In her review of studies of oral reading Weber reported:

> In fact, the close comparison of error profiles of early readers with training in the systematic use of sound-letter correspondences in contrast to those with training in pairing whole written words with oral words has not received much attention in regard to oral reading errors (1968, p. 108).

The few studies that have examined the relationship between instruction and how children read have indicated that there are significant differences in the strategies used by children depending on the methods by which they were taught reading (Elder, Daniels and Diack, and Barr). Studies of retarded readers have shown that they are often suffering from difficulties caused by the overuse of partial reading strategies; they either rely on phonic clues and neglect available contextual information (Smith, 1973) or lack knowledge of sound-symbol relationships and thus fail to read unfamiliar material (Roswell and Chall, 1957).

As more information is gathered about children's reading behaviors and how they learn to read it is important that the significance of instruction not be ignored.

Purpose of the Study

This study is designed to provide a better understanding of the relationship between instructional methods and the oral reading of first grade children. To explore the relationship between instruction and particular patterns in oral reading, the oral reading performances of two groups of first grade readers, one taught by a phonics-oriented and the other by a whole word approach are compared. Children's errors are evaluated to determine if there is any relationship between the frequency of particular categories of errors made and instruction in reading. Errors are also analyzed to determine what kinds of information, contextual and graphic, the readers attend to. Reading performances at both instructional and frustration levels are compared in an effort to clarify what happens to reading behavior as the difficulty of the material increases.

Hypotheses

The hypotheses tested in this study are stated in the null form as:

1. There are no significant relationships between error patterns and instructional methods at the instructional or frustration level.

2. There are no significant relationships between types of substitution errors and the instructional methods.

3. There are no significant relationships between the

contextual appropriateness of substitution errors and instructional methods at either performance level.

4. There are no shifts in error patterns from instructional to frustration level.

Each of these hypotheses is tested using a number of error categories and types.

Definition of Terms

Word recognition strategy refers to the method used by a reader to recognize a word and pronounce it correctly. Important strategies include the use of configuration, phonic regularities, and contextual information.

Context cues are those aids to word recognition that come from an understanding of meaning and syntactic regularities of language.

Graphic cues are those aids to recognition that come from the written form of the word. These include both general configuration and the letter sequence.

Error refers to any response that differs from the written content except for divergence due to dialect. The basic categories of errors are substitution, omission, addition, and non-response.

Instructional level refers to the graded reading level at which the reader pronounces correctly between 88%-98% of the words in passages at the first and second grade levels or between 92%-98% of the words in passages at the third grade level.

Frustration level refers to the graded reading level at which

the reader is unable to meet the word recognition criteria of 88% for first and second grade material or 92% for third grade material or cannot read at least 45 words per minute.

Successful first grade readers are those students who scored between 2.0 and 3.0 on the Comprehension Test of the Gates-MacGinitie Reading Test, Primary A-1 and who were not repeating first grade.

Phonics approach refers to an approach to beginning reading instruction that teaches sound-symbol relationships as a primary tool in word recognition. Children learn to respond to letters and blend sounds together by phonic rules thus making mediated visual-auditory responses to words.

Whole word approach to beginning reading refers to programs that direct children to see words as wholes and to make immediate responses to words as they read. Immediate visual perception of words is taught rather than analysis of word parts as a primary technique of reading.

Limitations

This study involves a comparison of the oral reading performances of readers taught reading from only two approaches to beginning reading available commercially. Only successful first grade readers are included so the effects of the instructional methods cannot be extended to other groups of readers. No control was included for individual differences in learning types among the students included in the study. Because this study was conducted in the classroom rigorous experimental conditions were not possible to maintain and some contamination with extraneous factors is possible.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Studies dealing with children's oral reading and the influence of instructional methods fall into two categories. The first group of studies focus solely on the actual reading strategies of beginning readers. The second group deal directly with the importance of instruction in oral reading behavior. While there are numerous studies similar to those reported here dealing with older children and adults, only studies directly applicable to beginning readers are included in this review.

Beginning Reading Studies

Most studies investigating how children learn to read have concentrated on how individual words are perceived apart from contextual constraints. Studies of this nature are insightful but they have limited application when generalizations are made to the total reading process.

The earliest of these studies was reported by Gates and Boeker (1923). They analyzed the "means by which inexperienced children learn words (p. 470)" when presented with isolated words and given the correct pronunciation of the words. Although the

subjects were drawn from one kindergarten class, the number of children and other pertinent information about them was not included. All the children were individually taught nine word lists each containing six words of equal length except for one group of mixed length. The length of words varied from three to ten letters. Each child was given six presentations of each word and six tests of learning.

A comparison of the average number of words learned showed that longer words were more difficult to remember and that the children's skill increased with practice. When errors were analyzed to determine what made some words easier to learn than others no pattern emerged. When asked what cues they had used to remember words, students indicated that they frequently observed some minute detail of the words. Gates and Boeker concluded that children need guidance in "learning to see words appropriately (p.483)" and that further studies were needed on how best to develop habits of effective word perception.

Wiley (1928) reported an experiment with 56 first-grade children to study "factors which condition the acquiring of a reading vocabulary by first grade children (p.278)." All children were taught 60 new words, three per day. Children's responses were recorded from the testing and the errors were analyzed. In contrast to Gates, Wiley found no significant differences in difficulty with length of words, but did find a negative correlation between ease in learning and inclusion on Thorndike's first 500 words or on the Gates Primary list. According to Wiley, config-

uration confusion accounted for a high percentage of errors. Even more than configuration, though, the best indicator of successful learning came from the quickness of association task which indicated how meaningful the words were to the students. Wiley concluded that the meaning a word has for the first-grade child is a factor that will "greatly influence the difficulty he may have in learning to recognize the word symbol (p.285)."

Marchbanks and Levin (1965) designed an experiment to test what cues nonreaders and beginning readers use in remembering words. The cues they controlled for were shape of words and position of letters in the words. Subjects included 50 kindergarten children with no reading experience and 50 first grade children having five months of basal reading experience. Subjects were shown a word on a card and after it was withdrawn they were asked to find the same word from a group of words on a second card varying in the stated conditions. Reliability was determined by consistency of choice cues utilized by the different groups and the significance of differing strategies was determined by the Friedman two-way analysis of variance. The variation of strategies was significant for both age and sex groups. The Cochran Q test, used to compare each cue with every other cue, revealed that the first letter was used significantly more than the last letter on quingrams, but that there was strong competition between these cues in the trigrams. The least used cue for all groups was shape.

The results hardly seem surprising to this writer given the nature of the tasks the children were required to perform. Shape

was so narrowly defined with all possible choices having the same number of letters that utilization of shape cues was made virtually impossible. The increased accuracy and utilization of first letter cues and first, second, and third letters by first graders probably reflected the influence of instruction on the cues utilized by the children.

The difficulty encountered by all of these researchers in determining initial word recognition strategies of children before they have learned to read is not unexpected. Until children have had practice with written symbols their responses would tend to be more haphazard and might depend on minute cues. The cues that are actually used by children as they learn to read in a more prolonged course of time has been the focus of recent studies that reflect interest in the total language process.

Illustrative of this more broadly conceived research orientation is the study reported by Biemiller (1970). He was interested in the learning to read process in first grade children and so listened to and recorded oral reading errors made by 42 children throughout one school year. Children in two classes were included in the study. One was suburban and middle class; the other rural and lower class. Children in the first group were able pre-readers while those in the second group were high risk students at the inception of the study. All of the children were taught reading in a "basal" approach. Data on their errors was collected by "trained observers" as children read from their texts. Their errors were then analyzed according to type, their graphic similarity (based

on matching of first letters) and their contextual acceptability. Each child's performance was evaluated monthly to determine if phases occurred in reading growth as Biemiller had anticipated. From analysis of the error patterns Biemiller suggested that learning to read involves a three-stage process: the first characterized by a predominant use of contextual information and reliance on sight vocabulary, the second by a predominance of non-response errors, and the third phase by a co-occurrence of graphic and contextually constrained errors. Biemiller found that during the course of a year most children moved through the pre-non-response stage to the non-response stage and that 32 of the 42 children were in the post non-response stage by May. Analysis of the percentages of graphic or contextual substitutions according to the chi-square showed significant differences in the phases. In all three stages contextually constrained errors were most frequent and graphic constraints less likely. There was a large and significant increase in the percentage of graphic substitution errors among response errors made by children during the non-response stage. Even in the post non-response stage half of the substitution errors did not reflect graphic constraints.

This study presents a new conception of the development of reading ability and of the nature of the strategies children utilize. However, Biemiller's interpretation is based solely on the performance of children learning by an undefined "basal approach." He failed to account for the role the instructional program played in the pattern of reading errors students produced. Therefore, it seems that generalizations about the universality of the learning to read

process must be most tentative.

Weber (1970) studied the oral reading errors of first grade children to determine what strategies they used to identify words. Data was collected on the oral reading performances of children in one class from December to June. The class was taught reading from a basal reading series supplemented with instruction in sound-letter correspondence. The errors children made in their oral reading were analyzed and reported for two groups, those identified as high and low in reading achievement. Results indicated that substitutions accounted for about 80% of the errors for both groups. A more detailed analysis of the types of errors was made on the level of sounds and letters, word structure, and syntactic and semantic appropriateness.

Based on the use of the graphic similarity index Weber reported that the high group approached correct responses more frequently than did the low group. However, on measures of syntactic and semantic appropriateness there was little difference between the two groups with both of them evidencing use of grammatical constraints in reading. After analyzing syntactic and semantic similarity separately she found an almost complete overlap between the two. This led her to conclude that the analysis of letters and sounds reflected the influence of learning, but that the semantic and syntactic analysis demonstrated that the children did not need to learn the use of the constraints of grammatical structure in reading -- they already knew it and actively used this knowledge while reading.

Clay (1968) analyzed theoral reading errors of 180 five year

old children in New Zealand schools to determine the influence of linguistic structure on children's word choices in reading. The children were described as representative of the Auckland urban area in intelligence, sex distribution, occupation of parents and physical environment. The children had been taught reading by a method that utilized natural speech and "discouraged the teaching of words singly or in lists and emphasized instruction in response to errors (p.434)." Records of oral reading were made weekly for the children from their entry into school until their sixth birthday. Errors were classified according to their structural equivalence to the correct response according to the linguistic criteria developed by Harris. Single word substitutions were then analyzed to estimate phoneme-grapheme correspondence. Percentages of errors falling into each category were calculated. Clay reported

> despite the very generous interpretation of correspondence, only 41% of the single word substitutions showed that the child might be responding to some visual characteristics of the letters (p.437).

Of the single word errors 79% were of equivalent morpheme class. She concluded that a child's guesses or strategies "tend to be dominated by his control over the syntax of his language (p.437)." While this conclusion may be valid, the results probably reflect the high meaning orientation of the instructional program also. Comparisons should be made with reading responses from children instructed under different kinds of reading programs before any conclusions are extended to all readers.

One of the first researchers to ask linguistic questions of

oral reading errors was K. Goodman (1965). He studied the oral reading errors of 100 first through third grade children from one Detroit school in an attempt to understand how children learn to read. Children were asked to read both words in isolation and stories containing those words at an appropriate instructional level. An analysis of the errors made on both measures showed that "average first grade children could read almost two of three words in the story which they missed on the list (p.641)." In calculating types of errors Goodman found that nearly half of first graders' errors were omissions while the older children showed increasing tendencies to try to sound out words and to use cue systems from their knowledge of language. Goodman's study of regressions led him to conclude that almost all regressions were made to correct previous reading errors. Only when the errors made no difference to the meaning or when the reader was relying so heavily on analytic techniques that he had lost meaning did errors go uncorrected. Despite the fact that all students had attended the same school and had learned to read with a "fairly consistent methodology (p.643)" Goodman reported that they exhibited virtually every kind of reading difficulty predictable.

In an exploratory study of the development of oral reading behavior Y. Goodman (1967) conducted a longitudinal analysis of six beginning readers over a nine month period from January through November of the next school year. Three good readers and three slow readers from a basal (whole word) reading program were recorded each month as they read orally from stories similar to those in

their own readers and then retold the stories to test their comprehension.

Using the Goodman Taxonomy of Miscues to evaluate all responses that differed from the expected response she identified a number of reader characteristics. Using the number of miscues per hundred words as an index of reading proficiency she concluded that beginning readers have adequate comprehension with a miscue range of 5-14 per hundred words. The higher the percentage of miscues per hundred words the lower was the correction rate indicating the breakdown of comprehension. Goodman reported that the type of miscues (substitution, omission, reversal or insertion) was not as important in understanding the reader's behavior as was the quality of the miscues, how they corresponded to the graphic, semantic, and syntactic structures of the material. All children used all of the cue systems (graphic, contextual, and personal language and experience) as they read and exhibited their ability to correct themselves through their regressions.

These recent studies of first grade reading errors or miscues have led to a broader understanding of the kinds of information children attend to as they read. The findings are limited, however, because the data is based on children's errors when taught solely by a basal, or whole word, approach. The high utilization of context could reflect the combination of learned language competence and the teaching approach used in the schools. How context would be utilized under a different approach was not determined -- a possibly important variable was not accounted for in these studies.

Comparative Studies

In contrast to the numerous studies on word recognition strategies used by beginning readers, there is a paucity of research dealing with the influence of instructional methods on the children's oral reading.

Gates (1927) compared the commonly practiced phonetic method of teaching reading with his own program utilizing "intrinsic" methods. He developed materials that stressed comprehension and did not include phonetic drill. Materials were of two kinds, those used to stimulate reading to secure thought and those used to increase accurate discrimination of words and phrases. His report includes data gained from two experiments comparing methods of teaching. Both experiments involved equivalent groups of students taught under one of the approaches throughout a school year. A number of tests, both standardized and informal, were administered at the end of the year and results are reported in quantitative scores. All of the scores favored the non-phonetic method except for two tests on reading phonograms. While not explaining the qualitative analysis of the data he reported that

> the two types of training seem to produce differences in the modes of observation...the non-phonetic pupils usually showed a greater disposition to depend on the context and to attack the larger word units or features of configuration; the phonetic groups resorted more to detailed analysis of the new words encountered (pp.224-225).

The findings of the studies led Gates to suggest a de-emphasis on phonic training and more attention to intrinsic methods of learning to read.

While the study makes interesting reading there are many questions that are not answered. First, it would be important to know the ages of the students and what kind of reading instruction they had had previous to the experiment. His statements about the differences in oral reading would be more impressive if he explained how such judgments were made. And one wonders if the Hawthorne effect combined with Gates' obvious bias against phonetic methods could not have distorted the results appreciably.

Daniels and Diack (1965) reached a different conclusion about the effectiveness of phonic training in beginning reading as reflected in oral reading performances of students. Eschewing the practice of teaching phonic skills in isolation they developed a phonic-word method which they defined as similar to the phonic method in using reading material graded according to degree of phonic complexity, but which always stresses meaning and does not teach sounds in isolation. This method was compared to the "mixed method" commonly used in British schools in which the basal series formed the central part of the reading program supplemented by teaching of letters and sounds. The study involved 99 children, all of them non-readers in their first year of junior school. All were from similar socio-economic status homes and of approximately the same age. Forty-four of the children were in a class taught by the phonic-word method derived by the authors and the other 55 were in three different classes all taught by teachers using the "mixed method" approach. At the end of the year of instruction children in both groups were tested on six word recog-

nition tests, four involving word lists and two sentences. The average scores for both groups on the six measures were computed and the results indicated that both groups had less difficulty with phonetically regular words than with lists of irregular words from basal readers or from Thorndike's list of 500 words. Inter-correlations on the six tests varied from .60 to .90 and a group factor analysis yielded one general and one bi-polar factor. The first factor was defined as a general reading factor and the second as a sentence reading factor, involving the use of context clues. When tested for statistical significance Group A, the phonic word method, was superior to the mixed method Group B on word recognition.

In evaluating the oral reading errors they reported that a very high percentage of the errors made by both groups was due to their ignoring some of the letters in the words, especially the middle letters. They found that lack of attention to letters was more pronounced among children taught by the mixed method than those taught by the phonic word method. The most frequent error type was no response with the mixed-method group having a much higher percentage of those errors than the phonics group. Substitution errors were not frequent and occurred equally in both groups. They concluded:

> These facts would seem to indicate that even those children who have been taught to pay close attention to letters at the early stages may, when they have reached a certain degree of fluency, make mistakes of the "meaning-substitution" type -- an indication that at least they are not so tied to letters as to ignore meaning. That this holds for the traditional phonic method, however, cannot be assumed from the present evidence since the materials used in teaching Group A emphasized reading for meaning as well as being phonically simple (p.66).

The study substantiated the contention that instruction can have an influence on the word recognition strategies children use in reading. Daniels and Diack cautioned that few valid statements can be made about children's reading errors unless the question of how they have been taught is also considered. "It is obvious," they argued,

> that children's behavioral patterns are not fixed in detail by nature but are modified by experience and it is important to remember this when making a study of errors in children's reading, since a particular type of error may result from a method of teaching (p.38).

Mason (1970) related word confusion among beginning and peer readers to the basal method of instruction. He hypothesized that since teachers in basal programs neglected to call attention to letters or the sequence of letters in words children independently chose either relevant or irrelevant cues by which to recognize words. Without guidance, confusion results in word recognition attempts leading to over-generalizations and incorrect generalizations. Testing these hypotheses, Mason conducted two studies. In the first he taught 18 five-year old children seven common words by a look-say method in four short sessions over a two week period. They were then asked to name new words bearing a close graphic similarity to the words taught. While 89% of the children failed to respond, those that did responded with the words taught.

While this evidence seems very meager to lend support to the hypotheses Mason also collected data on oral reading errors made by poor readers in many different grades. The Chi square technique was used to determine the significance of differences among three

patterns of errors and to test the significance of his hypotheses. He concluded that children did over-generalize one spoken word response to at least two similar printed stimuli and that children responded with the first word taught when presented with that word or a similar word taught later.

The conclusions Mason makes come from very few responses. He is analyzing small samples and particularly with the school children grades 1-12 presents no indication of how he knows which words were presented first. While offering an interesting hypothesis, the support Mason gives is most disappointing.

Another study of the influence of instructional method on the oral reading strategies used by beginning readers was made by Elder (1966). He compared the oral reading performances of Scottish and American children to determine if Scottish children obtained an advantage over American children by starting reading earlier and by receiving greater phonic emphasis in beginning reading. The Scottish sample consisted of 49 children from eight schools with a mean chronological age of 91 months. The American sample consisted of twice as many students from a Michigan school system, one group with the same mean age as the Scottish sample and another group twelve months older. Oral reading was measured by the Gray Standardized Oral Reading Paragraphs. The mean scores on the tests were compared for the three groups and tests for statistical significance were run. The results indicated that the Scottish sample scored significantly above the test norm for the American children and the mean score for the children of the same age. However there was no

significant difference in test norms or score means for the Scottish children and the American children a year older with equal schooling. In analyzing errors Elder found that the American samples had significantly higher numbers of substitutions than the Scottish children, but that the Scottish children had significantly greater tendency to make substitutions that changed the meaning. He concluded that the Scottish children were superior in ability to pronounce words accurately during oral reading due to their early start and phonic training, but they pay the price for this advantage by reading slowly and not using contextual information to best advantage.

Choosing a more controlled experimental design Barr (1972) studied the influence of two instructional methods on the word recognition errors made by 42 pre-reading first graders. The sample consisted of 18 urban and 24 suburban first graders with an equal number of boys and girls. They were all taught the words on the Mill's Learning Methods Test (using auditory and visual methods) and Barr's own Word Learning Tasks (phonic and sight word) in four separate sessions. At the conclusion of each session children were tested on their retention of the words presented. Evaluation of errors was made in terms of non-response, sources of substitutions, and graphically constrained errors. Substitutions were examined to determine if the erroneous responses came from words previously taught, another word from the same teaching list, or a non-list source. Graphic constraint was identified if the first letter of the response was the same as that of the stimulus word.

After tabulating errors by categories for each teaching condition the means and standard deviations were computed. To determine if there were significant differences in errors with instructional condition a multivariate analysis of variance for repeated measures was performed. Barr found that the percentage of non-response errors for the phonics method was significantly greater than for the sight word method. Significantly more graphically-constrained errors occurred for the phonic than the sight word method. Barr reported that children appeared to use different strategies depending on the instructional demands. When taught by the sight word method children remembered the group of aural responses and some of the graphic sequences. When taught by the phonic method they responded with nonsense words or words not included in the presentation. She concluded that,

> These findings suggest the conclusion that different instructional methods influence differentially the pattern of word recognition errors. Different instruction entails different strategies for word recognition. The limitations of the generalizability of this conclusion can only be determined by further research assessing the effect of different instruction on children's reading strategies over longer time periods using contextual materials (p.527).

Her study indicated that children responded to the particular demands of the teaching approaches, there were distinct error patterns for each instructional condition. This conclusion is particularly significant because the same children were used for both teaching methods. As all of the testing was conducted within a two week period it would seem that there might easily have been contamination between methods of teaching. The importance of direct teaching was

demonstrated to be influential in initial stages of reading, at least in teaching isolated words.

While all of these studies indicate that instructional methods are related to the strategies used by children when reading, one study presents conflicting evidence. Although not testing first graders, Herlin (1965) compared the oral reading errors of two groups of third and fourth grade pupils taught to read using different basal programs. He compared error patterns on the Monroe Diagnostic Reading Examination and the Durrell Analysis of Reading Difficulty. He found that there were inconsistent results reflected on the two measures although on the total scores for the tests there was a high correlation. The comparison of scores for the two methods of instruction showed no significant differences in mean or standard deviation. On the error analysis significant differences were approached in many categories but only in word omissions was the mean difference significant at the .01 level; in consonant errors, repetitions, and word omissions the standard deviation differences were significant. Herlin concluded that different school instruction did little to influence reading error patterns.

The conclusion Herlin came to must be evaluated in light of the two approaches represented in the schools. Both of them were basal programs, representing two frequently used series in this country. Rather than providing a real comparison of the influence of different methods they seem to reflect only a slightly different emphasis on phonic skills within the basal approach. Given the similarity of the two methods, especially by the third and fourth

grade levels, the fact that significant differences were reached in any category of error analysis seems more significant than he indicated. Weber (1968, p.108) concluded that "Herlin's subjects had not been required to make truly distinctive types of responses on their initial reading tests."

Reviewing the studies on strategies used by beginning readers in word recognition it is clear that the results of many of the experiments do reflect the instructional conditions imposed by the experimenter on the learning task. Although there have been few studies that compare the effect of instruction on recognition strategies, those that are available indicate that different patterns are associated with different teaching approaches. Generally it seems that phonic methods lead to more errors reflecting graphic constraint and more careful word analysis. Basal whole word methods tend to cause children to use other cues to word recognition and to confuse similar words. Most of the studies indicate that students in both methods rely more heavily on context constraints than they do on graphic cues, with the graphic information becoming more important as they progress in early reading.

CHAPTER III

DESIGN AND METHODOLOGY

This chapter contains the description of the population of the study, the testing procedures, the instruments used in collecting the data, and the statistical treatment of the data.

Description of the Population

The population for this study consisted of sixty successful first grade readers selected from two school systems of comparable size in central Oklahoma. Two predominantly middle-class schools in each system participated in the study. The reading program in one system utilized traditional basal readers with some supplemental phonics instruction in the latter part of the year. The amount of phonics introduced varied somewhat from teacher to teacher. In all cases, however, it provided only a supplement to the basic sight word orientation of the reading program. The two schools in the other system used a phonics approach to beginning reading instruction. Children were taught to make sound-symbol associations and to blend sounds as a primary means of word recognition.

The ten first grade teachers in the four schools that participated in the study recommended students in their classes who met the following criteria:

1. The student had not known how to read in the fall but was now a successful developmental reader.
2. The student was not repeating first grade.
3. The student spoke standard English as his native language.

All of the students referred by the teachers were then administered the Comprehension Test of the Gates-MacGinitie Reading Test, Form A-1. Those students scoring between 2.0 and 3.0 were considered successful readers for the purposes of this study.

From the original students referred by their teachers thirty students in each school system who fit all of the above criteria were selected for the testing program.

Testing Procedures

Extended oral reading passages were administered individually to the students during a two and a half week period in late April and May. In all cases the schools provided quiet rooms where the oral reading could proceed undisturbed. Three trained examiners from the Oklahoma State University Reading Center did all of the testing. The examiners explained to each child that they wanted to know more about how first grade children read when teachers were not there to help them. The children were asked to read a story at their instructional level and then to continue reading until both the instructional and frustration levels had been reached on word recognition errors. Usually these levels were established easily, but if an extended number of readings were necessary to establish

these levels, the child would be called for a second session so that he would not tire.

Each child was instructed to do his best, and when he came to words he did not know, he was instructed to try to figure them out by himself without prompting from the examiner. During the oral reading sessions the examiners timed and recorded all of the errors made by the students on copies of the reading selections while a tape recording was made of the reading. Each transcription was later checked by the examiners to insure an accurate record of the reading sessions. Errors were then recorded on a work sheet and classified according to the appropriate categories. After all transcriptions had been evaluated, the frequencies of all error categories were then tallied on a summary sheet for the statistical analysis.

Instruments Used

Gates-MacGinitie Reading Test -- Primary A-1

This is an achievement test designed for use with first grade students. The test includes two parts: Vocabulary and Comprehension. The Comprehension Test contains 34 items designed to measure the ability to read and understand whole sentences and paragraphs. The norms for the whole series were established from tests given to approximately 40,000 pupils in 38 selected communities. Reliability was established by using both alternate form reliability coefficients and split-half reliabilities. Reliability coefficients for the

Primary A-1 Comprehension Test are reported as .83 for the alternate form and .94 for the split-half form.

Extended Oral Reading Material

In order to obtain a representative sample of the children's oral reading behavior, stories similar to those used in the classroom were desired. Therefore two separate sets of graded stories were compiled; one from a basal reading series comparable to that used in the one school system, and another set of stories from a phonics-oriented program similar to that used in the other system.

All of the stories that were selected contained approximately 200 words so that an accurate sample of error patterns could be obtained (Steuver, 1970). A number of stories from each series were evaluated and pre-tested on a pilot group of students before the final selection was made. Each of the sets used in the study contained a story at the 1.8, 2.0, 2.4, 2.8, and 3.4 readability levels as established using the Spache readability formula (1953).

Error Analysis

The oral reading error analysis was designed to provide a better understanding of the kinds of information children utilized as they read. This use of error analysis assumes that correct aspects of errors reflect the kinds of information, both graphic and contextual, that readers attend to generally, not just when they make an error (Weber, 1970; Goodman, 1965). Errors at both instructional and frustration levels were analyzed for the two

groups of readers. A 200 word selection was used for analysis with the first 25 words excluded because research has indicated that there is a lack of stability in the errors that occur in the first 25 words read and that a selection of 125-150 words provides a more accurate sampling of reading behavior (Steuver, 1970).

The error categories developed to analyze use of graphic information in reading errors were drawn from the B-S-R Analysis (Ray, 1970) with modifications to facilitate an understanding of first grade reading behavior.

Following are the categories of reading errors evaluated in this study. The first four categories were considered scoreable errors in the determination of word recognition scores and in total number of errors. The other categories were recorded and tabulated but not counted against the readers.

Substitution. Any response different from the printed word, including mispronounciations, were included in this category. All substitutions were also evaluated in the following sub-categories to determine the way graphic information was used.

1. Visual-Perception -- Word Parts. An error was classified in this category if the response to the stimulus word was made instantaneously with no attempt to sound it out. The assumption was made that the child had looked at one or more parts of a word and said another word that the part(s) suggested.

2. Visual-Auditory. An error was classified in this category if the response was incorrect after a discernible attempt had been made to "sound it out." These errors reflect "faulty perception of sound-symbol relationships, faulty application of phonics principles, or lack of application of alternative word recognition techniques to sound-symbol relationships" (Ray, 1969).
3. Directional Confusion. An error was classified in this category if the order of letters or words was incorrect or if the letters were rotated.
4. No Graphic Similarity. An error was classified in this category if the response to the stimulus word contained no letters in common with the stimulus.

Omission. Any word or words skipped over entirely with no apparent attention to them were included in this category.

Addition. Any word or words inserted during oral reading that were not in the text were included in this category.

Non-Response. Any word or words the reader attended to, noticeable by a pause in reading, but did not attempt orally were included in this category.

Repetition. Any word or words repeated orally were included in this classification. Three types of repetitions were distinguished in the analysis.

1. Successful correction. Any time the first pronounciation was incorrect but by repeating the word or words the child read the material correctly, the repetition was included in this category.
2. Attempted correction. If, after an initial attempt, the reader repronounced a word or words, but did not do so correctly, it was included in this category.
3. Anticipation, etc. Repetitions of correctly pronounced words that might have been caused by anticipation of a difficult word and other unspecified repetitions were included in this category.

Sounding Out Successfully. When the reader consciously and deliberately dealt with individual letters and sounds and blended them together to arrive at the correct pronounciation of a word it was included in this classification. These behaviors and repetitions were not considered as scorable errors but were noted because they represented attempts to deal with reading material in a manner different from what happens in fluent reading performances.

Utilization of Context. All substitutions were analyzed to determine the extent to which readers utilized contextual informa-

tion as they read. The assumption was made that substitutions that made sense in the sentence context had been to some extent influenced by that context. While this would not inevitably be the case, a high degree of contextually appropriate substitutions would indicate the use of contextual information in reading. A substitution was considered appropriate if it made sense grammatically and conveyed meaning.

Use of context by first grade readers was explored in two ways:

1. Use of preceding context. Each substitution was evaluated to determine if it made sense with the preceding part of the sentence so that the sentence could be completed in any way to make a grammatically and semantically correct sentence. If the substitution was the first word in the sentence it was recorded simply as the first word and not included in this part of the analysis. If the substitution was the last word in a sentence then it was evaluated as to its appropriateness for the ending of a sentence.
2. Total sentence context. Each substitution was evaluated in terms of the total sentence to determine if the substitution resulted in a grammatically and semantically correct sentence. The meaning did not necessarily have

to be consistent with the rest of the story
but did have to constitute a meaningful unit.

The reliability of the coding system was checked by having four graduate students in reading analyze the errors on the same reading passages. They were in 98% agreement on classifying errors according to graphic similarity. The percentages of agreement for classification of errors that were appropriate to preceding context and total sentence context were 94% and 96% respectively. The disagreements as to appropriateness occurred with errors that produced sentences which might be considered possible in fantasy. For example, in the sentence, "So did the fresh air," the word fierce was substituted for fresh, making the sentence read, "So did the fierce air." Because many children's stories deal in fantasy, some disagreement among scorers was unavoidable.

Evaluation and Statistical Treatment of Data

The total number of errors in each of the categories for both instructional groups was tabulated for the instructional and frustration levels of reading. The percentages of total errors for each category of scoreable errors were determined and comparisons were made between the two groups of readers at both performance levels. To assess the statistical significance of the differences of proportions in these error categories 2 x 2 chi-square tables were calculated for each type of error in relation to all other errors for both groups of readers.

Patterns of substitutions made by the phonics and whole word groups were determined. For both groups the total numbers of substitutions were compiled and the percentages for each type of substitution in relation to the total numbers were computed. Then 2 x 2 chi-square tables were calculated to determine the statistical significance of the relationship between the types of substitutions made and the instructional methods.

The total number of repetitions and the percentages of each kind of repetition made by both groups of readers were reported. The total number of successful attempts to sound out words was also included in the profile of reading behavior.

Substitutions that were correct in the preceding and total sentence context were tallied and the percentages of all substitutions that fit these categories were reported for both groups. The statistical significance of the relationship between appropriate substitutions and instructional method was determined by the chi-square technique at both instructional levels.

The chi-square was chosen for the statistical analysis because it permits the determination of a relationship between two variables that involve nominal level data. For each 2 x 2 test contingency tables are constructed containing the numbers of cases in each category of the variables considered. The determination of the chi-square is based on the differences between observed and expected frequencies for each cell of the table of variables. The basic formula for the chi-square is:

$$X^2 = \sum \frac{(f_o - f_e)^2}{f_e}$$

where

f_o = observed frequency in a given cell

f_e = expected frequency in the same cell

$\sum$ = instruction to add the $\frac{(f_o - f_e)^2}{f_e}$ ratios for every cell involved.

The expected frequency for each cell is found by multiplying the two marginal totals that contain that cell and dividing that product by the total number of cases.

Significance of the computed chi-square for a 2 x 2 test is determined by reference to the table of critical values for cases with one degree of freedom (Bruning and Kintz, 1968). A significant chi-square indicates that a relationship between the two variables does exist.

The chi-square does not indicate the strength of the relationship between the variables, however. Therefore a phi coefficient, calculated for each significant chi-square can provide a better indication of how much relationship exists. The formula for calculating phi is $\Phi = \sqrt{\frac{X^2}{N}}$. Theoretically phi varies from -1.0 to +1.0 but these maximal limits are possible only in tables where the marginal proportions for the rows and columns are equal. According to Games and Klare (1967):

> ...a correlation coefficient could have an absolute value of 1.00 only if the two marginal distributions have identical forms. This requirement is more important in situations with 2 x 2 tables than in those

> with bivariate distributions of continuous measures. Therefore, the differing proportions in the two marginal distributions often place a lower maximum value than 1.00 on the phi coefficient (p. 515).

Because in this study marginal proportions were unequal the maximum values of phi for the unequal distributions were computed so that the obtained phi coefficients would be more meaningful. The formula for maximal phi is:

$$\Phi_{max} = \sqrt{\left(\frac{q_1}{p_1}\right)\left(\frac{p_2}{q_2}\right)}$$

where

p = the larger of the marginal proportions for rows and columns. The larger of the two proportions designated p is p_1, the other proportion is p_2.

q = the smaller proportion for the rows and columns. The proportions designated q are labeled with the same subscripts as with the p (Senter, p. 449).

CHAPTER IV

TREATMENT OF DATA AND ANALYSIS OF RESULTS

This study investigated the relationship between the oral reading error patterns of first grade readers and the method of instruction they had received in their classes. The oral reading errors made by children taught to read with a phonics orientation were compared with those made by children taught by a sight word emphasis. Errors at both the instructional and frustration levels were analyzed to determine if the relationships between errors and instruction were similar at both levels of difficulty and to determine if there was any shift in error patterns from instructional to frustration level for either group of readers.

The hypothesis concerning the relationship of error patterns and instruction for the two groups of readers was examined first. Then a more detailed analysis of substitution errors in terms of their graphic similarity to the text and their contextual appropriateness was made. Finally, error patterns at instructional and frustration levels for each group of readers were compared to see if there was any significant relationship between kinds of errors and the difficulty of the reading material.

Tests of the Hypotheses

Hypothesis 1: There is no significant relationship between error patterns and instructional methods at the instructional or frustration level.

To test this hypothesis, the total number of scoreable errors was first tabulated for each group and the percentages of each error type were computed at both the instructional and frustration levels. Table I presents a profile of the percentages of each error type made by the phonics and whole word groups at both performance levels.

TABLE I

ERROR PATTERNS OF TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Error Category	Performance Level			
	Instructional		Frustration	
	Phonics	Whole word	Phonics	Whole word
Substitutions	83%	71%	84%	65%
Omissions	9	10	7	8
Additions	2	4	2	8
Non-responses	6	15	7	24
Total	100%	100%	100%	100%
Number	377	390	565	712

At the instructional level the total number of errors recorded for the two groups were nearly equal. Substitutions constituted by far the most common error type for both instructional groups, although the phonics-oriented readers produced a higher percentage of substitutions than did the whole word group. The whole word group made a higher percentage of their total errors in the non-response category. At the frustration level the pattern remained much the same with some shift in percentages between the substitution and non-response categories noticeable for the whole word group. Both groups had similarly low percentages of omissions and additions at both performance levels.

Two other reading behaviors, repetitions and successful attempts to sound out unknown words, were also included since they provided additional information about how the children read. Because they were not scored as errors the occurrence of each of these behaviors were reported separately. Total numbers of repetitions and percentages of each type of repetitions were computed for both instructional groups. Table II presents the data on the kinds of repetitions made at both instructional and frustration levels. In terms of total numbers the phonics-oriented readers made more repetitions, at both instructional and frustration levels. When types of substitutions were considered both groups showed similar patterns.

TABLE II

PATTERNS OF REPETITIONS MADE BY TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Repetition Type	Performance Level			
	Instructional		Frustration	
	Phonics	Whole word	Phonics	Whole word
Attempted correction	14%	10%	18%	11%
Successful correction	57	56	52	53
Anticipation, etc.	29	34	30	36
Total	100%	100%	100%	100%
Number	228	166	266	202

At least half of all repetitions resulted in successful corrections at both instructional and frustration levels. The phonics group exhibited some change between instruction and frustration levels in successful and attempted corrections with 57 percent successful corrections at instructional level and 52 percent at frustration level. The change in success was noted in the attempted corrections category with the percentages increasing from 14 to 18 between instructional and frustration level. Changes in percentages of types of substitutions were less noticeable for the whole word readers.

The differences in the numbers of words that were successfully sounded out by the two groups were striking. As Table III indicates, at the instructional level the phonics-oriented group was successful

in sounding out 72 words as contrasted to 16 by the whole word group. At the frustration level the phonics-oriented readers were successful in 106 attempts contrasted with 10 successful attempts to sound out words by the whole word group.

TABLE III

WORDS SOUNDED OUT SUCCESSFULLY BY PHONICS AND WHOLE WORD READERS AT TWO PERFORMANCE LEVELS

Performance Level	Instructional Method	
	Phonics	Whole word
Instructional	72	16
Frustration	106	10
Total	178	26

Because the profiles of errors were different for the two instructional groups, chi-squares were calculated for each error category to determine if there was a statistically significant relationship between the proportion of total errors in each category and instructional methods. The results of those tests of significance follow.

Substitutions

Whenever a child said a word other than the stimulus word, it was considered a substitution error. Table IV presents the statistical

test for the relationship of the proportions of substitutions and instructional methods. At both instructional and frustration levels the chi-squares were significant to the null hypothesis of no relationship between error pattern and instructional methods was rejected for the test with substitutions.

TABLE IV

RELATIONSHIP OF SUBSTITUTIONS TO OTHER SCOREABLE ERRORS FOR PHONICS AND WHOLE WORD READERS AT TWO PERFORMANCE LEVELS

Performance Level	Instructional Group	Sub./Other Errors	Chi-square	Phi Coefficient
Instructional	Phonics	312/65	16.4***	.14+
	Whole word	276/114		
Frustration	Phonics	474/91	56.7***	.21++
	Whole word	464/248		

***significant at the .001 level
+ Φ max = .54
++ Φ max = .67

Omissions

Words that the reader failed to respond to and skipped over rapidly without attending to were scored as omissions. Table V presents the data on the occurrences of omissions in relation to other errors for the two groups at the instructional and frustration

levels. At neither performance level was the difference significant and so the null hypothesis was not rejected. No significant relationship was established between instructional method and errors of omission.

TABLE V

RELATIONSHIP OF OMISSIONS TO OTHER SCOREABLE ERRORS FOR PHONICS AND WHOLE WORD READERS AT TWO PERFORMANCE LEVELS

Performance Level	Instructional Group	Omiss./Other Errors	Chi-square
Instructional	Phonics	33/344	.066 N.S.
	Whole word	36/354	
Frustration	Phonics	38/527	1.12 N.S.
	Whole word	60/652	

N.S. = Not Significant

Additions

Whenever the reader inserted words that were not in the text, they were scored as additions. Table VI presents the information about the occurrence of additions in relation to other scoreable errors for both instructional groups. The chi-square was not significant at either performance level so the null hypothesis of

no significant relationship between instructional method and additions was not rejected.

TABLE VI

RELATIONSHIP OF ADDITIONS TO OTHER SCOREABLE ERRORS FOR TWO GROUPS OF READERS AT BOTH PERFORMANCE LEVELS

Performance Level	Instructional Group	Add./Other Errors	Chi-square
Instructional	Phonics	10/367	2.36 N.S.
	Whole word	18/372	
Frustration	Phonics	13/542	.50 N.S.
	Whole word	20/692	

N.S. = Not Significant

Non-responses

When a reader made a definite pause in his reading but then failed to respond to the word orally, it was recorded as a non-response error. Table VII presents the test of significance for the relationship between the proportion of non-response errors and instructional methods. At both the instructional and frustration levels the chi-squares were significant so the null hypothesis must be rejected. Both the chi-square and the phi coefficients

reflect the greater difference between percentages of non-response at the frustration level. Failures to respond accounted for nearly a fourth of the errors by the whole group at the frustration level.

TABLE VII

RELATIONSHIP OF NON-RESPONSE ERRORS TO OTHER SCOREABLE ERRORS FOR TWO GROUPS OF READERS AT BOTH PERFORMANCE LEVELS

Performance Level	Instructional Group	N.R./Other Errors	Chi-square	Phi Coefficient
Instructional	Phonics	22/355	17.7***	.15+
	Whole word	60/330		
Frustration	Phonics	40/525	62.2***	.22++
	Whole word	168/544		

*** significant at the .001 level
+ Φ max = .34
++ Φ max = .50

Hypothesis 2: There is no significant relationship between the types of substitution errors and the instructional methods.

In order to determine how the children used graphic information in their reading, all substitutions were grouped into categories that indicated the graphic correspondence between the error and the stimulus words. These categories were visual-perception, visual-

auditory, directional confusion, and no graphic similarity. Table VIII presents a comparison of the percentages of each of the types of substitution errors made by the two groups of readers at the instructional and frustration levels.

TABLE VIII

TYPES OF SUBSTITUTIONS MADE BY TWO GROUPS OF READERS AT INSTRUCTIONAL AND FRUSTRATION LEVELS

Substitution Category	Performance Level			
	Instructional		Frustration	
	Phonics	Whole word	Phonics	Whole word
Visual-perceptual	69%	72%	62%	74%
Visual-auditory	25	16	32	17
Directional	2	1	2	2
No graphic similarity	4	11	4	7
Total	100%	100%	100%	100%
Number	312	276	474	464

Visual-perceptual errors were the largest category of errors for both groups at both performance levels. However, the phonics-oriented group made fewer visual-perceptual errors at the frustration level compared to a nearly equal percentage of visual-perceptual errors at both instructional and frustration levels for the whole word group. The phonics-oriented group made a larger percentage of visual-

auditory errors at both the instructional and frustration levels than did the whole word group. The percentages of directional confusion errors were nearly identical for both groups at both performance levels. At both the instructional and frustration levels the whole word group made more substitutions that had no graphic similarity to the text than did the phonics-oriented group. To determine if these percentages were statistically significant, 2 x 2 chi-square tables were calculated for each of the categories of substitution errors at both instructional and frustration levels. Results for each test are presented separately.

Visual-perception -- Word Parts

Errors in this category were made when the reader responded to the total word pattern with no attempt to sound out the word. Table IX presents the statistical test of the significance of the relationship between instructional methods and occurrence of visual-perceptual errors. For both groups most of the substitution errors were of this type, and at the instructional level there was no significant relationship between method of instruction and visual-perceptual errors. However, at the frustration level a difference in error patterns became apparent with the phonics-oriented readers producing fewer visual-perceptual errors. At the frustration level the chi-square was significant so the null hypothesis of no relationship between instructional method and visual-perceptual errors was rejected.

TABLE IX

RELATIONSHIP OF VISUAL-PERCEPTUAL ERRORS TO OTHER SUBSTITUTIONS FOR TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Performance Level	Instructional Method	V-P/Other Errors	Chi-square	Phi Coefficient
Instructional	Phonics	215/97	.81	
	Whole word	199/77		
Frustration	Phonics	291/183	16.35***	.13+
	Whole word	342/122		

*** significant at the .001 level
+ $\overline{\Phi}$ max = .67

Visual-auditory

Whenever the student made a conscious but unsuccessful attempt to apply sound-symbol correspondences to recognition of a word, it was scored as a visual-auditory error. Results of the statistical test for the relationship of visual-auditory errors to instructional method are presented in Table X.

TABLE X

RELATIONSHIP OF VISUAL-AUDITORY ERRORS TO OTHER SUBSTITUTIONS FOR PHONICS AND WHOLE WORD READERS AT TWO PERFORMANCE LEVELS

Performance Levels	Instructional Method	V-A/Other Errors	Chi-square	Phi Coefficient
Instructional	Phonics	79/233	8.1***	.01+
	Whole word	43/233		
Frustration	Phonics	151/323	28.31***	.17++
	Whole word	78/386		

*** significant at the .001 level
+ $\overline{\Phi}$ max = .51
++ $\overline{\Phi}$ max = .48

At both the instructional and frustration levels the chi-square was significant so the null hypothesis of no relationship between instructional method and proportion of visual-auditory errors was rejected.

Directional Confusion

When readers confused the order of letters, rotated letters in a word, or reversed the order in which they read two words, the error was classified as directional confusion. Table XI presents the statistical tests of these error patterns at both performance levels for the phonics-oriented and the whole word readers. The chi-squares

were not significant at either instructional or frustration level so the null hypothesis of no significant relationship between instructional method and directional confusion errors was not rejected.

TABLE XI

RELATIONSHIP OF DIRECTIONAL CONFUSION ERRORS TO OTHER SUBSTITUTIONS FOR TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Performance Level	Instructional Method	D.C./Other Errors	Chi-square	Phi Coefficient
Instructional	Phonics	5/210	.5 N.S.	
	Whole word	3/196		
Frustration	Phonics	11/463	.17 N.S.	
	Whole word	12/452		

N.S. = Not Significant

No Graphic Similarity

Substitution errors were recorded in this category if they contained no letters in common with the stimulus word. Table XII presents the statistical analysis of those errors at the instructional and frustration levels. At the instructional level the chi-square was significant indicating a positive relationship between the

instructional method and errors with no graphic similarity to the text. At the frustration level the null hypothesis was not rejected.

TABLE XII

RELATIONSHIP OF ERRORS WITH NO GRAPHIC SIMILARITY TO OTHER SUBSTITUTIONS FOR TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Performance Level	Instructional Method	N.G.S./Other Errors	Chi-square	Phi Coefficient
Instructional	Phonics	13/299	9.84***	.13+
	Whole word	31/245		
Frustration	Phonics	21/453	2.87	
	Whole word	32/432		

*** significant at the .005 level
+ Φ max = .30

Hypothesis 3: There is no significant relationship between the contextual appropriateness of substitution errors and instructional methods at either performance level.

As an indication of the extent to which students utilized context clues in reading substitution errors were evaluated in terms of their appropriateness within the preceding context and in terms of their appropriateness in the total sentence. Table XIII presents

the statistical test for the relationship between substitutions appropriate to the preceding context and instructional methods.

TABLE XIII

RELATIONSHIP OF SUBSTITUTIONS CONTEXTUALLY APPROPRIATE TO THE PRECEDING CONTEXT MADE BY PHONICS AND WHOLE WORD READERS AT TWO PERFORMANCE LEVELS

Performance Level	Instructional Method	Approp./Not Errors	Chi-square	Phi Coefficient
Instructional	Phonics	172/119	3.88*	.08+
	Whole word	166/ 81		
Frustration	Phonics	243/208	1.49	
	Whole word	251/181		

* significant at the .05 level
\+ Φ max = .85

Because errors in first words of sentences were not considered in this analysis, the total number of substitutions used for the calculations also had first word substitutions subtracted. Therefore, for example, the total number of substitutions by the phonics-oriented group at instructional level is 291 rather than 312. At the instructional level the chi-square was significant and so the null hypothesis of no relationship between instructional method and contextual appropriateness of substitution errors was rejected. The

phonics-oriented group made more errors that were not appropriate to the preceding context than did the whole word group. At the frustration level both groups made fewer appropriate substitutions and the difference between them did not result in a significant chi-square so the null hypothesis of no significant relationship between instructional method and contextual appropriateness to the preceding context was not rejected for this performance level.

All of the substitutions were also analyzed to determine if they were appropriate in the total sentence. Table XIV presents the results of that test of statistical significance. At neither the instructional nor frustration level was the chi-square significant so the null hypothesis of no significant relationship between instructional method and contextual appropriateness in the total sentence was not rejected. Both groups had low percentages of errors that were contextually appropriate in the total sentence, between 25 percent and 30 percent at instructional level and between 20 percent and 25 percent at frustration level.

TABLE XIV

RELATIONSHIP OF SUBSTITUTIONS THAT WERE CONTEXTUALLY APPROPRIATE IN THE TOTAL SENTENCE AND INSTRUCTIONAL METHOD AT TWO PERFORMANCE LEVELS

Performance Level	Instructional Method	Approp./Not Errors	Chi-square
Instructional	Phonics	77/235	2.19 N.S.
	Whole word	84/192	
Frustration	Phonics	93/381	3.57 N.S.
	Whole word	115/349	

NS.S = Not Significant

Another factor that was considered as possibly influencing the contextual appropriateness of substitutions was the extent to which the reader had to focus on the sound-symbol relationships to recognize a word. Therefore the percentages of substitutions appropriate in the preceding context for each of the substitution categories were computed. Table XV presents this information. It is apparent that when the readers focused on sounding out words, they made many more inappropriate substitutions than when they responded more rapidly to words.

TABLE XV

PERCENTAGES OF EACH TYPE OF SUBSTITUTIONS THAT WERE CONTEXTUALLY APPROPRIATE TO THE PRECEDING CONTEXT FOR TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Type of Substitution	Performance Level			
	Instructional		Frustration	
	Phonics	Whole word	Phonics	Whole word
Visual-perception	77% (N-215)	71% (N-199)	79% (N-291)	63% (N-342)
Visual-auditory	14 (N- 79)	12 (N- 43)	10 (N-151)	20 (N- 78)
Directional	100 (N - 5)	50 (N - 2)	71 (N - 7)	85 (N- 13)
No graphic similarity	92 (N- 13)	100 (N- 27)	90 (N- 20)	90 (N- 30)

Many of the responses that were considered inappropriate were so because they did not constitute real words. Particularly in the visual-auditory category most of the substitutions were non-words. Table XVI presents the percentages of non-word substitutions in each of the categories of substitution errors. Both groups of readers made non-word responses at the visual-auditory level as they sounded out words, and because of the much greater reliance on sounding by the phonics-oriented group this meant that many more of their substitutions were non-words than were those of the whole word group.

TABLE XVI

PERCENTAGES OF EACH TYPE OF SUBSTITUTIONS THAT WERE NOT WORDS FOR TWO GROUPS OF READERS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS

Type of Substitution	Performance Level			
	Instructional		Frustration	
	Phonics	Whole word	Phonics	Whole word
Visual-perceptual	8% (N-215)	12% (N-199)	6% (N-291)	11% (N-342)
Visual-auditory	84 (N- 79)	74 (N- 43)	89 (N-151)	76 (N- 78)
Directional	0 (N - 5)	0 (N - 2)	0 (N - 7)	0 (N- 13)
No graphic similarity	0 (N- 13)	0 (N- 27)	0 (N- 20)	0 (N- 30)

Hypothesis 4: There is no shift in error patterns from instructional to frustrational level.

To test this hypothesis percentages of errors in each of the four major categories were compared at both instructional levels. Table XVII presents the profiles of the types of errors made at instruction and frustration levels for the two groups of readers. It is clear that there was no real change in pattern for the phonics-oriented group, but there was a shift in percentages of errors in two categories for the whole word group. Therefore, chi-squares were computed on the proportions of substitutions and non-responses for the whole word group to see if there was any statistically significant relationship between performance level and error pattern.

TABLE XVII

PROFILES OF ERROR PATTERNS AT TWO PERFORMANCE LEVELS FOR PHONIC AND WHOLE WORD READERS

Error Category	Instructional Group			
	Phonics		Whole word	
	Instr.	Frust.	Instr.	Frust.
Substitutions	83%	84%	71%	65%
Omissions	9	7	10	8
Additions	2	2	4	8
Non-response	6	7	15	24
Total	100%	100%	100%	100%
Number	377	565	390	712

Results of the tests for relationship between instructional and frustration levels for substitutions are presented in Table XVIII. Because the chi-square is significant, the null hypothesis of no relationship between performance level and substitution errors must be rejected.

TABLE XVIII

RELATIONSHIP OF SUBSTITUTIONS TO OTHER SCOREABLE ERRORS AT INSTRUCTIONAL AND FRUSTRATION LEVELS BY THE WHOLE WORD GROUP OF READERS

Performance Level	Substitution/Other Errors	Chi-square	Phi Coefficient
Instructional	276/340	28.5***	.16+
Frustration	464/712		

*** significant at the .001 level
+ $\bar{\Phi}$ max = .93

The relationship between non-response errors and performance level for the whole word group was also checked. Results of the test of significance are presented in Table XIX. Because the significant chi-square indicated that a relationship between non-response errors and performance level did exist the null hypothesis was rejected.

TABLE XIX

RELATIONSHIP OF NON-RESPONSES TO OTHER ERRORS MADE AT INSTRUCTIONAL AND FRUSTRATION LEVELS BY THE WHOLE WORD GROUP OF READERS

Performance Level	Number of Errors	Chi-square	Phi Coefficient
Instructional	60/330	10.61**	.10+
Frustration	167/545		

** significant at the .005 level
+ $\overline{\Phi}$ max = .70

The kinds of substitutions made at both the instructional and frustration levels were also compared to determine if there was any change in use of graphic information related to performance levels. Table XX presents the percentages of all substitutions for each category at both instructional and frustration levels.

When types of substitutions were compared at instructional and frustration levels, the whole word group showed little change in errors but the phonics-oriented readers made a shift from 25 percent visual-auditory errors to 32 percent visual-auditory errors and a corresponding decrease in the number of visual-perceptual errors as they read frustration level material. To test for statistical significance of this shift 2 x 2 chi-square tables were computed for the relationship between performance level and both visual-auditory and visual-perceptual error categories. The results of the test for the visual-perceptual error shift are given in Table XXI.

TABLE XX

PERCENTAGES OF EACH TYPE OF SUBSTITUTION ERROR MADE AT INSTRUCTIONAL AND FRUSTRATION LEVELS BY TWO GROUPS OF READERS

Type of Substitution	Instructional Method			
	Phonics		Whole word	
	Instr.	Frust.	Instr.	Frust.
Visual-perceptual	69%	62%	72%	74%
Visual-auditory	25	32	16	17
Directional	2	2	1	2
No graphic similarity	4	4	11	7
Total	100%	100%	100%	100%
Number	312	474	276	464

TABLE XXI

RELATIONSHIP OF VISUAL-PERCEPTUAL ERRORS TO TOTAL SUBSTITUTIONS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS FOR PHONICS-ORIENTED READERS

Performance Level	Visual-Perceptual/Other Errors	Chi-square	Phi Coefficient
Instructional	215/ 97	4.54*	.08+
Frustration	291/183		

* significant at the .05 level
+ Φ max = .89

The significant chi-square indicates that there is a relationship between performance level and visual-perceptual error rate for phonic-oriented readers, with errors in this category decreasing at the frustration level.

Results of the statistical test for the relationship between performance level and visual-auditory errors for phonics-oriented readers are presented in Table XXII. Because the chi-square did not reach significance, the null hypothesis of no relationship between performance level and visual-auditory errors was not rejected.

TABLE XXII

RELATIONSHIP OF VISUAL-AUDITORY ERRORS TO TOTAL SUBSTITUTIONS AT THE INSTRUCTIONAL AND FRUSTRATION LEVELS FOR PHONICS-ORIENTED READERS

Performance Level	Visual-Auditory/Other Errors	Chi-square	Phi Coefficient
Instructional	79/223	3.7 N.S.	
Frustration	151/323		

N.S. = Not Significant

Summary

The results of the analysis of oral reading errors made by phonics-oriented and whole word readers demonstrated that there was a relationship between instruction and the proportion of

substitutions and non-response errors that were made at both instructional levels. There were no differences in the occurrence of omissions or additions at either instructional level related to instruction.

When patterns of repetitions were compared, both groups had similar percentages of repetitions in each category of repetition. The noticeable difference was in the number of repetitions made, with the phonics group repeating more at both instructional levels. The comparison between the number of words successfully sounded out by each group indicated that the phonics-oriented readers successfully used this strategy to a much greater degree than did the whole word readers.

The types of substitutions made by both groups were analyzed to determine how graphic information was used. Of the four types of substitutions, visual-perceptual errors were most common for both groups. The whole word group made more visual-perceptual errors at both instructional levels but the relationship between instruction and this category of substitutions was significant only at the frustration level. The relationship between visual-auditory errors and instructional method was significant at both levels of performance, with the phonics-oriented group making more substitutions of this type. The whole word group made more substitutions that had no graphic similarity to the text and the relationship between these errors and instruction was significant at the instructional level. There was no difference in directional confusion errors, but these errors were very infrequent.

When use of the contextual information was evaluated, the whole word group showed somewhat higher percentages of appropriate responses but the relationship between instruction and contextual appropriateness was significant only at the instructional level for errors that were appropriate to the preceding context. The higher percentages of inappropriate responses for the phonics group reflected the number of non-word substitutions they made, particularly at the visual-auditory level.

The relationship between the error pattern and the performance levels for each group of readers was investigated to determine if readers shifted their types of errors with the difficulty of the material. When the four types of scoreable errors were compared, the phonics-oriented readers showed no change in percentages of errors in any category from instructional to frustration level. However, the whole word group did show a change in types of errors made from instructional to frustration level. There were fewer substitutions and more non-response errors at the frustration level than at the instructional level. The relationship between errors and performance level was significant for both substitutions and non-responses for the whole word group.

Categories of substitutions were also analyzed at the two performance levels for each of the groups of readers. The whole word group exhibited no change in percentages of substitutions but the phonics-oriented readers did evidence a change in types of substitutions. They made more visual-auditory and fewer visual-perceptual errors at the frustration level than at instructional

level. When the significance of the relationship between performance level and errors was calculated, the chi-square was significant for the relationship between visual-perceptual errors and performance level but not for visual-auditory errors for the phonics group.

CHAPTER V

SUMMARY AND CONCLUSIONS

General Summary

This study explored the relationship between instructional emphasis and the oral reading errors made by first grade readers. Successful first grade readers were selected from two school systems in central Oklahoma whose reading programs reflected alternative approaches to reading instruction. In one system the children learned to read in a program that taught phonic skills as a primary method of word recognition. In the other system the children were taught from a basal program that stressed responding to words as wholes and building of sight vocabulary. The children in this system were introduced to only a limited amount of phonic instruction gradually during the school year.

The sixty children who participated in the study were referred as successful non-repeating first graders by their teachers and met the criteria established for the study. All children read orally from stories similar to those in their respective reading programs. Reading performances at both instructional and frustration levels were obtained for all subjects. The students' readings were taped and transcriptions made during the sessions were rechecked to provide accurate records of the sessions. Errors at both perfor-

mance levels were then analyzed according to the criteria and categories established for the study and comparisons were made between the phonics-oriented and whole word groups. Then the error patterns for each of the groups at instructional and frustration levels were compared to determine if there was any shift in error types as the children read more difficult material. The chi-square statistic was calculated for each error comparison to determine significance of the relationships between error patterns and instructional methods.

Conclusions

This study established that the instruction children receive in reading is an important factor related to their oral reading performance. The patterns of oral reading errors made by the two groups of first grade readers that took part in this study clearly reflected the differences in the ways they had been taught to read. Both when general categories of errors (substitutions, omissions, additions, and non-responses) and when the use of graphic and contextual information in substitutions were considered, the error patterns reflected the instructional programs.

The two approaches to reading produced different patterns of substitutions and non-responses at both instructional and frustration levels. The children who had received phonics-oriented instruction made a significantly higher proportion of their errors as substitutions at both performance levels than did the whole word readers. While the phonics-oriented readers generally made some response to unfamiliar words, the whole word readers often refused to respond.

At the instructional level, 15 percent of the errors made by the whole word group were non-responses compared to 6 percent by the phonics-oriented group and at frustration level, the percentages were 24 compared to 7. Lacking skill in sounding out words when sight and context failed, the whole word group had no alternative strategy for word recognition and so refused to attempt many words.

This tendency on the part of the whole word group to make non-response errors is similar to the pattern of non-responses noted in Biemiller's study (1971) of first grade readers. Although Biemiller found even higher percentages of non-responses, perhaps because he analyzed errors made during class reading sessions, the striking differences with the 6-7 percent of non-response errors by the phonics-oriented group cannot be overlooked. The children taught to read in the program that emphasized sound-symbol relationships usually made some response to unfamiliar words. The children from the whole word program were less likely to make substitution errors when they were unsure of words and instead simply refused to attempt such words.

The differences in attention to graphic information were obvious when the mean number of errors for the 200 words read by each group were compared. Figures 1 and 2 present the profiles of the error patterns at instructional and frustration levels. Substitutions are broken down into visual-auditory, visual-perceptual, directional confusion and nongraphic similarity categories. The profiles at instructional level (Figure 1) show the differences in non-response errors and also indicate that the average phonics reader attended

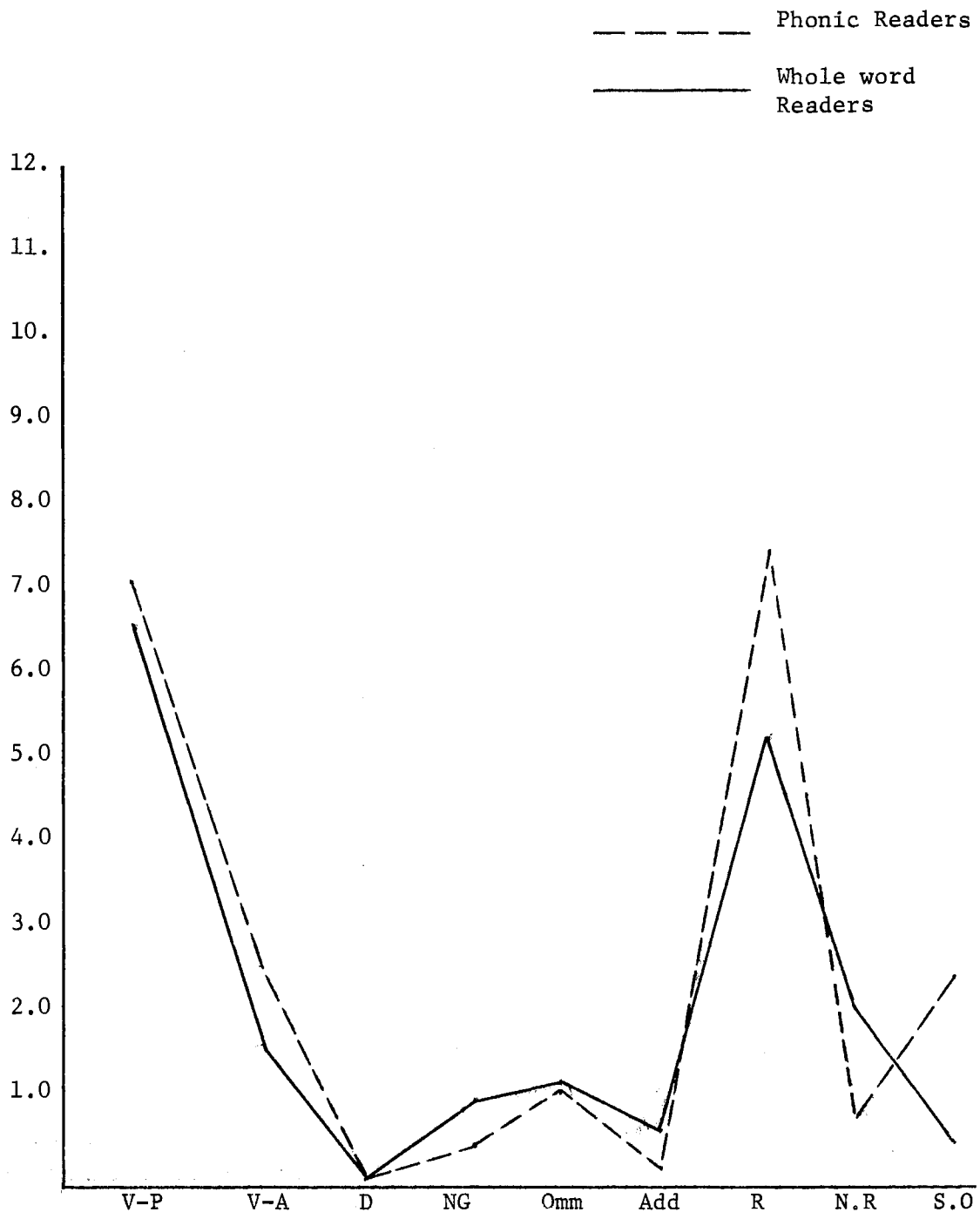

Figure 1. Profiles of Mean Raw Scores for Each Error Type Made by Phonics and Whole Word Readers at Instructional Level

more to graphic information by making the larger number of visual-perceptual and visual-auditory errors. The whole word reader made more errors that had no graphic similarity than did the phonics reader.

The differences in attention to graphic information are more apparent at the frustration level (Figure 2). The whole word reader made almost all of his substitutions as visual-perceptual errors. Because context did not provide as much support at frustration level, the whole word reader made fewer substitutions with no graphic similarity, and since he did not have many skills in sounding out words, he showed little increase in visual-auditory substitutions. The phonics reader, in contrast, made more visual-auditory errors at frustration level where he found the words more difficult. Approximately one-third of the substitutions made by the phonics readers at frustration level involved some attempt to sound out words while the whole word readers made only 17 percent of their substitutions while making visual-auditory associations.

The number of words successfully sounded out also indicated the use of graphic information and the ability to use phonic skills. At neither performance level did the average whole word reader successfully sound out even one word. The phonics-oriented reader, however, successfully used this strategy for 2.5 words at the instructional and 3.5 words at the frustration level.

By attending more carefully to graphic information, the phonics readers tended to read more slowly and make more visual-auditory errors that did not constitute real words. When all substitution categories were compared to determine the percentages of non-words,

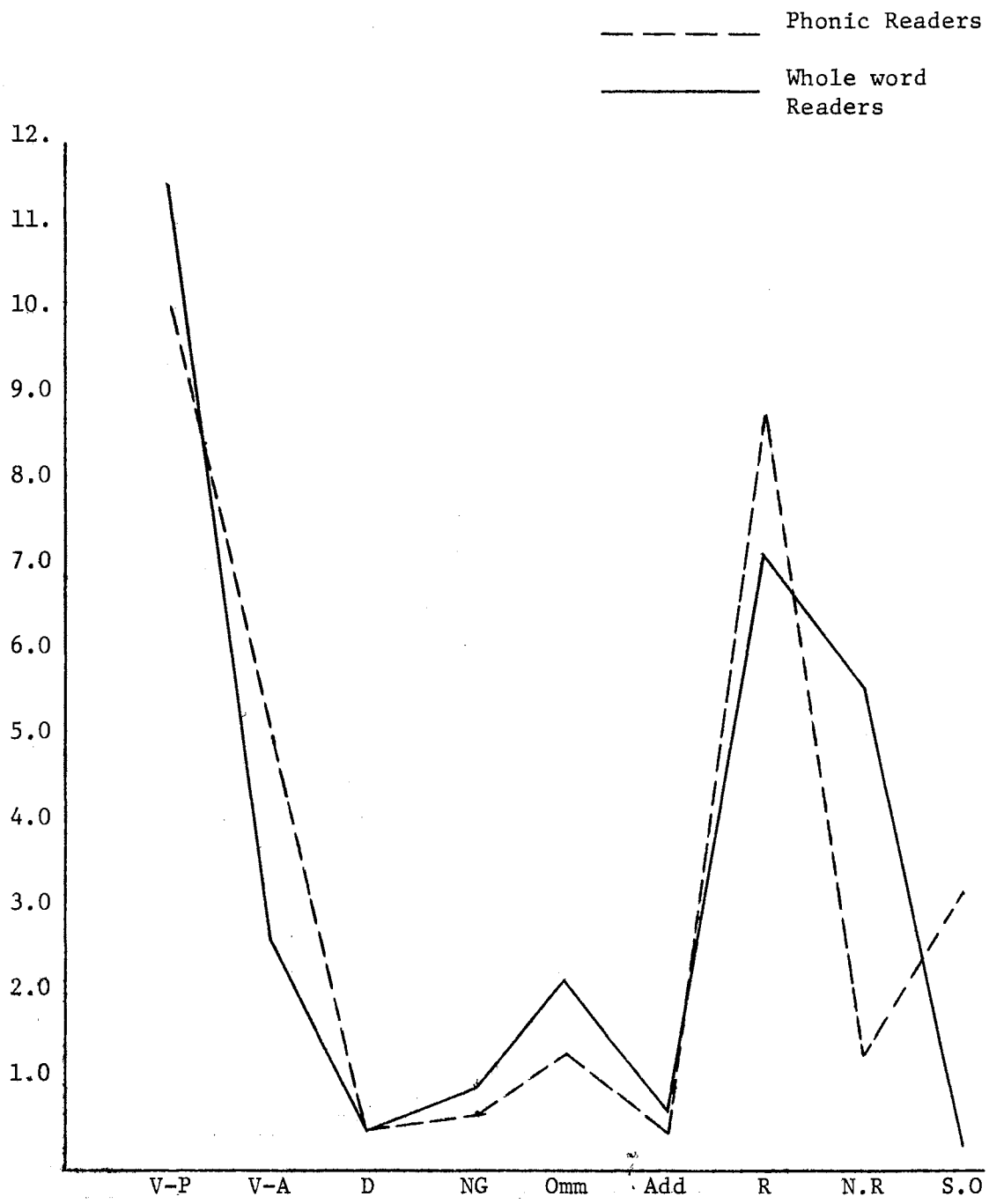

Figure 2. Profiles of Mean Raw Scores for Each Error Type Made by Phonics and Whole Word Readers at Frustration Level

it was clear that when both groups of readers attempted to sound out words they were more likely to make non-word errors. Approximately 80 percent of all visual-auditory responses were non-words as contrasted with 10 percent of the visual-perceptual errors. All of the substitutions in the directional confusion and no graphic similarity categories were actual words. When the students had to attend carefully to the letter-sound correspondences, they were more likely not to attend to context and meaning. These results are consistent with what Weber (1970) found in her study of first grade readers. She reported that:

> a relatively intensive analysis of the graphic display sometimes results in the neglect of contextual information. For these beginning readers, the ability to use information from both sources efficiently is not entirely in hand (p. 158).

Differences in utilization of contextual information were also noted when all substitutions were evaluated for their contextual appropriateness. The whole word group produced a higher percentage of appropriate substitutions both when preceding and total sentence contexts were considered. However, a statistically significant relationship was obtained only on substitutions appropriate to the preceding context at instructional level. The differences in percentages of correct substitutions were due in part to the number of non-word substitutions made by the phonics readers. When each kind of substitution was analyzed for contextual appropriateness, the phonics group had higher percentages of visual-perceptual substitutions that were appropriate than did the whole word group.

For both groups the preceding context was more important than the total sentence context as an aid in word recognition. Between 59-67 percent of the substitutions made at instructional level were appropriate in the preceding context while only 25-30 percent were appropriate in the total sentence. The readers tended to use the information that came before but not to be as sensitive to the total sentence meaning.

Although this study focused on the relationship between instruction and particular patterns of errors, the similarities in oral reading should not be overlooked. The majority of errors for both groups were substitutions and both had similarily low percentages of omissions and additions. When the substitutions were analyzed more specifically, both groups of readers made the majority of their errors while responding rapidly to words (visual-perceptual errors) and generally produced substitutions that were contextually appropriate to the preceding part of the sentence. The patterns of repetitions were also similar for both groups of readers although the phonics-oriented group made more repetitions at both performance levels. The majority of the repetitions by both groups resulted in the correction of errors, and the percentages of anticipations and attempted corrections were similar.

The errors made by each group were also compared at instructional and frustration levels to determine if there were any shifts in reading strategies depending on the difficulty of the material. The phonics group did not demonstrate any change in the four basic error types but when the nature of their substitutions were evaluated, they

they showed a decrease in visual-perceptual errors at frustration level and more reliance on visual-auditory attempts. This shift to a more deliberate attempt to sound out words as the material became more difficult indicates that they were attempting to utilize the skills that they had been taught.

The whole word group did not show any change in kinds of substitutions as the material became more difficult except that the number of substitutions with no graphic similarity decreased. They did demonstrate a change in their willingness to attempt words at the frustration level. They produced fewer substitutions and made many more non-response errors since they did not have a strategy for word recognition when context was no longer adequate.

The differences in the reading strategies of the phonics and whole word groups were apparent in the comparisons of oral reading that were made in this study. The differences were most noticeable at the frustration level, particularly when non-responses and visual-auditory errors were compared. The comparison of shifts in errors from instructional to frustration levels also revealed the differences in emphasis on graphic and contextual information in the two approaches to reading. The phonics-oriented readers applied their knowledge of sound-symbol relationships to unknown words and showed increased reliance on this method of word recognition at the frustration level. The whole word readers used contextual information and previously learned words but frequently refused to attempt unfamiliar words, particularly at the frustration level.

Because of the real differences in error patterns, evaluations of beginning readers ought to take into account the instruction they have received. All successful first grade readers should not be expected to produce the same patterns of errors but use different strategies in reading that reflect the way they were taught to read. Sensitivity to the relationship between instruction and oral reading performance can make diagnosis of readers' strengths and weaknesses more accurate and can facilitate an understanding of the reading process.

Recommendations

1. It is recommended that a longitudinal study comparing these two instructional programs be conducted to determine if the oral reading error patterns become more similar as the readers gain proficiency in the total reading act.
2. It is recommended that this study be replicated with second or third grade readers so that comparisons of errors at this level could be made.
3. It is recommended that two groups of readers being taught in phonics and basal programs be studied throughout the first grade year to determine if there are significant differences in the stages they go through in learning how to read.

BIBLIOGRAPHY

Barr, R. C. The influence of instructional conditions on word recognition errors. Reading Research Quarterly, 1972, 7, 509-529.

Bennett, A. An analysis of errors in word recognition made by retarded readers. The Journal of Educational Psychology, 1942, 33, 25-37.

Biemiller, A. The development of the use of graphic and contextual information as children learn to read. Reading Research Quarterly, 1970, 6, 75-96.

Bruning, J. L. & Kintz, B. L. Computational Handbook of Statistics. Dallas: Scott, Foreman and Co. 1968.

Chall, J. Learning to Read: The Great Debate. New York: McGraw-Hill, 1967.

Clay, M. M. A syntactic analysis of reading errors. Journal of Verbal Learning and Verbal Behavior, 1968, 7, 434-438.

Coombier, J. E. A psycholinguistic analysis of oral reading errors made by good, average, and poor readers. Unpublished doctoral dissertation, University of Wisconsin, 1972.

Daniels, J. C. & Diack, H. Progress in Reading. University of Nottingham: Institute of Education, 1956.

Elder, R. D. A comparison of the oral reading of groups of Scottish and American children. Unpublished doctoral dissertation, University of Michigan, 1966.

Games, P. A. & Klare, G. R. Elementary Statistics: Data Analysis for the Behavioral Sciences. New York: McGraw-Hill, 1967.

Gates, A. I. Studies of phonetic training in beginning reading. The Journal of Educational Psychology, 1927, 18, 217-226.

Gates, A. I. & Boeker, E. A study of initial stages in reading by pre-school children. Teachers College Record, 1923, 24, 469-489.

Gates, A. I. & MacGinitie, W. H. Gates-MacGinitie Reading Tests Teacher's Manual. New York: Teachers College Press, 1965.

Goodman, K. S. A linguistic study of cues and miscues in reading. Elementary English, 1965, 42, 639-643.

Goodman, K. S. Analysis of oral reading miscues: applied psycholinguistics. Reading Research Quarterly, 1969, 5, 9-29.

Goodman, Y. M. A psycholinguistic description of observed oral reading phenomena in selected young beginning readers. Unpublished doctoral dissertation, Wayne State University, 1967.

Guilford, J. P. Fundamental Statistics in Psychology and Education. St Louis: McGraw-Hill, 1965.

Herlin, W. R. A comparison of oral reading errors on Monroe Diagnostic Reading Examination and the Durrell Analysis of Reading Difficulty. Unpublished doctoral dissertation, University of Utah, 1963.

Levin, H. & Mitchell, J. Final report: Project literacy. Ithica: Cornell University, September, 1969.

Marchbanks, G. & Levin, H. Cues by which children recognize words. The Journal of Educational Psychology, 1965, 56, 57-61.

Mason, G. Word confusion among beginning and poor readers: A semantic explanation. Journal of Reading Behavior, 1970, 2, 314-320.

Powell, W. R. Reappraising the criteria for interpreting the informal inventories. In DeBoer, D. (Ed.) Reading Evaluation, 1968 Proceedings, 13 (pt. 4). Newark: International Reading Association, 1969.

Powell, W. R. The validity of the instructional reading level. In Leibert, R. E. (Ed.) Diagnostic Viewpoints in Reading. Newark: International Reading Association, 1971.

Ray, D. D. A qualitative analysis of oral reading behavior. Unpublished paper, Oklahoma State University, 1969.

Roswell, G. & Chall, J. Helping poor readers with word recognition skills. The Reading Teacher, 1957, 10, 200-204.

Senter, R. J. Analysis of Data: Introductory Statistics for the Behavioral Sciences. Glenview: Scott Foresman and Company, 1969.

Smith, F. Psycholinguistics and Reading. Chicago: Holt, Rinehart and Winston, Inc., 1973.

Smith, F. Understanding Reading. New York: Holt, Rinehart and Winston, Inc., 1971.

Spache, G. A new readability formula for primary-grade reading materials. Elementary School Journal, 1953, 53, 410-413.

Stuever, R. F. Analysis of relationship of length of passage to categories of oral reading errors. Unpublished doctoral dissertation, Oklahoma State University, 1969.

Weber, R. M. The study of oral reading errors: A survey of the literature. Reading Research Quarterly, 1968, 4, 96-119.

Weber, R. M. A linguistic analysis of first-grade reading errors. Reading Research Quarterly, 1970, 5, 427-451.

Weber, R. M. First-graders' use of grammatical context in reading. In Levin, H. & Williams, J (Eds.) Basic Studies on Reading. New York: Basic Books, Inc., 1970.

Wiley, W. E. Difficult words and the beginner. Journal of Educational Research, 1928, 17, 178-289.

VITA

Donna Mae Ogle

Candidate for the Degree of

Doctor of Education

Thesis: A STUDY OF THE RELATIONSHIP OF INSTRUCTIONAL METHODS TO THE ORAL READING ERRORS MADE BY FIRST GRADE READERS

Major Field: Elementary Education

Biographical:

Personal Data: Born in Des Moines, Iowa, November 10, 1942, the daughter of Viola and Marion Sederburg; married, June 5, 1965, to Arthur H. Ogle, Jr.

Education: Graduated from Mankato High School, 1960; attended Gustavus Adolphus College, 1960-1962; received Bachelor of Arts degree from Macalester College, 1964; attended Southern Connecticut State College, 1966-1967; received Masters of Education degree from the University of Virginia, 1970; attended the University of Oklahoma, 1971; completed requirements for the Doctor of Education degree at Oklahoma State University, May 1974.

Professional Experience: Eighth grade social studies and English teacher in Roseville, Minnesota, 1964-1965; Title I enrichment teacher in Wallingford, Connecticut, 1965-1967; Title I language arts teacher in Albemarle County, Virginia, 1967-1969; demonstration teacher, McGuffey Reading Center, summer of 1970; reading consultant to Woodrow Wilson Rehabilitation Center, Fischersville, Virginia, 1970-1971; reading consultant to Culpepper, Virginia, summer reading program, 1971; instructor for the University of Virginia School of General Studies, 1970-1971; Director of Reading-Study Skills Program, Oklahoma Baptist University, 1972-1973; Adjunct Professor at National College of Education, Evanston, Illinois, 1974.