

AN INVESTIGATION OF THE DIFFERENCE IN THE
EFFECTS OF TWO READING PROGRAMS ON SELECTED
LANGUAGE MEASURES OF FIRST-GRADE PUPILS IN
INDIAN AFFAIRS SCHOOLS IN MANITOBA

by

Barbara Patricia Rudyk

A thesis

submitted in partial fulfillment

of the requirements for the degree of

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PREFACE

This study was made possible through a grant by the Department of Indian Affairs, Manitoba Region, directly through the support and encouragement of Mr. F. Foss, Superintendent of Elementary and Secondary Education. The thesis topic was part of the curriculum development and planning for the Region.

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Chapter 1

INTRODUCTION

Rationale of the Study

This study investigated the effectiveness of two approaches to reading instruction, a phonics-emphasis approach and a whole-word-emphasis approach, for first-grade children in geographic and cultural areas in Manitoba administered by the Federal Department of Indian Affairs.

Educational administrators of Indian Affairs schools in Manitoba have noted two general trends in pupil achievement:

1. the quality of reading and writing is perceived to be low,
2. there is an age-grade retardation rate of 10-30% at the grade three level (from a statement issued by F. Foss, Superintendent of Elementary and Secondary Education, Department of Indian Affairs, January, 1978).

Education officials perceived that the weaknesses noted were caused by the reading instructional methods and materials used in the schools, specifically, the Macmillan Reading Program (Harris and Clark, 1968). A decision was made to terminate the use of the Macmillan Reading Program, and to implement the Open Court Reading Program (Hughes, et. al., 1976) in the first-grade classrooms, commencing September, 1978.

The purpose of the study was to compare the performance of

first-grade pupils in Indian Affairs schools in Manitoba on a specified number of reading and writing variables in order to assist the Department of Indian Affairs in their evaluation of the two reading programs.

Theoretical Framework

Writers in the field of beginning reading instruction have compared the performance of children instructed by phonic-oriented and whole-word-oriented approaches to initial reading instruction. A phonic-oriented approach to reading instruction is usually characterized by gradual, analytic phonics derived from a core of sight words (Harris and Sipay, 1975; Johnson and Pearson, 1978). Comparisons of the relative merits of each approach have been reported, but without any clear conclusions. Evidence exists supporting more intensive phonics instruction at the outset of beginning reading instruction (Bleismer and Yarborough, 1965; Chall, 1967; Gurren and Hughes, 1965). Yet, evidence exists, also, refuting the claim that the one approach is clearly more meritorious than the other (Bond and Dykstra, 1967; Cleland and Millar, 1965; Harris and Sipay, 1975). The Co-operative Research Program in First-Grade Reading Instruction (Bond and Dykstra, 1967) included in the conclusions of the report that no one instructional approach to beginning reading instruction was universally successful in all situations for all pupils. Each of the approaches to beginning reading instruction yielded some unsuccessful learners, indicating that full knowledge of primary reading instruction is still incomplete in this area. There is some evidence that children with certain pre-reading characteristics experience different reading achievement with

different approaches to beginning reading instruction (Hartlage, 1974). There is also some evidence to indicate that phonics and sight word methods do not develop similar eye movements within the learner (Peoples and Nelson, 1977). Therefore, there apparently are differences in the eventual abilities of the child depending on the type of instructional approach used in beginning reading instruction. More data is needed to answer further research questions about the variation in efficiency of particular methods of reading instruction for specific backgrounds and pupil characteristics (Malmquist, 1975; Harris and Sipay, 1975).

The Purpose of the Study

The purpose of this study was to determine what differences, if any, could be identified in the overall reading achievement (indicated by standardized measures), and in non-standardized performance tasks (word identification, aural comprehension, and free-writing) after seven months of instruction using two different reading programs: the Open Court Reading Program with a phonic-emphasis, and the Macmillan Reading Program with a whole-word emphasis.

Subjects were 159 first grade pupils in available schools administered by the Government of Canada, Department of Indian Affairs, Manitoba Region.

The independent variables were the reading programs, Open Court (a phonics approach) and Macmillan Reading Program (a whole-word approach); and the reading ability of the subjects (identified as being high, middle, and low by a standardized measure of reading achievement).

The dependent variables were the changes in the reading achievement as measured by the scores on the standardized measures administered as the pre-tests and post-tests. Additional dependent variables were the post-test only measures for the three performance tasks mentioned above.

In order to meet the purpose of the study, the following research questions were generated:

1. Does instruction using either the Open Court Reading Program, a phonics-oriented approach, or the Macmillan Reading Program, a whole-word-oriented approach, have a greater effect on the reading performance of first-graders identified as having high, middle, or low reading ability as indicated by scores on standardized measures of reading performance?

2. Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a greater effect on the word identification performance of first graders identified as having high, middle, or low reading ability?

3. Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a greater effect on the aural comprehension performance of first-graders identified as having high, middle, or low reading ability?

4. Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a greater effect on the free writing performance of first graders identified as having high, middle, or low reading ability?

Definitions

The following terms have been used by the writer throughout the study, and are operationally defined below.

Reading ability is defined as the total raw score of four selected sub-tests of the Stanford Early School Achievement Test, Level II, (1971) administered as the pre-test. (S.E.S.A.T.)

The four subtests are:

- i) Letters and Sounds, Part Three
- ii) Aural Comprehension, Part Four
- iii) Word Reading, Part Five
- iv) Sentence Reading, Part Six (Madden and Gardner, 1971).

Reading achievement is defined as the difference or gain in the total raw score of the S.E.S.A.T. administered at the post-test, when compared to the total raw score of S.E.S.A.T. at the pre-test.

The aural cloze test used in this study is defined as a test of comprehension in which the test-taker is given a passage orally, first intact, then with 25 deletions. Response format is a maze-type of multiple-choice selection (Guthrie and Seifert, Burnham, and Caplan, 1974).

Aural Comprehension is defined as the raw score obtained on the aural cloze test.

Experimental group is defined as that group of subjects receiving beginning reading instruction with an intensive synthetic phonics component, identified as the Open Court Reading Program.

Free writing is defined as the independent writing done by a pupil "...on whatever topic the children happened to be concerned with in the normal course of their schoolwork" (Hunt, 1977). A picture stimulus, based upon the content of the aural cloze test, was used to elicit the free written response of the subjects.

The Open Court Reading Program (Hughes et. al., 1976) is a set of materials in which the initial emphasis is on phonics, a method "...in which letters are introduced systematically in contextual material and repeated within a variety of words of similar pattern and length" (Barr, 1975b). This program will be referred to as the phonic approach to reading instruction.

The Macmillan Reading Program (Harris and Clark, 1968) is a set of materials in which the initial emphasis is on whole-word development, a method which introduces "... a limited number of words varying in length and pattern, introduced systematically, and repeated frequently within the reading text stories" (Barr, 1975b). This program will be referred to as the whole-word approach to reading instruction.

Reference group is a term referring to that group of subjects receiving beginning reading instruction with a whole-word approach and analytic phonics component, identified as the Macmillan Reading Program.

Word identification is defined as the process whereby a subject visually scans a printed word presented in isolation, determines distin-

tive features, and pronounces the word. The term is used synonymously with word recognition.

Limitations of the Study

This study was done with children enrolled in schools in Manitoba under the jurisdiction of the Federal Department of Indian Affairs, 1978-79, and does not include generalizations beyond this sample. Factors can be identified that were beyond the control of the investigation, such as teacher expertise, pupil attendance, treatment assigned to intact classrooms, and teacher-pupil relationships. This study does not include the isolation of the effects of variables such as these.

Summary

The purpose of this study was to compare the effects of two beginning reading programs, the Open Court Reading Program and the Macmillan Reading Program to determine if any differences developed in the reading achievement, word identification performance, aural comprehension performance, and free writing ability of first grade pupils after seven months of instruction.

A standardized test was administered to determine pre-test and post-test performance scores.

Intact classrooms were randomly assigned to one of two reading programs, Open Court or Macmillan.

After instruction, measures of word identification, aural cloze, and free writing were taken as post-test measures, in order to

investigate any differences in the performance of pupils in both treatments.

Data were gathered in order to investigate the reading achievement of the subjects, and the proficiency of subjects in word identification, aural comprehension, and free writing.

The remainder of this study is organized in the following manner:

Chapter II: a review of the literature.

Chapter III: a description of the design and procedures.

Chapter IV: a presentation and discussion of the results.

Chapter V: summation, conclusions, and implications of the investigation.

Chapter 2

REVIEW OF THE LITERATURE

Introduction

The purpose of this study was to compare the effectiveness of two reading programs, the Open Court Reading Program and the Macmillan Reading Program, used in the first-grade classrooms in Indian Affairs schools in Manitoba in terms of general reading achievement, and specifically, in terms of word identification, aural comprehension, and free writing performance.

Among the reported standards suggested as bases for program comparisons are the assessment of student progress toward stated objectives (Ammons, 1967), the assessment of the perceptual, cognitive and affective goals of the program (Barret, 1967), the development of reading skills and the extent the reading skills reach beyond the reading programs (Winkeljohann, 1974), the analysis of the process of instruction in addition to proficiency of the learners (Talmage and Walberg, 1978), and the assessment of the child's gain in independence in identified reading skills such as word identification and basic comprehension (Bond, 1965). Two main emphases, the process of instruction and the product of instruction can be identified (Cronbach, 1963). The emphasis selected for this study was pupil achievement and performance, or product, as a result of instruction by two different reading programs.

Criteria forming the basis of comparison were selected from among those suggested in The Standards for Evaluating First Grade Reading Programs (Bond, 1965), which outlines three main issues to be considered in determining the effectiveness of a reading program. First, effectiveness can be determined by the extent pupils are gaining independence in word recognition; second, effectiveness can be determined by the extent children are developing basic comprehension abilities (for example, word meanings); third, program effectiveness can be determined by the extent that the program reinforces and extends other phases of the language arts, for example, the quality of independent writing produced by pupils (Bond, 1965).

The literature review that follows includes relevant research and theory of beginning reading, the development of word identification, the relationship between word identification and comprehension, and the relationship between reading and writing.

I. Beginning Reading Instruction.

Beginning reading instruction is considered to be the second of five stages within the conceptual framework of a developmental reading program. It follows the Readiness Stage, a state of intellectual and perceptual maturity which, when reached, permits children to respond successfully to reading instruction (Gray, 1960), and is followed by three further stages of reading acquisition that develop the skills, the range of content, and refinement of the reading ability of the child.

Among the five stages of reading development, beginning reading is considered the most crucial to eventual reading maturity (Harris and Sipay, 1975). Yet, this crucial stage in the development of reading is not always introduced to the child in the kind of positive, relaxed learning environment that has characterized previous learning in the home. Beginning reading, as an experience, has been identified as being a sudden, potentially anxiety-producing event, without concrete, immediate, personally motivating reinforcement that has characterized other kinds of language learning already experienced by the child (Wardhaugh, 1971). Beginning readers have to adjust to the pressures of the learning environment characteristic of reading instruction.

In the reading instructional setting, children generally experience lessons taught under teacher-direction. Reading activities are dominated and guided by another person with an external purpose. This is markedly different from mature, competent, fluent reading in which the reader generally sets his own purpose for reading. This condition can alter the child's perception of the reading process, and the kind of behavior required of the reader. Children need a clear understanding of the reading process if they are to be able to reconstruct for themselves. In an investigation by Dehn (1979), children that were experiencing difficulty with reading generally had an inaccurate idea of what constitutes the reading task. She concluded that when the perception of the task is not congruent with the actual task performance expected, then successful learning of the task is extremely difficult.

If accurate perception of the task is essential to and influences

reading achievement it would follow that beginning readers would generally have some understanding of the reading process. Investigations into children's perceptions of the reading process show that, in fact, children have serious difficulty in understanding not only the reading process, but the purpose of written language in general (Downing, 1969; Johns and Ellis, 1976; Weintraub and Denny, 1966). Johns and Ellis (1976) reported that children considered reading an activity only occurring in groups in classrooms, using textbooks. Weintraub and Denny (1966) interviewed 111 first-graders about the purpose of reading, and found that less than 37% of the children saw themselves as taking some initiative, some active role, in the learning process. Forty per cent of the children said a passive kind of obedience was required to learn to read, and 20% of the children said that the teacher would show you how to read.

This apparent lack of insight into the reading process has some serious implications if the goal of reading instruction is consistent with the psycholinguistic viewpoint of the reading process. Psycholinguistic theory suggests that reading is an interactive process between the reader's thoughts and the surface structure offered by the writer in order that the reader can reconstruct the writer's deep structure or meaning (Goodman, 1967; Smith, 1971). The reader, using minimal syntactic and semantic cues and a familiar graphophonic code, selects cues, makes tentative decisions about forthcoming content, and confirms, refines, or rejects the initial decisions through further reading; the reader is thus motivated, according to Smith (1971),

by the reduction of uncertainty about what the text means. The reader's response is an interpretation of the writer's deep structure suggested to him by the surface structure. Efficient, mature reading, therefore, develops from the use of all three cueing systems, graphophonic, syntactic, and semantic (Goodman, 1973) offered in the reading environment. Mature reading is only partially a visual activity (Kolers, 1969) and the extent of the visual input is largely determined by the experiences, reading ability, information and background of the reader (Smith, 1973). From this, it is evident that efficient reading is not the result of the meticulous identification of all the visual elements; rather, efficient reading is the result of using the fewest clues to make the best guesses (Goodman, 1967). Implied here is the active contribution made by the reader to construct for himself the author's intended meaning. This construct of reading, which is the goal of reading instruction, is far removed from the reported perceptions and notions of reading actually held by children who see themselves as being essentially peripheral to the reading act.

Further differences have been identified between beginning readers and fluent readers by Smith (1971) who considers fluent readers as ones who use more syntactic and semantic cues - non-visual sources of information - whereas beginning readers rely more on visual cues. In other words, fluent readers, according to Smith, use their own experience to predict what the surface structure is intended to mean. Smith considers a beginning reader as one who invests the most energy on the analysis of the surface structure, using a maximum amount of

visual information in an attempt to retrieve the deep structure. Because the beginning reader identifies each word individually, the efficient use of syntactic and semantic redundancy is inhibited, resulting in only minimal opportunity for a beginning reader to construct the deep structure (Smith, 1973).

Additional characteristics of beginning readers have been identified by Wardhaugh (1971) who, in a comparison of reading acquisition and language acquisition, concluded that some beginning readers may not have certain cognitive abilities that reading requires, nor have they necessarily mastered all the sounds of the language to the extent that adults have.

Authorities, therefore, agree that there are special characteristics of beginning readers, and that generally, they are reading with an effort and an efficiency different from that of a fluent reader.

II. Three Steps of the Reading Process

It is thought that beginning readers use one main cueing system in reading, the graphophonic system, and rely less on the syntactic and semantic cuing systems than do fluent readers (Smith, 1971).

This assumption is consistent with beginning reading instructional programs which are largely concerned with word analysis. However, even beginning readers use both graphophonic and contextual cues when they are identifying words in a passage (Weber, 1970). Analysis of the miscues made by first-graders' reading of basal and other textual material showed that approximately 90% of the miscues made by

the children did not violate the preceding context of the passage. Weber found this to be the same for all children regardless of ability, and concluded that not only do children exploit context as word identification strategy, but may over rely on it.

A three-phase model of reading acquisition has been suggested by Biemiller (1970) based on observations that beginning readers used different error-types at different times. Biemiller noted that children in phase one made errors primarily constrained by context; children in phase two made fewer contextually constrained errors and more non-response errors; children in phase three made fewer non-response errors and more errors using both graphic and contextual constraint. Use of all three cueing systems is developmental and is gradually acquired by the beginning reader.

Reading as a process is thought to have three steps, identified as follows:

1. recognition and pronunciation of the word;
2. lexical access (retrieving a meaning for the word from one's semantic memory);
3. text organization (extracting the syntactic relationships which hold between the words and relate the information to the reader's personal knowledge system) (Golinkoff, 1976).

However, in the light of Biemiller's (1970) findings, it may be that not all beginning readers can successfully complete all three steps of the reading process in the early stages of reading acquisition. Each of the three steps will be discussed as they apply to the beginning reader.

III. Word Identification

The beginning reader attends much more to visual language cues than does the mature reader; in fact, the beginning reader is more frequently involved in mediated word identification in which additional, non-visual processes of word synthesis are necessary and occur after perception of the ink marks and before identification of a word (Smith, 1971). This attention to visual cues means much more energy is invested in word identification, leaving less energy available for the beginning reader to invest in the comprehension of what has been identified (Smith, 1973). Supporting this view is the information processing model of LaBerge and Samuels (1974), who suggest that the reader, as a receiver of stimuli, has only a limited channel capacity to receive information; the more the channels are occupied with identification of individual words, the fewer channels are open to process the meanings of what is read. So long as words are automatically processed, remaining channels are open to attend to the semantic system of the text, and to organize and comprehend the content.

Studies show that efficient word identification contributes significantly to improved comprehension in both children and adults (Perfetti and Hogaboam, 1975; Samuels, Begy and Chen, 1976; Schwartz, 1977a), suggesting that an important skill contributing to successful reading is quick, automatic identification of the words encountered in print.

Words are thought to have multiple dimensions; they are the abstracted linguistic symbols of the personal experiences and associa-

tions of each individual reader (Huey, 1968). Words are thought to have many distinctive features (graphological, orthographic, phonological, semantic, and syntactic) making the learning of a word not just a simple response to a simple stimulus, but a process whereby learning is something selected from the multiplicity of information offered within the word (Gibson, 1971).

Word identification, or word recognition, as a learned behavior, was thought to be a developing skill having an hierarchy of habits, progressing from simple to complex (Huey, 1968). A model of word identification has been formulated by LaBerge and Samuels (1974), in which it theorized that the reader reacts to the presentation of the word by selecting cues, recognizing the cues from visual memory, responding to the cue through context, and associating the cue with the appropriate response.

Another theoretical view of word identification describes the visual scanning pattern during reading as the serial letter identification of each word from the visual image stimulated by the visual pattern reflected into the retina (Gough, 1972). Once the letters are mapped, using phonological information, the lexical information of that word is retrieved from the memory, and is eventually interpreted.

Reading methods classified as whole-word-oriented methods often assume that children identify words by responding to the configuration of a word. Reading methods classified as phonic or synthetic assume that children identify words through rigorous left-to-right letter scanning.

Researchers have investigated these assumptions to determine what types of visual information are extracted by children at different developmental levels. Several studies have reported data that refute the assumption that children rely on overall word shape as a major cue in word identification (Fisher and Price, 1970; Marchbanks and Levin, 1966; Rayner, 1976; Rayner and Hagelberg, 1975; Timko, 1970; Williams, Blumberg and Williams, 1970).

A study by Marchbanks and Levin (1966) of one hundred subjects in kindergarten and grade one presented with a delayed match-to-stimulus task, with the responses controlled for letter cue, concluded that the subjects, attending to the easiest cue for recognition, selected the first letter as the major cue. Although the final letter cue was salient, it was so for trigrams more often than quingrams. Middle letter and word shape were less frequently selected as cues.

In a similar study by Timko (1970) which compared the relative saliency of identical letters and geometric shape on word identification of first graders, subjects again selected first-letter cues most frequently, followed by last-letter matching. Word shape was the weakest cue used by subjects in this word identification task.

Both Marchbanks and Levin (1966) and Timko (1970) conclude that beginning readers do not respond to configuration, but rather discriminate parts of words from the time they begin to learn to read. The assumption that no analysis is done by beginning readers when encountering the whole word is questionable.

Williams, Blumberg, and Williams (1970) investigated the word identification strategies of kindergarten, first grade and college

students by using a similar match-to-sample task for trigrams and quingrams. They reported that beginning readers used the first and last letter cues most often for trigrams, and only first letter cues for quingrams, whereas proficient readers used both letter cues and word shape for identification.

A similar study of first and third grade children, and college students was done by Fisher and Price (1970); they concluded that younger children use individual letter cues most frequently, noting that first grade children did use word shape as a significant cue when identifying longer words, although third graders did not. Rayner and Hagelberg (1975) also report that first graders use first letter plus shape for identification, although only for trigram identification; for quingram stimuli, shape was a less important cue for identification with children, whereas it remained an important cue for proficient readers.

The research indicates strong evidence to support the conclusion that children do use individual letter cues in word identification. However, the findings by Fisher and Price and Rayner and Hagelberg raise doubts about there being no role for word shape as a word identification strategy used by beginning readers. Word shape was not used consistently as a response to similar stimuli, however. In the Fisher and Price study, shape was significant for quingrams only, whereas Rayner and Hagelberg reported shape as a significant cue for trigrams only. Therefore, the major word identification strategy used by beginning readers seems to be individual

letter cues, especially first letter cues, and to some extent, word shape, although it remains uncertain under what circumstances the use of shape occurs.

The type of visual search used in word identification is considered to be a developmental skill. Research comparing kindergarten, grade two and college students indicated that although kindergarten children used a letter-by-letter search process, children in grades two and above used higher order orthographic information: they sought perceptual units within the words they were identifying; in other words, they searched for spelling patterns to facilitate their word recognition (Chabot, 1977). This is consistent with the view of Gibson (1970) that states that children's word boundary development stems from the structure of spelling patterns.

Research into the question of how children analyze words supports Gibson's (1970) position, and Chabot's conclusion (1977) concerning a developmental ability to seek spelling patterns or units from the words to be identified. An investigation into the word analysis behavior of successful decoders in the second and fifth grades analyzed children's verbalization of how they decoded a word (Glass and Burton, 1973). It was found that 85% of the children used letter clusters as a primary mode of word attack. Although many children did verbalize that they took clusters of three or four letters at a time a large proportion of the children verbalized what they had heard in their reading instruction at school (that is, syllabication, or phonics rules) when in fact this was not indicated by their performance in the

word recognition task. Research by Hardy, Stennet, and Smythe (1973) comes to a similar conclusion; successful first and second grade children were observed as using a consistent search for familiar units or clusters within the words in an identification task, whereas unsuccessful children responded using only vague, intuitive strategies.

It would seem that word identification is a developmental skill, with a difference in the kinds of cues selected by proficient and non-proficient readers. Proficient readers generally employ a systematic strategy of searching for familiar spelling patterns within words, whereas non-proficient readers use a letter-by-letter strategy to identify words.

IV. Lexical Access of Individual Words

Assumptions have been made that consider that once a child has identified a word, the child automatically can access its meaning. This is evident in reading programs where instructional effort is primarily invested in teaching graphophonic relationships (Guthrie, 1973). There is evidence to suggest that word identification does not assume lexical access.

Proficiency in word identification has been found to be independent of proficiency in the ability to access word meanings (Golinkoff and Rosinski, 1976). Third and fifth graders classified as good and poor comprehenders were given a picture-word interference task using three variables, 100% congruency between the picture and the superimposed word, 0% congruency, and a trigram superimposed on a picture.

This research study showed that interference was found to be a significant factor for both good and poor comprehenders. Golinkoff and Rosinski concluded that semantic strategies for both good and poor comprehenders were the same, despite the fact that poor comprehenders possessed weak decoding skills. It cannot be assumed that the decoding of words and the accessing of meanings are identical since the two seem to be independent factors of word identification.

Lexical access to word meanings seems to be a developmental ability, occurring in different degrees at different grade levels. Research investigating this developmental word access ability was conducted using second, fifth graders, and junior high subjects who were given a picture-word identification task similar to that developed by Golinkoff and Rosinski (1976) (Ehri, 1976). Analysis of the data showed that the amount of semantic interference was inversely proportional to the age of the subject: that is, beginning readers suffered more interference than did more proficient readers. It appeared that once the word identification process was automatic, as in the case of subjects in the higher grades, the attention of the reader was able to be diverted to a greater amount of semantic processing. Ehri (1976) reported, however, that subjects achieving at a level below their grade could decode printed words but not recognize them automatically.

Therefore, the research indicates that word identification and lexical access of individual word meanings are independent skills. Performance on word identification tasks may not be an indication that a meaning can be automatically supplied by the reader (Step Two of

Golinkoff's description, 1976).

It would seem that the assumption made by phonic approaches in which the decoding and the accessing the meanings of words are identical abilities is questionable.

Organization and Textual Comprehension

One of the goals of reading instruction is the development of basic comprehension skills (Bond, 1965).

Comprehension has been defined as a procedure of weighing and organizing the elements of a sentence, selecting their connotation, and determining a final response in the light of many forces (Thorndike, 1971). The Encyclopedia of Education defines comprehension as the holding together in the mind "the elements of meaning coded by a writer into print" (Sanford, 1971). Comprehension is considered to be an active process in which the reader uses three cueing systems, graphophonic, syntactic and semantic (Goodman, 1973) from which to select the minimal cues necessary from the visual array, which is the surface level of the message, and from which the reader reconstructs the deeper level of the writer's intended message (Goodman, 1967; Smith, 1971). Knowledge of the three cueing systems form expectations within the reader, upon which he bases decisions about what may follow and which further reading confirms or rejects (Goodman, 1967). The comprehension process, therefore, is a highly interactive process in which the reader attempts to recreate the author's message through the printed abstractions (words).

In order for comprehension to take place, the reader needs to have linguistic information about the meanings of words, and about the structure and components of sentences; he needs knowledge about the world in general, and about the social context of language usage in order to supplement and refine the accuracy of message reconstruction (Griffin, 1977). Finally, there is another aspect to the comprehension process, and that is the quantity and quality of the reader's pre-knowledge of the specific content. In this way, comprehension is perceived as the difference between what someone knew about a topic before reading, and what he possesses following the reading (Robinson, 1977). Comprehension, therefore, is the result of the active contribution made, not from the materials, but from the reader, whose role in the process is one of pursuit rather than retreat (Chomsky, 1978).

There is a widely-held assumption that efficient word identification leads to effective comprehension (Gates, 1947), and this assumption is often evident when children identified as poor comprehenders are given remediation in phonics almost automatically (Guthrie, 1973). However, the assumption that poor comprehension is a direct result of poor word identification has been questioned (Cromer, 1970), since poor reading can be identified as either a word identification problem or a comprehension problem (Kendall and Hood, 1977; Oaken, Wiener, and Cromer, 1971).

Cromer (1970) suggested a 'difference model' to explain some reading difficulties; he found that there were children who apparently made responses inconsistent with the response pattern generally assumed

necessary for reading. These 'difference' readers scored lower on single word-mode of comprehension questions than other poor readers labelled 'deficit', or lacking in a particular skill or ability. Cromer suggested that 'difference' readers, those making responses in a pattern different from that expected, were caused by beginning reading instruction being rigorously concerned with word identification at the expense of teaching the skill of comprehension.

Further evidence that word identification may not be clearly related to comprehension was reported by Oaken, Wiener, and Cromer (1971). They found that poor readers who were taught to decode words in a passage prior to reading that passage yielded no increase in their comprehension performance. This supports the position that accurate word identification, although usually apparent in good readers, is not a necessary condition for good comprehension in all readers.

It can be observed that comprehension is not simply the product of good word identification skills in which the child can understand the words identified through aural-oral linguistic translation (Gates, 1947). Comprehension is a separate facility of organizing language into meaningful units (Schwartz, 1977b). Steiner, Wiener, and Cromer (1971) conducted an investigation of good and poor readers in which the poor readers were given supplementary comprehension training in the extraction of contextual information in order to help them organize reading material into meaningful units and to facilitate the predictive ability of the poor readers. Modes of presentation were: 1) single word presentation (with and without comprehension training) and 2)

paragraph presentation (with and without comprehension training). Results show that comprehension training had no significant effect on the performance of poor readers who failed to use context even when presented with it. Poor readers read all presentation of material as if the words were unrelated syntactically or contextually and did not use the various cueing systems available in the written language. Concluding the report, Steiner, et. al. attribute the non-use of available cueing systems by poor readers to be a result of the beginning reading instructional approach in which pronunciation of the word is stressed and at the expense of the development of skill in using other cueing systems available (Steiner, Wiener, and Cromer, 1971).

IV. Word Identification Instruction

Proficiency in word identification and its relationship to comprehension has been explored in various research studies which show that word identification automaticity is highly related to comprehension (Cunningham, 1979; Perfetti and Hogaboam, 1975; Samuels, Begy, and Chen, 1976; Schwartz, 1977a) in that the more proficient readers could identify words faster, more efficiently, and more correctly than less proficient readers. Accurate word identification alone does not guarantee automatic comprehension (Cunningham, 1979) as it can attract excessive attention to the identification of the words and detract from the comprehension process. However, better readers were generally found to be faster, more accurate decoders, and it was hypothesized that they could invest more attention in the retrieval of the meaning.

of the text.

From the research, it is apparent that efficient word identification can contribute to successful comprehension. However, the relationship of word analysis and comprehension has been found to be weaker at the post-elementary level than normally found at the elementary level (Gustafson and Klumb, 1977), when readers are more consciously involved with all three cueing systems in the material. It is possible that beginning reading programs should develop basic comprehension skills (Bond, 1965) and a program that stresses an overattention to meticulous word identification using only one of the cueing systems, phonics, may form within the beginning reader a pattern of behavior that prohibits lexical access of words, and inhibits the development of reading fluency that has been observed in the reading behavior of mature readers.

Whole-Word and Phonic-Blend Methodology

Groff (1974) concluded that instruction in word identification should be consistent with the child's spontaneous word recognition strategy. How a child is instructed should, in some way, acknowledge and build on the kinds of word perception skills that research has shown exist in children. In other words, the beginning reader comes to the learning task with certain attributes: he has a lexicon, a comprehension device, and a phonological system, all of which are developing to maturity. What the child does lack is a character recognition device in order to convert the characters into phonemes (Gough, 1972).

It is the task of making the child efficient in character recognition with which beginning reading instruction is initially concerned.

Phonic-blend training has been found to be an effective instructional procedure in that it yielded greater transfer to the identification of new stimuli (Fox and Routh, 1976; Jeffrey and Samuels, 1967; Jenkins, Bausell and Jenkins, 1972; Muller, 1972).

Jeffrey and Samuels (1967) explored the effects of two modes of reading training on initial reading and transfer of training to new words. Sixty kindergarten children were divided into three treatment groups: single-letter-training, word-training, and no training. Six graphemes formed eight nonsense words based on the c-v pattern. These words were taught by either phonic or whole word method to the first two treatment groups. The letter-trained group needed fewer trials to meet criterion in the initial instruction and was significantly superior to the other two treatment groups on the transfer task, indicating support for initial reading instruction having a code emphasis.

Similar findings were reported by Muller (1972) when he compared the performance of first-grade subjects given training in blending followed by different types of letter training such as phonics training, non-phonics training, and no letter training. He found that the phonics-trained group performed significantly better on a transfer word-naming task than all other treatments.

The question of whether letter-name knowledge or letter-sound knowledge facilitates subsequent word recognition in first grade children was investigated by Jenkins, Bausell, and Jenkins (1972), who

divided their subjects into three treatment groups: letter-name training, letter-sound training, and control. Performance was compared on a transfer word recognition task, and analysis of variance showed that letter-sound relationships took significantly longer to learn, but in the transfer task, facilitated word recognition to a greater extent than the other treatments.

In a study by Fox and Routh (1976) who compared the treatments of phonic-blend training and no phonic-blend training four-year-olds, no significant effects were found for either the main effect of phonic blend training, nor for any interactions with other variables. When the data were analyzed according to the ability of the subjects to segment syllables into sounds, a significant main effect for segmenting ability was found. Proficient segmenters learned the letter-sound combinations faster than non-proficient segmenters, made fewer errors, and were superior on the transfer task when compared to non-segmenters. A significant interaction was reported between segmenting ability and phonic-blend training. Children who could not proficiently segment syllables into sounds did not benefit from phonic-blend training. This research underscores the role of auditory analysis in beginning reading instruction, where the ability to segment syllables into sounds was found to be a useful predictor of children's subsequent performance in decoding written words.

The above studies indicate that first graders taught by a phonic-blend approach generally transfer the skills to new words more effectively than children taught by a whole-word approach. Evidence

has been cited, however, to support a possible pre-requisite skill of syllable segmentation without which phonic-blend training may not be an appropriate method of instruction for first graders.

Approaches to Beginning Reading Instruction

Learning to read assumes that children have certain phonics abilities when instruction begins. It is not always certain that these have yet developed (Wardhaugh, 1971). Investigation into pre-school children's perception of English phonology is different from that of adults (Read, 1971). Research into children's ability to segment syllables into phonemes from spoken language was found to be a difficult task for pre-school children (Leong and Haines, 1978; Fox and Routh, 1975). Yet, it is the ability to segment sequential acoustic and graphic information which is an assumed pre-requisite for phonics instruction (Gibson, 1970).

Beginning reading instruction generally includes some component of phonics instruction in the program; it seems to offer the child help in learning to read (Groff, 1977). However, phonics instruction has received severe criticism because it is often based on fact and fiction (Wardhaugh, 1969) and can actually interfere with a child's reading progress rather than improve it (Groff, 1973).

Reading methodology reflects two main approaches to word identification instruction, a part-to-whole or synthetic approach, or a whole-to-part or analytic approach. The synthetic method is believed to be more efficient for the pronunciation of unfamiliar words by

beginning readers, whereas the analytic method is believed to emphasize meaningful reading through immediate sight recognition of words and phrases (Harris and Sipay, 1975). Research examining the comparative effects of the analytic and synthetic approaches to beginning reading instruction has been largely inconclusive.

Phonics instruction has been the focus of criticism about its limitations (Durkin, 1974; Groff, 1973; Wardhaugh, 1969). Phonics is not sensitive to the differences between lexical and structural words in its instructional approach (Groff, 1973). Phonics is generally not sensitive to the phonemic regularity of English, which follows a morphemically regular system (Chomsky, 1970). Both Groff and Chomsky point out that phonics asks the reader to attend to the surface level of the words, encouraging "sounding out" according to rules, rather than attending to the deeper levels of the words, levels such as syntax and semantics.

A major review of the existing research on the question of which approach achieves superior results in beginning reading instruction was undertaken by Chall (1967). She classified instructional programs into two categories, code emphasis or meaning emphasis (Chall, 1967), and used eight measures of reading ability in the analysis of first-grade studies dating from 1912 to 1940 in order to identify a trend in the type of instruction most successful with beginning readers. Her conclusions included support for code-emphasis instruction, where there was an early, direct, heavy emphasis on teaching the sound values of the letters. Chall also examined twenty-five first-grade studies,

dating from 1926 to 1953, which compared systematic and intensive phonics instruction with intrinsic phonics instruction (Chall, 1967). Word identification and oral reading were found to be superior for the systematic phonics group, with one study as an exception to the conclusion. Vocabulary and comprehension scores on standardized tests showed overall results were higher in first grade for instruction using a systematic phonics component. Three additional studies cited also added support to her conclusions that systematic phonics instruction yields superior results in measures of word identification and comprehension. Chall qualified the reliability of the research findings because of a lack of accountability for novelty effect, but generally she supports the conclusion that methods which pay early attention to intensive systematic phonics instruction tend to produce better results than methods with a less intensive phonics component.

Chall's conclusions have been questioned (Strang, 1968; Evertts, 1968) because of her lack of differentiation between good and poor research in reaching her conclusions, and that different teachers obtained a variety of results while using the same method. Therefore, her conclusions should be considered tentative.

Another research project centered around the question of which approach to instruction produces superior reading achievement for the first grade was the Co-operative Research Program in First-Grade Reading Instruction (Bond and Dykstra, 1967). A variety of reading instructional programs were implemented (ita, basal, basal plus phonics, language experience) for one year, and pupil achievement was measured

by pre-test/post-test standardized testing. Analysis of variance and covariance of scores indicated the following: no one approach to beginning reading instruction was more effective for all pupils and all teachers; no one method was capable of accommodating all the needs of the children who learned from it; no one program was universally successful in all situations. Where a reading program was found to yield superior results, it was superior for all children regardless of sex, I.Q., or pre-instruction letter knowledge. However, the observation was made that a program which had a systematically taught word identification component was likely to produce superior reading achievement. Combination programs which included many word identification strategies were superior to single approaches. Since children learned to read by a variety of methods and materials, it was recommended that no one approach be used exclusively in the classroom. The findings also indicated that a program with a large writing component is likely to be an effective addition to a beginning reading program. Bond and Dykstra (1967) also noted that other elements existing beyond classroom instruction, such as the particular school system, have a greater relationship to reading achievement than those variables investigated.

This study indicated that there is still a lack of conclusive evidence about which reading instructional methodology is most effective in overall reading achievement. As an exploratory study, it reports that no one best method is universally effective in beginning reading instruction, but does support a phonics component in the instruction.

In addition to the major surveys by Chall and Bond and Dykstra, there have been a number of individual studies that compared the relative effectiveness of both types of phonics instruction, analytic and synthetic. In a study of fourteen first-grade classrooms, the same basal reading program was implemented, supplemented by one of two kinds of phonics instruction, analytic or synthetic phonics instruction (Bear, 1959). Analysis of the results on the standardized measures administered after the first half of first-grade showed higher scores for the synthetic phonics group in overall reading achievement, although the analytic phonics group obtained higher scores on the word meanings and visual discrimination subtests. These findings are inconsistent in that they fail to indicate which type of phonics instruction is more effective.

In a comparison of eight different reading programs classified as having either a synthetic or analytic phonics emphasis, Bleismer and Yarborough (1965) found that programs having a synthetic approach produced higher scores for word identification although no significant differences were found when the comprehension scores were analyzed. The analytic phonics group scored higher on a paragraph reading task, indicating that synthetic phonics may be more successful for specific skills such as word identification rather than in more global skills.

Cleland and Miller (1965) compared the effectiveness of a basal reading series and a basal plus phonics supplement. One hundred and twelve children, matched for socio-economic status, I.Q., and prior kindergarten instruction were divided equally between the two treatment

groups. Pre-test and post-test scores of the standardized measure were subjected to analyses of covariance, and the results showed significant differences on only two subtests in which boys in the experimental group scored higher. There were no significant main effects, and no interaction between treatment and sex. The overall conclusions drawn from the results indicated neither a basal nor basal plus phonics program was significantly superior in beginning reading achievement.

In a review of twenty-two studies comparing intensive phonics, (defined as instruction which introduces all main vowels, consonants, and blending strategy at the outset) and gradual phonics (defined as instruction introducing consonants first, delaying some vowel sounds until second grade, and encouraging the use of structural analysis and context as additional word identification strategies) Gurren and Hughes (1965) reported that most studies showed higher achievement in beginning reading instruction in the programs using intensive phonics instruction. Two of the studies included in the review were longitudinal with subjects tested at the 1st and 6th grade level. It was concluded that subjects taught by intensive phonics had an early advantage and maintained it.

Despite the fact that there appears to be a trend favoring intensive phonics instruction in beginning reading programs, conflicting evidence has been noted by a report by Harris and Sipay (1975) of the London publication by Morris in 1966. The research study reviewed and compared the progress of pupils instructed by a whole-word, analytical

approach and a phonics-first approach. Subjects were followed through the first six years of school. Findings in the reported research indicated that the analytic phonics pupils were ahead of the intensive phonics pupils at the end of the study.

Research of first grade instruction using different emphases in the phonics component of the programs indicate no clear, consistent trend as to which type of phonics instruction is better. Research has been cited which supports intensive synthetic phonics as being a better approach, and also that gradual, analytic phonics is better. In other words, no final conclusions can be made from the research. It has been recommended that further efforts should concentrate on determining which program works best with which children (Harris and Sipay, 1975).

A similar suggestion has been made by Spache and Spache (1977) who considered that since letter-sound systems of reading instruction are more effective with higher ability pupils than with lower ability pupils, the use of such instructional approaches should be as a limited supplementary resource for better pupils rather than prescribed instruction for all. It is this recommendation which supports the basis of this study.

Although the research is inconclusive about the quantitative performance a beginning reader can make with various approaches to beginning reading instruction, there have been research reports indicating that the kind of instructional approach used in beginning reading can influence qualitatively the performance of the learner. In a reported study by DeLawter (1970), investigating the comparative oral reading

performance of children instructed in phonic and sight-word meaning emphasis programs after two years of instruction, the errors made by children were qualitatively different, depending on the instructional approach used. Children taught by a phonic emphasis approach were found to make errors that were non-words with high graphophonic correspondence to the test items, whereas children taught by a sight-word emphasis approach made errors that were real words with low graphophonic correspondence to the test items.

Further research supports the assumption that the instructional condition qualitatively influences the reading performance of children. Barr (1972) analyzed the errors made by children instructed either by a phonics or a sight-word approach, and found that the children instructed by a phonics program did not respond as often, made more errors that were non-words or words that were untaught by the reading program, and made more graphically constrained errors than children instructed by the sight-word approach. Children taught by the sight-word approach answered more frequently, responded more often with words taught by the reading program, and made errors that were not graphically constrained. Barr (1972) concluded that the instructional strategy can influence the child's word identification habits in general.

Further investigations by Barr (1975a; 1975b) into the response characteristics of children taught by phonics and sight-word instructional approaches made it possible to identify that children, in fact, were influenced by the kind of reading approach used. Most children

taught by the phonics method were using phonics strategy, and most children taught by the sight word method were using the analytical strategy in their reading performance (Barr, 1975b). In the same study, Barr also found it was possible to identify children that had developed their own word identification strategies different from the instructional method taught. This difference between child-strategy and instructional strategy was found to occur more often in children taught by the phonics instructional approach, in that 37.5% of the children instructed by the phonics approach were actually using a strategy expected of those subjects instructed by a sight-word approach. When the performance of those 37.5% was compared to children using the phonics approach in the phonics instructional program, the 'different' children scored significantly lower in overall reading achievement and approached significant difference in contextual comprehension. The reading materials, rather than the child's personal reading strategy, were found to have the greatest influence on the kinds of response children make to printed words (Barr, 1975a). Children reading from phonics materials responded differently than children reading from sight-word materials, regardless of word strategy used by the child. Children taught by phonics materials responded to short words more frequently than long words, and simple words more frequently than complex words, whereas children taught with sight word material responded with equal frequency to simple and complex words, regardless of personal word identification strategy.

The above research indicates that there are clear differences

in the quality of reading behavior developed in the child depending on the kinds of materials used for instruction and in the kinds of strategy developed in the child. Also suggested was the possibility that a mismatch could develop, more likely in the phonics approach, between the child's personal word identification strategy and that used by the teacher for instruction.

In summary, two major approaches to beginning reading instruction exist: the analytic, or whole-to-part sequence; and the synthetic, or part-to-whole sequence. Neither approach has been universally more successful in yielding greater reading achievement scores on all measures. Each approach has been found to develop qualitatively different response characteristics within the learners.

V. The Relationship between Reading and Writing

One of the standards for examining a reading instructional program is the extent it reinforces and extends other phases of the language arts, with specific attention given to the quality of independent writing done (Bond, 1965). Bond's suggested criteria implies a positive relationship among the receptive and expressive language arts.

Research studies have found a positive correlation between the language arts. (Evanechko, Ollila, and Armstrong, 1974; Loban, 1976; Straw, 1978). Evanechko, Ollila and Armstrong found that measures of reading ability were correlated to indices of children's writing at the sixth grade level. Straw found that improving children's writing maturity at the sixth grade level also improved their reading ability. Loban

found that as children mature, their writing became more complicated and more elaborated. Although the growth in complexity seemed to follow a predictable pattern, it was not correlated to reading proficiency in the Loban study. This study was designed to identify whether the same relationship found between reading and writing at the upper elementary levels is also found at the first grade level in Manitoba Indian Affairs schools.

The development of children's oral and written language was investigated by O'Donnell, Griffin and Norris (1967). They studied the oral language of kindergarten, grade 1, 2, 3, 5, and 7 children and the written language of grade 3, 5, and 7 children. They found that significant increases in the use of structures and in the use of more complex transformations occurred with maturity in oral language. They found that similar increases in the use of structures and co-ordinations occurred with maturity in written language. However, this study did not include written data from children at the first grade level.

Hunt (1965b) compared the writing of children in grades 4, 8, 12 and superior adults. He found that as the subjects matured, they wrote longer sentences, and within sentences wrote more words per clause.

Hunt (1965a) also studied the grammatical structures of children in grades 4, 8 and 12. He concluded that as children mature, their writing increases in length, the structures used become more complex and more consolidated.

Hunt (1966) later stated that one index of children's writing maturity was length. He observed that "...as children mature, they tend

to produce more words on any given subject. They have more to say." (p. 732). It was this index of children's writing maturity that was selected as the basis for the analysis of first grade writing maturity in this study.

In conclusion, the relationship between children's reading achievement and writing maturity has been identified at the upper elementary grade levels. Trends in writing development indicate that with maturity children are able to produce a greater number of words. This study compared this index of writing maturity with reading achievement at the first grade level in order to confirm the relationship between reading and writing at the first grade level.

Summary

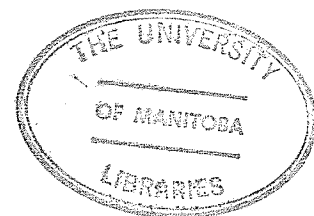
Chapter 2 has included a review of the literature related to beginning reading instruction, word identification, comprehension and writing development. For beginning readers, insight into the reading process should not necessarily be assumed to be within the child's understanding. Along with the reading act per se, the child was found to be learning about the reading process in general. Investigations into the relative effectiveness of two main approaches to beginning reading instruction, identified as phonic or whole-word, were reviewed. Evidence exists that supports the merit of each approach, and no definite quantitative difference could be found in the reading achievement of children taught by either one or the other, although qualitative differences were found in children's word analysis strategies. The present

study sought to find data to support the qualitative differences in word analysis produced by the two approaches (phonic or whole-word).

Word identification was found to be related to comprehension in most cases. However, studies were cited that contribute evidence to the two skills being independent in some children. Therefore it was concluded that word identification proficiency could be assumed to yield comprehension proficiency in all students. This study analyzed data about the relationship between word identification and comprehension.

Finally, the review examined research into the writing development of children, and concluded that as children mature they can produce more words. This index was selected for comparison with the reading achievement of first graders in order to confirm a relationship at this level.

A discussion of the design and an explanation of the procedures of the study will be presented in Chapter 3.



Chapter 3

DESIGN AND PROCEDURES

The purpose of this study was to examine the effects of the Open Court and the Macmillan Reading Programs on the reading achievement and selected language measures of first grade pupils in Indian Affairs schools in Manitoba.

Four general questions were posed:

1. Does instruction using the Open Court or Macmillan reading program differentially affect the standardized reading achievement of first-grade students identified as having high, middle, and low reading ability?

2. Does instruction using the Open Court or Macmillan reading program have a differential effect on the word identification performance of first-grade students identified as having high, middle, and low reading ability?

3. Does instruction using the Open Court or Macmillan reading program have a differential effect on the aural comprehension performance of first-grade pupils identified as having high, middle, and low reading ability?

4. Does instruction using the Open Court or Macmillan reading program have a differential effect on the free writing ability of first-grade pupils identified as having high, middle, and low reading ability?

The Study

Sample

The subjects in this study were children attending schools on Indian Reserves in Manitoba. The overwhelming majority of children were Native Canadians. An acknowledgement of the larger educational context of Native education in Manitoba seems necessary before the particular sample is defined.

The value system in which Native children are raised, teaches respect for the collective above the individual, the extended family above the nuclear family. Nature is not technologically controlled, but is a force lived with in harmony. Extensive verbalization by children is de-emphasized. These are examples of the social value system that teachers in the schools encounter.

Native children have been identified as having predictable problems in education, the underlying difficulty stemming from a difference between the education system and the child in world views, specifically between the roles of science and magic (Sealey, 1980). Native people view reality and deal with their environment through a logical process different from the assumptions of Aristotelian principles. Within the school curriculum, the content is not congruent with the Native child's culture. Sealey identified this as contributing to a forced cultural assimilation, contributing directly to general educational problems.

It is problems such as these that provide the context through

which the sample of children should be understood.

The subjects in this study were 159 first-grade students in 16 classrooms in schools situated on Indian Reserves in various locations in Northern Manitoba for whom English is generally a second language. First grade students were selected as subjects in order to examine differences between quantitative and qualitative learning measures as part of the evaluation program for the Department of Indian Affairs. First-grade subjects were chosen in order to permit comparisons between this investigation and conclusions previously reported about comparative first-grade reading achievement (Bond and Dykstra, 1967).

The two treatments were the Open Court Reading Program and the Macmillan Reading Program. Subjects numbered 122 in the Open Court treatment and 37 in the Macmillan treatment.

The subjects were also assigned to one of three ability groups, high, middle, or low, on the basis of the pre-test total SESAT scores. Subjects obtaining a raw score of 95 or greater were identified as having a high reading ability. Subjects obtaining a raw score between 94 and 72 were identified as having middle reading ability. Subjects obtaining a raw score below 72 were identified as having low reading ability. The high ability group numbered 55, the middle ability group numbered 53, and the low ability group numbered 51.

The Pilot Study

A pilot study was conducted to determine whether sampling and testing procedures for the three performance tasks were operational.

The subjects for the pilot study were ten first-graders, five boys and five girls, in one school administered by the Department of Indian Affairs in rural Manitoba. Standardized testing using the SESAT was administered in October, 1978. Experimental testing was carried out on April 9, 1979, and included the Word Identification Task, the Aural Cloze Task, and the Free Writing Task. Testing was completed in one morning (9 a.m. - 12:10 a.m.). The Word Identification Task was individually administered in a quiet area adjacent to the classroom. The Aural Cloze Task was administered second, as a whole-class activity. Before the task, the aural cloze story was read, with flannel board figures and props used as visual aids. Additional time was allotted for instructions and practice in completing aural cloze exercises. The Free Writing Task was administered next, using a picture-stimulus based on the aural cloze story.

The hypothesis for the pilot study was as follows: Hypothesis 1: There is no significant correlation between the standardized scores on selected subtests of SESAT (Letters and Sounds Subtest; Aural Comprehension Subtest; Word Reading Subtest; Sentence Reading Subtest) and the scores of the three experimental tests: (Word Identification Task; Aural Cloze Task; Free Writing Task). No SESAT was administered in April because the schedule for post-test administration of the SESAT was at a later date. Pearson Product-Moment correlations were performed among the seven scores identified above. Correlations between the Word Identification Task and Word Reading (.53) and Sentence Reading (.63) Subtests of SESAT indicate the word reading test does measure similar

constructs (Table 3.1).

Correlations between the Aural Cloze Task and the Letters and Sounds (.67) and Aural Comprehension (.79) Subtests of SESAT indicate the Aural Cloze Task does measure comprehension. Correlation between the Free Writing Task and the Word Reading (.48) Subtest, and to a lesser extent, with the Letters and Sounds (.26) Subtest of SESAT indicate that the writing sample is related to word reading proficiency, but is a separate skill apart from word identification proficiency. Correlation between the Word Identification Task and Aural Cloze Task (.65) indicates that the two tasks measure abilities somewhat similar in nature (Table 3.2). Correlation between the Word Identification Task and Free Writing Task (.37) indicates only a weak relationship between those variables. The pilot study addressed the hypothesis that there was no significant correlation between SESAT scores and the scores on the three performance tasks. The findings indicate significant correlations between and among the scores of SESAT and the three performance tasks, indicating content validity to the developed informal tests, as appropriate measures of word identification, aural comprehension, and writing.

Further analysis of the responses to fourteen selected stimulus words on both the Word Identification Task and Aural Cloze Task indicates that the subjects identified 50% of the words, without lexical access in context on the Aural Cloze Task. The subjects identified 43% of the selected words successfully in context without identifying them in isolation. Seven per cent of the words were identified and had successful lexical access in context by the subjects.

TABLE 3.1

Pearson Product-Moment Correlations
among the SESAT and the Experimental Tests
(Pilot Study)

SESAT	Experimental Tests		
	Word Iden- tification	Aural Cloze	Free Writing
Letters and Sounds	.056	.67*	.26
Aural Comprehension	-.24	.79**	-.003
Word Reading	.53	.44	.48
Sentence Reading	.63*	.274	.07

*p = .05

**p = .01

TABLE 3.2

Intercorrelations Among Experimental Tests
(Pilot Study)

	AC	FW
Word Identification Task	.65*	.37
Aural Cloze Task (AC)		.07

* $p \leq .05$

Differences were noted in the trends of responses in terms of lexical vocabulary and functional vocabulary; in addition, more words were identified when presented in oral context than when presented in isolation.

Based on the results of the pilot study, changes were made to the aural cloze test after the pilot study. One word was deleted, making the total number of responses 25. Several sentences were deleted, reduced or modified, making the final Aural Cloze Task a passage of 339 words.

The Treatments

In order to examine the qualitative and quantitative differences in children's responses to different reading programs representing different approaches to beginning reading instruction two published programs were used.

By Barr's (1975b) criteria, one treatment group, designated the experimental treatment group, was taught by the Open Court Reading Program, a program having a phonics-oriented approach stressing phonic synthesis during the initial stages of instruction with minimal sight word development. The other treatment group, designated the reference treatment group, was taught by the Macmillan Reading Program, a program having a more eclectic approach stressing sight word development and comprehension of stories during the initial stages of instruction, but included instruction in phonics and structural analysis. The subjects in each treatment group received instruction from their regular classroom teachers. Classroom teachers planned lessons by following the

format, lesson organization and content, reading materials, practice exercises, and other instructional suggestions recommended by the reading program used, as interpreted by the classroom teacher.

Eight months prior to instruction, first-grade teachers in the experimental group were instructed for one week in the methodology recommended for Open Court by consultants of the Open Court Publishing Company. During September and October of 1978, the investigator met with many superintendents and principals to explain the purpose and procedures of this study. Because of the vast geographical area, not all classroom teachers could be visited personally, and some communication and instructions were by letter.

The treatment groups received instruction from the regular classroom teacher for an average of one hundred to one hundred and twenty minutes per day, depending on the class schedule. Instruction occurred from September, 1978 to May, 1979, with routine planned and unplanned interruptions caused by school holidays, northern weather conditions, in-service training days for teachers and other conditions which may not have been similar among the classrooms.

The standardized pre-tests were administered to the sample between the dates October 20 and November 30, 1978, by the classroom teachers, under the best conditions locally possible. The standardized post-tests were administered to the sample between the dates May 1 and May 31, 1979, also by the classroom teachers. The additional performance tests were administered between May 9 and June 12, 1979, to a selected subsample, after the standardized testing program was completed.

The experimenter constructed and administered the additional

performance tests. Instructional materials were the Open Court and Macmillan reading programs and were used as the basis of instruction by the classroom teachers, the Open Court Program in the experimental group and the Macmillan Program in the reference group. Each treatment comprised the total reading component of the first-grade curriculum.

Instructional Materials

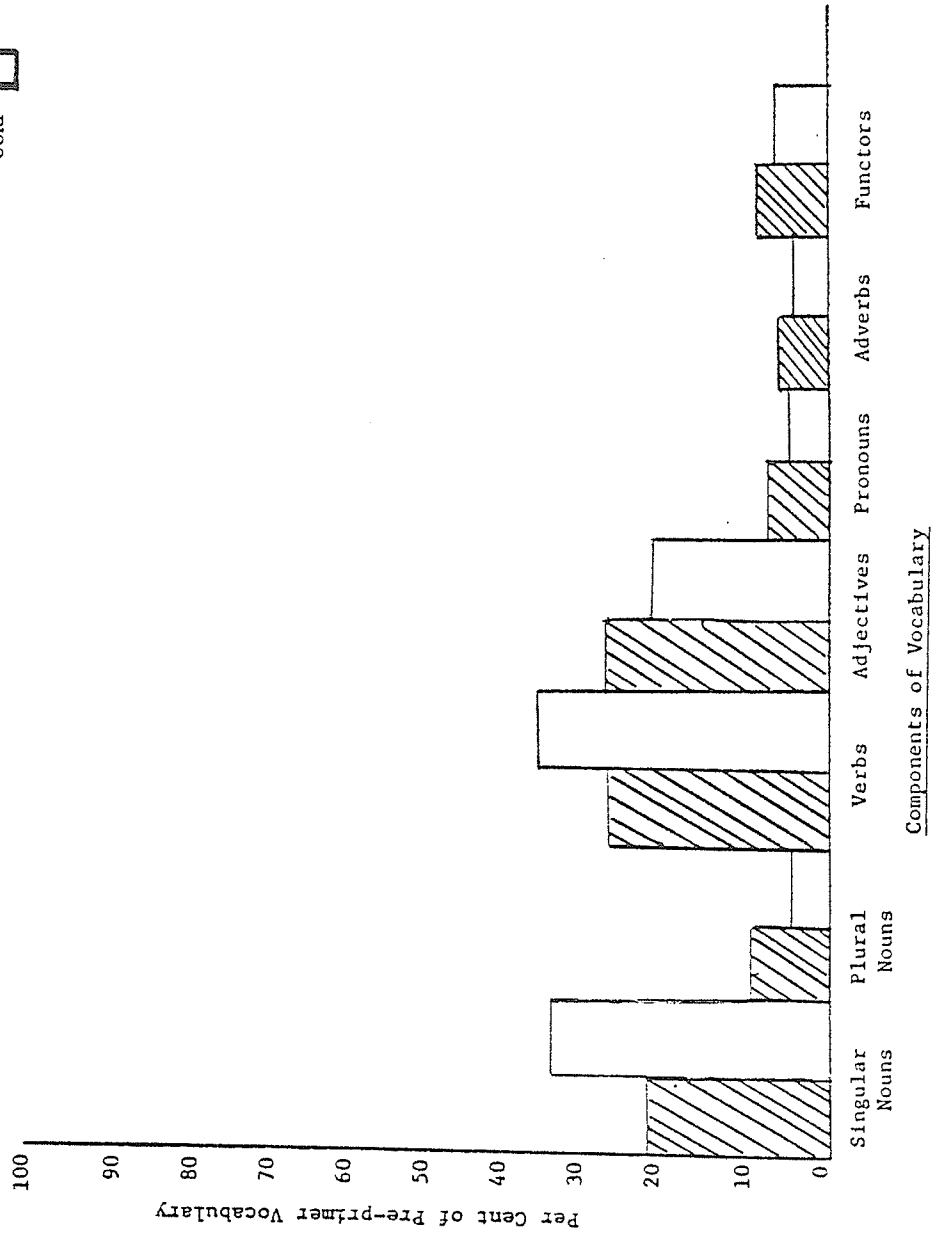
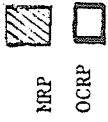
The reading materials, the stimulus for instruction including "... individual words in terms of graphophonemic regularity, length, aural referent; the word sample, in terms of number of words and their repetition; and the sentences, in terms of syntax and meaning" (Barr, 1975b), reflected two approaches to beginning reading instruction. A full analysis of instructional materials appears as Appendix A.

The experimental treatment used the Open Court Reading Program (Gurren, et. al., 1976) consisting of two reader-workbooks entitled Learning to Read and Write and Reading and Writing, with an accompanying Teacher's Guide to the Foundation Program 1 : 1. Instructional design centered around letters and sounds presented in isolation, in words, in poems, and with alternate forms of spelling introduced for some of the sounds (for example, long E: spelled e, ēē, ea, e_e). Letters were presented with diacritical markings, and were blended into a variety of words from which phonics words were to be learned inductively. To reinforce the sound-symbol relationships, the phonics rules, and the phonetically controlled vocabulary, pupils were given extensive printing exercises copying the letters, vocabulary, and sentences learned in the oral component of the lesson; the exercises appear in the Reader-workbooks.

A total of 55 lessons comprise the Foundation Program, or Pre-primer level, and recommended pacing is two lessons per week. Ten "Getting Acquainted Lessons," during which all 26 letters are introduced, begins the program. Letter-sound relationships and words are blended to form a small reading vocabulary. Once the vocabulary repertoire is sufficiently extensive (beginning with Lesson Six), small storybooks based on the phonetically controlled vocabulary are added to the program. Comprehension, to be developed through classroom discussion, is to be taught following the few comprehension questions, mostly open-ended, which appear in the teacher's manual. The content of the pre-primer Reader-workbooks contains a total of thirty stories, all fables. The present tense is used initially in the story text, until Lesson 20, when the story is completely in the past tense, continuing in this tense throughout the Reader-workbook. Direct speech is used infrequently in the stories, and sentences approximately two-thirds of the way into the program occasionally contain embedded clauses in the sentence structure. Recommended pacing is considered lively, with mastery not essential before new material is introduced.

The reference treatment used the Macmillan Reading Program, with the instructional design centered around a limited number of words, varying in length and pattern, systematically introduced and repeated frequently within the context of the stories presented in the reader. A vocabulary of 212 words comprises the pre-primer levels, containing phonetically regular and irregular words from the outset (See Figure 3.1).

Figure 3.1
Analysis of Vocabulary of the Two Reading Programs



The reference treatment consisted of the Macmillan Reading Program, specifically the three pre-primer levels denoted by the readers Opening Books, A Magic Box, and Things You See (Harris and Clark, 1968). Instructional design is centered around a limited number of words, varying in length and pattern, systematically introduced and repeated frequently within the context of the stories presented in the reader. A vocabulary of 212 words comprises the pre-primer levels, containing phonetically regular and irregular words from the outset. Comprehension is developed through detailed directed questioning, through the use of picture-context cues, phonic analysis extrapolated from the whole-words presented, and structural analysis. Story content is about children, their pets, and their parents in home and play situations, reflecting an urban setting. Syntax of the stories is largely quoted speech, using present tense in the speech phrases, and past tense in the reported phrases as illustrated by the example from A Magic Box, Page 33: "Mike said, 'I can get Velvet.'" (Harris and Clark, 1968). Sentences contain no embedded clauses throughout the pre-primer levels. Further analysis of the reading programs appears in Appendix A.

Lesson Format

The lesson format for the Open Court Program suggested by the Teacher's Guide To The Foundation Program (Hughes and others, 1976) consists of whole class introduction for sounds and words, followed by two or three guided printing exercises of the sounds and words learned. Group activities using phonic cards, alphabet materials, printing exercises, and story booklets are used.

The lesson format for the Macmillan program suggested by the Teacher's Annotated Edition and Guide (Harris and Clark, 1968) consists of a three-step format. First, the preparation stage, introducing background content, 76 concepts, and new vocabulary necessary for the story; second, silent and guided oral reading of the story; third, follow-up activities, pencil-and-paper activities, phonic, structural analysis, vocabulary, and enrichment activities from which the teacher can select according to the needs of the class.

Test Instruments

Standardized Test

The Stanford Early School Achievement Test, Level II (SESAT) (Madden and Gardner, 1971) was selected as the standardized measure suitable for the comparison of general reading achievement, stated as the first general question earlier in this chapter. Selection of a standardized test was appropriate in that it allows for a controlled assessment, identified as useful in wide assessment procedures such as comparing two modes of instruction in terms of general goals (Farr and Anastasiow, 1969).

The SESAT claims to be a suitable standardized measure for children with English as a second language, and whose educational progress is at a rate somewhat slower than the quoted norms. Although the SESAT contains six subtests, two were omitted as being irrelevant to the purposes of this study; these were the Mathematics and Environment subtests. Four remaining subtests included as measures in this study

were: 1) Letters and Sounds, 2) Aural Comprehension, 3) Word Reading, 4) Sentence Reading.

The SESAT, Level II reviewed by Cazden (1978) in the Eighth Mental Measurements Yearbook (Buros, 1978) is acknowledged as being satisfactory in terms of item analysis and standardization programs. Cazden notes that data is missing concerning the content validity of the measure, with serious reservations about the Environment subtest, which was omitted from this study. Cazden admits that the Letters and Sounds subtest contains traditional uncontroversial items and that the aural comprehension subtest measures orally such skills as memory, sequence, and inference. No specific criticism is offered about the Word Reading and Sentence Reading subtests. Reliability was satisfactory, although Cazden questions the attempt to provide interpretive support between the SESAT and the Otis-Lennon Mental Ability Test. The SESAT, specifically the four subtests selected for the purposes of this study, were therefore considered to be useful in contributing data about the general reading achievement of the first-grade subjects of this study.

Word Identification Task

Measuring the reading vocabulary of a person is useful in determining the general educational level of an individual (U.S. Department of Health and Welfare, 1974), and also the specific reading behavior of an individual. Persistent inaccuracy in word identification having been identified as a major stumbling block among poor readers (Roswell and Chall, 1957). As part of reading assessment, word lists have been

developed (Johnson, 1976; LaPray and Ross, 1969; Stone, 1956) and can be used to evaluate word recognition proficiency and to detect errors in the word analysis strategy of first graders (Barr, 1972; 1975a; 1975b).

In the present study, a selected subsample of subjects, two classrooms in the experimental treatment, and two classrooms in the reference treatment, were given a Word Identification Task as a post-test only measure in order to obtain an extended data base beyond standardized scores from which to compare the subjects' word identification abilities after experimental treatment. The Word Identification Task consisted of 25 randomly selected words from a total pool of 76 words common to the pre-primer levels of both the Open Court and the Macmillan Reading Programs, used as the instructional materials. The word list appears in Appendix B. Words were printed on 7.5 cm. by 12.5 cm. cards. Several general procedures were adopted in the administration of this test, further details of which appear under the heading The Pilot Study. Each subject was individually tested in as quiet an area as possible near, but separate from, the classroom. Each subject was given these general directions:

I have some cards. Each card has one word written on it. I want to see which words you can read. I will give you the cards, and you will read each word out loud one at a time. If you know the word, say it out loud. If you don't know the word, you can try to think what it is and take a guess. You can leave out a word if you don't know it. You can change your mind if you make a mistake, and you can change your word. I cannot help you. I cannot tell you if you are right or wrong.

Instructions were explained further if the child did not understand them.

No time limit was given to the subjects. Words for which there was no response the first time were presented again after the twenty-fifth card to give shy children a chance to overcome their hesitation at responding. Responses were recorded according to three criteria, correct response, no response, and the substitution uttered (Barr, 1972).

Aural Cloze Task

Johnson and Pearson (1978) report on research into the importance of format in the performance of children on meaning vocabulary tests. Several formats were used in the study: synonyms, cloze blanks, oral recognition. They found that children did not perform consistently well in each format, and may not "know" a word in one format when they had already "known" it in a previous format. For this reason, an additional test was developed in order to allow the subjects another format to demonstrate word knowledge.

Cloze tests have been recognized as reliable and valid measures of reading comprehension (Bormuth, 1967; Taylor, 1953). They have been used successfully on culturally disadvantaged beginning readers (Kingston and Weaver, 1970), first graders (Malicky, 1976; Weaver, 1977), and second-language learners (Aitken, 1977; Swain and others, 1976).

Oller and Conrad (1971) in a rationale for testing for ESL subjects support the cloze procedure because it measures integrative skills. The subject performs a task similar to what Native speakers do when sending and receiving messages. Therefore, Oller and Conrad consider cloze testing especially appropriate for revealing the reading

proficiency of ESL subjects.

Evidence exists to show that beginning readers use context during oral reading (Biemiller, 1970; Weber, 1970), and made approximately 90% of their oral reading errors semantically congruent to the preceding context, regardless of the reading ability of the child (Weber, 1970). There is additional evidence to indicate that poor readers, however, may be less successful in accessing the semantic features of words and may be less successful in using the semantic cueing system during reading. Samuels, Begy, and Chen (1976) found that poor readers were less successful than good readers in filling in spaces when presented with the stimulus phrase "black c___", indicating that semantic cues available during reading are not being used by poor readers.

It was found that the mode of presentation can influence the comprehension performance of poor readers, in that good and poor readers performed equally well on comprehension questions when the input was auditory, whereas poor readers performed less well in visual-input material.

Since poor readers perform better with auditory input material, and since beginning readers and second language readers are capable of making cloze responses, the aural cloze test format was selected as the one measure of semantic accessibility and comprehension of words already encountered in reading lessons.

Several problems in using the Aural Cloze Task were identified. Cloze itself can be a confusing experience for first-graders when faced

with the deletion of every nth word. The aural cloze procedure, where selected words are deleted without regular formula from a high interest passage has been suggested as appropriate for introducing primary students to the predictive, context-dependent response format required for the cloze task (Blachowicz, 1977).

In listening cloze or aural cloze format, the subject is not in control of the message, and must fill in the gaps as they occur without being able to wait for more information to help him. Pauses and gaps in the auditory input may affect his memory of what has already been heard. In a study of fifth-graders, identified as high and low comprehenders, given a free cloze, a restricted cloze, and a listening cloze test, poor comprehenders had less significant differences between the scores on the three test modes than did the better comprehenders, who did better on the free cloze test (Neville and Pugh, 1976). In order to overcome the problem of mutilated auditory input, and to overcome comprehension interference because of the second-language factor, the entire selection, without deletions, together with flannelboard figures as visual aids was presented to the class. In this way, the storyline was known before the cloze passage was administered. The procedures for administering the Aural Cloze Task are further described within the section The Pilot Study, earlier in this chapter.

Short sentence structures with deletion transformations typical of the fragmentary sentences in introductory reading materials are difficult for beginning readers to comprehend, having a greater effect on the comprehension performance than on word identification performance

of first-graders when comprehension was assessed by the cloze technique (Malicky, 1976). Younger readers, moreover, are less able to respond correctly in cloze tests where contextual constraint is weak (Deck, 1977; Froese, 1978). In order to compensate for lower scores being caused by deletion-produced sentence structures and low contextual constraint, two factors were built into the design of the aural cloze task. First, no deletion - produced transformations were used in the text. A grade one level readability score for the passage was measured by the Fry Readability Formula (1969). Second, the response availability was limited by using the maze technique as the response mode (Guthrie, Seifert, Burnham, and Caplan, 1974), a procedure which has been found to have reliability and to have merit as a tool for monitoring reading progress.

Therefore, in the present study, the aural cloze procedure, with a maze response format, was designed and used as a post-test only measure of comprehension for beginning readers. The aural cloze task, following the selected vocabulary deletion procedure for first-graders (Blachowicz, 1977) was based on a narrative legend, a genre suggested by Guthrie and Tyler (1978) as having a hierarchy of important ideas that, through reading and listening alike, require the kind of constructive psycholinguistic processing that comprehension depends on. The task consisted of a 339 word passage of which 25 words were deleted. The 25 deleted words were the same 25 words used in the Word Identification Task, administered individually. Although the deletions occurred selectively, there were not less than four words between blanks. The

first paragraph was left intact. The following directions were read:

Put your windows around the first box. I will tell you a little story. You must listen carefully. I will forget to say one of the words in the story. You must look on your paper and find the word I forgot to say. When you find the word, put a circle around it very quietly. Then move your window to the next box. Try to put the circle for every story.

Responses were made following the maze procedure, where in addition to the correct response, two words were provided according to Guthrie's (1974) criteria of distractors. Subjects received cardboard "windows" with openings of 5.5 cm. by 4 cm., in order to frame the responses and help the subjects attend to the correct place on the answer sheet. The passage for the aural cloze test was selected from a trade book, and rewritten to simplify the syntactic structure of the story. The passage was at the grade readability level as computed by the Fry Readability Formula (1969). The test passage and data on readability are presented in Appendix C.

The subjects completed the aural cloze task in one sitting, as a whole-class activity. No time limit was given for the task. Sentences were read orally by the investigator, and repeated as often as necessary for individual subjects. Before the aural cloze task, the entire story was read aloud to the children, with flannel board figures and props used as visual aids, in order that the subjects with English as a second language would have a chance to hear and see the whole story, unutilated, and to ask questions and discuss aspects of the story unfamiliar to them. Also, before the aural cloze task commenced, time was allowed for instructions and practice in completing aural cloze exercises.

Free Writing Task

Three features of children's writing have been noted. First, writing is a developmental skill (Stallard, 1977) that should be reinforced and extended by other areas of language arts (Bond, 1965). Second, reading performance develops, so does writing performance (Evanechko, Ollila, and Armstrong, 1974). Finally, as children mature, they can produce more words on any given subject (Hunt, 1966).

Research into writing development generally use third- (Loban, 1976), fourth- (Hunt, 1976), or sixth-graders (Evanechko, Ollila, and Armstrong, 1974) in investigations into writing development. Writing is a surface production of language, dependent on the child's facility in manipulating in a reflective, conscious way, linguistic structures, and operational structures of the language (Perron, 1978) from simple to complex sentences. It involves different demands on the child's cognitive structures than speaking.

Free writing "...on whatever topic the children happened to be concerned with in the normal course of their schoolwork" (Hunt, 1977) was generally the format used to elicit the writing sample from the subjects. Hunt (1977) did not influence the subject matter or style of writing; however, in this study, because of the age of the pupils, the subject matter was provided.

The subjects were given a picture stimulus (presented in Appendix D), with the main characters of the legend used in the aural cloze task represented in the picture. Eight lines, 1.5 cm. apart, were drawn under the picture. The subjects were told to write a story about the

main characters in the story. No additional assistance was given concerning style, content, vocabulary, format, sentence structure, or other writing conventions. Initial spelling help was given by three words printed on the chalkboard and by additional words printed on request from individual subjects. Twenty minutes were given to complete the writing task. Further procedures are detailed earlier in this chapter under the heading The Pilot Study.

Analysis of the Data

In order to assess the effect of independent variables on achievement, a number of different analyses were carried out. The SESAT scores were subjected to a completely crossed three-way (2x3x2) analysis of variance with repeated measures with two between subjects variables (Program and ability) and one within subjects variable (test time). It was decided that if significant differences were observed for treatment groups prior to instruction that a two-way (2x3) analyzing covariance would be completed on SESAT data.

Covariates for each post-test score were the corresponding pre-test scores.

In addition, because the three non-standardized measures were administered as post-instruction measures only, subjects' scores were analyzed employing a completely crossed two-way (2x3) analysis of covariate for the Aural Cloze Task was the auditorily comprehensive pre-test score; the covariate for the Word Identification Task was the Word Reading pre-test score; and the covariate for the Free Writing Task was the total score for SESAT pre-test time.

When the analyses of variance or covariance indicated significant effects for ability, multiple t-tests employing the Tukey procedures and criterion of significance were applied to the data to clarify results.

In order to judge significance for all analyses, criterion was set at $\alpha \leq .05$.

Responses on the Word Identification Task were analyzed using Barr's (1975a) criteria of qualitative differences in the frequency of graphic similarity of the responses to the target word, and in the frequency of real words as responses.

Hypotheses

The four general questions posed in this study will be presented with their specific hypotheses.

For the Sample. Question 1: Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a differential effect on the reading achievement of first-grade pupils within high, middle, and low reading ability groups, based on the total raw score and four selected sub-tests of SESAT?

Hypothesis 1.1. There is no significant difference between first-graders, identified as having high, middle, or low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their raw scores or four selected sub-tests of SESAT.

Hypothesis 1.2. There is no significant difference between

first-graders, identified as having high, middle, or low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their scores in the Letters and Sounds subtest of SESAT.

Hypothesis 1.3. There is no significant difference between first-graders, identified as having high, middle, or low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their scores on the Aural Comprehension Subtest of SESAT.

Hypothesis 1.4. There is no significant difference between first-graders, identified as having high, middle, or low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their scores on the Word Reading subtest of SESAT.

Hypothesis 1.5. There is no significant difference between first-graders, identified as having high, middle, or low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their scores on the Sentence Reading subtest of SESAT.

For the Subsample. Question 2: Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a differential effect on the word identification performance of first-grade pupils within high, middle, and low ability groups, based on the raw score obtained on the Word Identification Task?

Hypothesis 2.1. There is no significant difference between first-graders, identified as having high, middle, and low reading

ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their raw scores on the Word Identification Task.

Question 3: Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a differential effect on the aural comprehension performance of first-grade pupils with high, middle, and low ability groups, based on the raw score obtained on the Aural Cloze Task?

Hypothesis 3.1. There is no significant difference between first-graders, identified as having high, middle, and low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by their raw scores on the Aural Cloze Task.

Question 4: Does instruction using either the Open Court Reading Program or the Macmillan Reading Program have a differential effect on the aural comprehension performance of first-grade pupils with high, middle, and low ability groups, based on the number of words written on the Free Writing Sample?

Hypothesis 4.1. There is no significant difference between first-graders, identified as having high, middle, and low reading ability, taught by the Open Court Reading Program and the Macmillan Reading Program when compared by the number of words written on the Free Writing Sample.

Qualitative Analysis

Further qualitative analysis was performed on the data in order

to determine further possible treatment effects. Responses on the Word Identification Task were examined in order to find out if treatment effects qualitatively influenced the responses.

Summary

This chapter identified the subjects that comprised the sample for this study and described the instructional materials and procedures. The test instruments were described, and a pilot study conducted to evaluate the testing and data collection procedures was discussed. The design of the study, methods of data analysis, and hypothesis were presented.

The statistical analysis and findings will be presented in Chapter 4.

Chapter 4

ANALYSES AND FINDINGS

Chapter 4 contains a review of the design and procedures of the study, a description of the analysis of the data, and a discussion of the findings for each specific hypothesis.

The purpose of the study was to assess the effects of two programs of beginning reading instruction on subtests of a standardized reading achievement test, and on experimental tests labelled Word Identification Task, Aural Cloze Task, and Free Writing Task.

The subjects in this study were 159 first-graders who were assigned to two groups - one treatment group (N=122) and one reference group (N=37). The subjects in the treatment group were taught by the Open Court Program; the subjects in the reference group were taught by the Macmillan Reading Program. Instruction was performed by the regular classroom teacher throughout the entire school year.

Reading achievement was measured by four selected subtests of the Stanford Early School Achievement Test or SESAT (Madden and Gardner, 1971), which were administered as pre-tests and as post-tests.

For the sub-sample, three further language measures were administered as post-tests only. The Word Identification Task constructed with selected words common to both reading programs measured word identification proficiency. The Aural Cloze Task constructed with selected word deletions using the same vocabulary items as the Word

Identification Task measure aural comprehension proficiency.

The Free Writing Task, in which the subject was asked to write independently on a topic introduced by the Aural Cloze Task, measured the extent the child was developing independent writing.

It was hypothesized that after treatment no differences attributable to the reading program used would be found in the reading achievement of students identified as having high, middle, and low reading ability when compared by their pre-test scores on the SESAT.

It was further hypothesized that after treatment no differences attributable to the reading program used would be found in the Word Identification Task, Aural Cloze Task or Free Writing Task when the scores of students identified as having high, middle, and low ability were compared.

The analysis procedures and findings will be presented under three main headings: Standardized Scores, Non-Standardized Measures, and Qualitative Analysis.

STANDARDIZED SCORES

The five standardized scores, sum of the raw scores of the four sub-tests (total score), and the raw scores of the following sub-tests were analyzed separately: a) Letters and Sounds, b) Aural Comprehension, c) Word Reading, d) Sentence Reading. Initially, a 2x3x2 analysis of variance with repeated measures (the scores at pre-test and post-test times) was performed for the total raw score using the BMDP 2V program (Dixon, 1975) in order to determine if subjects varied significantly

within and between reading programs at either test time. The between-subjects variables were Program and Reading Ability. The first factor, Program, consisted of two programs, the Open Court and the Macmillan Reading Programs. The second factor, reading ability, consisted of three levels of reading ability labelled high, middle, and low. To control statistically for any differences in performance on the post-test standardized measures which might have confounded the differences between treatment groups, subsequent analyses were performed using the pre-test standardized scores as covariates. A 2x3 analysis of covariance was performed for each of the five standardized post-test scores using the BMDP2V program (Dixon, 1975). The independent or between-subjects factors were the same as those identified in the initial analysis of variance. Post hoc analyses using the formula for the Tukey (1953) criterion of significance were applied to the data to further clarify results.

Total SESAT Score

In analyzing the results of the SESAT total post-test score, the main question being considered was whether there would be differences between ability groups in their performance on the SESAT standardized measure. The null hypothesis formulated relating to this question appears below, followed by the results and analysis of the data.

Hypothesis 1.1. There were no significant differences between the Open Court Reading Program and the Macmillan Reading Program when first graders identified as having high, middle, and low reading ability were compared on their total SESAT post-test scores.

In Table 4.1 the group means on the post-test SESAT total scores are reported together with the means adjusted on the basis of the covariate (pre-test scores).

A comparison of the means of the total score of SESAT at the post-test for each ability group showed that though not significant, the Macmillan Reading Program had higher mean scores at post-test time than the Open Court Reading Program when each ability group was considered separately. The mean score for the high ability group in the Macmillan program was 142.76, and was the highest mean score on the post-test. The mean scores for the middle ability group in the Macmillan program was 117.50, higher than the mean score of 108.44 obtained by the middle Open Court Program group. The low ability group in the Macmillan program had a mean score at the post-test of 90.50, similar to the 90.25 score for the low Open Court group.

The high ability Macmillan group was also found to have had the highest mean on the SESAT total score on the pre-test. Their mean score was 122.04, as compared to 108.17 for the high ability Open Court group. The pre-test mean of the middle ability Macmillan group was 83.88, similar to the pre-test mean of 81.40 for the middle ability Open Court group. The pre-test mean of the low ability Macmillan group was 49.50, compared to 59.87, the pre-test mean of the low ability Open Court group. A three-way analysis of variance with repeated measures (reading program x reading ability x gain) was computed on the total raw scores of SESAT (Table 4.2). For the first factor, reading program, $F_{1,153}$ was 2.37, $p < .05$; therefore the main effect of reading programs was not considered

Table 4.1

Mean Scores for the Two Reading Programs on the Total
Score of the Stanford Early School Achievement
Test Before and After Covariate Adjustment

Program	Reading Ability	Covariate Pretest	Post-test Means	Adjusted Means
Open Court	High	108.17	134.90	119.79
	Middle	81.40	108.44	111.42
	Low	59.87	90.25	107.76
Macmillan	High	122.04	142.76	118.29
	Middle	83.88	117.50	118.80
	Low	49.50	90.50	115.01

Table 4.2
 Analysis of Variance of the Total Score of SESAT
 at Pre-test and Post-test Times

Source	SS	df	MS	F	P
Between					
Program (P)	544.17	1	544.17	2.37	.1255
Ability (A)	80849.30	2	40424.65	176.33	.000 *
P x A	1501.44	2	750.92	3.27	.041 *
1. Error	35076.44	153	229.26		
Within					
Gain (G)	32757.43	1	32757.43	335.54	.000 *
G x P	127.16	1	127.16	1.30	.256
G x A	991.84	2	495.92	5.08	.007 *
G x P x A	601.31	2	300.65	3.08	.049 *
2. Error	14936.90	153	97.63		

* $p \leq .05$

to be significant. For the second factor, reading ability, the $F_{2, 153}$ was 176.33, $p < .05$, therefore the main effect of reading ability was considered to be significant. For the factor of gain, a comparison of pre-test - post-test difference in total score of SESAT, $F_{1, 153}$ was 335.54, $p < .05$, a significant main effect.

A two-way interaction between gain and reading program ($F_{1, 153} = 1.30$, $p = .26$) was not statistically significant. A two-way interaction between gain and reading ability ($F_{2, 153} = 5.08$, $p = .007$) was statistically significant.

A three-way interaction among the factors of reading program, reading ability and gain ($F_{2, 153} = 3.08$, $p = .049$) was statistically significant.

In order to locate the significant differences, post hoc multiple comparisons were made using the Tukey (1953) procedure. For the factor of gain, all three ability groups in each of the two programs obtained a t value beyond the critical value of $q_{2, 153} = 1.96$, significant at the .05 level of probability (Table 4.3).

Examination of the summary table of multiple t -test comparisons (Table 4.4) for the factor of ability reveals that for both programs comparisons of the scores obtained by ability groups all exceeded the critical value of $q_{3, 296} = 2.34$, therefore being significant at the .05 level of probability. In the Open Court group, the mean score obtained by the high group compared to scores obtained by the middle and low groups compared to the scores obtained by the low group were significantly different. Results of these comparisons were the same for the Macmillan program. Multiple comparisons of the group means for the factor of

Table 4.3

Summary of Multiple t-test Comparisons of the

Pre and Post Test Means for SESAT Total Score ANOVA

Program	Ability	k	df	MS	Critical Value of q	Actual Value of t	Signif.
Open Court	High	2	153	97.63	1.96	10.48	*
	Middle	2	153	97.63	1.96	13.00	*
	Low	2	153	97.63	1.96	15.58	*
Macmillan	High	2	153	97.63	1.96	7.43	*
	Middle	2	153	97.63	1.96	6.81	*
	Low	2	153	97.63	1.96	5.87	*

* p = .05

Table 4.4

Summary of Pair-Wise Multiple t-test Comparisons
of Ability Group Means for ANOVA

Reading Program	Test Time	Ability	k	df pooled	MS pooled	Critical Value of q	Actual Value of t	Signif.
Open Court	pre	(H vs M)	3	263.30	163.44	2.34	9.36	*
		(H vs L)	3	263.30	163.44	2.34	16.89	*
		(M vs L)	3	263.30	163.44	2.34	8.41	*
	post	(H vs M)	3	263.30	163.44	2.34	9.25	*
		(H vs L)	3	263.30	163.44	2.34	15.60	*
		(M vs L)	3	263.30	163.44	2.34	7.10	*
Macmillan	pre	(H vs M)	3	263.30	163.44	2.34	7.35	*
		(H vs L)	3	263.30	163.44	2.34	10.54	*
		(M vs L)	3	263.30	163.44	2.34	4.39	*
	post	(H vs M)	3	263.30	163.44	2.34	4.86	*
		(H vs L)	3	263.30	163.44	2.34	7.60	*
		(M vs L)	3	263.30	163.44	2.34	3.45	*

H = High; M = Middle; L = Low. * $p = .05$

Program (Table 4.5) were computed using the Tukey criterion of significance for which the critical value was $q_{2,263.30} = 1.96$, $p = .05$. Comparison of the high ability groups on the two reading programs at pre-test time showed an actual value of $t = 4.10$, $p = .05$. This indicated that the high ability groups in each program were significantly different prior to the treatment. Comparisons of the middle ability groups in each program indicated no significant differences between the groups before treatment. Comparisons of the low ability groups in each program indicated no significant differences between the groups before treatment. In order to control for the significant differences in reading ability between programs, all post-test mean scores of the standardized test were adjusted using the pre-test scores as covariates.

Inspection of the adjusted means in Table 4.1 revealed that the differences among groups had been reduced, and the adjusted mean for the high ability Open Court group was 119.79, now higher than the adjusted mean 118.29 for the high ability Macmillan group. The adjusted mean of the middle ability Macmillan group was 118.80, higher than 111.42, the mean of the middle Open Court group, and was slightly higher than 118.29, the adjusted mean of the high ability Macmillan group. The adjusted mean of the low Macmillan group was 115.01, higher than the adjusted mean of 107.76 for the low Open Court group.

In the analysis of covariance (Table 4.6), reading program, ($F_{1,152} = 1.87$, $p = .17$) was not statistically significant. For the second factor, reading ability, ($F_{2,152} = .49$, $p = .62$) was not statistically significant. The interaction between program and ability

Table 4.5

Summary of Multiple t-test Comparisons of
Program Group Means for ANOVA

Reading Ability	Test Time	k	df pooled	MS pooled	Critical Value of q	Actual Value of t	Signif.
High	pre	2	263.30	163.44	1.96	4.10	*
	post	2	263.30	163.44	1.96	2.33	*
Middle	pre	2	263.30	163.44	1.96	.51	
	post	2	263.30	163.44	1.96	1.86	
Low	pre	2	263.30	163.44	1.96	1.56	
	post	2	263.30	163.44	1.96	.036	

* p = .05

Table 4.6
 Analysis of Covariance for Total SESAT Means

Source	SS	df	MS	F	P
Program (P)	348.53	1	348.53	1.87	.17
Ability (AP)	180.66	2	90.33	.49	.62
P x A	422.68	2	211.34	1.14	.32
Covariate	6800.35	1	6800.35	36.52	.000 *
Error	28301.95	152	186.20		

* $p \leq .05$

($F_{2,132} = 1.14, p = .32$) was not found to be statistically significant.

The null hypothesis 1.1 was accepted. On the basis of total results of SESAT at post-test times, no significant differences were found between the two reading programs. There were no significant differences on post-test results between similar reading ability groups on the total SESAT score.

Letters and Sounds Subtest
of SESAT

Hypothesis 1.2. There were no significant differences between the Open Court Reading Program and the Macmillan Reading Program when subjects identified as having high, middle, and low reading ability were compared by their scores on the Letters and Sounds sub-test of SESAT.

In Table 4.7 the means at post-test time for the high ability group within the Open Court Program was 38.07, and for the high ability group within the Macmillan Program was 37.88. The means at post-test time for the middle ability group in the Open Court Program was 34.18 and in the Macmillan program the mean at post-test time was 35.88. The means for the low ability group in the Open Court Program was 27.98 and in the Macmillan program was 28.00, a marginal difference.

In this sub-test, the pre-test mean obtained by the Open Court high ability group was 35.63 and the mean obtained by the Macmillan high ability group was 33.28. The middle Macmillan group obtained a mean of 28.50 on the pre-test, higher than the mean of 27.16 obtained by the middle Open Court group. The low Open Court group obtained a mean score of 20.28 on the pre-test and the low Macmillan group obtained a

Table 4.7
 Mean Scores for the Two Reading Programs on
 Letters and Sounds Subtest of SESAT
 Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Pretest	Post-test Means	Adjusted Means
Open Court	High	35.63	38.07	34.56
	Middle	27.16	34.18	34.31
	Low	20.28	27.98	31.06
Macmillan	High	33.28	37.88	35.39
	Middle	28.50	35.88	35.43
	Low	15.75	28.00	33.03

mean of 15.75.

In the analysis of covariance (Table 4.8), the factor of reading program ($F_{1,152} = 1.40$, $p = .24$) was not considered to be significant. The factor of reading ability ($F_{2,152} = 1.35$, $p = .26$) was not considered to be statistically significant. Interaction between program and reading ability ($F_{2,152} = .09$, $p = .92$) was not statistically significant.

The null hypothesis 1.2 is accepted. Based on covariate analysis of the post-test results of the Letters and Sounds sub-test of SESAT, there were no significant differences found for the factor of reading program. There were no significant differences among ability groups on the post-test scores of the Letters and Sounds sub-test. There was no significant interaction effect between the factors of program and ability on the Letters and Sounds sub-test of SESAT.

Aural Comprehension Sub-Test of SESAT

Hypothesis 1.3. There is no significant difference between the Open Court Reading Program and the Macmillan Reading Program in the scores obtained by subjects identified as having high, middle, or low reading ability when comparing their scores on the Aural Comprehension sub-test of the SESAT.

The means for the Aural Comprehension sub-test of SESAT at post-test time, together with the covariate pre-test means and adjusted post-test means are presented in Table 4.9.

Inspection of the post-test means of the Aural Comprehension sub-test shows that the high ability Macmillan group has a mean of 22.80

Table 4.8
 Analysis of Covariance of the Means on the
 Letters and Sounds Subtest of SESAT

Source	SS	df	MS	F	P
Program (P)	30.32	1	30.32	1.40	.24
Ability (A)	58.35	2	29.18	1.35	.26
P x A	3.78	2	1.19	.09	.92
Covariate	487.91	1	487.91	22.49	.000*
Error	3297.02	152	21.69		

* $p \leq .05$

Table 4.9
 Mean Scores for the Two Reading Programs on the
 Aural Comprehension Subtest of SESAT
 Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Pre-test	Post-test Means	Adjusted Means
Open Court	High	16.17	18.33	16.34
	Middle	12.24	13.93	14.66
	Low	9.28	12.11	14.89
Macmillan	High	20.08	22.80	18.10
	Middle	14.75	17.13	16.12
	Low	5.50	10.75	16.15

as compared to 18.33 obtained by the high ability Open Court group. The middle ability Macmillan group obtained a mean of 17.13, higher than the 13.93 mean score obtained by the high ability Open Court group. The low Open Court group obtained a post-test mean of 12.11 which was higher than the mean of 10.75 obtained by the low ability Macmillan group.

Again, using the BMDP 2V program (Dixon, 1975) a 2x3 analysis of covariance (reading program x reading ability) was performed on the post-test means with the pre-test means being used as the covariate. Results of the analysis of covariance appear in Table 4.10.

No significant main effect was obtained for the factor of reading program ($F_{1,152} = 3.26, p = .07$). No significant main effect was obtained for the factor of reading ability $F_{2,152} = 2.09, p = .13$). No significant interaction between program and ability was revealed ($F_{2,152} = .03, p = .97$).

The null hypothesis 1.3 is accepted. Based on the analysis of covariance performed on the post-test scores of the Aural Comprehension sub-test, there were no significant differences found between the two reading programs. Nor were there any significant differences found between ability groups on their post-test scores on the Aural Comprehension sub-test. There was no significant interaction effect between the factors of program and ability on the Aural Comprehension sub-test.

Word Reading Sub-Test
of SESAT

Hypothesis 1.4. There were no significant differences between

Table 4.10
 Analysis of Covariance of the Scores on the
 Aural Comprehension Subtest of SESAT

Source	SS	df	MS	F	P
Program (P)	40.34	1	40.34	3.26	.07
Ability (A)	51.61	2	25.82	2.09	.13
P x A	0.84	2	.42	.03	.97
Covariate	851.10	1	851.10	68.87	.00*
Error	1878.46	152	12.36		

* $p \leq .05$

the Open Court Reading Program and the Macmillan Reading Program when subjects identified as having high, middle, or low reading ability were compared by their scores on the Word Reading sub-test.

The post-test means of the Word Reading sub-test are reported in Table 4.11 together with the pre-test means used as the covariate and the adjusted means after covariance. Examination of the post-test means shows that the post-test means of the high, middle, and low ability groups in the Open Court Reading Program are higher than the respective scores in the Macmillan Reading Program. The same observation can also be made of the pre-test means, where each of the three ability groups in the Open Court Reading Program obtained mean scores which were higher than the corresponding ability group in the Macmillan Reading Program.

A 2x3 analysis of covariance (reading program x reading ability) was performed on the post-test means using the pre-test means as the covariate. Results of the analysis of covariance are reported in Table 4.12. The factor of reading program ($F_{1,152} = .10, p = .75$) was not found to be significant. The factor of reading ability ($F_{2,152} = 2.39; p = .10$) was not found to be statistically significant. No interaction between program and ability ($F_{2,152} = 1.00, p = .37$) was statistically significant.

The null hypothesis 1.4 is accepted. After analysis of covariance of the post-test scores of the Word Reading sub-test of SESAT, no significant differences were found for the factor of reading program. Also, no significant differences were found for the factor of reading ability, although the results approached significance. There was no significant

Table 4.11
 Mean Scores for the Two Reading Programs on the
 Word Reading Subtest of SESAT
 Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Pre-test	Post-test Means	Adjusted Means
Open Court	High	42.23	52.63	46.59
	Middle	31.42	45.93	46.12
	Low	20.94	36.09	42.30
Macmillan	High	43.88	51.84	44.85
	Middle	27.00	45.75	48.47
	Low	17.25	34.75	43.09

Table 4.12
 Analysis of Covariance of the Scores on the
 Word Reading Subtest of SESAT

Source	SS	df	MS	F	P
Program (P)	3.96	1	3.96	.10	.75
Ability (A)	185.95	2	93.98	2.39	.10
P x A	77.53	2	38.76	1.00	.37
Covariate	1637.46	1	1637.46	42.09	.00 *
Error	5913.58	152	38.91		

* $p \leq .05$

interaction effect between the two factors of program and ability on the Word Reading Sub-test.

Sentence Reading Sub-Test
of SESAT

Hypothesis 1.5. There was no significant difference between the Open Court Reading Program and the Macmillan Reading Program when subjects identified as having high, middle, and low reading ability were compared by their scores on the Sentence Reading sub-test of SESAT. The means for the Sentence Reading sub-test at post-test time are presented in Table 4.13, together with the pre-test means and the adjusted means.

The high ability group in the Macmillan Reading Program obtained a mean of 29.44, and the high ability group in the Open Court Reading Program obtained a mean of 25.87. The middle ability group in the Macmillan Program obtained a mean of 18.75 and the middle ability group in the Open Court Reading Program obtained a mean of 15.42. The low ability group in the Macmillan Reading Program obtained a mean of 12.25, and the low ability group in the Open Court Reading Program obtained a mean of 13.72. However, at the pre-test time in all three ability groups the Macmillan Reading Program had greater mean scores than those obtained by the corresponding ability groups of the Open Court Reading Program.

A 2x3 analysis of covariance (reading program x reading ability) was performed on the post-test means of SESAT using the pre-test means as covariate. Results of the analysis of covariance are reported in Table 4.14.

Table 4.13
 Mean Scores for the Two Reading Programs on the
 Sentence Reading Subtest of SESAT
 Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Pre-test	Post-test Means	Adjusted Means
Open Court	High	14.13	25.87	25.71
	Middle	10.36	15.42	15.92
	Low	9.38	13.72	14.39
Macmillan	High	24.80	29.44	27.42
	Middle	13.25	18.75	18.74
	Low	11.00	12.25	12.64

Table 4.14
 Analysis of Covariance of the Scores on the
 Sentence Reading Subtest of SESAT

Source	SS	df	MS	F	P
Program (P)	14.34	1	14.34	.46	.50
Ability (A)	2111.60	2	1055.80	33.69	.00 *
P x A	51.28	2	25.64	.82	.44
Covariate	153.07	1	153.07	4.92	.03 *
Error	4725.19	152	31.09		

* $p \leq .05$

No significant main effect was found for the factor of reading program ($F_{1,152} = .46$, $p = .50$). A significant main effect was found for the factor of reading ability ($F_{2,152} = 33.69$, $p < .001$). No interaction between program and ability was found to be significant ($F_{2,152} = .82$, $p = .44$).

Multiple comparisons were computed in an effort to identify the source of the significant main effect found for the factor of reading ability (Table 4.15). A comparison of the scores of the high ability group and the middle ability group indicated that the actual value of t was 5.85, therefore a significant difference was found between the post-test scores of the high ability group when compared to the middle ability group. A comparison of the mean scores of the high ability group and the low ability group yielded a value of $t = 5.63$ which indicated a significant difference between the mean scores of the groups. However, for the comparison of the mean scores of the middle and low groups, the actual value of t was 1.15 which indicated no significant difference between the post-test scores of the middle and low groups on the Sentence Reading sub-test.

The null hypothesis 1.3 was partially accepted. For the factor of reading program no significant differences were found. However, the high ability groups achieved a significantly different mean post-test score when compared to the post-test mean scores of the middle and low ability groups. No interaction effect between the two factors (program x ability) was noted.

Table 4.15

Multiple Comparisons of Adjusted Ability Group Means
on the Sentence Reading Subtest of SESAT, Collapsed over the Program Factor

Reading Ability	k	df	MS	Critical Value of q	Actual Value of t	Signif.
High vs Middle	3	152	85.18	2.34	5.85	*
High vs Low	3	152	85.18	2.34	5.63	*
Middle vs Low	3	152	85.18	2.34	1.15	

* p = .05

NON-STANDARDIZED MEASURES

Word Identification Task

Hypothesis 2.1. There was no significant difference between the Open Court Reading Program and the Macmillan Reading Program when children identified as having high, middle, and low reading ability were compared by their scores on the Word Identification Task.

The experimental Word Identification Task was administered as a post-test only. In order that the score on the Word Identification Task could be analyzed by covariance, an appropriate covariate was selected. The Word Reading sub-test of SESAT was selected as the appropriate covariate for the following reasons:

1. The Word Reading sub-test correlated significantly with the Word Identification Task at the pre - ($r = .69, p \leq .01$) and at the post - ($r = .86, p \leq .01$) test times.

2. The Word Reading sub-test measures word knowledge and is similar in nature to the purpose of the Word Identification Task.

The mean scores on the Word Identification Task are reported in Table 4.16. The high ability Open Court group obtained a mean score of 17.50 and the high ability Macmillan group obtained a mean score of 17.82. The middle ability Open Court group obtained a mean score of 13.38 and the middle ability Macmillan group obtained a mean of 16.29. The low ability Open Court group obtained a mean score of 6.25 and the low ability Macmillan group obtained a mean of 12.00. A 2x3 analysis of covariance (reading program x reading ability) computed using the

Table 4.16
 Mean Scores of the Word Identification Task
 Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Pre-test	Means of Word Identification Task	Adjusted Means
Open Court	High	41.00	17.50	14.21
	Middle	31.88	13.38	13.56
	Low	18.75	6.25	11.43
Macmillan	High	43.76	17.82	13.48
	Middle	28.00	16.29	17.95
	Low	17.00	12.00	17.85

BMDP 2V program (Dixon, 1975) with the pre - test mean scores on the Word Reading sub - test as the covariate. Results of the analysis appear as Table 4.17. The first factor, reading program, ($F_{1, 43} = 3.48, p = .07$) approached significance, but was insufficient to confirm a main effect, indicating no difference in word identification proficiency attributable to reading program. The second factor, reading ability, ($F_{2, 43} = .42, p = .66$) was not statistically significant, indicating no main effect for reading ability. No significant interaction ($F_{2, 43} = .39, p = .26$) was revealed between program and ability.

Hypothesis 2.1 was accepted. No significant main effects were found for the factors reading program or reading ability, nor was a significant interaction between these factors revealed by the Word Identification Task.

Aural Cloze Task

Hypothesis 3.1. There was no significant difference between the Open Court Reading Program and the Macmillan Reading Program when children identified as having high, middle, and low reading ability were compared by their scores on the Aural Cloze Task.

Because the Aural Cloze Task was administered as a post-test only, an appropriate covariate was selected from among the pre-test standardized scores. The Aural Comprehension score with a correlation of .42 ($p \leq .01$) at the pre-test time and .63 ($p \leq .01$) at the post-test

Table 4.17
 Analysis of Covariance of the Mean Scores
 of the Word Identification Task

Source	SS	df	MS	F	P
Program (P)	87.1	1	87.1	3.48	.07
Ability (A)	21.02	2	10.51	.42	.66
P x A	69.72	2	34.86	1.39	.26
Covariate	246.06	1	246.06	9.84	.00 *
Error	107.96	43	25.00		

* $p \leq .05$

time was considered an appropriate covariate. Also, the Aural Comprehension sub-test was chosen because it claimed to measure the comprehension of text presented aurally, a task conceptually similar to the Aural Cloze Task.

The mean scores obtained on the Aural Cloze Task, the selected covariate scores, and adjusted mean scores after covariance appear as Table 4.18. For the Aural Cloze Task, the mean score of the high ability Open Court group was 22.00 whereas the mean score was 16.53 for the high ability Macmillan group. A wide range in the mean scores of the middle ability groups was noted. The middle Open Court group obtained a mean score of 9.00, compared to the middle ability Macmillan group which obtained 18.33 as a mean score. The low ability Open Court group obtained 8.00 as a mean score compared to the low ability Macmillan group which obtained a mean score of 10.00 for the Aural Cloze Task.

A 2x3 analysis of covariance (reading program x reading ability) was computed for the post-test means of the Aural Cloze Task using the pre-test mean score obtained on the Aural Comprehension sub-test of SESAT as the covariate. The analysis appears as Table 4.19.

The first factor, reading program ($F_{1, 42} = 2.20, p = .15$) was not statistically significant, indicating no significant main effect for the factor reading program. The second factor, reading ability ($F_{2, 42} = 8.53, p < .001$) was statistically significant, confirming a main effect for reading ability. An interaction between the factors reading program and reading ability ($F_{2, 42} = 8.08, p < .001$) was revealed to be statistically significant.

Table 4.18

The Mean Scores of the Aural Cloze Task
Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Pre-test	Means of Aural Cloze Task	Adjusted Means
Open Court	High	14.00	22.00	22.03
	Middle	9.50	9.00	7.86
	Low	8.25	8.00	6.54
Macmillan	High	20.82	16.53	18.33
	Middle	14.33	18.33	18.45
	Low	4.50	10.00	7.56

Table 4.19
 Analysis of Covariance of the Mean Scores
 of the Aural Cloze Task

Source	SS	df	MS	F	P
Program (P)	47.47	1	47.47	2.20	.15
Ability (A)	368.28	2	184.14	8.53	.00 *
P x A	349.01	2	174.50	8.08	.00 *
Covariate	30.92	1	30.92	1.43	.24
Error	9061.65	42	21.59		

* $p \leq .05$

Multiple comparisons using the Tukey (1953) criterion of significance were computed for the factor of reading program within reading ability, and the results appear as Table 4.20. No significant difference was found between reading program within the high ability groups. A significant difference was found between the reading programs for the middle ability groups, indicating the Macmillan middle reading ability group mean of 18.33 was significantly higher than the group mean of 9.00 in the Open Court middle ability group. Differences between reading programs for the low ability groups were not found to be significant.

Similar multiple comparisons were computed for the reading ability factor within reading program. The results appear in Table 4.21. Within the Open Court Reading Program the mean score obtained by the high ability group was significantly higher than the mean score obtained by the middle ability group. The mean score obtained by the high ability group was also significantly higher than the mean score obtained by the low ability group. No significant difference was found between the mean scores obtained by the middle and low groups within the Open Court Reading Program.

Within the Macmillan Reading Program no significant difference was found between the means obtained by the high and middle ability groups. A significant difference was found between the means of the high and middle ability groups, and between the middle and low ability groups within the Macmillan Reading Program.

Table 4.20

Summary of Multiple Comparisons of Adjusted Program Group Means on the

Aural Cloze Task

Reading Ability	k	df	MS	Critical Value of q	Actual Value of t	Signif.
High	2	42	28.71	2.02	1.76	
Middle	2	42	28.71	2.02	2.72	*
Low	2	42	28.71	2.02	.19	

* p = .05

Table 4.21

Summary of Multiple Comparisons of Adjusted Ability Group Means
on the Aural Cloze Task

Reading Program	Reading Ability	k	df	MS	Critical Value of q	Actual Value of t	Signif.
Open Court	H vs M	3	42	28.71	2.43	4.32	*
	H vs L	3	42	28.71	2.43	5.03	*
	M vs L	3	42	28.71	2.43	.54	
Macmillan	H vs M	3	42	28.71	2.43	.05	
	M vs L	3	42	28.71	2.43	2.69	*
	M vs L	3	42	28.71	2.43	2.48	*

H = High; M = Middle; L = Low. * p = .05

The findings indicated certain significant differences between programs and led to a rejection of Hypothesis 3.1. Significant differences were found between the two programs for the medium ability group, in that subjects in the middle ability group in the Macmillan reading program made a significantly higher mean score than the subjects in the middle ability Open Court program, after covariate adjustment. Multiple comparisons of the factor of reading ability within program identified differences within program. For the Open Court Program the high ability group obtained a higher mean score than the other ability groups. For the Macmillan program both the high and middle reading ability groups obtained higher mean scores than the low ability group.

Free Writing Task

Hypothesis 4.1. There is no significant difference between the Open Court Reading Program and the Macmillan Reading Program when children identified as having high, middle, and low reading ability were compared by their scores on the Free Writing Task.

The developed Free Writing Task was administered as a post-test only. In order that the scores obtained on the Free Writing Task could be analyzed by covariance, an appropriate covariate was selected. The total score of SESAT was used as the covariate for the following reasons:

1. The total SESAT score is a global measure of general reading achievement.
2. The total SESAT score correlated at the pre-test ($r = .53$, $p \leq .01$) and at the post-test ($r = .57$, $p \leq .01$) indicating a significant

correlation to general reading proficiency as indicated by total SESAT scores.

The mean scores of the Free Writing Task appear as Table 4.22. The Open Court high ability group obtained a mean of 27.67 compared to the mean score of 14.71 obtained by the Macmillan high ability group. The Open Court middle ability group obtained mean of 4.13, compared to the mean of 9.17 obtained by the Macmillan middle ability group.

The Open Court low ability group obtained a mean of 5.25, close to the mean of 5.00 obtained by the low ability Macmillan group.

A 2x3 analysis of covariance (reading program x ability) was computed using the BMDP 2V program (Dixon, 1975), with the pre-test total SESAT scores acting as covariate. Results of the analysis appear as Table 4.23. The factor reading program ($F_{1, 42} = 1.47, p = .23$) was not statistically significant, indicating no significant main effect for the factor reading program. The factor reading ability ($F_{2, 42} = 6.14, p = .005$) was statistically significant, indicating a significant main effect for the factor reading ability. An interaction between the factors reading program and reading ability ($F_{2, 42} = 5.40, p = .008$) was statistically significant.

Multiple t-test comparisons using the Tukey (1953) criterion of significance were computed on the factor of reading program at each ability level. The results of the comparison of the factor of program within level of reading ability appears in Table 4.24.

For the comparisons of the two reading programs within

Table 4.22
 Mean Scores of the Free Writing Task
 Before and After Covariate Adjustment

Reading Program	Reading Ability	Covariate Means	Means of Free Writing Task	Adjusted Means
Open Court	High	106.33	27.67	27.02
	Middle	78.88	4.13	4.54
	Low	58.58	5.25	6.45
Macmillan	High	121.47	14.71	13.48
	Middle	87.50	9.17	9.25
	Low	49.33	5.00	6.55

Table 4.23
 Analysis of Covariance of the Mean Scores
 of the Free Writing Task

Source	SS	df	MS	F	P
Program (P)	66.98	1	66.98	1.47	.23
Ability (A)	559.86	2	279.93	6.14	.005 *
P x A	491.99	2	245.99	5.40	.008 *
Covariate	8.49	1	8.49	.19	.67
Error	1913.66	42	45.56		

* $p \leq .05$

Table 4.24

Summary of the Multiple Comparisons of Adjusted Program Group Means
on the Free Writing Task

Ability	Program Comparisons	k	df	MS	Critical Value of q	Actual Value of t	Signif.
High	OC vs M	2	42	75.63	2.02	2.49	*
Middle	OC vs M	2	42	75.63	2.02	1.00	
Low	OC vs M	2	42	75.63	2.02	.002	

* p = .05

the high ability group the value of t was 2.49 which is significant at the .05 level of probability. For the comparison of the two reading programs within the middle ability group, the value of t was 1.00, insufficient to meet the critical value of q . For the comparison of the two reading programs within the low ability group, the value of t was .002, insufficient to meet the critical value of q .

Therefore, the multiple t -test comparisons of the reading programs within the ability groups revealed a significant difference between the Open Court and Macmillan Reading Programs within the high ability group, but revealed no significant differences between the two reading programs within the middle and low ability groups.

Multiple t -test comparisons were computed for the reading ability factor within each reading program (Table 4.25). Within the Open Court Reading Program, the high ability group obtained a significantly higher Free Writing score than either the middle or the low ability group within the same program, whereas the middle and low ability groups achieved similar scores. No significant differences were found in Free Writing scores for any of the three ability groups within the Macmillan Reading Program.

QUALITATIVE ANALYSIS

In the Word Identification Task responses were categorized into four types (Barr, 1975b): correct response, no response, real word, non-word. A comparison of the frequency of response type for each reading program was made. Considerable differences were found between

Table 4.25

Summary of Multiple T-test Comparisons of Adjusted Ability Group Means
on the Free Writing Task

Reading Program	Ability	k	df	MS	Critical Value of q	Actual Value of t	Signif.
Open Court	H vs M**	3	42	75.63	2.43	3.83	*
	H vs L	3	42	75.63	2.43	3.70	*
	M vs L	3	42	75.63	2.43	.48	
Macmillan	H vs M	3	42	75.63	2.43	1.01	
	M vs L	3	42	75.63	2.43	1.28	
	M vs L	3	42	75.63	2.43	.44	

H - High; M = Middle; L = Low. * p = .05

the category of error most frequently noted within each reading program (note Figure 4.1). Incorrect responses analyzed for the frequency of real words resulted in different percentages for the two reading programs. Whereas the Open Court Program yielded 30.54% of incorrect responses as real words, the Macmillan program yielded 74.90% of incorrect responses as real words. Incorrect responses were analyzed for the frequency of non-words, for which the Open Court program yielded 11.86% and the Macmillan yielded 5.99%.

Incorrect responses on the Word Identification Task were also analyzed for the incidence of "no response". The Open Court program had 57.58% of incorrect responses as "no response", whereas the Macmillan program had 19.1% of incorrect responses as "no response".

For the Word Identification Task, all responses that were incorrect were analyzed for their graphic similarity defined as having the identical initial letter as the test word (Barr, 1972). The percentage of graphically similar responses was 51.4% for the Macmillan program and 84.1% for the Open Court program. The percentage of graphically dissimilar responses was 48.6% for the Macmillan program and 15.9% for the Open Court program (Figure 4.2). The Open Court Program seemed to develop in the subjects a higher sensitivity to graphic cues than did the Macmillan Program with subjects almost evenly divided between both kinds of graphic responses.

Summary

Earlier in this chapter, a complete description of the specific statistical procedures used for the analysis of the data was reported.

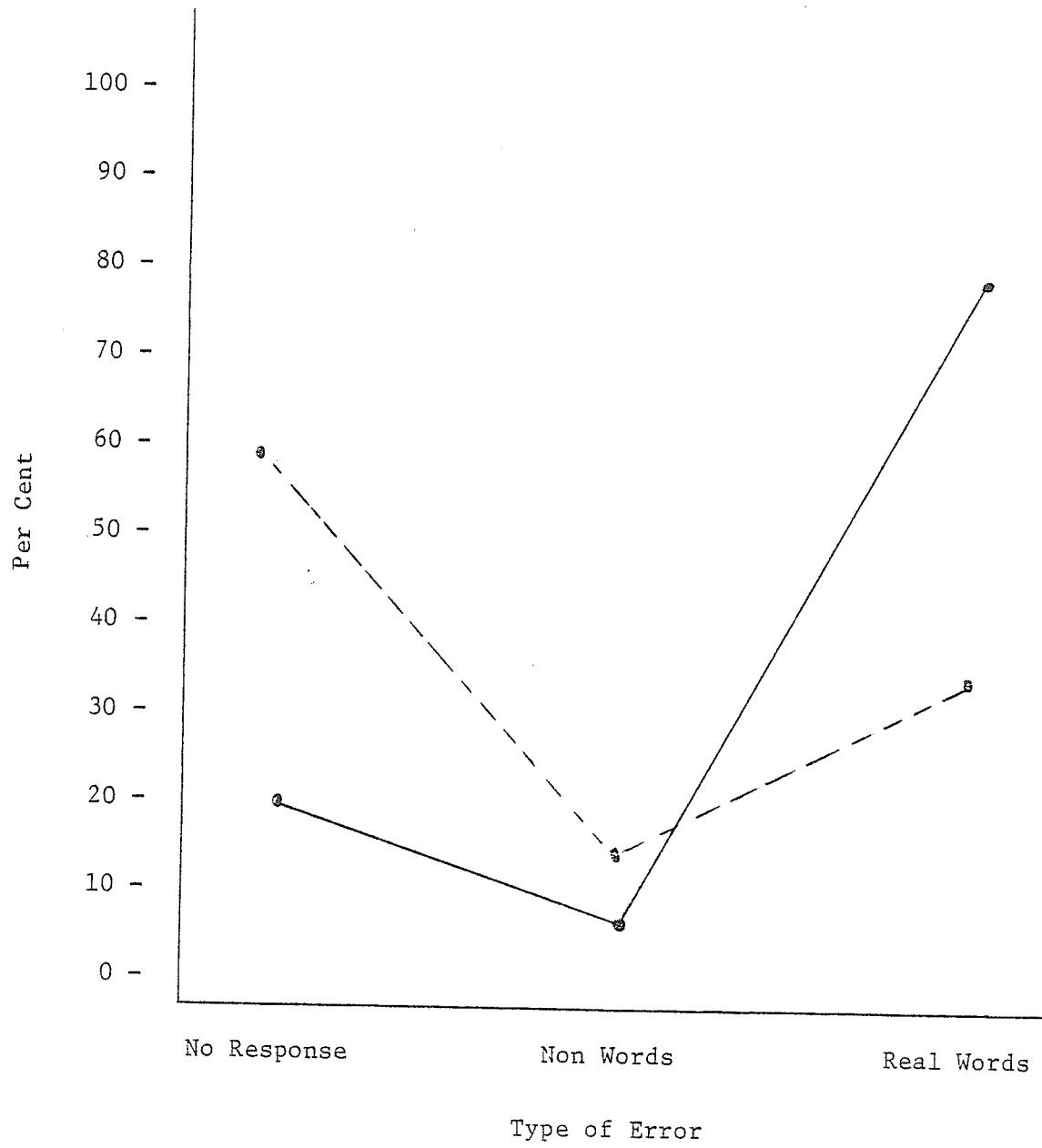


FIGURE 4.1 PERCENTAGE OF TYPES OF ERRORS IN THE WORD IDENTIFICATION TASK

———— Macmillan
----- Open Court

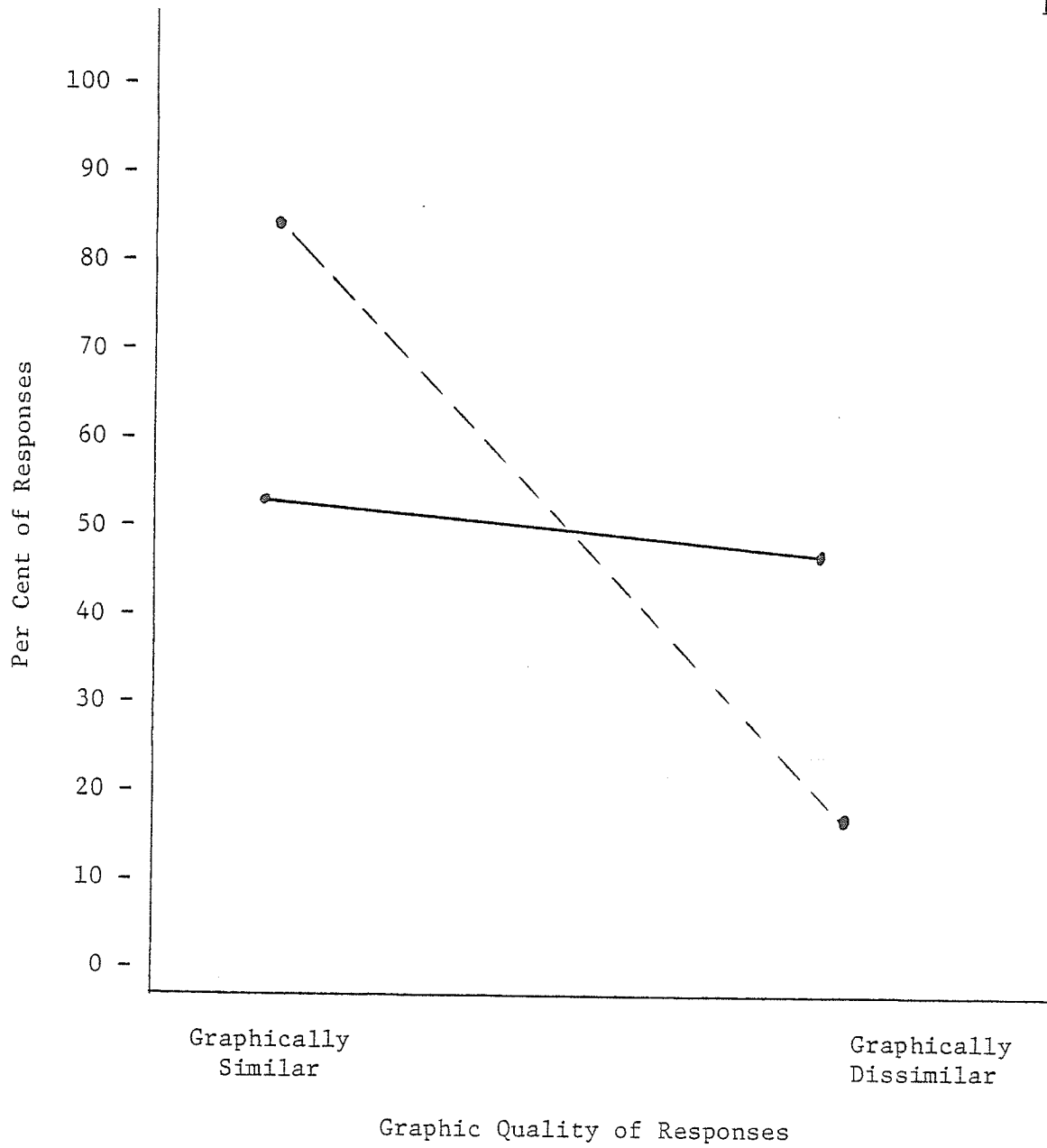


FIGURE 4.2 GRAPHIC QUALITY OF RESPONSES FOR THE WORD IDENTIFICATION TASK FOR THE TWO READING PROGRAMS

———— Macmillan
----- Open Court

In addition, any significant results were probed by post hoc procedures. A summary of the findings for the sample appeared in Table 4.26, and a summary of the findings for the subsample appeared in Table 4.27.

General Findings

The analyses of covariance indicated that the subjects instructed in either the Open Court or Macmillan Reading Programs made comparatively similar achievement. None of the analyses revealed a significant main effect for the first factor, reading program. This indicates that comparing on selected standardized and non-standardized measures, no differential effect on reading achievement could be attributable to the reading program used.

Of the eight analyses of covariance performed, three revealed significant a main effect for the second factor, reading ability.

For the Sentence Reading sub-test a significant main affect for the ability factor was found, across treatment, where the performance of the combined high ability group was significantly higher than either the middle or low ability groups. This indicates that the most reading achievement was made by the aggregate high ability group.

For the Aural Cloze Task, a significant main effect was found for the factor reading ability. Differences were found between the middle group of the Open Court Program and Macmillan Program indicating instruction using the two reading programs have a differential effect on the Aural Cloze performance of the middle ability group.

The high ability Open Court group scored significantly higher

Table 4.26
 Summary of Statistical Findings for the Standardized Measures

Hypothesis	Score Used	Statistical Test	Results
1.1	Total SESAT	ANOVA	No significant main effect for program. Significant main effect for ability. Significant P x A interaction. Significant main effect for gain. No significant G x P interaction. Significant G x A interaction. Significant G x P x A interaction.
		Multiple Comparisons For:	All ability groups in both programs significant. All within-program comparisons significant. Significant differences between High groups in both programs at pre-test and post-test.
		1. Gain	No significant differences. Hypothesis 1.1 accepted.
		2. Ability	No significant differences. Hypothesis 1.2 accepted.
		3. Program	No significant differences. Hypothesis 1.3 accepted.
		ANCOVA	No significant differences. Hypothesis 1.4 accepted.
1.2	Letters and Sounds Subtest	ANCOVA	No significant differences. Hypothesis 1.2 accepted.
1.3	Aural Comprehension Subtest	ANCOVA	No significant differences. Hypothesis 1.3 accepted.
1.4	Word Reading Subtest	ANCOVA	No significant differences. Hypothesis 1.4 accepted.
1.5	Sentence Reading Subtest	ANCOVA	No significant main effect for program. Significant main effect for ability. No P x A interaction.
		Multiple Comparisons For:	(Program collapsed) High group significantly different than Medium or Low groups.
		1. Ability	

Table 4.27

Summary of Statistical Findings for the Non-Standardized Measures

Hypothesis	Score Used	Statistical Test	Results
2.1	Word Identification Task	ANCOVA	No significant main effect for program. No Significant main effect for ability. No P x A interaction. Hypothesis 2.1 accepted.
3.1	Aural Cloze Task	ANCOVA	No significant main effect for program. Significant main effect for ability. Significant P x A interaction.
		Multiple comparisons for: 1. Program 2. Ability	Medium M* group significantly higher than Medium OC** . No Significant difference between High and Low groups. OC High group significantly higher than OC Medium or OC Low. M High and Medium groups significantly higher than M Low groups. Hypothesis 3.1 rejected.
4.1	Free Writing Sample	ANCOVA	No significant main effect for program. Significant main effect for ability. Significant P x A interaction.
		Multiple comparisons for: 1. Program 2. Ability	OC High group significantly higher than M High group. No significant differences between Mediums and Lows. OC High significantly higher than OC Medium and OC Low. No significant differences within Macmillan program. Hypothesis 1.5 accepted.

* M = Macmillan

** OC= Open Court

than the high ability Macmillan group on the Free Writing Task. No significant differences were found between the programs at the middle or low ability groups.

Of the eight analyses, two interactions were significant. One was the program by ability interaction in the Aural Cloze Task. In the Open Court program, the high ability group achieved significantly superior results when compared to the scores of the middle and low ability groups, indicating that program has a differential effect on the performance of ability groups. In the Macmillan program, the middle group achieved significantly superior results when compared to the scores of the high and low ability groups, indicating that program also has a differential effect on the performance of ability groups.

On the Aural Cloze measure where the subject selected a word associated with a given context the Open Court program seems better suited to children of high ability, whereas the Macmillan Program seems better suited to children of middle ability.

The other was a program by ability interaction on the Free Writing Task. Between program differences were found for the high ability groups. A significantly higher score was achieved by the Open Court high ability group compared to the Macmillan high ability group, indicating that the Open Court Program seems a more effective instructional strategy for the high ability group in terms of their writing development.

Within program comparisons of Free Writing scores indicated no differences among ability groups in the Macmillan program. However, significant differences among ability groups were found in the Open Court Program. Within the Open Court Program the high ability group

made significantly higher scores than either the middle or low ability groups within that program. For Free Writing, comparisons both within treatment and between treatment indicate that the Open Court Reading Program was most effective for the high ability group.

It is evident that no significant differences were found attributable to reading program. No consistent differences were found for the factor of reading ability, indicating some differential achievement for some ability groups, but this was not consistent for each measure.

Relationship to other Findings

Previous research findings regarding the best approach to beginning reading instruction have been inconclusive. Bond and Dykstra (1967) reported that no one method was universally successful in all situations with all children. The present study adds to the above findings in that no differences in the quantitative reading performance was found for the two reading programs when measured by a standardized test.

Previous research findings regarding the effects of phonic-blend training versus no phonic-blend training have also remained inconclusive. Jeffrey and Samuels (1967) found letter-training more effective than word-training on initial reading. Muller (1972) found phonics produced better performance on a transfer task. However, Fox and Routh (1976) found no significant effects for phonic-blend training in the performance of young children. The present study supports the findings of Fox and

Routh, and adds some additional data to support the conclusion that no difference in the word identification ability appears to be developed by either the Open Court or Macmillan Reading Program. However, differences were found for the Aural Cloze Task and the Free Writing Task, in that the high ability group in the Open Court Program achieved significantly better scores when compared with the other ability groups, both within and between the programs. In these skills, the phonics emphasis program was revealed as a more effective instructional program for the high ability group, assisting and developing an understanding of words identified, and in developing related language arts, specifically independent writing. This finding contributes support for the opinion that letter-sound instruction is thought to be more effective with higher ability pupils than with lower ability pupils (Spache and Spache, 1977).

Previous research into the qualitative reading performance of children instructed by phonics and sight word approaches indicated clear differences in the response characteristics developed by those particular instructional conditions. DeLawter (1970) found that children taught by a phonics program made more errors that were non-words closely resembling test items in graphophonic elements, while children taught by a sight-word approach tended to make errors that were real words with low resemblance to test items in graphophonic elements. Barr (1972) also found that phonics instruction yielded more "no-response" errors, more errors that were non-words, and more graphically constrained errors than children taught by the sight-word approach. The qualitative analysis revealed differences in response characteristics

similar to those found by DeLawter and Barr. The present study confirms that phonics instruction produces a greater incidence of "no response" errors and more graphically constrained responses.

The present study also confirms that the sight-word oriented approach produces more real words as responses, more graphically unconstrained responses, and a lower incidence of "no-response" errors. These findings suggest the possibility of a qualitative treatment effect, where different characteristics responses are encouraged by the two reading programs. The Open Court Reading Program produces responses characteristic of the phonics approach, and the Macmillan Program produces responses characteristic of the sight-word approach.

One explanation for the qualitative findings can be through the application of Biemiller's (1970) stages of development for word identification strategies in beginning readers. Biemiller suggests that children pass through three developmental phases in word identification:

- a) A high incidence of real word responses based on an overuse of contextual cues because of a lack of graphophonemic proficiency.
- b) A high incidence of non-response and high graphic constraint to responses because it is overattentive to graphic cues.
- c) A use of both contextual and graphic cues in the identification of words.

It may be that the Open Court Program with its phonics emphasis encourages the development of the second stage of word identification proficiency, in encouraging the child to attend to graphic cues (84.1% of errors were graphically similar to the test word). The Macmillan

Program may encourage the third, more mature mode of word identification, that is, the use of both contextual and graphic cues, in that it had 74.90% of errors as real words, and 51.4% of errors as graphically similar to the test word. The Macmillan Program may in fact be instrumental in the more rapid development of a mature word identification strategy as identified by Biemiller.

In this chapter, the five general questions posed at the beginning of the study and their accompanying hypotheses have been evaluated and discussed in detail. In the following chapter, the conclusions arising from these findings, limitations, implications for classroom practice, and suggestions for further research are presented.

Chapter 5

SUMMARY AND CONCLUSIONS

The major purpose of this study was to investigate the effects of the Open Court and Macmillan reading programs on the reading achievement and other language measures of first grade children in schools administered by the Department of Indian Affairs, Manitoba.

Previous research has been inconclusive about which approach to beginning reading instruction develops superior reading achievement in all students. Although some studies have reported findings supporting intensive phonics instruction as developing superior reading achievement (Bleismer and Yarborough, 1965; Chall, 1967; Gurren and Hughes, 1965), other studies have found no clear differences in the reading achievement of either a phonics or whole word approach (Bear, 1959; Bond and Dykstra, 1967; Harris and Sipay, 1975). Authorities have suggested that a phonic emphasis approach may be useful only for some children (Harris and Sipay, 1975; Spache and Spache, 1977), and it may in fact yield adverse effects on children for whom it is not suited (Barr, 1975b). In addition, qualitative differences in the response characteristics taught by either a phonics or a sight-word emphasis have been reported (Barr, 1972; 1975a; 1975b). The present study investigated these issues in order to determine quantitative and qualitative differences would accrue from two different instructional programs.

In this study, answers were sought for four general questions:

1. Does instruction using the Open Court or Macmillan reading program differentially effect the standardized reading achievement of first grade students identified as having high, middle, or low reading ability?

2. Does instruction using the Open Court or Macmillan reading program differentially effect the performance on the Word Identification Task by first grade students identified as having high, middle, or low reading ability?

3. Does instruction using the Open Court or Macmillan reading program differentially effect the performance on the Aural Cloze Task comprehension by first-graders identified as having high, middle, or low reading ability?

4. Does instruction using the Open Court or Macmillan reading program have a differential effect on the experimental Free Writing Task when completed by first graders identified as having high, middle, or low reading ability?

Summary of the Design

The subjects in this study were 159 first-grade pupils of the Department of Indian Affairs Schools in various locations of Northern Manitoba, Canada. The subjects were assigned to two treatment groups - one was termed the experimental treatment group (N = 122) and was instructed in the Open Court Program; the other was termed the reference treatment group (N = 37) and was instructed using the Macmillan program.

Subjects were identified as having high, middle, or low reading ability on the basis of the total score on the standardized measure at pre-test time.

The standardized blocking measure was the sum of four sub-tests from the Stanford Early School Achievement Test, Level II (Gardner and Madden, 1971). Subjects whose raw scores were 95 or greater were assigned to the high ability group (N = 55); subjects whose raw scores were between 94 and 72 were assigned to the middle ability group (N = 53); subjects whose raw scores were less than 72 were assigned to the low ability group (N = 51).

The Open Court and the Macmillan reading programs were implemented as the two treatments. The experimental treatment, the Open Court program, had a part-to-whole progression of skill development. Initial instruction was a systematic introduction of letter-sound relationships followed by blending activities from which reading vocabulary was synthesized. The reference treatment, the Macmillan program, had a whole-to-part progression of skill development. Initial instruction was by whole-word presentation, from which letter-sound relationships were analyzed. Instruction was provided by the regular classroom teachers. Analyses of the two programs are included as Appendix A.

The pre-test and post-test measures were four sub-tests from the Stanford Early School Achievement Test, Level II. These were administered before and after a six month instructional period. From this sample, two intact classrooms were selected for each treatment and were designated as the sub-sample to which three additional language measures

were administered as a post-test. These three experimental measures were:

1. A Word Identification Task, on which the subject pronounced the word in isolation; words used were common to both reading programs.
2. An Aural Cloze Task, on which the subject selected the correct response to an aural cloze passage from a maze, multiple choice response format.
3. A Free Writing Sample for which the subjects wrote independently on the topic of the aural cloze story.

Summary of Findings and Conclusions

The findings and conclusions are summarized below:

1. A three-way analysis of covariance using the factors treatment, ability, and test-scores was computed for the five standardized dependent measures (total score on the SESAT standardized measure, and for each of the four sub-tests of SESAT administered). There were no significant main effects for the factor of reading program in any of the five analyses. There was a main effect for the factor of reading ability for only the Sentence Reading sub-test. In that sub-test, the total high ability group, collapsed across treatments, was identified through multiple comparisons as scoring significantly higher than the total middle or low ability groups. There were no significant interactions between program and ability for the two treatments (experimental and reference) and it was concluded on the basis of standardized measures that there were generally no differential effects attributed

to the two reading programs between the Open Court and Macmillan programs.

2. An analysis of covariance for the Word Identification Task, revealed no significant main effects for the factor of reading program, nor were there significant main effects found for the factor of reading ability. There was no significant program by ability interaction between the two treatment groups. The program main effect, however, approached significance in favor of the Macmillan program indicating the possibility of word identification ability being differentially affected by the type of reading program used for instruction.

3. An analysis of covariance for the Aural Cloze Task indicated no significant main effects found for the factor of reading program. A significant main effect was found for the factor of reading ability and a significant interaction was found between program and ability. Multiple t-tests using the Tukey criterion of significance were computed to compare the scores for the factor of program, and for the factor of ability. Comparing reading programs, the only differences found were for the middle ability group. Scores on the Aural Cloze Task were significantly higher for the Macmillan Reading Program than for the Open Court Reading program for the middle ability group. No significant differences were found between high or low groups. For the factor of reading ability, scores were compared within each reading program by multiple t-test comparisons. For the Open Court program, the high ability group made a significantly higher mean score on the Aural Cloze Task when compared to the middle and low Open Court groups. For the

Macmillan program both the high and middle ability made significantly higher mean scores than the low ability Macmillan group.

4. For the Free Writing Task, the analysis of covariance revealed no significant main effect for the factor of reading program. A significant main effect was found for the factor of reading ability. The interaction between program and ability was significant. Multiple comparisons of the factor of reading program revealed that the high ability Open Court group wrote significantly more words than the high ability Macmillan group. This finding can be interpreted through the context of initial differences between those two groups; the high Macmillan group was identified as significantly different from the high Open Court group at the pre-test, the high Macmillan group achieving the greater score initially. The Open Court program does, therefore, seem to promote greater development of writing proficiency within the high ability group, and no differential effects were noted between middle or low ability groups.

When the Free Writing scores were compared within the programs, significant differences were found within the Open Court program. The high ability group scored higher than either the middle or low ability groups within that program; no significant differences were found among ability groups in the Macmillan program.

5. A qualitative analysis of the graphic similarity of responses indicated that the Open Court subjects had a higher percentage of graphically similar responses (84.1%) as compared to the Macmillan subjects (51.4%). Whereas the Open Court subjects made predominantly graphically

similar errors, the Macmillan subjects made responses that were both graphically similar and dissimilar to the target word. The inference can be made that in nearly half the attempts at word identification the Macmillan subjects used cues other than graphophonic cues whereas the Open Court subjects relied on graphophonic cues almost exclusively.

6. An examination of the responses in the Word Identification Task of the frequency of error-types for the two reading programs indicates that Open Court subjects more frequently (57.58%) gave no response than the Macmillan subjects (19.1%). When responses were analyzed for the kind of response given by subjects, the Macmillan subjects supplied real words as a response made much more frequently (74.90%) than the Open Court subjects (30.54%), whereas the Open Court subjects supplied non-words more frequently (11.86%) than the Macmillan subjects (5.99%).

Discussion

The findings of the present study should be interpreted in terms of the previous criteria selected for the comparison of the two reading programs (Bond, 1965) presented in Chapter 2. Specific criteria included the examination of the overall reading achievement, the word identification proficiency, the comprehension proficiency, and the extent other areas of language arts were collaterally developed, especially in the independent writing ability of the pupils.

The results of the standardized measures indicate no differential effect of the two reading programs on the overall reading achievement of the first grade children in Indian Affairs schools in Manitoba. Although

a significant main effect was found for the factor ability on one sub-test, Sentence Reading, no other differences were significant in the standardized measures which would suggest a differential effect produced by the reading program used for instruction. This finding is similar to those reported by Bond and Dykstra (1967) who found no instructional approach significantly better for first graders in all situations.

Although no overall differences were found to be statistically significant, qualitative differences in the responses in the Word Identification Task were noted. Using Barr's (1972, 1975b) criteria of response analysis, responses by subjects in the Open Court Program were found to have a higher frequency of graphic similarity, a higher frequency of responses that were non-words and a higher frequency of "no response" than the subjects in the Macmillan program.

Differences in the scores on the Aural Cloze Task were found in that subjects in the Macmillan program made a significantly higher mean score than the subjects in the Open Court Program for the middle ability group only. Other differences were identified within each program. Within the Open Court Program, the high ability group made a significantly higher score than both the middle and low ability groups. Within the Macmillan Program, the high and middle ability groups made significantly higher scores than the low ability group. These findings support the observations by Spache and Spache (1977) and by Harris and Sipay (1975) that there might be a differential effect on reading acquisition by certain ability groups by the instructional approach used. In the Aural Cloze Task, neither program seemed to be especially effective for

the students identified as having low ability.

A greater mean score was achieved in the Free Writing Task for the high ability Open Court group than the high ability Macmillan group. Significantly more words were produced by the Open Court high ability group possibly because of the emphasis on graphophonemic elements in reading instruction producing more automaticity in word writing, in which the child's energy may be available to manipulate the surface structure of the language. No other differences occurred for the middle and low ability groups in the two programs.

Three methodological factors were identified as possible reasons in explaining the lack of a significant main effect for the type of reading program used.

First the decision to implement a new reading program was a decision made at the district-level of the educational administrative structure. This decision may have precipitated diverse reactions from individual classroom teachers. It is possible to speculate that if input into the decision-making process had been sought at the building- and classroom-levels, a more universal commitment to the decision may have been made by classroom teachers. It is possible that teacher commitment may have influenced the results of this study because commitment to program has been found to influence pupil achievement (Bond and Dykstra, 1967). The results of the Open Court pupils may have been influenced by this uncontrolled variable.

Second, in any program comparison it is difficult to control slippage, which occurs when a new curriculum is not being implemented

according to its intent (Talmage and Walberg, 1978). In this study interference of previous teaching methods with the new Open Court method was possible. Because of the vast geographic distances involved, the experimenter was unable to monitor instructional procedures closely, and the lack of a differential program effect may have been partly attributable to this variable.

Third, the reference group classes were unequal in number to the experimental classes. This was a sampling constraint outside of the control of the experimenter. Also the reference group classes were assigned by non-random selection, another imposed constraint, and it was possible that the reference classes represented pupils not representative of the population. An inordinately high or low level of achievement by the reference classes may have biased the findings.

In addition to the methodological factors identified as affecting the findings, three features within the individual reading programs may have influenced the findings as well.

First, the actual amount of instructional time may have been different for the two reading programs. A total of 120 minutes per day spent in reading instruction is recommended by the Open Court Reading Program. Although no guidelines for instructional time are suggested in the Macmillan teacher's guide, perusal of the suggested lesson format seems to indicate that a lower estimated amount of daily instructional time is assumed by the Macmillan Program. Although results were found to be similar, they may have been due to a different amount of instructional time.

Related to instructional time is the role that reading programs assume as part of the whole classroom curriculum. It was possible for some teachers to have considered the reading program to be only one part of language arts instruction whereas other teachers may have considered the reading program as sufficient for the entire language arts program within the classroom curriculum, thus affecting student performance on post-test measures.

Second, the story material is different for each reading program and may not have been suitable for the learners. The stories in the Macmillan Program deal with three middle-class children who ride bikes and scooters. The content may have been inappropriate for children in Indian Affairs schools in northern Manitoba. The Open Court Program content begins with an introduction to sounds and letters through captioned pictures of clowns in a circus setting. Stories following this are about children in a seaside setting and at the farm. The Open Court Program may also not have been appropriate for children in Indian Affairs schools in Manitoba. The children may have achieved different results after instruction using content that was adjusted to fit their own experiences and cultural background (Downing and Thackray, 1971).

Third, it is questionable that all children can be taught effectively by one reading series. In fact, basal reading programs are estimated to be unsuccessful for the instruction of 15-25% of primary children (Spache and Spache, 1977). Therefore the lack of program differences may suggest that neither the Open Court nor the Macmillan Reading Program are sensitive enough to individual differences in order to

prepare all children for eventual success in reading.

Perusal of the graphed adjusted mean scores of the Aural Cloze Task (Figure 5.1) and the Free Writing Task (Figure 5.2) revealed a trend in the performance of certain ability groups. For both measures the adjusted means for the high Open Court group were notably higher than the adjusted means for the high Macmillan group. This suggests that the code emphasis approach to beginning reading instruction may be more suitable for high ability children who have oral language development in vocabulary and structure adequate to process written linguistic input and need only an introduction to the code.

Perusal of Figures 5.1 and 5.2 for the middle ability groups indicated that the middle Macmillan group obtained higher adjusted means in both the Aural Cloze Task and the Free Writing Task than the middle ability Open Court group. Both of the measures are on a more conceptual level than mere isolated word identification and the Macmillan Program with its emphasis on comprehension may be more effective in stressing to the learner that reading has a communicative function. By minimizing the linguistic technicalities and stressing comprehension, the Macmillan Program may aid in clarifying the purpose of reading for the learner. Without this purpose clearly understood, children can experience confusion not only about learning to read but also about the process of reading itself (Downing, 1979). Most children in this study are learning to read in a second language possibly confusing the relationship between reading and writing perceived by the children. The Macmillan Reading Program may help dispell this confusion somewhat more effectively for the

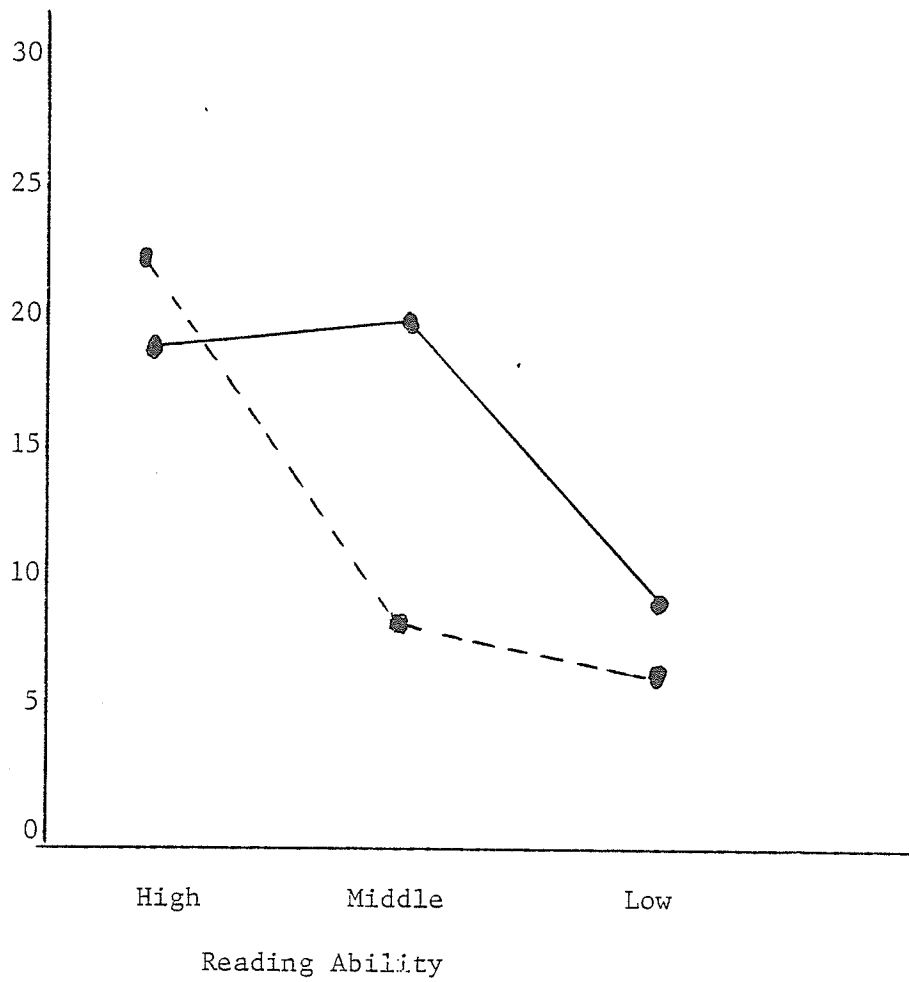


FIGURE 5.1 ADJUSTED MEANS OF AURAL CLOZE TASK FOR
EACH ABILITY GROUP

———— Macmillan
----- Open Court

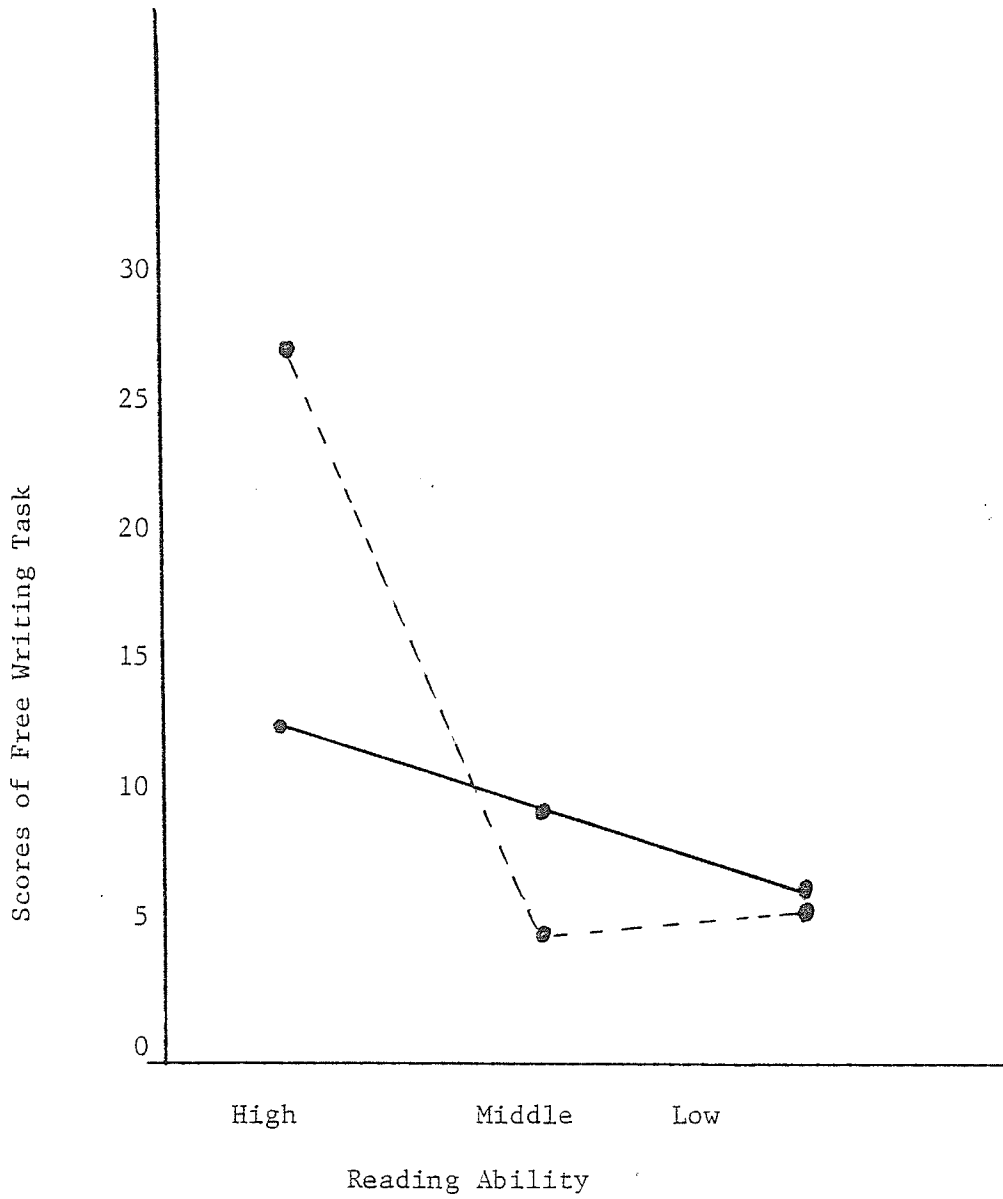


FIGURE 5.2 ADJUSTED MEANS OF FREE WRITING TASK FOR EACH ABILITY GROUP

———— Macmillan
----- Open Court

middle ability group than the Open Court Program.

For the low ability groups, perusal of the graphed adjusted means (Figures 5.1 and 5.2) shows similar achievement within each program. Both programs seemed to be similarly effective for the low ability group. Direct reading instruction seemed to be unsuccessful with these children who may benefit more from a full program of reading readiness, which would help the children meet the demands of reading instruction when it was introduced (Downing and Thackray, 1971).

Limitations of the Study

The following limitations need to be recognized when considering the findings in this study. The limitations presented in Chapter 1 have been restated and further limitations have been reported where recognized by the investigator.

1. The investigation was limited to analyzing the data for first grade pupils in Indian Affairs schools in sixteen schools in Northern Manitoba and cannot be generalized beyond this sample.

2. Measurement of the students' performance was limited to the reliability and validity of the standardized and non-standardized tests used as measuring devices. The Stanford Early School Achievement Test presented the reliability coefficients for each sub-test (Madden and Gardner, 1971).

Each non-standardized test was correlated with the two applications of the SESAT sub-tests (Appendix F). The similar correlation coefficients at pre- and post-test times was used as a basis on which

reliability of the non-standardized tests was assumed.

Based on the correlations between the non-standardized measures and SESAT, limited construct validity was assumed for the non-standardized measures.

3. Some subjects did not complete all the testing and therefore were deleted from the original sample. This may have caused a certain sampling bias.

4. The classroom teachers administered the standardized tests and instructed the experimental and treatment groups. This increased the possibility of teacher bias because of their awareness of being in an experimental or reference group.

5. The experimenter conducted the testing for the sub-sample and thereby may have introduced an additional element not present for the other subjects.

6. Intact classrooms were used as it was not practical to assign the subjects randomly to treatment groups. This may have caused sampling bias as well.

7. Exact repetition of the instructional methods are impossible to replicate because regular classroom teachers planned and carried out the instructional program throughout the entire year. However, it is assumed they followed the guidebooks as supplied by the publishers.

8. The limited time available for this study may have been insufficient to allow differences to develop fully, and the measures used may not have been sensitive enough to the differences in the children at the first-grade level. More time may have allowed differences to become more pronounced.

Implications for Educational Practice

A number of results from this study have implications for the classroom.

1. Because the Open Court Reading Program yielded an overall reading achievement similar to the Macmillan Reading Program, there is no substantive reason to support the implementation of one of the reading programs over the other.

2. Because the Open Court Reading Program developed word identification proficiency similar to the Macmillan Reading Program, there is no substantive reason to support one program over the other in order to develop word identification.

3. Free writing seems to be developed to a greater extent by the high ability Open Court group than the high ability Macmillan group. This would imply that teachers should consider using a program like Open Court with high ability students in order to enhance free writing performance.

4. Because first grade children in Indian Affairs schools in Manitoba learn in a second language, they would be likely to benefit more from reading readiness and language development than from formal reading training (Downing and Thackeray, 1971).

5. First graders in Manitoba Indian Affairs schools may benefit more from a multi-text approach to reading instruction, which would offer an opportunity to supplement the comprehension component of reading instruction.

6. Attempts should be made to develop reading instructional

materials which include content suitable to the cultural and social environment familiar to Indian children.

Implications for Further Research and Development

The results of this study have provided some additional information about the instructional effects of two reading programs on the standardized reading achievement and on additional language measures of first grade children in Indian Affairs schools in Manitoba. This study has also raised issues which require further investigation. Some of these are:

1. More longitudinal research is necessary to confirm the findings of the present study.
2. There is a need for further examination of the qualitative differences in the reading behavior produced by different instructional programs in first graders.
3. More research is needed to validate the use of aural cloze as a measure of comprehension in first grade children.
4. There is a need to investigate the kind of writing produced by different reading programs within first grade.
5. More research is necessary to compare the effectiveness of formal reading instruction and reading readiness instruction in the first grade in Indian Affairs schools in Manitoba.

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APPENDIX A

APPENDIX A

Instructional Materials

Used as instructional materials were the following reading programs:

- a) The Open Court Reading Program (OCRP)
- b) The Macmillan Reading Program (MRP).

Appendix A consists of a description of both reading programs, looking specifically at the first five weeks of instruction, in terms of individual words learned, the word list, the sentences, and instructional activities performed by the learners.

Identified as the first five weeks of instruction for each program are the following:

- a) OCRP: Week 1, Getting Acquainted Lessons 1-5
Week 2, Getting Acquainted Lessons 6-10
Week 3, Lessons 1 and 2
Week 4, Lessons 3 and 4
Week 5, Lessons 5 and 6
- b) MRP: Week 1, Story 1 (Jeff)
Week 2, Story 2 (Mike Rides)
Week 3, Story 3 (Who Can Ride?)
Week 4, Story 4 (Policemen Can Ride)
Week 4, Story 5 (Can Mike Play?)

Individuals Words

The Open Court Reading Program begins with 10 lessons introducing the alphabet, after which blending skills are taught, developing a core vocabulary based on the graphophonic relationships learned. Deviations from the graphophonic rules are called "Outlaw Words", to be learned by memory. Initially, word length is controlled, being from three to five letters in length. Initial instruction contains words from mainly two form classes of words, nouns and verbs.

Forty-four per cent of the words learned through blending skills are used in the context of a T-unit, and 54% of the vocabulary in the first five weeks appears in isolation only (Figure A.1).

The Macmillan Reading Program begins the first five weeks of instruction with the use of picture clues in order to introduce the vocabulary of the stories. Word length is not generally controlled, and varies from one to eight letters. Initial instruction contains a variety of form classes (Figure A.1) with all vocabulary appearing in the context of a T-unit.

Vocabulary density is another difference between OCRP and MRP, with the OCRP introducing a greater number of words to the learner (29) compared to the number introduced by MRP (16); the OCRP also introduces words later in the instructional design, beginning with the third week, whereas the MRP begins word learning from the first lesson (Figure A.2).

Figure A.1

Form Classes of Vocabulary for the First Five Weeks of Instruction of
the Open Court Reading Program and the
Macmillan Reading Program

	Noun	Verb	Adjective	Adverb	Pronoun	Functor
OPEN COURT	meat	heat	free		me	the
	sea	see	these		we	
	seat	meet	real		he	
	feet	eat				
	teeth	heats				
	meal	feed				
	Lee	read				
	leaf	hear				
	weed	sees				
	seed	freeze				
	seal					
	three					
	heel					
TOTAL	13	9	3		3	1
MACMILLAN	Jeff	rides			who	and
	Mike	can			I	with
	Mary	can't				the
	policeman	ride				
	ball	play				
		said				
TOTAL	5	6			2	3

Sentence Structure

There is a difference in the frequency of sentences read by learners in each program. The Open Court Reading Program offers a total of 32 T-units of 91 running words during the first five weeks of instruction. The Macmillan Reading Program offers a total of 39 T-units of 138 running words. The overall mean T-unit length for the first five weeks of instruction in each program is different, OCRP has a mean T-unit length of only 2.8, compared to MRP with 3.5.

However, there is a difference in the density of new words that the learner encounters with each program. Whereas the learner in the MRP meets 15 new words in the first five weeks of instruction, the learner in OCRP meets 31 new words, of which only a portion appears in the context of a sentence, and additional words are met in isolation only (Figure A.2). Therefore there appears to be more practice of more T-units based on a smaller vocabulary read in the Macmillan Program, compared to the vocabulary read in the Open Court Reading Program. In other words, more effort is spent by the learner in the Open Court Program learning words not practiced in the context of T-units compared to those learned in the Macmillan Program.

Figure A.2

Distribution of Vocabulary Density and T-unit Length of First Five Weeks of Instruction

Content	MRP	Week 1		Week 2		Week 3		Week 4		Week 5	
		Jeff	Getting Acquainted	Mike Rides	Who Can Ride?	Policemen can Ride	Can Mike Play?				
	OCRP	Lessons 1-10	Lessons 1 & 2	Lessons 3 & 4	Lessons 5 & 6						
Number of Words Read	MRP	8	19	20	47	44					
	OCRP	0	0	63	70	76					
Number of new words encountered	MRP	4	2	2	3	4					
	OCRP	0	0	5	9	14					
Number of T-units read	MRP	0	7	6	12	14					
	OCRP	0	0	15	8	9					
Mean T-unit length	MRP	0	2.3	3.3	3.9	3.1					
	OCRP	0	0	2.4	3	3.4					

Instructional Activities

There is a difference in the emphasis of the kinds of activities learners perform in the first five weeks of each program. Learners in the Open Court Reading Program practice tracing letters, words, sentences based on the graphophonic relationships learned. These relationships are reinforced through alphabet games, anagram cards, response card drills, and other suggested alphabet activities. Learners in the Macmillan Program practice new words, reinforce vocabulary through matching and maze-types of pencil and paper exercises, read silently and under guided oral questions, begin phonic and structural analysis, and begin a range of comprehension skills (Figure A.3). There is more variety in the range of initial instructional activities in the MRP than the suggested activities in the OCRP.

Figure A.3
Types of Activities Suggested for the First Five Weeks of Instruction in the Open
Court and Macmillan Reading Programs

WEEK	One	Two	Three	Four	Five
OCRP	Introduction to letters A to O. Printing letters. Alphabet games and exercises.	Introduction to letters P to Z. Printing. Tracing letters. Alphabet activities.	Learning sounds m, e, ee, s, t, ea. Blending words: see, me, meet, eat, meat. Printing exercises. Alphabet card drills.	Learning sounds h, w, f, th. Printing: he, heat, heats, we, sea, seat, feet, teeth, the. Drills.	Learning sounds l, d, r, z. Printing: meal, Lee, leaf. See the seal. See me feed the seal. We see the real feet. Real, freeze, read, these, hear, sees. First reading book.
MRP	Evaluation of pupil readiness. Introduction to the reader. New vocabulary. Paper & pencil exercises. Dictionary Silent & guided oral reading. Phonic analysis. Follow-up paper & pencil exercises. Enrichment.	New vocabulary. Phonic analysis. Structural analysis. Language cues discussed. Silent & guided oral reading. Comprehension: literal, predictive, classification, inferential. Enrichment.	New vocabulary. Silent & oral reading. Comprehension: location of information, expressive oral reading. Phonic analysis. Paper & pencil review of new vocabulary. Enrichment.	New vocabulary. Matching new words. Silent reading. Guided oral reading. Comprehension: identifying questions, finding information in the text, structural analysis, paper & pencil maze exercises, phonic analysis. Enrichment.	Introduction to quoted speech. New vocabulary. Comprehension: reading between the lines. Silent & guided oral reading. Re-reading. Answers & questions. Maze exercises. Test: evaluation of work covered and suggestions for follow-up.

APPENDIX B

APPENDIX B

List of words used in the Word Identification Task

out	and
what	put
my	with
big	is
good	the
little	back
make	ran
go	trick
house	to
see	was
want	too
let's	it
	how

APPENDIX C

APPENDIX C

The Aural Cloze Task

One day, a beaver and a muskrat were playing happily in the water. What fun they had! They dived in and (out) of the water.

The muskrat had a big tail. The beaver had a little tail.

The beaver paused and listened for a moment. The beaver said, "My! What a good sound! (What) a loud sound is coming from that big tail."

The beaver looked at his little tail. The beaver said, "I wish (my) tail was like the muskrat's tail. The muskrat's tail is (big). The muskrat's tail makes a (good) sound when it hits the water. My tail is (little). My little tail doesn't (make) any noise at all. I will (go) to the muskrat's house to see him."

The beaver went over to the muskrat's (house). The beaver said, "Hello, muskrat. I came to see you. And I came to (see) your big tail. I (want) to have a tail like your tail. (Let's) trade tails for just a little while."

The muskrat said, "Yes." The muskrat (and) the beaver traded tails. The beaver put on his new tail. The muskrat (put) on his new tail. The beaver was happy (with) his new tail.

The beaver said, "This (is) a very good tail."

The beaver jumped in the water. The beaver played in (the) water, with the big new tail.

The muskrat was not happy with the little tail. The muskrat

wanted to get his big tail back. The muskrat said, "I want to get my big tail (back)."

The beaver did not want to give the big tail back. He ran away. He ran and (ran).

The muskrat did not get the big tail back. He always had the little tail now. The muskrat said, "You played a (trick) on me. You did not give the big tail back (to) me." The muskrat (was) very sad. He wanted the big tail, (too).

The beaver would not give (it) back. The beaver kept it always. And that is (how) the beaver got his big tail.

(339 words)

APPENDIX D

APPENDIX D

Name _____

1. out for down	2. how cage what	3. run her my	4. big see bad
5. just good red	6. to little big	7. put three make	8. go red did
9. boat how house	10. see tell boy	11. how want help	12. let's big can't
13. but and to	14. please put ran	15. for go with	16. down see is
17. to the but	18. may away back	19. saw ran the	20. go trick night
21. to first for	22. was with call	23. the too good	24. it he look
25. what see how			

APPENDIX E

APPENDIX E



APPENDIX F

APPENDIX F

Pearson Product-Moment Correlations for all Measures Used

Table F.1

Pre-test Correlations of S.E.S.A.T.

	TOT	L&S	Test ^{a.b.}	AC	WR
L&S	.84**				
AC	.79**	.61**			
WR	.91**	.77**		.59**	
SR	.67**	.28**		.49**	.44**

^{a.}TOT: total raw score on four subtests of S.E.S.A.T.;

L&S: score on Letters and Sounds subtest;

AC: score on Aural Comprehension subtest;

WR: score on Word Reading subtest;

SR: score on Sentence Reading subtest.

^{b.*} p: .05 or less;

** p: .01 or less.

Table F.2
 Post-Test Correlations of S.E.S.A.T.

	TOT	L&S	Test ^{a.b.}	AC	WR
L&S	.81**				
AC	.74**	.49**			
WR	.86**	.76**		.44**	
SR	.79**	.47**		.68**	.53**

a.b. See Table F.1

Table F.3

Pre-Test / Post-Test Correlations of S.E.S.A.T.

		Pre-test ^{a.b.}				
		TOT	L&S	AC	WR	SR
	TOT	.84 ^{**}	.79 ^{**}	.69 ^{**}	.79 ^{**}	.41 ^{**}
	L&S	.62 ^{**}	.68 ^{**}	.49 ^{**}	.59 ^{**}	.22 [*]
Post-test ^{a.b.}	AC	.68 ^{**}	.54 ^{**}	.78 ^{**}	.54 ^{**}	.44 ^{**}
	WR	.69 ^{**}	.74 ^{**}	.48 ^{**}	.75 ^{**}	.18 [*]
	SR	.77 ^{**}	.63 ^{**}	.62 ^{**}	.68 ^{**}	.54 ^{**}

a.b. See Table F.1

Table F.4

Correlations of Word Identification Test with S.E.S.A.T. Scores

Test ^{a.b.}	Correlation of Word Identification	
	with Pre-test	with Post-test
TOT	.70 ^{**}	.79 ^{**}
L&S	.81 ^{**}	.72 ^{**}
AC	.52 ^{**}	.54 ^{**}
WR	.69 ^{**}	.86 ^{**}
SR	.34 ^{**}	.55 ^{**}

a.b. See Table F.1

Table F.5

Correlations of Aural Cloze Test with S.E.S.A.T. Scores

Test ^{a.b.}	Correlation of Aural Cloze Test	
	with Pre-test	with Post-test
TOT	.50**	.71**
L&S	.60**	.65**
AC	.42**	.63**
WR	.49**	.64**
SR	.18	.60**

a.b. See Table F.1

Table F.6

Correlations of Free-Writing Scores with S.E.S.A.T. Scores

Test ^{a.b.}	Correlation of Free-Writing	
	with Pre-test	with Post-test
TOT	.53 ^{**}	.57 ^{**}
L&S	.51 ^{**}	.51 ^{**}
AC	.50 ^{**}	.52 ^{**}
WR	.49 ^{**}	.46 ^{**}
SR	.37 ^{**}	.63 ^{**}

a.b. See Table F.1

Table F.7

Intercorrelations of the Three Non-Standardized Tests

Test ^{b.}	Word Identification	Aural Cloze
Aural Cloze	.89**	
Free-Writing	.70**	.76**

b. See Table F.1