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DEVELOPMENTAL STAGES IN THE PROCESS OF LEARNING TO READ OF BELOW AVERAGE READING ACHIEVERS IN GRADES ONE AND TWO

by

© M. DANIELLE MOORE

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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Supervisor

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Date ..October 5, 1982.....

ABSTRACT

The purpose of this study was to examine stages of development in learning to read of children who were below average reading achievers in grades one and two. The research was conducted in May of the school year in order to investigate further the findings of Biemiller (1969) and Fleming (1974) and thereby obtain a clearer description of these below average readers in grades one and two. Such a description is important in view of the concerns voiced by parents and educators of readers who are achieving at a level below their peers. This study also investigated student performances on self-correction rates, words identified in context compared to words identified in isolation, and influence of instructional approach and passage level difficulty on reading strategies.

The student sample consisted of 39 below average reading achievers from five grade one and five grade two classrooms in a small urban central Alberta school system. Subjects were selected on the basis of teachers' judgements and on their performance on the Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1). Each subject in the sample was asked to read total passages on The Gray Oral Reading Test which were designated as base passages (first three passages on The Gray Oral Reading Test) and passages up to and including two consecutive ceiling passages on which the student produced seven or more errors. Prior to reading each passage, subjects individually read a list of randomly ordered words from each passage. In addition, four comprehension questions were asked following each passage. Student responses while reading passages and words in

isolation, and while answering comprehension questions were recorded and transcribed for further analysis.

On the basis of percentages of graphically similar, syntactically acceptable, semantically acceptable, and non-response errors made while reading total passages on The Gray Oral Reading Test, an attempt was made to place each subject first into one of Fleming's five developmental stages in reading or secondly into one of stages four or five of Fleming redefined by the present researcher. All 39 subjects selected for the present study were achieving in one of Fleming's five stages in reading.

A one-way analysis of variance revealed statistically significant differences between, first, the scores on the Gates-MacGinitie Reading Test, for grade two but not grade one, and second scores on The Gray Oral Reading Test, for grades one and two, among developmental stages in learning to read. The Scheffé multiple comparison of means further revealed that some but not all of the developmental stages in reading were statistically significantly different, one from the other.

The additional analyses of student performances indicated that: (1) grade two reading achievers corrected a greater percentage of errors than grade one, (2) both grade one and grade two students identified a greater percentage of words in context than in isolation, and (3) the instructional approach and passage level difficulty seemed to influence reading strategies of students in both grades one and two.

Implications for teaching of beginning reading and suggestions for further research into children's developmental stages in the process of learning to read were suggested.

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Chapter 1

INTRODUCTION

A well known researcher in the field of reading, K. Goodman (1972), described reading as a language processing activity in which the reader has available three kinds of information for processing: graphic, syntactic, and semantic. All readers, regardless of reading proficiency level, process these three kinds of information but differently, distinguishing the better from the poorer readers.

During the past decade, qualitative analysis of oral reading miscues has remained popular in examining how readers process graphic, syntactic, and semantic information from print providing insight into the way children learn to read. Studies, described below, employing miscue analyses have reported several differences in the way better and poorer first grade readers process information.

One difference among grade one readers revealed in qualitative miscue analysis studies is that although poorer readers do process graphic information, these poorer readers process that graphic information less well than better readers. In a discussion of a longitudinal study, over a period of seven years, of three average and three slower grade one readers, Y. Goodman (1976) reported that as the average and slower readers matured, both groups' miscues developed closer graphic similarity to the text indicating that better as well as poorer readers, described by her as average and

slower readers respectively, do process graphic information during oral reading. Weber (1970a) investigated the oral reading errors generated by high and low reading achievers from December to June of the same year. She noted that the better, high reading achievers, produced a greater proportion of graphically constrained errors than the poorer, low reading achievers, suggesting that the better readers were processing more graphic information than poorer readers.

Another difference among grade one readers is evident in their correctional behavior. An investigation of 100 first grade children over the period of one year was conducted by Clay (1968). The better readers described by Clay in high and high middle reading achievement groups corrected more errors than did the poorer readers in low middle and low groups. A study confirming findings of Clay (1968) was conducted by Carson (1979) in the spring of the school year. She found that the six high reading achievers who were the better readers in grade one corrected a higher proportion of errors than the six low reading achievers who were the poorer readers in grade one.

Another difference in the way grade one readers process information is seen in the proportions of contextually (syntactically and semantically) acceptable miscues produced by these readers. Recently a study by Keith, Carnine, and Carnine (1981) of ten high and ten low ability reading achievers in grade one in June examined proportions of contextually constrained errors and reported that the better readers who were high in reading ability produced more syntactically and semantically acceptable miscues than poorer readers who were low in reading ability. Most recently, a study by March

(in progress) exploring the reading behavior of 16 better or proficient readers as described by March and 16 poorer (less proficient) readers in grade one in April confirmed findings of Keith, Carnine, and Carnine (1981). In an earlier analysis of oral reading errors produced by 42 grade one children from October to May, Biemiller (1969) studied the use of graphic and contextual information as these children learned to read over an eight month period. Oral reading errors were collected on a weekly basis and pooled for monthly analysis in terms of their graphic and contextual constraints (syntactic and semantic). Biemiller showed that these beginning readers in grade one pass through a series of three phases in the following order:

1. Pre non-response phase, characterized by a predominance of contextually constrained errors (syntactic and semantic).

2. Non-response phase, distinguished by a preponderance of non-response errors in which the reader is looking at and seems to be attending to the graphic information but is unable to produce a word response. According to Biemiller the non-response phase begins in a month where 50 percent of the errors produced are non-responses. This same non-response phase terminates following two consecutive months where less than 50 percent of errors are non-response.

3. Post non-response phase, characterized by a high proportion of both contextually (syntactic and semantic) and graphically constrained errors. Percentages of contextually constrained and graphically similar errors among total errors (designated by Biemiller as substitutions, omissions, and insertions) were calculated over eight months as children progressed through the three stages in

learning to read and are noted in Table 1.1

According to Biemiller, a substitution error produced during oral reading could be classified as graphically constrained and/or contextually constrained, therefore the errors in any one stage do not necessarily total 100 percent. Graphically constrained errors as defined by Biemiller were substitution errors in which the first letter of the observed response was the same as the first letter of the expected response. Contextually constrained errors were substitution, omission, and insertion errors which were grammatically and semantically acceptable up to and including the error.

Biemiller (1969) observed that the proportion of all contextually constrained substitutions, omissions, and insertions declined in the non-response phase when compared with the pre non-response phase but increased in the post non-response phase. The proportion of all substitution errors that were graphically similar increased as the readers progressed from the first to the second and finally to the third phase of reading acquisition. It should be noted that the percentage of all contextually constrained miscues was higher than the percentage of graphically similar miscues in all three phases. The non-response phase was marked by a dramatic increase in non-response errors which declined in the post non-response phase. In summarizing the results of his study, Biemiller suggested that the non-response phase identified a shift in grade one children's reading behavior from use of contextual constraints towards increased use of graphic information. According to Biemiller, during this second phase of reading acquisition, children relied on either

Table 1.1

Percentage of Contextual and Graphic Errors Among Total Errors* in Eight Months of Grade One by Phase, Found by Biemiller

Kinds of Errors	Pre Non-Response Phase One Errors in Percent	Non-Response Phase Two Errors in Percent	Post Non-Response Phase Three Errors in Percent
Contextually Constrained Errors	74%	71%	84%
Graphically Constrained Errors	21%	40%	48%

*Total errors refer to substitutions, omissions, and insertions.

contextual or graphic information not on both types of information. These children remained unable to relate both types of information successfully until the third phase. The ability of readers to simultaneously use graphic and contextual information in the third phase separated the better from the poorer readers. Although not evident in Table 1.1, at the end of the school year in May better readers were found to be performing in the post non-response phase of reading acquisition compared with poorer readers who were performing in the non-response or pre non-response phases on the basis of their miscue proportions.

Fleming (1974) hypothesized five stages in the process of learning to read in an extension of Biemiller's study of better and poorer readers in grade one (Table 1.2). Fleming examined the percentage of semantic or syntactic and graphic errors among total errors (substitution, mispronunciation, omission, insertion, and non-response errors) of 40 better and poorer first grade readers during one testing session in April. Although Fleming (1974) described stages of development in reading and Biemiller (1969) described phases of development in reading, both terms (stage and phase) refer to grade one children's development in the process of learning to read and will be used as synonymous terms for the present study.

Fleming initially began with the same three stages described by Biemiller but through a pilot study found it necessary to expand to five stages to accommodate some individual reading performances. The first two stages projected by Fleming were similar to Biemiller's first two stages, pre non-response and non-response, in terms of

Table 1.2

Percentage of Semantic or Syntactic and Graphic Errors out of Total Errors* of Each Grade One Reader by Stage, Projected by Fleming, in April

Kinds of Errors	Stage One Errors in Percent	Stage Two Errors in Percent	Stage Three Errors in Percent	Stage Four Errors in Percent	Stage Five Errors in Percent
Semantically or Syntactically Acceptable Errors	At least 50%		Less than 50%	Less than 50%	At least 50%
Graphically Similar Errors	Less than 50%		Less than 50%	At least 50%	More than 50%
Non-Response Errors		50%	Less than 50%		

*Total Errors refer to substitutions, omissions, insertions, mispronunciations, and non-responses.

describing a higher proportion of contextually acceptable than graphically similar errors in stage one followed by an increase in non-response errors in stage two. Fleming's stage two does differ somewhat from Biemiller's non-response stage two in that Biemiller noted a decline in contextually acceptable errors in stage two whereas Fleming did not predict such a decline until stages three and four. A further difference apparent in these two researchers' stages is that the percentage of contextually acceptable errors in the post non-response stage three was found to be higher by Biemiller than the percentage of graphically similar errors. Fleming predicted that in his stages four and five, percentages of graphically similar errors would be higher than contextually acceptable errors. This projection of higher percentages of graphic and contextual information used by beginning readers in both researchers' later stages notably sets Fleming's stage descriptions apart from that of Biemiller. A substantial similarity is, however, inherent in both researchers' stages; graphically similar errors increased across all stages reported by Biemiller and across all stages projected by Fleming.

The reader is reminded that in Table 1.2, according to Fleming, an error can be classified according to one or both categories (graphically similar and/or semantically or syntactically acceptable) therefore the percentage of errors in any one stage may not necessarily total 100 percent.

During his one testing session in April, Fleming found that the better and poorer grade one readers could be grouped into three of his projected five stages on the basis of their oral reading miscues.

He reported that there were not any grade one children in stage one in April and he suggested conflating stages three and four since no significant differences were evident between these stages.

Grade one children's stages of development in learning to read reported by Biemiller (1969) and projected by Fleming (1974) as described in this chapter are presented in Table 1.3 to facilitate comparison of three stages of Biemiller and five stages of Fleming. The reader is reminded that the percentage of errors in any one stage may not total 100 percent because an error can often be classified by Biemiller as graphically constrained and/or contextually constrained and by Fleming as graphically similar and/or semantically or syntactically acceptable. To aid the comparison of Biemiller's and Fleming's stages in reading presented in Table 1.3, Fleming's use of the term graphically similar has been equated to Biemiller's term graphically constrained. In addition Fleming's categorical term, semantically or syntactically acceptable, has been conflated to Biemiller's contextually constrained categorical term.

On the basis of findings previously reported in this chapter, it was indicated by Fleming that the better grade one readers processed information differently than the poorer grade one children learning to read producing different proportions of contextually acceptable, graphically similar, and non-response errors as they progressed through various stages of development. An analysis then, of grade one children's oral reading errors made it possible by Fleming to place these better and poorer grade one readers into four of five projected stages of development in reading and to show how these two groups

Table 1.3

Percentage of Contextual and Graphic Errors Among Total Errors* as Found by Biemiller and as Projected by Fleming for Grade One Readers by Stage

Kinds of Errors	Stage One (Phase)		Stage Two (Phase)		Stage Three (Phase)		Stage Four (Phase)		Stage Five (Phase)	
	Average Percentage of Errors produced by 26 Grade One Readers in Pre Non-Response Stage One Found by Biemiller	Percentage of Errors Produced by Each Grade One Reader in Stage One Projected by Fleming	Average Percentage of Errors Produced by 35 Grade One Readers in Non-Response Stage Two Found by Biemiller	Percentage of Errors Produced by Each Grade One Reader in Stage Two Projected by Fleming	Average Percentage of Errors Produced by 31 Grade One Readers in Post Non-Response Stage Three Found by Biemiller	Percentage of Errors Produced by Each Grade One Reader in Stage Three Projected by Fleming	Biemiller has no Stage Four	Percentage of Errors Produced by Each Grade One Reader in Stage Four Projected by Fleming	Biemiller has no Stage Five	Percentage of Errors Produced by Each Grade One Reader in Stage Five Projected by Fleming
	Biemiller	Fleming	Biemiller	Fleming	Biemiller	Fleming	Biemiller	Fleming	Biemiller	Fleming
Contextually Constrained Errors	74%	At least 50%	71%		84%	Less than 50%		Less than 50%		At least 50%
Graphically Constrained Errors	21%	Less than 50%	40%		48%	Less than 50%		At least 50%		More than 50%
Non-Response Errors				50%		Less than 50%				

*Total Errors of Biemiller refer to substitutions, omissions and insertions.
Total Errors of Fleming refer to substitutions, omissions, insertions, mispronunciations, and non-responses.

progressed. Although Fleming placed children into four of five stages in reading, differences were not great between stage three and four and therefore he subsequently conflated these two stages.

However, further information is needed about children's stages of development in reading at grade one to: (1) confirm findings of Biemiller and Fleming about poorer readers and (2) more clearly describe the reading behavior of these poorer or below average readers. Many research studies (Y. Goodman, 1976; Weber, 1970; Clay, 1968; K. Goodman, 1973; Keith, Carnine, and Carnine, 1981; March, in progress) which employed below average readers did so in order to investigate how the reading behavior of the poorer subjects differed from that of the better reader. As a result of such studies, valuable information was added to the field of reading. However, research has not focused exclusively on the processing strategies of below average readers as a discrete group in order to examine and more clearly describe stages of development in learning to read. Such an examination is crucial in light of the concerns voiced by parents and educators of today's readers who are achieving at a level below their peers.

In addition, beyond the grade one level, researchers have not classified readers' miscues according to those stages described by Biemiller or Fleming. Fleming suggested that poorer readers at other grade levels may be "stuck" in a stage, particularly stage two, where the reader must change strategies before proceeding to stage three. Further information then, is needed to investigate whether poorer readers at the grade two level could be placed into stages similar to those proposed by Biemiller and Fleming on the basis of their oral

reading miscues. As noted earlier, the reading behavior of below average children who are not achieving at a level commensurate with their peers is a constant concern for parents and educators. It was out of this concern for the below average reader that the following purpose of the present study was formulated.

Purpose

The purpose of this study was to examine stages of development in learning to read of children who are below average achievers in their reading in grades one and two. The research was conducted in May of the school year in order to investigate further the findings of Biemiller (1969) and Fleming (1974) and thereby obtain a clearer description of these below average readers in grades one and two.

Definition of Terms

For the purposes of this study, the following definitions will be used.

Stages of reading refer to the levels or phases a reader passes through on his way to becoming a proficient, mature reader (Fleming, 1974). The present study described three phases of Biemiller (1969), five stages of Fleming (1974), and two stages of this investigator using the terms phases and stages as comparable terms. On the basis of quantitative and qualitative analyses of miscues, a child was placed into either one of Fleming's projected five developmental stages in reading or into his stage four or five as defined by the present researcher.

Miscue refers to an observed response that differs from the text or a non-response a child makes while reading orally. The word miscue is used synonymously with reading error. Percentages of four kinds of miscues were analyzed for the present study:

1. Percentage of graphically similar substitution and mispronunciation miscues out of the total number of substitution, mispronunciation, insertion, omission, and non-response miscues.

2. Percentage of syntactically acceptable substitution, insertion, and omission miscues out of the total number of substitution, mispronunciation, insertion, omission, and non-response miscues.

3. Percentage of semantically acceptable substitution, insertion, and omission miscues out of the total number of substitution, mispronunciation, insertion, omission, and non-response miscues.

4. Percentage of non-response miscues out of the total number of substitution, mispronunciation, insertion, omission, and non-response miscues.

For the purposes of the present study, percentages of syntactically acceptable and semantically acceptable miscues were analyzed separately and not conflated as "contextually acceptable," the category used by Biemiller.

Base passages refer to the first three passages of The Gray Oral Reading Test. Each child in the sample was required to read these passages to establish a common starting point on which below average readers in grades one and two would not exceed the number of errors specified by the Gray test author. Biemiller (1979), Kibby (1979), Christie and Alonso (1980) reported that reading errors changed

qualitatively as readers progressed from less to more difficult passages therefore the present researcher analyzed and compared the percentage of oral reading errors produced while subjects in grades one and two read passages that progressed from the less difficult base passages to the more difficult ceiling passages on which subjects produced seven or more errors. Percentages of the four kinds of miscues described above were calculated to attempt to determine which of the five stages of development in reading projected by Fleming or which of the two stages modified by the present researcher each child reached. This definition of base passages is not comparable to that of Fleming in which he specified the first five passages of the Diagnostic Reading Scales (Spache, 1963) as base passages.

Total passages read refer to the three base passages and to the passages following them, including the two consecutive ceiling passages in which a child produced seven or more errors specified by the author of The Gray Oral Reading Test as the child's ceiling. Percentages of the four kinds of miscues described above were calculated to determine which stage of development in reading, projected by Fleming or modified by the present researcher, each child reached.

Syntactic information refers to the reader's knowledge of English language patterns. Use of syntactic information is observed when the reader substitutes a word for the text word, omits or inserts a word without changing the grammatical structure of the phrase.

Semantic information refers to the information the reader brings to the situation (knowledge of subject matter from background

experience). Use of semantic information is observed when the reader substitutes a word for the text word, omits, or inserts a word without altering the meaning of the phrase.

Graphic information refers to the sounds of language and their graphic representations. Use of graphic information is observed when the initial letter of the child's substitution or mispronunciation is the same as the initial letter of the text word.

Below average reader refers to: (1) subjects in grade one who, in their teachers' judgements, were the poorer readers in the class and who subsequently scored at either the third or the fourth stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 (Canadian norms); (2) subjects in grade two who, in their teachers' judgements, were the poorer readers in the class and who subsequently scored at either the third or fourth stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 (Canadian norms).

Experimental Design

Sample

Forty-four children, who in their teachers' judgements were below average in reading achievement in five grade one and five grade two elementary school classrooms located in a small urban center in central Alberta were selected for further testing after parental permission and appropriate screening. Then the appropriate comprehension sections of the Gates-MacGinitie Reading Test were administered

to the 44 students. Three children scored below and two children above the criteria set by this researcher for below average reading achievers on the Gates-MacGinitie Reading Test so were rejected from the study. The total sample then, consisted of 39 children; 19 children below average in reading achievement in grade one and 20 children below average in reading achievement in grade two.

Instrument and Procedure

Each child in the sample read the first three passages orally on The Gray Oral Reading Test to establish a common starting point at which below average readers in grades one and two would not exceed the number of errors specified, by the Gray test author, to terminate reading. Any reader in grade one or two who did exceed the specified number of errors would have been excluded from the study, however, all below average readers in grades one and two read the base passages with fewer errors than required by the Gray test author to terminate reading. Each child then continued reading beyond base passages up to and including two consecutive ceiling passages on which he made seven or more errors on The Gray Oral Reading Test.

As previously stated in this chapter, a common starting point on The Gray Oral Reading Test was necessary in light of previous research (Biemiller, 1979; Kibby, 1979; Christie and Alonson, 1980) which reported that reading errors changed qualitatively as readers progressed from less to more difficult passages. Therefore, this researcher analyzed and compared types of errors produced while subjects read less difficult base passages up to and including more difficult ceiling passages (two consecutive passages on which subjects exceeded

the number of errors specified by the Gray test author) in order to examine qualitative changes in errors.

Base passages together with passages up to and including two consecutive ceiling passages on The Gray Oral Reading Test were defined as total passages for the present study. Following the reading of each passage on The Gray Oral Reading Test, comprehension questions as given on that test were asked.

In addition, all words from passages each child read were randomly ordered in isolated lists and read by each child prior to reading each corresponding passage (Potter, 1980). The child's oral reading of word lists and passages as well as his responses to comprehension questions were recorded and transcribed for data analysis.

Oral reading miscues produced by subjects in grades one and two while reading total passages were then analyzed to explore which of the five stages of development in reading described by Fleming (1974) or which of his stages four or five redefined by the present researcher by reference to Biemiller (1969) each grade one and two reader reached.

The reading performance of these grade one and two children on both the comprehension section of the Gates-MacGinitie Reading Test and the comprehension questions on The Gray Oral Reading Test was then compared to one of the five developmental stages in learning to read set out by Fleming or stage four or five of Fleming as redefined by the present researcher in light of Biemiller which each child reached on the basis of his oral reading miscues on total passages which, of course, included the base passages.

Hypotheses

In order to facilitate the reader of this investigation in reading the following six research hypotheses, Table 1.4 has been prepared. Each letter, A to L, designates a group of subjects (below average readers in grades one or two) who scored higher or lower while reading either the Gates-MacGinitie Reading Test or The Gray Oral Reading Test. A line connecting two letters under each hypothesis indicates the two groups of readers being compared.

Research Hypothesis One

Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of the Gates-MacGinitie Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE and whose raw score on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 was HIGHER (Group A in Table 1.4) than other children identified by their teachers as below average in reading achievement in grade ONE (Group B in Table 1.4) will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

Table 1.4

Research Hypotheses One to Six for Below Average Reading Achievers in Grades One and Two

Below Average Readers	Higher Raw Score on the Comprehension Section of the Gates-MacGinitie Reading Test	Lower Raw Score on the Comprehension Section of the Gates-MacGinitie Reading Test	Higher Comprehension Score on The Gray Oral Reading Test	Lower Comprehension Score on The Gray Oral Reading Test	Stanine Four on the Gates-MacGinitie Reading Test	Stanine Three on the Gates-MacGinitie Reading Test	Higher Comprehension Score on The Gray Oral Reading Test	Lower Comprehension Score on The Gray Oral Reading Test
Grade One	Hypothesis One A B		Hypothesis Two C D		Hypothesis Five I		Hypothesis Six K	
Grade Two	Hypothesis Three E F		Hypothesis Four G H			J		L

Note: Below average readers were assigned to grade one and grade two and these grade groups are mutually exclusive. However, the grade groups are not necessarily mutually exclusive as far as reading achievement of the readers is concerned.

Research Hypothesis Two

Below average readers in grade one who scored higher than other below average readers in grade one on comprehension questions of The Gray Oral Reading Test will reach a more advanced stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE and who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test (Group C in Table 1.4) than other children identified by their teachers as below average in reading achievement in grade ONE (Group D in Table 1.4) will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

In order to confirm findings of Fleming who compared each child's performance on comprehension questions on Spache Diagnostic Reading Scales to his/her stage of development reached, this researcher asked children comprehension questions from a comparable test, The Gray Oral Reading Test.

Research Hypothesis Three

Below average readers in grade two who scored higher than other below average readers in grade two on the comprehension section of the Gates-MacGinitie Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade TWO and whose raw score on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 was HIGHER (Group E in Table 1.4) than other children identified by their teachers as below average in reading achievement in grade TWO (Group F in Table 1.4) will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

Research Hypothesis Four

Below average readers in grade two who scored higher than other below average readers in grade two on comprehension questions of The Gray Oral Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade TWO and who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test (Group G in Table 1.4) than other children identified by their teachers as below average in reading achievement in grade TWO (Group H in Table 1.4) will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

Research Hypothesis Five

Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of

the Gates-MacGinitie Reading Test and below average readers in grade two who scored lower on the comprehension section of the Gates-MacGinitie Reading Test will reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE who scored at the FOURTH stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 (Group I in Table 1.4) and children identified by their teachers as below average in reading achievement in grade TWO who scored at the THIRD stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 (Group J in Table 1.4) will all reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read. The basis for this hypothesis was the professional judgement of the present researcher based upon two years of observation of children.

Research Hypothesis Six

Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension questions of The Gray Oral Reading Test and below average readers in grade two who scored lower than other below average readers in grade two on the comprehension questions of The Gray Oral Reading Test will reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as

below average in reading achievement in grade ONE who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test (Group K in Table 1.4) than other children identified by their teachers as below average in reading achievement in grade ONE and children identified by their teachers as below average in reading achievement in grade TWO who answered a LOWER percentage of comprehension questions correctly on The Gray Oral Reading Test (Group L in Table 1.4) than other children identified as below average in reading achievement in grade TWO will all reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read. The basis for this hypothesis was the same as in hypothesis five.

Limitations

The following limitations should be observed when considering the findings of the study.

1. The sample for the current study was selected from a small, central Alberta urban center with a population of approximately 4,000. The reading program used by teachers of the sample was the Nelson Language Development Reading Program and phonics teaching strands which were carried over from the previously used Copp Clark Reading Program. The results can be generalized only to comparable populations with similar instruction using similar emphasis in the teaching program.

2. Similarly, results can be generalized only to the below average readers as defined for the study in comparable grade groups. The average and above average readers were excluded from the sample.

Assumptions

1. Having known and taught with nine of ten teachers for a one year period, it was assumed by this researcher that these teachers would recommend all below average reading achievers in their classrooms for testing.

2. It was assumed by the present researcher that during testing sessions, the reading performance of below average reading achievers in grades one and two would be comparable to their reading performance in the regular classroom.

Significance

The purpose of this study was to examine developmental stages in learning to read of children who were below average reading achievers as determined by their teachers' judgements and by their pupil scores on the comprehension section of the Gates-MacGinitie Reading Test in grades one and two in May. Examining stages of development of below average achievers is significant to reveal a clearer description of the reading behavior of those children who are not achieving at the same level of reading proficiency as their classmates. Such a description should provide insight into processing strategies of those below average readers and should enable educators to develop lessons better designed to facilitate movement of readers into the next stage in the reading process.

Love (1981) in a study of only grade two readers concluded that a description of the reading behavior of below average readers in particular, made it possible to design appropriate reading strategy

lessons which were effective in developing the reading proficiency of below average readers.

Overview

Literature pertinent to the study will be reviewed in Chapter 2 to provide a theoretical base for the present study. The experimental design of the study will follow in Chapter 3. An analysis of the data will be presented in Chapter 4. Finally, Chapter 5 will include the overview of the study, main findings and a discussion of them, conclusions, implications, and suggestions for further research.

Chapter 2

REVIEW OF THE LITERATURE

Chapter 2, divided into five sections, will review literature relevant to this investigation of stages of development in learning to read of below average reading achievers in grades one and two. The first section of this chapter briefly discusses the function of error analysis in oral reading. The second section deals with sensitivity to contextual constraints of language demonstrated by young readers. The third section notes young readers' sensitivity to graphic constraints of the printed word. Stages of development in reading are presented in the fourth section. Finally, the fifth section deals with factors influencing oral reading strategies.

Function of Error Analysis in Oral Reading

For many years, researchers have recognized that errors readers make while reading orally provide information about their reading performance. Early researchers (Monroe, 1928, 1932; McCullough et al., 1946) focused on children's reading errors to obtain diagnostic information revealing weaknesses which then created a basis for remedial instruction. Another group of researchers, to be reviewed later, concerned more with the actual process of reading and strategies used by beginning readers to gain meaning from print also observed and analyzed children's errors. However, unlike their precursors, this latter group of researchers analyzed the syntactic

and semantic appropriateness of errors based on the reader's knowledge of contextual constraints. Prior to this time, as Weber (1968) noted in a review of the literature, most errors were viewed as indications of perceptual inaccuracies or evidence of a poor sight vocabulary.

K. Goodman (1970) described reading as a psycholinguistic guessing game requiring the reader to interrelate language and thought in an effort to reconstruct the author's written message. To aid the reader in reconstructing the message, Goodman noted three interrelated cue systems simultaneously available to the reader: graphophonic, syntactic, and semantic. According to K. Goodman, efficient reading involves selecting the fewest most productive cues necessary to "guess" correctly. An incorrect "guess," noted when the child's observed response does not match the expected response, is termed a miscue. K. Goodman (1972) described miscues as "windows on the reading process" because through an analysis of oral reading miscues, insight is gained into strategies used by children to obtain meaning from print.

In order to do an indepth qualitative analysis of oral reading miscues, Y. Goodman and Burke (1972) developed a complex taxonomy designed to evaluate dialect, intonation, graphic and sound similarity, grammatical function, correction, grammatical acceptability and semantic acceptability, and meaning change. Other researchers, included in the following sections, have either applied Goodman and Burke's taxonomy in their own research or have devised similar taxonomies to facilitate investigation of research questions.

Regardless of the taxonomy favored by researchers, an underlying assumption common to all taxonomies is that miscues provide

valuable insight into oral reading and strategies used to gain meaning from print. The present study placed children into developmental stages of the learning to read process on the basis of four types of miscues: graphically similar, syntactically acceptable, semantically acceptable, and non-response miscues. While Goodman and Burke (1972) judged errors for graphic similarity in initial, medial, and final word positions, this study judged errors in the initial word position only as did Biemiller (1969) and Fleming (1974). An additional difference among taxonomies is evident in that errors were judged by Y. Goodman and Burke (1972) for syntactic and semantic acceptability at the sentence level whereas this researcher analyzed errors for syntactic and semantic acceptability at the phrase level as did Fleming (1974). The term "phrase level" is explained in Chapter 3.

Sensitivity to Contextual Constraints of Language Demonstrated by Young Readers

The following studies, many of which utilize miscue analysis, discuss young readers' sensitivity to contextual (syntactic and semantic) constraints of language during oral reading. This section is divided into five parts. The first part discusses young readers' use of syntactic information. The second part describes young readers' use of syntactic information compared to their use of semantic information. The third part compares better and poorer readers' use of syntactic and semantic information. Self correctional behavior of better and poorer readers is described in the fourth part. The fifth part discusses word identification in context and in isolation by young readers.

Young Readers' Use of Syntactic Information

Several researchers (MacKinnon, 1959; Weber, 1970b; Coomber, 1972; Brody, 1973) showed that all children, regardless of age or reading proficiency level, produced syntactically acceptable errors demonstrating sensitivity to both syntactic information in the print and grammatical structure of the language. In view of these reported findings, the present researcher assumed first and second grade children who were below average in reading achievement would produce results similar to studies reviewed in this section in their use of syntactic information.

One of the earliest studies which examined readers' use of syntactic information was conducted by MacKinnon (1959) who focused on the grade one readers of various proficiency levels. Profiles of these first grade children's reading performance noted that they made use of syntactic information, described as grammat[redacted] constraints in MacKinnon's study, by adding or omitting words which made the sentence grammatically correct as well as correcting grammatically unacceptable errors over grammatically acceptable errors.

Weber (1970b), also interested in grade one readers, conducted a longitudinal study investigating oral reading miscues of two classes of first grade readers including 21 subjects from December to May and 24 subjects from November to June. The subjects, divided into high and low reading achievers in both classes made responses which were grammatically acceptable with respect to the preceding context indicating that both groups of readers were making use of syntactic information during oral reading.

In an analysis of oral reading errors produced by a class of good, average, and poor third grade readers, Coomber (1972) found findings similar to those reported by Weber (1970b). Readers in all three proficiency groups made use of syntactic information. These readers were described by Coomber as sensitive to the sentence structure on the basis of their grammatically acceptable miscues.

While Weber and Coomber investigated the oral reading behavior of several subjects, Brody (1973) examined the oral reading errors of six readers on a grade four passage. Three of the four subjects who were better readers were described by Brody as proficient third grade readers and three poorer readers described by Brody as retarded readers were two fifth and one sixth grade reader. Consistent with findings cited in Weber and Coomber, on readers' use of syntactic information, both better and poorer readers produced syntactically acceptable errors demonstrating sensitivity to the grammatical structure of language.

The present study focused on the poorer readers (below average reading achievers) in grades one and two. In light of findings reported by MacKinnon (1959), Weber (1970b), Coomber (1972), and Brody (1973) it was expected by the present researcher that below average readers in grades one and two would demonstrate sensitivity to both syntactic information in print and grammatical structure of the language by producing syntactically acceptable errors during oral reading.

Young Readers' Use of Syntactic Information Compared to Their Use of Semantic Information

While researchers (MacKinnon, 1959; Weber, 1970b; Coomber, 1972; Brody, 1973) have shown that young readers process syntactic information

during oral reading by producing syntactically acceptable errors, other researchers (C. Burke, 1969, 1976; Allen, 1969; Menosky, 1971) have compared the amount of syntactic information processed by young readers to the amount of semantic information processed by them.

In an analysis of six proficient grade six subjects reading one or more years above grade level, C. Burke (1969) found 81 percent of the subjects' miscues to be totally syntactically acceptable while only 61 percent were totally semantically acceptable. C. Burke (1976) also noted in a study of average grade two and average grade six readers' errors that the syntactic acceptability of errors was higher than the semantic acceptability for both grade two (71 percent-43 percent) and grade six (74 percent-44 percent).

Allen (1969) reported that syntactic acceptability was higher than semantic acceptability for grades two, four, and six average readers' errors. Menosky (1971) conducted a study of grades two, four, six, and eight and found all groups produced an overall higher percentage of syntactically acceptable miscues than semantically acceptable miscues. Menosky suggested that all readers, especially the younger ones, were able to control the syntactic structures better than meaning structures. This latter suggestion seems to be in agreement with findings reported by C. Burke (1969, 1976) and Allen (1969).

Consistent with research reported above, the present researcher expected the below average readers in grades one and two to produce a higher proportion of syntactically acceptable miscues than semantically acceptable miscues. In order to test this expectation, the percentage of syntactically and semantically acceptable miscues produced by grade one and two readers were calculated for the present study.

Use of Syntactic and Semantic Information by Better and Poorer Readers

Several researchers whose studies will be reviewed here compared the better and poorer readers in terms of the percentage of syntactically and/or semantically acceptable errors produced. Although the present researcher did not include an analysis of the more proficient reader, it was felt that the below average readers selected for the present study would produce some degree of contextually constrained errors as did readers identified as poorer in the following studies.

In an early study, Y. Goodman (1967) examined the oral reading behavior of six grade one readers at nine successive monthly intervals. Comparing the better readers whom she defined as average with the poorer readers whom she described as slower than average readers, Y. Goodman found that the average beginning readers in grade one produced a greater percentage of miscues that were syntactically and semantically acceptable suggesting that the average readers were more efficient in their use of context than the slower group of readers.

A more recent study, in agreement with Y. Goodman (1967) was conducted by Au (1977). She analyzed oral reading errors produced by 15 good and poor second grade Hawaiian children over a ten day period. Au reported that the better readers, described as good readers in the study, demonstrated greater use of context in producing a greater percentage of meaningful substitutions and less use of visual phonic information than did poorer readers. Good readers used context in 72 percent of their errors compared to poor readers who used context in only 38 percent of their errors. A higher percentage of nonmeaningful substitutions and omissions were generated by the poor group as they

relied on visualphonic information during oral reading.

Leslie (1980) reported on an investigation of the use of graphic and contextual information by 40 average grade two subjects and 40 below average grade three to grade six subjects during one testing session. Miscue rates were equated for both groups as all subjects read a fictional narrative and non-fictional informational selection. On both stories, average readers produced more semantically acceptable errors as well as more omissions than poorer readers. In contrast to the average readers, poorer readers, who were below average in reading ability, produced a higher proportion of graphically similar errors and semantically unacceptable errors, although these semantically unacceptable errors were syntactically acceptable.

Keith, Carnine, and Carnine (1981) analyzed oral reading errors of 10 high and 10 low reading achievers at the end of the grade one school year. The proportion of semantically and syntactically acceptable errors for poorer readers described as low in reading ability was found to be significantly lower than the proportion of semantically and syntactically acceptable errors for better high ability readers on the same test suggesting that better readers were more sensitive to contextual constraints.

In another recent study, Christie (1981) examined the oral reading errors produced by 120 high and low ability readers in grades two, four, and six while reading four passages ranging in difficulty from grades one to seven. All children in the sample read one passage of 300 words which corresponded most closely to their grade level. Errors made while reading orally were analyzed for graphic similarity,

syntactic, and semantic acceptability at the sentence level. The better readers specified by Christie as high in reading ability made a higher percentage of contextually (syntactically and semantically) acceptable miscues than poorer readers, lower in reading ability. Christie also noted that the percentage of contextually acceptable miscues increased with grade level. An earlier study by E. Burke (1976) investigated average seven, eight, and nine year old readers' miscues during one testing session and showed use of syntactic and semantic information increased with the age of readers. In addition, no significant increase in the use of graphic information was reported for older subjects; the mean score for nine year olds was only slightly higher than that for the seven year olds. Moreover, the graphic similarity score calculated for the eight year old group was significantly lower than that for the seven and nine year olds.

Recently Potter (1980) conducted a study specifically testing the validity of syntactically and semantically acceptable errors as indicators of readers' use of context. Potter suggested that readers who processed graphic information in the final word position were more likely if they made errors, to make a syntactically acceptable error than if they processed information from the beginning or middle of the word. On the basis of research (Marchbanks and Levin, 1965; Timko, 1970; Williams et al., 1970) it has been indicated that children learning to read make use of graphic information primarily in the initial word position. In view of this finding, Potter hypothesized that better readers, like poorer readers would process information from initial word positions but being more advanced than poorer readers,

better readers would process more information from final word positions than poorer readers and consequently would produce more graphically similar miscues than poorer readers.

Since graphically similar miscues produced in final word positions were more likely to be syntactically acceptable than miscues produced in either initial or medial positions, better readers who produced more graphically similar miscues in final word positions were hypothesized by Potter to be also producing more syntactically acceptable errors than poorer readers. Therefore Potter suggested that research, specifically that of E. Burke (1976), reporting greater use of contextual information based on a higher percentage of syntactically and semantically acceptable errors by better readers than poorer readers may have been due simply to more efficient processing of graphic information from final word positions rather than more efficient processing of contextual information by better readers. To investigate his assumption, Potter selected 16 better and 12 poorer readers from first year classes of a junior school. One half the subjects from each group of good and poor readers read words out of context first (randomly ordered word lists) and words in context second (passages corresponding to word lists). The other one half of subjects from each group read passages first and lists second. A one week interval separated the two presentations of passages and word lists. Words read in and out of context were analyzed for syntactic as well as semantic acceptability. The findings of Potter supported previously cited research in this chapter in that better readers produced errors that were syntactically more acceptable than were errors

produced by poorer readers in passages. However, unlike previously cited research, Potter stressed that the better readers who generated syntactically more acceptable errors may have processed graphic information more efficiently from final word positions than poorer readers instead of having processed contextual (syntactic and semantic) information more efficiently. In contrast, the semantic measure was considered valid in that different scores were reported for semantically acceptable errors in isolation and in context. In concluding remarks Potter (1980) suggested that, "despite the invalidity of the syntactic acceptability measures, it is possible to draw conclusions about the reader's use of the syntactic and semantic context by analyzing oral reading errors as long as one compares the contextual acceptability of the errors to words in and out of context" (p. 127).

In view of Potter's findings, the present study did include a measure of syntactic and semantic acceptability of words in isolation as well as in context.

Unlike studies reviewed in this section, the present study focused on below average reading achievers and did not investigate average or above average readers. The findings from studies comparing better and poorer readers are however of relevance to the present study in that poorer readers in studies reviewed were found to be sensitive to contextual constraints and used syntactic and semantic information to some degree during oral reading. Based on these studies, it was assumed by the present researcher that poorer readers who were below average in reading achievement in all stages in reading would be able to make use of syntactic and semantic information during oral reading.

It was also hypothesized by this investigator that if: (1) poorer readers use context (syntactic and semantic information) less well than better readers (Y. Goodman, 1967; Au, 1977; Leslie, 1980; Keith, Carnine, and Carnine, 1981; Christie, 1981), (2) use of context (syntactic and semantic information) increases as readers mature (Christie, 1981; E. Burke, 1976), (3) the reader achieving in a higher developmental stage of reading is a better reader than the reader achieving in a lower stage (Biemiller, 1969; Fleming, 1974) then the better reader who will be achieving in a higher developmental stage should be generating a higher percentage of contextually (syntactically and semantically) acceptable miscues than the reader in a lower stage. Stages four and five proposed by Fleming (1974) were redefined by the present researcher to reflect such an increase, from stage three to stage four to stage five, in the quantitative use and in the better qualitative use of contextual information for below average readers in grades one and two. Fleming's stage five showed an increase in the use of contextual information from stage four to stage five but stage four did not show any increase in contextual use from stage three.

Research findings of Biemiller (1969), Weber (1970a) and Juel (1980) reporting that better readers use equal or less amounts of contextual information compared to poorer readers contradict findings of Y. Goodman (1967), Au (1977), Leslie (1980), Keith, Carnine, and Carnine (1981), Christie (1981), and Potter (1980).

Biemiller (1969), to be discussed in greater detail later in this chapter, analyzed the oral reading errors of 42 children in two first grade classes from October to May. He reported that high, average

and low reading ability groups processed equal amounts of contextual information over the eight month period.

A study conducted by Weber (1970a) analyzed oral reading errors of 21 high and low reading achievers in grade one from December to June and reported on grammatic acceptability and semantic acceptability of these subjects' errors. The better readers described by Weber as high reading achievers and poorer readers described as low reading achievers produced negligible differences in the percentage of errors that were grammatically appropriate to the preceding context. However, the poorer readers produced a greater percentage of errors (95.3 percent) that were semantically appropriate in the sentence compared to the percentage of errors reported for the better readers (91.1 percent) suggesting that at the sentence level, better readers appeared to process less of the meaning context than poorer readers.

In a more recent study than Weber's, Juel (1980) analyzed the use of graphic and contextual information by high, average, and low ability readers from grades two and three. These subjects read 20 target words in isolation, and 20 sentences where the subject and/or verb was related directly to the target word (designated as moderate context condition by Juel). One week later, the same subjects read 20 other target words in isolation and in 20 sentences in which the subject and/or verb was not directly related to the target word (designated as poor context conditions by Juel). She found that all readers used context during oral reading but as readers became more skilled, they relied on context less than poorer readers. Juel reported that poorer readers with low reading ability utilized context

to identify both easy and hard decodable words whereas better readers, described as high in reading ability, utilized context primarily in identifying low frequency, hard decodable words during oral reading.

On the basis of findings of Y. Goodman (1967), Au (1977), Leslie (1980), Keith, Carnine, and Carnine (1981), Christie (1981), and Potter (1980), this researcher expected below average reading achievers in grades one and two to process some contextual information from the text by producing syntactically and semantically acceptable errors. Findings of Biemiller (1969), Weber (1970a) and Juel (1980) add further support to the present researcher's expectation even though findings of researchers reviewed here are in disagreement as to which readers, better or poorer, processed more contextual information.

Correctional Behavior of Better and Poorer Readers

Several research studies reviewed investigating correctional behavior during oral reading have consistently reported significant differences between better and poorer readers. These studies suggested that better readers were more sensitive to the context as exhibited by their correctional behavior. This researcher did not compare better and poorer readers but focused instead on poorer readers who were below average in reading in order to obtain a clearer description of these readers. The following comments are, however, relevant to the present study in that below average readers achieving in a lower stage in reading were expected to correct less errors than below average readers achieving in a higher stage in reading.

Over the period of one year Clay (1967) conducted a longitudinal

study of 100 grade one children. The grade one readers in the sample were divided into high, high middle, low middle, and low reading proficiency groups at the end of the school year based on a word recognition task. She noted that the better readers in high and high middle reading achievement groups corrected one in three or four errors while the poorer readers in low middle and low groups corrected one in eight errors and one in twenty errors respectively. Clay indicated that the high self correction rates observed for the high and high middle groups resulted from these readers attending to and relating syntactic, semantic, and graphic information efficiently whereas the low group corrected errors less frequently so therefore attended to and related information less efficiently.

While Clay observed the correctional behavior of readers at the grade one level, Au (1977) reported on the behavior of 15 good and 15 poor readers at the grade two level. The better readers described by Au as good readers were characterized by a preponderance of self corrections compared to the poorer readers who rarely corrected errors.

An investigation of 15 good grade four and 15 poor grade six readers was conducted by King (1978) in the spring of the school year. She also noted differences between better readers and poorer readers; the better readers corrected a higher percentage of errors than the poorer readers, especially errors which changed the meaning of the text.

Another study which reported on readers' self-correctional behavior was conducted by Pflaum and Bryan (1980). Subjects participating in the study were 36 learning disabled children and 43 "normal"

children. Pflaum and Bryan noted that the learning disabled who were poorer readers made fewer corrections on "serious meaning change" errors than did "normal" better readers which suggested learning disabled readers were poorer users of context than better "normal" readers.

Most recently D'Angelo (1981) investigated the number of corrections made by good and poor readers but also reported on the effect of passage level difficulty on correctional behavior. Subjects selected for the study were 60 good and 60 poor readers from grades four to eight. At both instructional and frustration levels, good (better) readers corrected a higher percentage of errors than poor readers. As the passages became more difficult the poor readers relied more on graphic and less on syntactic and semantic information to make corrections whereas good readers at frustration level corrected a higher percentage of syntactically and semantically unacceptable errors than they did at instructional level.

Previously cited research studies have compared better and poorer readers while Menosky (1971) examined the errors produced by 18 children selected from grades two, four, six, and eight. She reported that children in all grades attended to the context to some degree by not correcting syntactically acceptable errors. Children in grades two, four, six, and eight showed some tendency not to correct errors that were totally semantically acceptable.

Correctional behavior of below average reading achievers in grades one and two was recorded for observation by this researcher. In view of previously reported findings in this chapter regarding

correctional behavior of better and poorer readers, it was expected that the better readers achieving in a higher stage in reading would correct a greater percentage of errors than poorer readers who were achieving in a lower stage in reading.

Word Identification in Context and Isolation by Young Readers

A few researchers, whose studies will be reviewed, have compared words read in isolation or "no context" conditions and words read in context to examine the extent to which readers use context to facilitate word identification. Findings reported in the following studies indicate that both better and poorer readers are sensitive to contextual constraints during oral reading suggesting these readers can employ available syntactic and semantic language cues to reduce inaccuracies during oral reading. The present researcher expected to find similar results for below average reading achievers in both grades one and two.

In a study which explored the relative ability of children to identify words isolated in lists and words in story context, K. Goodman (1965) found that 100 children in grades one, two, and three read correctly in story context at least one half of the words they could not recognize on word lists. The ability of children in successive grades to identify words in context increased; 67 percent of grade three children recognized four out of five words in context that were missed on lists, whereas 50 percent and 26 percent of grade two and grade one children respectively recognized the same number of words in context as grade three. In view of these findings, it was indicated that

children in successive grades were increasingly sensitive to contextual constraints of the language during oral reading.

A study investigating the effects of context on high frequency words was conducted by Allington and Fleming (1978). Subjects included 12 good and 12 poor readers in grade four. Each subject read one passage at high grade two level twice; one version of this passage contained randomly ordered words to make it more difficult to read (no context condition) whereas the other version was the original story by the author (context condition passage). Allington found negligible differences between good and poor readers' ability to recognize high frequency words in the context condition passage. However, in the random order, "no context" condition passage, good readers were more accurate in identifying high frequency words. Poor readers' performance on "no context" condition dropped in comparison to their performance on context condition while good readers' performance on both conditions was similar.

Potter (1980) reported on the reading behavior of 16 good and 12 poor readers from first year classes of a junior school and found readers were significantly more accurate at reading words in context than in isolation.

Another study comparing children's ability to read words in isolation and in context was conducted by Allington (1979). Subjects selected for his study were reading at a grade two level which was at least two years below their potential. Findings of the study indicated that some poor readers were able to use contextual information in word identification. However, Allington also noted from the data that some

poor readers could identify words in isolation that were read incorrectly in context. Type of instruction that readers received was suggested as a possible factor accounting for the discrepancy in use of contextual information to aid word identification.

In view of Allington's (1979) suggestion pertaining to effects of instruction on readers' use of contextual information to aid word identification, the present researcher noted and commented on the instructional reading method used to teach the sample population when analyzing percentages of their errors produced while reading words in isolation and in context.

Most recently, Krieger (1981) examined the ability of poor readers to identify high frequency words in isolation and in context. A group of 17 fourth grade poor readers enrolled in a university reading clinic and 13 fourth grade poor readers from classrooms were identified as accurate and inaccurate word identifiers of high frequency words in isolation. Krieger found that poor readers, whether accurate or inaccurate in identifying high frequency words in isolation all identified a greater number of these high frequency words in context than in isolation.

The present study, reported here, compared the oral reading of below average reading achievers on not only high frequency words but all words in isolation and in context on total passages in which base passages were included. Based on studies presented in this section, it was assumed that below average reading achievers in both grades one and two would identify more words in context than in isolation. Since this present study did not separate poor readers into accurate

and inaccurate identifiers of words in isolation for analysis of data, Krieger's (1981) results are of particular significance because they indicate that negligible differences were found between both groups of poor readers in their ability to recognize high frequency words in isolation and in context. This finding justifies not separating readers into accurate and inaccurate identifiers of words for the present study.

Before a review of the research discussing stages of development in reading and factors influencing oral reading strategies is presented, a review of readers' sensitivity to graphic constraints of the printed word will be discussed.

Sensitivity to Graphic Constraints of the Printed Word Demonstrated by Better and Poorer Readers

Weber (1970b), Clay (1968), Coomber (1972), Brody (1973), Cohen (1974), and E. Burke (1976) examined the extent that better readers used graphophonic information from the printed page in comparison to the poorer readers. This discussion of readers' use of graphic information is of importance to the present study in that findings reported in studies to follow indicated that the poorer readers made less efficient use of graphic information than better readers. It was expected by the present researcher that poorer readers would be those readers achieving in a lower stage in reading than better readers who would be achieving in a more advanced stage as determined by an analysis of their oral reading errors.

Weber (1970b) analyzed the degree to which errors of 21 grade one children approximated the correct response graphically by devising

a graphic similarity index and calculating a graphic similarity score for those substitution errors which shared letters with the text word. The mean graphic similarity score noted for the better reader in the high group (407.87) exceeded the mean score for poorer readers in the low group (265.47) by over 100 points. Similar findings were reported by Weber (1970b) in an analysis of the errors of a second group of 24 grade one readers from November to June. She found the mean graphic similarity score for the better readers in the high group to be 396.11 while the score for the poorer readers in the low group was 315.05. Although better readers in both groups approximated the correct response more closely than the poorer readers, Weber reported that there was an increase in the use of graphic information for all groups over the year.

In a longitudinal study conducted by Clay (1968), oral reading errors of 100 children were analyzed over the period of one year. The better readers in the high reading ability group produced more substitutions (56 percent) which showed graphic correspondence to the text than substitutions (43 percent) produced by poorer readers in the low group.

In another investigation of readers' use of graphic constraints, Coomber (1972) found that better third grade readers produced a higher number of graphically similar miscues than did the poorer readers. Results of Coomber's error analysis suggest that the better readers demonstrated greater sensitivity to graphic constraints of the printed word than the poorer readers

While Weber (1970b) and Coomber (1972) investigated the oral reading behavior of several subjects, Brody (1973) examined the oral

reading errors of six readers on a grade four passage. Three of the subjects were proficient third grade readers and three poorer readers were two fifth and one sixth grade reader. The errors generated by the proficient group approximated the expected response in terms of graphic similarity moreso than did the errors of the poor group.

Cohen (1974), to be reported on in greater detail later in this chapter, analyzed the oral reading errors of 50 children during the last eight months of grade one. In agreement with Weber, she found that the percentage of graphically similar errors increased for both better and poorer readers over the eight months but were always higher for the better readers suggesting that better readers were more sensitive to the graphic constraints than were poorer readers.

In another study of readers' use of graphic constraints, E. Burke (1976) investigated the mean graphic similarity scores for 18 seven, eight, and nine year old average readers. She found the scores for seven and nine year olds to be similar, suggesting these readers processed equal amounts of graphic information from the text. A slight increase in the graphic scores was reported for the nine year olds (51.49) compared to the eight year old readers (48.14) suggesting the older, better readers used more graphic information than readers one year younger.

In contrast to findings of Weber (1970b), Clay (1968), Coomber (1972), Brody (1973), Cohen (1974), and E. Burke (1976), other researchers reported that better readers processed less graphic information than poorer readers.

Au (1977) investigated oral reading errors of 15 second grade

children over a ten day period. She found that poorer readers produced a higher proportion of graphically similar errors (32 percent) than did better readers (18 percent).

In agreement with Au (1977), K. Goodman and Y. Goodman (1977) refer to a study reporting on the use of graphic information used by sixth, eighth, and tenth grade readers. The poorer readers in low reading achievement groups in the three grades were found to be using more graphic information than better readers in high reading achievement groups.

The present researcher expected below average reading achievers in grades one and two to be processing some of the graphic information from the text by producing graphically similar errors. Findings of Au (1977) and K. Goodman and Y. Goodman (1977) support this expectation although these researchers are in disagreement with findings of Weber (1970b), Clay (1968) Coomber (1972), Brody (1973), Cohen (1974), and E. Burke (1976) regarding which readers, better or poorer, processed more of the graphic information during oral reading.

Stages of Development in Learning to Read

Stages of development in learning to read have been proposed on the basis of oral reading miscue analyses. This discussion of stages of development described by Biemiller (1969) and Fleming (1974) is of particular importance to the present study in that the present researcher investigated whether below average readers in grades one and two could be placed into one of five stages projected by Fleming or into his stage four or five as redefined by the present researcher,

on the basis of proportions of miscues produced during oral reading of total passages in May.

Stages of Development in Learning to Read for Grade One Proposed by Biemiller (1969)

Biemiller (1969) conducted a longitudinal study of oral reading errors made by 42 children in two first grade classes from October to May. By analyzing oral reading errors of these children, Biemiller investigated the development of use of contextual and graphic information in word identification as these children learned to read. Three phases or stages of development (pre non-response, non-response, post non-response) were identified based on percentages of contextually (syntactically and semantically) acceptable, graphically similar, and non-response errors. Biemiller noted that a high proportion of grade one children's errors in the pre non-response phase were contextually constrained as well as restricted to words taught. Errors in this phase very rarely showed graphic resemblance to the text indicating grade one children in the pre non-response phase of development relied heavily on context during the reading task.

The pre non-response phase was followed by a non-response phase. This second phase was marked by a preponderance of non-response errors in which grade one children did not verbally attempt to pronounce an unknown word. The grade one reader did, however, visually attend to the word in what Biemiller suggested was an attempt to process the graphic information. Conversely, children in phase one, instead of attempting to process graphic information, generally responded to an unknown word by substituting a contextually constrained word already taught.

Following the non-response phase Biemiller noted a post non-response phase characterized by both contextually and graphically constrained errors. Biemiller reported that throughout phases one to three the percentage of contextually constrained errors were higher than the percentage of graphically constrained errors although a slight decline in contextual errors was noted in the second phase followed by an increase in these errors in the final phase. The crucial factor separating the good from the poor reader was observed in the use of graphic and contextual information simultaneously. During the first two stages, pre non-response and non-response stages, Biemiller reported that about 30 percent of graphic substitutions were contextually constrained whereas in stage three, the post non-response stage, about 70 percent of graphic substitutions were contextually constrained indicating simultaneous use of graphic and contextual information by grade one children in the third stage. Children who proceeded to the non-response stage early in the year, making increased use of graphic information, were the better readers at the end of grade one.

While Biemiller (1969) reported on a class of grade one children, the present study analyzed oral reading errors of below average reading achievers in grade two as well as grade one. The percentages of graphically and contextually constrained errors reported in the post non-response stage three described by Biemiller are of particular importance and interest to the present study. Biemiller reported that the use of contextual information by grade one subjects remained high throughout the three stages (pre non-response,

non-response, and post non-response stages) although a slight decline in the use of contextual information was noted in stage two. These same grade one subjects demonstrated a gradual increase in their use of graphic information as they progressed through developmental stages but in the final stage of Biemiller (post non-response stage three), the percentage of graphically constrained errors produced by grade one readers was lower than the percentage of contextually constrained errors. In recognition of this finding, the present study redefined Fleming's (1974) latter stages four and five to account for Biemiller's reported lower percentage of graphically constrained errors compared to percentage of contextually constrained errors.

As the reader will remember from Chapter 1, stage four criteria projected by Fleming specified that of the total number of errors, at least 50 percent would be graphically similar but less than 50 percent would be semantically or syntactically acceptable. The stage five criteria projected by Fleming specified that of the total number of errors, more than 50 percent would be graphically similar and at least 50 percent would be semantically or syntactically acceptable. The reader of this research will also remember that an error produced during oral reading can often be classified into more than one of three categories (graphic similarity, syntactic acceptability, semantic acceptability), therefore the percentage of errors in any one stage does not necessarily equal 100 percent.

The present researcher, in redefining Fleming's stage four, specified that of the total number of errors less than 50 percent would be graphically similar and at least 50 percent would be

syntactically or semantically acceptable. In redefining Fleming's stage five the current researcher specified that of the total number of errors, at least 50 percent would be graphically similar but more than 50 percent would be syntactically or semantically acceptable. Therefore, this researcher hypothesized that below average readers in grades one and two achieving in developmental stages four or five would make simultaneous use of contextual (syntactic and semantic) and graphic information although their use of contextual information would exceed their use of graphic information on total passages. Studies reporting on below average as well as average and above average readers' use of syntactic and graphic information (Clay, 1968; Allen, 1969; Burke and K. Goodman, 1970) indicated readers of different proficiency levels processed a greater percentage of syntactic than graphic information during oral reading.

Over the period of one year, Clay (1968) examined the oral reading behavior of 100 first grade readers assigned to one of four groups on the basis of their oral reading proficiency level: low, low middle, high middle, and high. She found that the four groups generated a higher percentage of syntactically acceptable errors (72 percent) compared to the percentage of graphically similar errors (41 percent).

Another study investigating oral reading errors in terms of their grammatical appropriateness and graphic similarity to the expected response was conducted by Allen (1969). Subjects selected for his study included 15 average readers, five each from grades two, four, and six. Allen also included phonemic and semantic relationships

in the analysis and found that the syntactic relationship was the highest of the four relationships studied for average readers in grades two, four, and six. In other words, these readers produced a higher percentage of syntactically acceptable errors than graphically similar, phonemically similar, or semantically acceptable errors.

In agreement with Clay (1968) and Allen (1969), Burke and K. Goodman (1970) conducted a study of a fourth grade proficient reader's miscues and found this reader's miscues were more contextually acceptable (82 percent) than graphically similar (60 percent) to the original text.

The findings of Clay (1968), Allen (1969), and Burke and K. Goodman (1970) are of particular relevance to the present study in that this researcher expected that the percentage of contextually acceptable errors for below average first and second grade readers, achieving in Fleming's stages four and five modified by the present researcher, would exceed the percentage of graphically constrained errors for these readers.

Stages of Development in Learning to Read for Grade One Proposed by Fleming (1974)

Fleming (1974) in a follow up study to Biemiller, investigated the possibility of placing 40 grade one readers into stages of development of learning to read on the basis of oral reading miscues attained during one testing session in April. As indicated in Chapter 1 of this study, Fleming originally began with three stages (pre non-response, non-response and post non-response) found by Biemiller but during a pilot study found it necessary to project five stages to

incorporate readers' individual differences. Fleming's projected stages one and two were comparable to Biemiller's pre non-response stage one and non-response stage two in which first grade readers progressed from producing predominantly contextual errors and few non-responses to producing an increased number of non-response errors in stage two. While Biemiller found grade one readers in his post non-response stage three to be processing a higher percentage of contextual (syntactic and semantic) information than graphic information, Fleming projected that in his stage three grade one readers would process less than 50 percent of graphic and less than 50 percent of contextual information. In other words, Fleming suggested that of the total number of errors produced by grade one readers, less than 50 percent would be graphically similar to the text word and less than 50 percent would be syntactically or semantically acceptable. Fleming projected two additional stages, beyond Biemiller's three stages, in which the percentage of graphic errors produced by first grade readers would exceed their percentage of contextual errors.

Substitutions, mispronunciations, omissions, insertions, and non-response errors were recorded by Fleming while subjects read: (1) the first five passages of the Diagnostic Reading Scales (Spache, 1963) designated as base passages by Fleming, (2) base passages as well as additional passages on Diagnostic Reading Scales (Spache, 1963) to exceed the number of errors specified by the test author designated as ceiling passages by Fleming, (3) passages on Diagnostic Reading Scales (Spache, 1963) in which more than 12 percent of the total number of words were miscued designated as the 12 percent

passage by Fleming.

Fleming confirmed that grade one children with high, average, and low reading ability could be placed in discrete stages of development in learning to read by calculating percentages of miscues made while orally reading base and ceiling passages. When compared with base and ceiling criteria, the 12 percent passage was less successful in discriminating between stages.

In view of these findings regarding the base, ceiling, and 12 percent criteria of Fleming, the present study used criteria similar to Fleming's ceiling but renamed his ceiling criterion as total passage. Renaming Fleming's ceiling criterion was done in order to avoid confusion with ceiling passages on The Gray Oral Reading Test (defined by the test authors as two consecutive passages in which readers produced seven or more errors). Like Fleming's ceiling criterion, the total passage criterion set by the present researcher included all passages read by subjects thereby including base passages (designated by this researcher as the first three passages on The Gray Oral Reading Test) and passages up to and including two consecutive ceiling passages on which subjects produced seven or more errors.

Regardless of the criterion used by Fleming (base, ceiling, or 12 percent) no children were achieving in stage one in April. Fleming suggested that since his study was conducted in April, children may have been beyond stage one due to eight months of instruction although Biemiller did find three children in stage one at a similar time of year. The present researcher retained stage one of Fleming since his stage one was comparable to Biemiller's pre non-response

stage one (high number of contextually constrained errors and low number of graphically constrained errors) in which Biemiller found three children in May, the same time of year as the present study.

Fleming also noted that his stages three and four did not differ throughout the study and so concluded that these stages three and four should be conflated for further research. However, in order for the present researcher to attempt to confirm this finding reported by Fleming, his stages three and four were not conflated for the present study. As the reader will remember, Fleming identified stages in reading on the basis of percentages of oral reading errors produced by first grade readers while reading Diagnostic Reading Scales (Spache, 1963) while this researcher identified stages in reading based on percentages of oral reading errors produced by below average first and second grade readers while reading a comparable test, The Gray Oral Reading Test. Since the Diagnostic Reading Scales and The Gray Oral Reading Test were considered by this researcher as comparable tests (see support in next chapter), it was expected that following stage identification based on percentages of errors produced by first and second grade readers while reading The Gray Oral Reading Test, an attempt to confirm Fleming's conclusion regarding conflating his stages three and four would be possible.

In addition to endeavoring to place below average grade one and two reading achievers into one of Fleming's five stages of development in reading, this researcher attempted to place subjects in grades one and two into either stage four or five of Fleming which were redefined by the present researcher. Stages four and five of Fleming were

redefined by this researcher to account for findings noted by Biemiller in his study of grade one readers in which the percentage of contextual errors exceeded the percentage of graphic errors.

Factors Influencing Oral Reading Strategies

Factors influencing oral reading strategies discussed in the following section include: method of reading instruction and level of passage difficulty.

The Influence of Instructional Reading Methods on Oral Reading Strategies

The main purpose of studies reviewed was to examine whether a relationship existed between children's mode of reading instruction and oral reading strategies. Most researchers, reviewed in the following section, compared oral reading errors of two groups of children each taught by a different reading method: a phonic method or a word method. For the purposes of this study, Harris and Hodges' (1981) definitions of phonic method and word method will be used to avoid confusion regarding the exact meaning of such terms. A phonic method defined by Harris and Hodges is: "a way of teaching reading in which the sounds represented by letters and letter combinations are emphasized in learning to identify words; sometimes called phonetic method." A word method defined by Harris and Hodges (1981) is: "a way of teaching reading in which a substantial number of words are learned as whole units for reading before word analysis is started."

Findings reviewed in the following section indicated that different instructional methods do influence the pattern of word

recognition errors produced during oral reading.

The Nelson Language Development Reading Program (1977) was used to teach children below average in reading achievement in grades one and two who were selected for the present study. The authors of The Nelson Language Development Reading Program (1977) suggest that:

> The skill development part of a reading program should assist children in confirming their insights about how to get meaning from print. It should deal with material in terms of units of meaning, beginning with the largest unit (the whole selection) and preceding to smaller units (paragraphs, sentences, words, and word parts). (p. viii)

According to Harris and Hodges' (1981) definitions of phonic method and word method, The Nelson Language Development Reading Program seems to emphasize a word method over a phonic method of teaching reading.

The purpose of this investigator was not to investigate the influence of the instructional method on children's reading strategies, but to examine stages of development in learning to read projected by Fleming (1974) and redefined by the present researcher based on oral reading errors of below average readers in grades one and two. Errors produced during oral reading may be a function of the instructional approach as opposed to development. Chall (1969) raises this issue:

> The most obvious question that arises is whether the same kinds of errors and particularly the developmental phases described by Biemiller, would be found among first graders taught by other than basal reader programs? Is it possible that the particular methods and materials by which these children were taught (with their use of illustrations, their emphasis on reading for meaning, the learning of a limited number of sight words first with a slow introduction of phonics and the relatively limited vocabulary load) influenced strategies they used to recognize words? Or are the strategies part of a general developmental sequence in learning to read, irrespective of the methods and materials used? (p. 565)

In view of the issue raised by Chall as well as findings indicated in studies reviewed in this section, this researcher felt

it necessary to report the instructional approach used as a possible factor in stages of development in the process of learning to read of below average reading achievers selected for the present study. Examining the effects of instructional methods on reading strategies is discussed as a suggestion for further research in the final chapter but is outside this present study.

A study conducted by Elder (1971) compared the oral reading achievement of a group of Scottish and a group of American children after two and one half years of reading instruction. Scottish children were taught by a phonic method which emphasized recognition of shapes of separate letters, groups of letters, and whole words, and association of appropriate sounds with those letters or collection of letters (Bullock, 1975) while American children were taught by a word method emphasizing, as Harris and Hodges (1981) would state, whole word learning. Scottish children taught by a phonic method produced more mispronunciations while reading passages than American children instructed by a word method. A significantly greater proportion of substitutions produced by the first group changed the sentence meaning and remained uncorrected. Elder suggested these findings were related to a phonic method of reading instruction which placed less emphasis on word meaning. In contrast, the American group exhibited a larger proportion of real word substitution errors per total errors compared with the Scottish group. In analyzing overall errors and reading rates, the Scottish phonic instructed group showed fewer word recognition errors and were consequently more accurate but slower in reading than the American word instructed group who showed decreased accuracy but

increased reading rate.

In a similar investigation Barr (1972) selected 41 prereading first grade children to examine whether their error patterns could be a function of instructional method. While Elder (1971) analyzed oral reading errors produced while reading passages, Barr (1972) analyzed errors made on isolated word lists. Children instructed by a sight word method, defined by Harris and Hodges (1981) as whole word learning, substituted an aural response from words taught. In contrast, the children instructed by a phonic method showed a high proportion of words other than those taught; a high number were nonsense words or non-responses. More graphically constrained responses were noted for the phonic instructed group than for the sight word instructed group. In view of these findings, it was indicated that different instructional methods influenced the pattern of word recognition errors. In comparing error patterns supplied by phonic and sight word instructed children with error patterns found in Biemiller's (1970) three stages, Barr concluded that the error patterns of children instructed by a phonic method correlated with Biemiller's non-response stage two while children instructed by a sight word method correlated to Biemiller's first stage.

In another study investigating the influence of instruction on reading strategies, Barr (1974) confirmed earlier findings that subjects taught by a phonic strategy emphasizing letter-sound relationships were not constrained by words previously taught while subjects using a word method or word meaning strategy were constrained by previously learned reading words. Subjects included in the study were

32 first grade children.

While researchers previously reviewed compared oral reading errors of children taught by two different approaches, Cohen (1974) analyzed oral reading errors made by 50 children instructed by a phonic method. Results reported over an eight month period indicated an initial preponderance of non-response errors for both good and poor readers. Cohen suggested early training in the use of letter sounds accounted for this finding. Good readers shifted their strategy from producing no response to producing nonsense words and then to word substitutions that were graphically closer to the stimulus. In contrast, at the end of the eight month period, nonsense errors generated by poor readers were high. Cohen concluded that the better readers shifted to use of nonsense words earlier in the year than poorer readers. Nonsense errors appeared to be a function of phonic instruction emphasizing blending of letter sounds.

Consistent with previously reported findings, DeLawter (1975) showed children instructed in a phonic method produced twice as many non-words as real words. The children taught by a word method, described in Harris and Hodges (1981) as emphasizing whole word learning, offered a higher percentage of real word miscues than non-words showing little graphophonemic similarity to test words. Both groups supplied undifferentiated proportions of syntactically acceptable and semantically acceptable real word substitutions.

Another study investigating the effect of instructional method on oral reading errors was conducted by Norton (1976). She observed that a greater number of non-words and words with high graphic

similarity to the text word were produced by both high and low ability first and third grade children instructed by a phonic method emphasizing, as Harris and Hodges (1981) stated, sounds representing letters and letter combinations in word identification. Children instructed by an analytic eclectic meaning approach, emphasizing whole word learning, relied heavily on semantic acceptability of the passage and corrected errors which distorted meaning.

More recently another investigation which selected two different approaches for beginning readers was conducted by Dank (1977) to determine the effect of instruction on oral reading errors of second grade children. Goodman and Burke's taxonomy (1972) used to analyze oral reading miscues produced by subjects while reading a story (509 words in length) indicated that the children taught by a phonic method generated more oral reading miscues that were high in graphic similarity as well as sound similarity to the expected story word. The children taught by a language experience approach emphasizing whole word learning produced a greater proportion of miscues that did not alter the author's message. Dank proposed that the difference between the miscues generated by the two groups was attributable to differences in the reading instructional approaches. The language experience approach emphasized obtaining meaning from print whereas the phonic approach focused on processing written symbols.

Most recently Ramig and Hall (1980) investigated reading strategies of first grade children taught by a language experience method emphasizing whole word learning (Harris and Hodges, 1981) and a basal reading program consisting of rigidly controlled vocabulary and

sequence of learning experiences (Harris and Hodges, 1981). An analysis of first grade children's errors made while reading a 140 word passage at grade one level indicated that children instructed by a basal and a language experience method supplied undifferentiated error patterns, therefore utilized graphic, syntactic, and semantic cues about equally. In explanation of these findings, Ramig and Hall suggested that the level of passage difficulty may have been a factor contributing to the lack of difference between the two groups. The language experience instructed group did, however, differ from the basal instructed group in generating more real words substituted on a word reading task.

The present study investigated oral reading errors of children taught by a Nelson Language Development Reading Program which emphasizes learning units of meaning, beginning with the largest unit (the whole selection) and preceding to smaller units (paragraphs, sentences, words, and word parts). The present researcher expected below average reading achievers in grades one and two to demonstrate reading strategies similar to reading strategies of children taught by a word meaning approach; producing real word substitutions and few nonsense errors. This investigator assumed a stage of development, following non-response errors, in which children produced nonsense words (Cohen, 1974) would <u>not</u> be extensively used by children taught a word meaning emphasis approach.

<u>The Influence of Passage Difficulty on Oral Reading Strategies</u>

A few researchers (Biemiller, 1979; Kibby, 1979; Christie and Alonso, 1980) investigated effects of passage difficulty on children's

oral reading error patterns. Studies reviewed consistently reported the qualitative aspect of reading errors changed as readers progressed from less to more difficult passages. The following discussion is of relevance to the present study in that this investigator expected below average readers in grades one and two to make qualitatively different errors as they read passages that progressed from the less difficult base (first three passages on The Gray Oral Reading Test) up to and including the more difficult ceiling passages (two consecutive passages on which readers made seven or more errors on The Gray Oral Reading Test).

A study conducted by Biemiller (1979) compared use of graphic, syntactic, and semantic information of grade one readers with various proficiency levels as they read passages of increasing difficulty. Results indicated that as passages became increasingly difficult, poorer readers made proportionately fewer non-response errors than did better readers. Biemiller concluded that the poorest readers used graphic information less efficiently than other readers when reading difficult material. In contrast, the better readers shifted from a high proportion of contextual errors on easier passages to proportionately more non-response and graphic substitution errors on more difficult passages.

While Biemiller studied better and poorer readers, Kibby (1979) focused on 46 fourth, fifth, sixth, and seventh grade disabled readers while reading difficult and less difficult passages. Findings reported by Kibby indicated that reading strategies of disabled readers were affected when reading the difficult passages; 76 percent of all

readers showed inefficient use of grammatical relationship on the difficult passage.

A study by Christie and Alonso (1980) confirmed findings of Biemiller (1979) and Kibby (1979) in that reading error patterns were significantly affected by difficult passages. Average readers in first and third grades read a series of increasingly difficult passages until frustration level was reached. These readers made errors which were higher in graphic similarity, grammatical function, and grammatical acceptability and lower in semantic acceptability when reading difficult material. These findings indicated that strategies on difficult material emphasized student attention to graphic and grammatical information rather than meaning.

The present study asked children to read total passages which included: base passages (first three passages of The Gray Oral Reading Test) and total passages (passages up to and including two consecutive passages on which the reader made seven or more errors). It was expected by the present researcher that all below average readers in grades one and two would read base passages without exceeding the number of errors specified by the author of The Gray Oral Reading Test, suggesting that these passages would not be at frustration level for any of the subjects in grades one or two. Total passages on The Gray Oral Reading Test did include two consecutive ceiling passages on which children were expected to exceed the number of errors specified by the test author. Therefore, it was assumed that the last two consecutive passages read by each child would be the most difficult at frustration reading level. This researcher expected below average

readers in both grades one and two to produce quantitatively and qualitatively different errors while reading base passages and passages up to and including two consecutive ceiling passages.

Summary

This chapter discussed the following areas: function of error analysis in oral reading, sensitivity to contextual constraints of language demonstrated by young readers, sensitivity to graphic constraints of the printed word demonstrated by young readers, stages of development in learning to read, and factors influencing oral reading strategies. Conclusions from these studies were drawn:

1. Miscue analysis is a widely used tool assessing children's use of graphic, syntactic, and semantic information during oral reading.

2. All readers, regardless of reading proficiency level, demonstrated sensitivity to contextual constraints by producing grammatically acceptable errors.

3. Better readers produced proportionately more syntactically and semantically acceptable miscues than poorer readers and therefore appeared to make increased use of contextual constraints than did poorer readers.

3. Use of contextual information increased as beginning readers matured.

4. The proportion of syntactically acceptable miscues was higher for most readers than the proportion of semantically acceptable miscues.

5. Better readers corrected a greater percentage of errors

than did poorer readers especially errors that changed the meaning of the text.

6. All readers, regardless of proficiency level, identified a greater number of words in contextual situations than in isolation.

7. Better readers generated proportionately more graphically similar errors than did poorer readers indicating more efficient use of the graphic information.

8. Use of graphic information increased as beginning readers matured.

9. Stages of development in the process of learning to read described for beginning readers suggested that these readers do make different use of contextual and graphic information when learning to read.

10. Beginning readers produced a higher proportion of contextually acceptable errors than graphically similar errors.

11. Instructional methods employed to teach reading seemed to influence children's oral reading strategies; word method instructed children produced real word substitutions from words taught whereas phonic instructed children produced nonsense words, words with high graphic similarity to the text and more words previously not taught.

12. Level of passage difficulty seemed to influence children's oral reading strategies and the subsequent qualitative (graphic, syntactic, and semantic) errors produced.

Each of these twelve points was considered in the analyses of children's oral reading miscues produced while reading total passages of The Gray Oral Reading Test for the present study.

Chapter 3

THE EXPERIMENTAL DESIGN

This chapter will describe the design of the study, method of sample selection, test instruments including their validity and reliability, and data collection and analyses.

Design of the Study

The purpose of this study was to examine stages of development in learning to read of children below average in reading achievement in grades one and two in May. The present study is in part a replication but also an extension of Fleming's study (1974) in which he found it possible to pinpoint stages in learning to read of children with high, average, and low reading ability in grade one during a single testing session in April.

The present study replicated Fleming's research by analyzing grade one children's oral reading errors for graphic similarity, syntactic acceptability, semantic acceptability, and non-responses during one testing session in May in order to help teachers place these grade one children into stages of development in reading and to help teachers identify below average readers. The present study differed from and extended Fleming's research in the following ways: (1) While Fleming selected a range of subjects from high to low reading achievers in grade one, this study focused on the below average readers in grade one in order to obtain a clearer description of one

discrete group of readers. (2) While Fleming pinpointed stages of development in reading on the basis of grade one readers' miscues, the present study included an analysis of oral reading miscues produced by below average reading achievers in grade two. (3) The present study retained five stages of development of Fleming but, in addition, modified Fleming's stages four and five. Stages one, two, and three of Fleming remained unchanged for the present study. Data were analyzed using Fleming's original five stages as well as the modified stages four and five. It was expected by this investigator that children, below average in reading achievement in grades one and two, would be performing in one of five stages of development in reading of Fleming or in one of two stages of development in reading modified by the present researcher.

In order to pinpoint which stage of development of Fleming or of the present researcher that children were performing in based on reading miscues, each subject read orally total passages; including base passages (first three passages on The Gray Oral Reading Test) and passages up to and including two consecutive ceiling passages on the same test, that is, passages on which seven or more miscues were produced on The Gray Oral Reading Test. Four comprehension questions as set out in The Gray Oral Reading Test per passages were then asked following oral reading of total passages. Prior to reading total passages, each subject read orally a corresponding list of randomly ordered passage words.

Negin (1981) examined the order effect of presenting an isolated word list containing story words prior to or following the story. He

randomly assigned 51 grade one and 51 grade three subjects to one of the following three conditions: (1) list/list condition in which the subject read and reread the same list of words; (2) list/story condition in which the subject read a word list containing story words prior to reading the story; (3) story/list condition in which the subject read a story and then a list of words contained in the story. Subjects in grades one and three read words in the appropriate condition at an "easy" level (primer level for grade one and grade 3^2 level for grade three) and a "hard" level (grade 2^2 for grade one and an incredible grade seven for grade three). Negin found greater improvement in gain scores for the list/story condition than the story/list or list/list condition. Negin suggested that better performance on the list/story condition compared to the story/list condition may have been due to memory in that, "Uncertainty created in the first exposure of the list/story condition may carry over to the second exposure whereas the complex stimuli of the first exposure in the story/list condition could overload a child's memory capacity" (p. 80).

Negin's study was based on subjects reading one list and one story whereas the present researcher asked subjects to read five to seven passages and accompanying word lists. For the present study, a word list was presented prior to each story so subjects read a sequence of list-story-list-story for five to seven stories. Such a sequence may have been perceived by subjects, after the first passage, as story-list-story-list or the reverse, therefore the order effect reported by Negin may not be relevant to a presentation sequence of more than one list and one story.

Reading of words in isolation and passages as well as responses to comprehension questions by below average reading achievers in grades one and two were recorded for data analyses. During oral reading of word lists, substitution miscues produced by grades one and two were analyzed for syntactic and semantic acceptability (Potter, 1980). Substitution, insertion, and omission miscues produced by these same subjects in the sample during oral reading of total passages were analyzed for syntactic and semantic acceptability, while substitution and mispronunciation miscues were analyzed for graphic similarity. Non-response errors made by below average reading achievers while reading total passages were also recorded. Each below average reader in both grades one and two was then placed into one of five stages of development in reading projected by Fleming or one of two stages modified by this researcher based on his percentage of graphically similar, syntactically acceptable, semantically acceptable, and non-response miscues out of the total number of miscues obtained while reading total passages on The Gray Oral Reading Test. The stage of development in reading, projected by Fleming or redefined by this researcher, reached by each child in the sample while reading total passages was compared to: (1) his/her achievement on the comprehension section of the Gates-MacGinitie Reading Test (Hypotheses One and Three); (2) his/her performance on comprehension questions on The Gray Oral Reading Test (Hypotheses Two and Four). Finally the stage of development in reading projected by Fleming or redefined by the present researcher reached by below average reading achievers in grade one who scored in stanine four on the Gates-MacGinitie Reading Test was compared

to the stage of development in reading reached by below average reading achievers in grade two who scored in stanine three on the Gates-MacGinitie Reading Test (Hypothesis Five). Also the stage of development in reading reached by below average reading achievers in grade one who scored highest on the comprehension questions of The Gray Oral Reading Test was compared to the stage of development in reading reached by below average reading achievers in grade two who scored lowest on the comprehension questions of The Gray Oral Reading Test (Hypothesis Six).

Method of Sample Selection

The sample for this study was selected from the population of 105 children in grade one and 125 children in grade two elementary classrooms located in a small urban center in central Alberta. The researcher, from personal experience in this school, can attest to the fact that although teachers were using The Nelson Language Development Reading Program, a more extensive phonic instruction sequence was added. Children described by their teachers as the poorer readers in grade one (24 children) and in grade two (22 children) were selected for further testing after parental permission had been received. Permission was not granted for two poorer readers in grade one and three poorer readers in grade two because the parents felt these children were already spending part of the school day in resource room for additional reading instruction and therefore could not afford the time involved in participating in the present study or they reported that the children requested not to be selected for the study. Since inadequate intelligence (less than 84 on the Slosson Intelligence Test), inadequate vision (determined by

children's performance on the Snellen acuity test administered by the rural health nurse), and inadequate hearing (determined by children's performance on pure tone hearing screening administered by the rural health nurse) may have been factors contributing to below average reading achievement, the cumulative files, of children in grades one and two identified by their teachers as below average reading achievers, were read by this investigator. On the basis of cumulative file reports, two below average reading achievers in grade one with intellectual quotients of less than 84 as indicated by the Otis-Lennon Intelligence Test were excluded from this study. The usual procedure followed by the rural health nurse for recording vision and hearing screening results was to record only inadequate results on either vision or hearing screening. Cumulative file reports on the remaining 44 below average reading achievers, 22 in grade one and 22 in grade two did not indicate that these readers had either inadequate vision on the Snellen acuity test or inadequate hearing on pure tone hearing screening administered by the rural health nurse, so these subjects were retained for additional testing.

The comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 was administered to each of the 22 first grade readers and the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 was administered to each of the 22 second grade readers. Both levels A and B of the Gates-MacGinitie Reading Test were administered separately to groups of not more than five children. These children were asked to match a sentence or paragraph with one of four pictures by shading in the space between two lines of a bar under the corresponding picture. The number of comprehension items answered

correctly determined each child's raw score from which a stanine was derived (Teachers Manual, Gates-MacGinitie Reading Test). Children, below average in reading achievement in grades one and two, who scored below the third or above the fourth stanines on the Gates-MacGinitie Reading Test were rejected from the study. On the basis of these criteria, two readers in grade one and one reader in grade two who scored below stanine three and one reader in grade one and one reader in grade two who scored above stanine four were rejected from the present study. Children below average in reading achievement in grades one and two who scored at either the third or fourth stanines were retained for the present study. The sample therefore consisted of a total of 39 children; 19 below average reading achievers in grade one and 20 below average reading achievers in grade two as indicated in Table 3.1

Table 3.2 describes the number of below average readers in grades one and two by their raw scores that set them in stanines three and four on the Gates-MacGinitie Reading Test (comprehension section). Details of the students' scores are found in Chapter 4.

Test Instruments

Tests used to select the sample population (Snellen acuity test, pure tone hearing screening, Slosson Intelligence Test, Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1) as well as the instrument used to collect data (The Gray Oral Reading Test) will be discussed in this section.

Table 3.1

Final Sample of Poorer Readers in Grades One and Two Selected from the General Population of Readers in Grades One and Two

Number of	Grade One	Grade Two
Children in the general population	105	125
Readers identified as poorer by their teachers	26	25
Poorer readers not granted parental permission for this study	2	3
Poorer readers scoring less than 84 on the Slosson Intelligence Test	2	0
Poorer readers scoring below stanine three on the Gates-MacGinitie Reading Tests	2	1
Poorer readers scoring above stanine four on the Gates-MacGinitie Reading Tests	1	1
Final sample of poorer readers	19	20

Table 3.2

Number of Below Average Readers in Grades One and Two by Sex in Stanines Three and Four as Measured by Raw Scores on the Gates-MacGinitie Reading Test, (Comprehension Section, Levels A and B, Form 1)

Sex of Readers	Grade One		Grade Two	
	Stanine 3	Stanine 4	Stanine 3	Stanine 4
	12-16* (raw score)	17-23 (raw score)	17-23 (raw score)	24-28 (raw score)
Males	6	11	3	10
Females	0	2	4	3
Total	6	13	7	13

*Range of raw scores as reported for grades one and two in stanines three and four on the Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1).

Tests Used in Sample Selection

1. Vision and Hearing Screening

The pure tone audiometer used in hearing screening testing of the sample population provides pure tones at discrete frequencies and controlled output intensity levels. Four different dials on the audiometer (frequency dial in Hz, intensity dial in dB, test tone interrupter dial, and right/left ear dial) allow the tester to regulate the frequency and intensity levels and deliver the tone to either the subject's right or left ear. The procedure generally accepted for hearing screening as stated by Anderson in Katz (1978) involves using "at least the frequencies 1000, 2000, and 4000 Hz at levels no higher than 25 dB (ANSI, 1969) in the criteria for referral" (p. 53). If the subject fails to hear the tone at any of these frequency levels, he is referred to appropriate medical personnel for further testing. The procedure discussed here for hearing screening was followed by the health nurse who tested children in grades one and two.

The Snellen acuity test used in vision screening of the sample population provides a distance measure of central visual acuity (Jobe, 1976, p. 29). Square shaped symbols (letters) printed in rows of specified sizes are on a chart which is placed 20 feet from the child being examined with the 20/20 line at his eye level. One eye is tested at a time while the subject keeps both eyes open but holds an occluder over the eye not being tested. The health nurse who tested children in the sample population followed this procedure and referred children to appropriate medical personnel for further testing if they failed to recognize any letters on the 20/40 line.

2. The Slosson Intelligence Test (Slosson, 1963)

The Slosson Intelligence Test is a brief individual test of intelligence, adapted from the Stanford-Binet Test, but with a lower base (two weeks) and a higher ceiling (27 years) than the Binet. The author reports product moment correlations between the intelligence quotients of the Slosson Intelligence Test and the Stanford-Binet Test ranging from .90 to .98 at each age from four to eighteen and above, derived from a heterogeneous population of 701 individuals (Buros, 1972). All questions on this test are presented verbally and require spoken responses. Areas tested include: mathematical reasoning, vocabulary, auditory memory, and information.

3. The Gates-MacGinitie Reading Test (MacGinitie

The Gates MacGinitie Reading Test consists of two separate sections, vocabulary and comprehension designed to cover grades one to twelve.

a. Vocabulary. The vocabulary section measures ability to recognize and structurally analyze words in isolation. At both Levels A and B, each of the 45 items required children to match a word with one of four pictures.

b. Comprehension. The comprehension section measures ability to gain meaning from prose passages. At both levels, each of the 40 items required children to match a sentence or paragraph with one of four pictures.

Although the Gates-MacGinitie Reading Test consists of a vocabulary and a comprehension section, only the comprehension section was used for this study.

The Gates-MacGinitie Reading Test (Levels A and B, Form 1) is a standardized achievement test based on Canadian norms of English speaking students. The test developers include procedures taken to assure validity and reliability (Kuder-Richardson Formula 20 reliability coefficients—vocabulary .91, comprehension .92) in the Teacher's Manual of the Gates-MacGinitie Reading Tests, Levels A and B, Form 1 (MacGinitie, Kamons, Kowalski, MacGinitie, and MacKay, 1980, pp. iv-v, 23-27).

4. The Gray Oral Reading Test (Gray, 1963)

The Gray Oral Reading Test is designed to assess oral reading skill and to aid in diagnosing reading difficulties. Four forms of this test are provided, with each form containing 13 passages ranging from preprimer level to adult or college levels.

The Gray Oral Reading Test, a test comparable (see case made later in Chapter 3) to the Diagnostic Reading Scales (Spache, 1963) used by Fleming (1974), was selected for the present study primarily because three passages were available at the grade one level which provided a common starting point for below average readers in both grades one and two. The Diagnostic Reading Scales employed by Fleming offered four passages at grade one level, two passages at grade 1.6 and two passages at grade 1.8. Fleming asked all his subjects in grade one to read one grade two passage in addition to the four passages at grade one level on the Diagnostic Reading Scales to establish base passages. However, since he noted that some of the grade one readers exceeded the number of errors specified by Spache (1963) to terminate reading on the first five passages, this researcher administered the

first three passages on The Gray Oral Reading Test to ensure establishing a common starting point for all below average readers in grades one and two.

As previously mentioned in Chapter 2, a common starting point on The Gray Oral Reading Test was established for both grade one and two readers in light of previous research (Biemiller, 1979; Kibby, 1979; Christie and Alonso, 1980) which reported that reading errors changed qualitatively as readers progressed from less to more difficult passages. Therefore, this researcher analyzed and compared types of errors produced while subjects read less difficult base passages up to and including more difficult ceiling passages (two consecutive passages on which subjects exceeded the number of errors specified by the Gray test author) in order to examine qualitative changes in errors.

The Gray Oral Reading Test used by the present researcher and the Diagnostic Reading Scales used by Fleming are comparable in that both tests require the reader to orally read passages of increasing difficulty until he reaches a ceiling level in which his errors exceed the number specified by each test author. In addition, comprehension questions follow each passage of both tests and require oral answers from the reader. But there were, however, differences between The Gray Oral Reading Test and the Diagnostic Reading Scales and these differences include base criteria, ceiling criteria, and passages available at each grade level.

Errors produced by below average readers in grades one and two while reading passages from The Gray Oral Reading Test were scored according to Gray (1963) as gross mispronunciations, partial mispronunciations, omissions, insertions, substitutions, repetitions, and

inverting word worder. Hesitations, self corrections, and repetitions of less than one word are not errors, but affect the score by increasing the time taken. The present investigator retained substitutions (including inversions), mispronunciations (gross and partial), omissions, insertions, and self corrections for analyses. Hesitations were coded as non-responses when the child hesitated for five seconds before skipping the word or hesitated for ten seconds if attempting to pronounce the word. Of the miscues retained for the present study, the total number of miscues analyzed (in agreement with Fleming) to place children into stages of development in reading projected by him or modified by the present researcher included: substitutions, mispronunciations, insertions, omissions, and non-responses.

Comprehension questions designed to measure literal recall follow each passage of The Gray Oral Reading Test. A comprehension score is attained but not counted in the total score on the test. For the purposes of the present study, the stage of development in reading, of Fleming (1974) or this researcher, reached by each child was compared to his performance on comprehension questions on The Gray Oral Reading Test. It was expected that grade one and two readers in the sample who answered the highest percentage of comprehension questions would be in a more advanced stage of development in reading. Form D of The Gray Oral Reading Test was used although forms A, B, C, and D are available. Intercorrelations among grade scores on forms A, B, C, and D are reported to be at approximately .98 indicating consistency among forms. Harris (in Buros, 1968) reported that "face validity and construct validity can be accepted as being high" (p. 368).

Data Analyses

Miscues

The following types of oral reading miscues produced by below average reading achievers in grades one and two while reading total passages on The Gray Oral Reading Test were noted for analyses:

a. Substitution. The child responds with a "real" word for a word in the word list or in the passage.

e.g. here (word list)
her (student response)
Mother is here. (passage text)
Mother is her. (student response)

b. Mispronunciation. The child responds with a nonsense word for a word in the word list or in the passage.

e.g. play (word list)
/plæ/ (student response)
Come and play. (passage text)
Come and /plæ/. (student response)

c. Non-response. During oral reading the child pauses for at least five seconds before skipping a passage word. If the child is attempting to sound out the word, he is given ten seconds before being requested to pronounce the next word in the passage.

d. Omission. The child leaves a word or group of words out of the passage without at least a five second pause.

e.g. You are a good girl. (passage text)
You are a girl. (student response)

e. Insertion. The child adds a word or group of words to the passage.

e.g. A cat wanted to find her kittens. (passage text)

A cat wanted to find her pretty kittens. (student response)

f. Self Corrections. The child repeats a word or group of words in order to correct a previous error.

e.g. Come and play. (passage text)

Come and pay. (student's initial response)

Come and play. (student correction)

Although self corrections produced during oral reading were noted for later analyses, they were not included in the total number of miscues.

Miscue Analysis

Substitution miscues produced while reading words in isolation were analyzed for syntactic and semantic acceptability (Potter, 1980) and will be compared to substitution miscues produced in context. Substitutions, mispronunciations, omissions, and insertion miscues produced during oral reading of passages on The Gray Oral Reading Test were analyzed in the following ways as shown in Table 3.3:

a. Graphically similar. The initial letter of the child's substitution or mispronunciation is the same as the initial letter of the printed word.

e.g. I want to play. (passage text)

I wish to play. (student response)

b. Syntactically acceptable. The child replaces a word with another word, omits or inserts a word without changing the grammatical structure of the phrase (phrase is defined later in

Table 3.3

Types of Miscues Analyzed in Total Passages on The Gray Oral Reading Test for Graphic Similarity, Syntactic Acceptability and Semantic Acceptability.

	Types of Miscues			
	Substitutions	Mispronunciations	Omissions	Insertions
Graphically Similar Miscues	✓	✓	Since the reader omitted pronouncing a text word, comparison between the expected response and the observed response was not possible.	Since the reader added a word to the text, comparison between the expected response and the observed response was not possible.
Syntactically Acceptable Miscues	✓	Since the reader did not pronounce the text word correctly, neither syntactic or semantic analyses of the observed response was attempted.	✓	✓
Semantically Acceptable Miscues	✓		✓	✓

this chapter).

e.g. The child substitutes a noun for a noun, a verb for a verb, etc., or when the word/words inserted or omitted are grammatical in terms of the other words at the phrase level.

(The child's observed responses rather than the expected responses at the phrase level were taken into account for error analysis. In the following example, the child's error "brown" would be analyzed with his error "the" not "a" from the passage and his error "the" is analyzed with his error "brown" not "black.")

e.g. a black dog (passage text)
the brown dog (student response)

c. Semantically acceptable. The child replaces a word with another word, omits or inserts a word without altering the meaning of the phrase.

e.g. can play with Mother (passage text)
could play with Mother (student response)

The first seven passages of The Gray Oral Reading Test were divided into noun phrases and verb phrases. Substitution, omission, and insertion errors produced by below average readers in grades one and two while reading total passages on The Gray Oral Reading Test were then analyzed in one of the following four ways at the phrase level for syntactic and semantic acceptability: (1) errors that occurred at the beginning of the phrase boundary were analyzed in terms of the succeeding context, e.g., /get my kittens/; (2) errors

that occurred at the end of the phrase boundary were analyzed in terms of the preceding context, e.g., /find my mittens/; (3) errors that occurred in the middle of the phrase were analyzed in terms of the preceeding and succeeding context within the phrase, e.g., /find her kittens/; (4) one word phrase errors that occurred between phrase boundaries were analyzed in terms of the preceding or succeeding phrase (within the same sentence). In the following example, the error "he" occurred between phrases "said Mother" and "can make something for you" but within the sentence "I can make something for you." Therefore the error "he" was analyzed with the succeeding context "can make something for you."

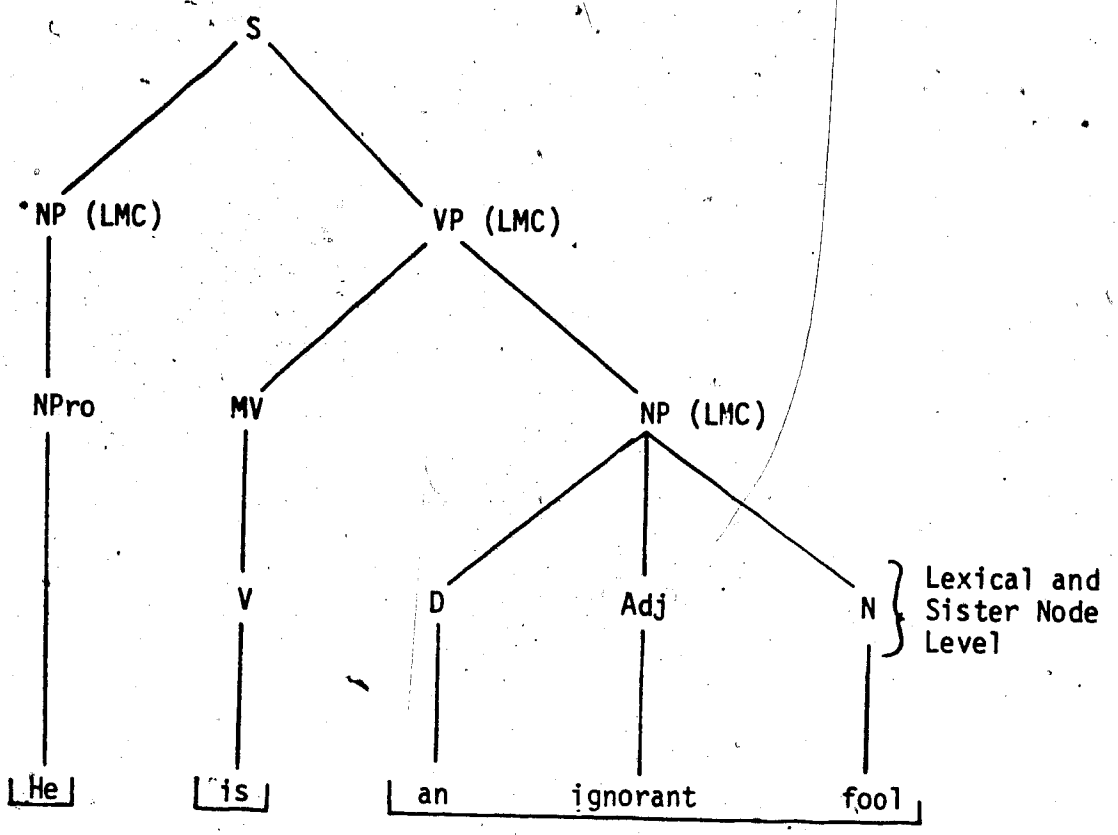
/said Mother/. I/ can make something for you/. (passage text)

/said Mother/. He/ can make something for you/. (student response)

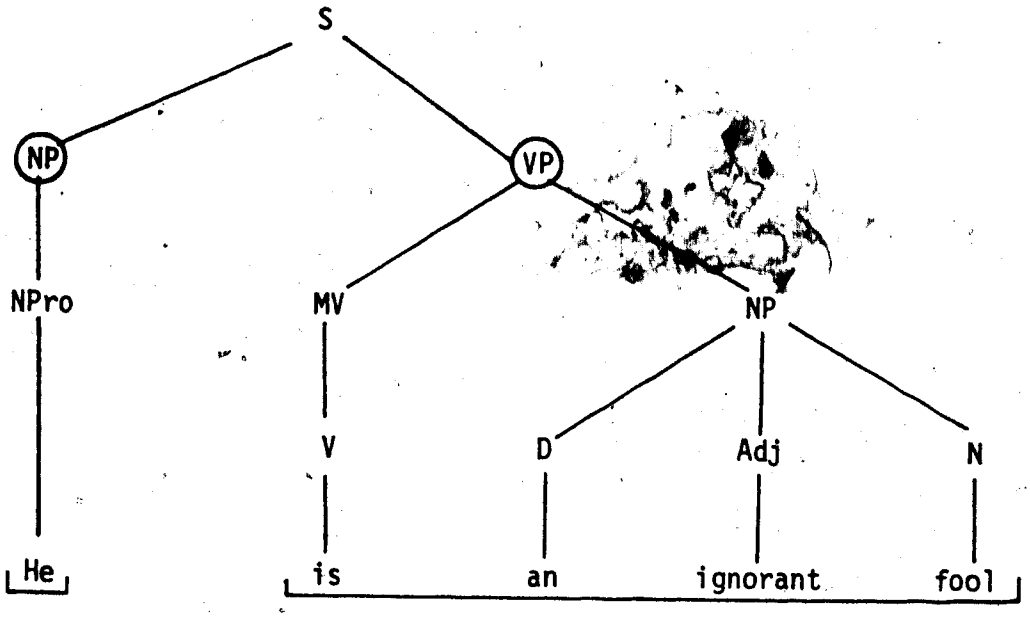
Fleming (1974) divided 11 passages on the Diagnostic Reading Scales into phrases which he defined as the lowest major constituent (Latham, 1973). In defining lowest major constituent, Latham (1973) stated:

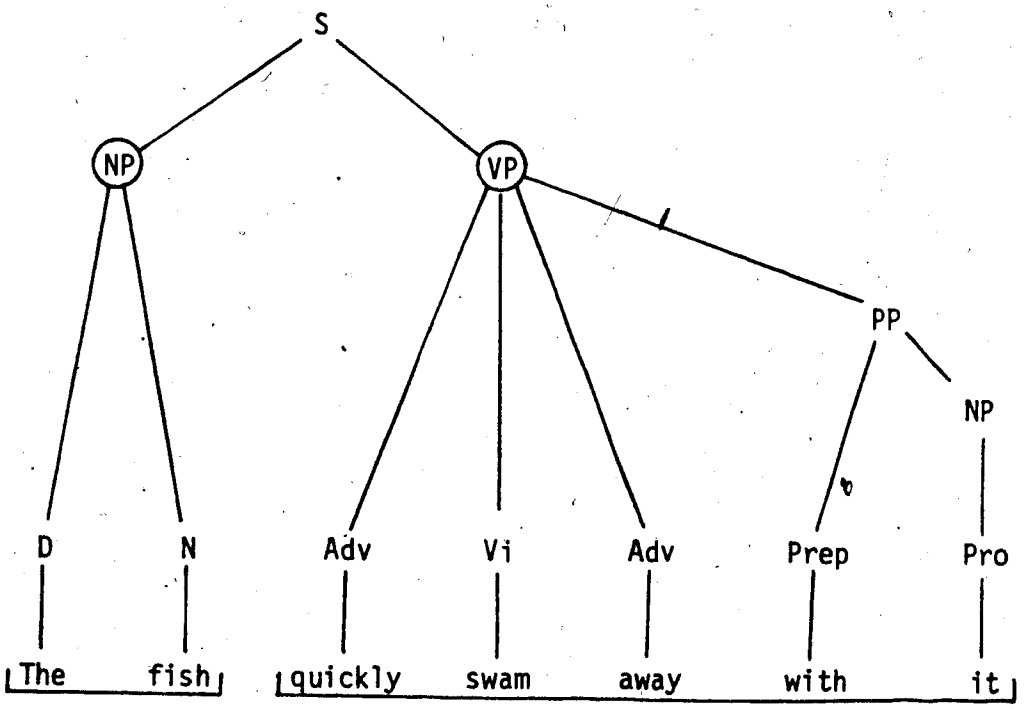
> Lowest major constituents (LMC) may be formed from all nodes in a surface structure tree except lexical nodes. They are found by locating those nodes which are immediately above the lexical nodes and deciding whether or not there are sister nodes to the lexical nodes. If there are no sister nodes to a specific lexical node then the node immediately above the lexical node, i.e., its dominating node is an LMC. If there are sister nodes to a specific lexical node, then the LMC associated with that node is the node which immediately dominates all sisters of the lexical node in question. (p. 190)

The surface structure phrase marker for the sentence, "He is an ignorant fool" would be:



The present researcher, unlike Fleming, did not define phrase as the lowest major constituent but as noun phrases and verb phrases. This was done because the present researcher found when a sentence was divided into lowest major constituents, many errors occurred at the phrase boundary. It was not known for certain, by this researcher, how Fleming analyzed errors at the phrase boundary for syntactic and semantic acceptability although an explanation was given by him in his study. Therefore, this researcher did not attempt to replicate Fleming's lowest major constituent analysis procedure but instead divided the first seven passages of The Gray Oral Reading Test into noun and verb phrases (a noun phrase that followed a verb was considered with that verb as a verb phrase). The following examples are used to illustrate this procedure.


S
NP
VP
NPro
MV
NP
V
D
Adj
N
He
is
an
ignorant
fool


S
NP
VP
PP
NP
D
N
Adv
Vi
Adv
Prep
Pro
The
fish
quickly
swam
away
with
it

Criteria for Determining Stages of Development in Learning to Read

As indicated in Chapter 1, Biemiller (1969) described three stages of development in reading for high, average, and low reading achievers in May. Stage one (pre non-response stage) was characterized by a preponderance of contextually constrained errors, stage two (non-response stage) was distinguished by a predominance of non-response errors, and stage three (post non-response stage) was characterized by a high proportion of both contextual and graphic errors. Fleming (1974), in an extension of Biemiller's work, described the following criteria as determining five stages of development in reading for high, average, and low reading achievers in grade one in April.

Stage One. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues less than 50 percent are graphically similar while at least 50 percent are semantically or syntactically acceptable.

Stage Two. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues at least 50 percent are non-response miscues.

Stage Three. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues less than 50 percent are graphically similar, less than 50 percent are semantically or syntactically acceptable, and less than 50 percent are non-response.

Stage Four. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues at least 50 percent

are graphically similar but less than 50 percent are semantically or syntactically acceptable.

Stage Five. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues more than 50 percent are graphically similar and at least 50 percent are semantically or syntactically acceptable.

On the basis of research reviewed in Chapter 2 (Christie, 1981; Burke, 1976; Biemiller, 1969; Clay, 1968; Allen, 1969; Burke and Goodman, 1970), this investigator revised stages four and five projected by Fleming. The criteria for the fourth and fifth stages of development in learning to read modified for below average reading achievers in grades one and two are listed below:

Revised Stage Four. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues less than 50 percent are graphically similar and at least 50 percent are syntactically or semantically acceptable. This revised stage four is different from Fleming's stage four, in terms of different percentages of projected graphic and syntactic or semantic miscues. Both Fleming's stage four and this researcher's stage four can be incorporated into Biemiller's stage three.

Revised Stage Five. Of the total number of substitution, mispronunciation, non-response, omission, and insertion miscues at least 50 percent are graphically similar and more than 50 percent are syntactically or semantically acceptable. This revised stage five is also different from Fleming's stage five, in terms of different percentages of projected graphic and syntactic or semantic miscues.

Both Fleming's stage five and this researcher's stage five can also be incorporated into Biemiller's stage three.

Inter-rater Reliability

The oral reading errors produced by four subjects (two below average readers in grade one and two below average readers in grade two, randomly selected) while reading orally words in isolation and words in total passages on The Gray Oral Reading Test were analyzed qualitatively to establish reliability by this researcher and a former teacher. Words read in isolation by four subjects were analyzed for syntactic and semantic acceptability while words read in total passages for the same four subjects were analyzed for graphic similarity, syntactic acceptability and semantic acceptability. The Arrington Reliability Formula (Feigel and Lorge, 1950) was used to compute the reliability score between this investigator and a former teacher:

$$\frac{2 \times \text{total agreements}}{2 \times (\text{total agreements and disagreements})}.$$

A score of 87 percent was calculated which was considered by this researcher an acceptable level of agreement.

Collection of Data

The appropriate comprehension section of the Gates-MacGinitie Reading Test was administered by this investigator to the below average grade one and two readers in groups of five in a private room. The time allotted for the comprehension section for grades one and two was 35 minutes each. All but one subject in grade one completed the test within the stringent time constraints. This child's correct

responses on questions he completed within the time constraints on the Gates-MacGinitie Reading Test were recorded.

The Gray Oral Reading Test was administered by this investigator to each of the 39 children in the sample on an individual basis in the room previously used to administer the Gates-MacGinitie Reading Test. Children in the sample were asked to read orally a word list followed by an accompanying story until they made seven or more errors on two consecutive ceiling passages. In addition, children were asked comprehension questions following their reading of each story. Oral reading of word lists and passages as well as responses to comprehension questions were recorded on tape for further analysis. Total time involved in administration of The Gray Oral Reading Test approximated 25 minutes per child.

Data Analyses

The computer facilities in the Division of Educational Research Services, University of Alberta, were used to analyze the data. Four types of data analyses described below were used to examine the six research hypotheses of the present study.

Pearson Product-Moment Correlation Coefficient

The Pearson product-moment correlation coefficient was used to examine whether correlations were statistically significant between raw scores, for grade one (hypothesis one) and grade two (hypothesis three), on the Gates-MacGinitie Reading Test (comprehension section) and (1) stages of development in reading found by the present researcher

and (2) four variables in determining stages in reading (percentages of graphically similar errors, percentages of non-response errors, percentage of syntactically acceptable errors, and percentages of semantically acceptable errors on total passages of The Gray Oral Reading Test). The Pearson product-moment correlation coefficient was also used to examine whether correlations were statistically significant between comprehension scores, for grade one (hypothesis two) and grade two (hypothesis four), on The Gray Oral Reading Test and (1) stages of development in reading found by the present researcher, (2) variables in determining stages in reading (as listed above), and (3) raw scores on the Gates-MacGinitie Reading Test (comprehension section).

The .05 level of significance was used to analyze all correlation coefficients. Hopkins and Glass (1978) stated, "Since α stands for the probability of making a certain type of incorrect decision, we prefer to keep it small. It is customary to let α equal .05 or .01" (p. 278).

One-Way Analysis of Variance

Research hypotheses one to four of the present study were analyzed by using a one-way analysis of variance to examine whether (1) the mean raw scores on the Gates-MacGinitie Reading Test (comprehension section) of first, grade one subjects (hypothesis one) and second, grade two subjects (hypothesis three), in each of the identified stages of reading, differed significantly among stages in reading and (2) the mean comprehension scores on The Gray Oral Reading Test of first, grade one subjects (hypothesis two) and second, grade

two subjects (hypothesis four), in each of the identified stages of reading, differed significantly among stages in reading.

Scheffé Multiple Comparison of Means

The Scheffé multiple comparison of means was used to examine where the difference between stages in reading and raw scores of the Gates-MacGinitie Reading Test (comprehension section) for grade one (hypothesis one) and grade two (hypothesis three) was statistically significant. The Scheffé test was also used to examine where the difference between stages in reading and comprehension scores on The Gray Oral Reading Test for grade one (hypothesis two) and grade two (hypothesis four) was statistically significant.

Chi Square

The Chi Square was planned to examine the degree of association between below average reading achievers in grade one who scored higher than other below average reading achievers in grade one and below average reading achievers in grade two who scored lower than other below average reading achievers in grade two on (1) the Gates-MacGinitie Reading Test (comprehension section) raw scores (hypothesis five) and (2) The Gray Oral Reading Test comprehension scores (hypothesis six).

Summary

Following parental permission, analysis of screening test results (hearing, vision, and intelligence) and administration of the appropriate level of the comprehension section on the Gates-MacGinitie

Reading Test to children judged by their teachers as below average in reading achievement in five grade one and five grade two classrooms located in a small urban center in central Alberta, 19 grade one and 20 grade two children were selected for the present study. Each subject in grades one and two read orally total passages which included: base passages (first three passages on The Gray Oral Reading Test) and passages up to and including two consecutive ceiling passages on which a reader produced seven or more errors. Subjects in both grades one and two were then requested to verbally answer comprehension questions which were asked following each passage on The Gray Oral Reading Test. In addition, subjects orally read word lists containing randomly ordered passage words prior to reading each passage. Percentages of syntactically acceptable and semantically acceptable errors produced by each subject in grades one and two, while reading words in isolation, were calculated. Also, percentages of syntactically acceptable and semantically acceptable as well as percentages of graphically similar and non-response errors produced by each below average reader in grades one and two, while reading words in passages, were calculated. Based on percentages of these errors produced while reading total passages, subjects were placed into one of five stages of development in the process of learning to read described by Fleming (1974) or stage four or five of Fleming, modified by the present researcher. The six research hypotheses were then statistically analyzed by use of Pearson product-moment correlations, one-way analysis of variance, and Chi square on the data. Findings of the present study are reported in Chapter 4.

Chapter 4

FINDINGS OF THE STUDY

This chapter presents first the data on student performances on: (1) the Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1), (2) The Gray Oral Reading Test (comprehension questions) and (3) The Gray Oral Reading Test (total passages read). Secondly, this chapter reports findings of the study for research hypotheses one through four inclusive which are reported statistically and also the findings for research hypotheses five and six which are reported descriptively.

In addition, this chapter also presents student performance and analyses of it as findings for below average reading achievers in grades one and two on: (1) self correction rates, (2) words identified in context compared to words identified in isolation, (3) influence of instructional approach on reading strategies, and (4) influence of passage difficulty on reading strategies. These four additional analyses of student performance were not covered formally by hypotheses but offer insights into areas of main focus in the study.

Data on Student Performances

Data on student performances on the Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1) and The Gray Oral Reading Test are shown in Tables 4.1 to 4.7 inclusive. The Gates-MacGinitie Reading Test scores are shown first in Table 4.1 for

Table 4.1

Grade One Children's (N = 19) Scores on the Gates-MacGinitie Reading Test (Comprehension Section), Level A, Form 1

Below Average Reading Achievers Stanine 4			Below Average Reading Achievers Stanine 3		
Grade One Subjects		Comprehension (Total Possible = 40)	Grade One Subjects		Comprehension (Total Possible = 40)
Males	01	22	Males	14	15
	02	22		15	15
	03	22		16	14
	04	22		17	14
	05	21		18	14
	06	21		19	12
	07	21			
	08	20			
	09	20			
	10	17			
	11	17			
Females	12	22			
	13	19			

grade one and in Table 4.2 for grade two. Thirteen below average reading achievers in both grades one and two placed at the fourth stanine on the basis of their raw scores on the Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1) while six children, below average in reading achievement in grade one and seven children, below average in reading achievement in grade two placed at the third stanine on the comprehension section (Level A and B) of the same test.

The raw score and percent correct on The Gray Oral Reading Test, comprehension questions, are shown in Table 4.3 for grade one and Table 4.4 for grade two subjects. Less than 50 percent of the comprehension questions were answered correctly by 12 out of 19 grade one children while 7 out of 19 children correctly answered more than 50 percent of questions on The Gray Oral Reading Test. The highest and lowest percentages of comprehension questions answered correctly by grade one subjects were 68 percent and 33 percent respectively.

In contrast to findings reported for grade one, all children in the grade two sample answered more than 50 percent of questions correctly on the same test. The highest and lowest percentages of comprehension questions answered correctly by grade two subjects were 83 percent and 54 percent respectively. Children in the grade two as well as in the grade one sample read passages up to and including two consecutive passages on which they produced seven or more errors on The Gray Oral Reading Test. Therefore, children in both these grades did not necessarily read the same number of passages (the

Table 4.2

Grade Two Children's (N = 20) Scores on the Gates-MacGinitie Reading Test (Comprehension Section), Level B, Form 1

Below Average Reading Achievers Stanine 4			Below Average Reading Achievers Stanine 3		
Grade Two Subjects		Comprehension (Total Possible = 40)	Grade Two Subjects		Comprehension (Total Possible = 40)
Males	01	28	Males	14	23
	02	28		15	21
	03	28		16	17
	04	28			
	05	28			
	06	27			
	07	27			
	08	27			
	09	26			
	10	25			
Females	11	28	Females	17	23
	12	27		18	23
	13	25		19	17
				20	17

Table 4.3

Raw Score and Percent Correct on The Gray Oral Reading Test, Comprehension Questions, for Grade One Subjects

Grade One Subjects	Raw Score on The Gray Oral Reading Test, Comprehension Questions	Percent Correct on The Gray Oral Reading Test, Comprehension Questions
01	12/20	60
02	13.5/20	68
03	12.5/20	63
04	9/20	45
05	9/20	45
06	13.5/20	68
07	11.5/20	58
08	11/20	55
09	9/20	45
10	8.5/20	43
11	9/20	45
12	12/20	60
13	7.5/20	38
14	6.5/20	33
15	7.5/20	38
16	7.5/20	38
17	9/20	45
18	8.5/20	43
19	8.5/20	43

Table 4.4

Raw Score and Percent Correct on The Gray Oral Reading Test, Comprehension Questions, for Grade Two Subjects

Grade Two Subjects	Raw Score on The Gray Oral Reading Test, Comprehension Questions	Percent Correct on The Gray Oral Reading Test, Comprehension Questions
01	17.5/28	63
02	20/28	71
03	21/28	75
04	20/24	83
05	20.5/28	73
06	19.5/28	70
07	19/28	68
08	16.5/24	69
09	17/24	71
10	21/28	75
11	22/28	79
12	15.5/24	65
13	19/28	68
14	13/24	54
15	14.5/24	60
16	13/24	54
17	16/24	67
18	14/24	58
19	16/24	67
20	14/24	58

total grade one sample read the first five passages while grade two read the first six or seven passages).

The number and percentage of errors were calculated for grade one and two students on total passages read on The Gray Oral Reading Test in order to place these students into one of five developmental stages of Fleming or one of stages four or five of Fleming as modified by the present researcher. Students in both grades were found to be achieving in one of Fleming's five developmental stages based on an analysis of their oral reading errors. The number and percentage of graphically similar, non-response, syntactically acceptable, and semantically acceptable errors produced by three grade one children and two grade two children on total passages read are presented in Table 4.5 to illustrate developmental stages one through five of Fleming. Tables 4.6 and 4.7 show the number and percentage of errors made by each grade one and two student on base and total passages read on The Gray Oral Reading Test and subsequent development stages in reading.

Research Hypothesis One

The hypothesis states: Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of the Gates-MacGinitie Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE and whose raw score

Table 4.5

Number and Percentage of Errors on Total Passages Read on The Gray Oral Reading Test and Subsequent Developmental Stages in Reading for Three Grade One Students and Two Grade Two Students

Grade One and Two Subjects	Graphically Similar Errors Made on Total Passages Read		Non-Response Errors Made on Total Passages Read		Syntactically Acceptable Errors Made on Total Passages Read		Semantically Acceptable Errors Made on Total Passages Read	
	Raw Score	Percent	Raw Score	Percent	Raw Score	Percent	Raw Score	Percent
Stage One Criteria	less than 50 percent of total errors are graphically similar		—		at least 50 percent of total errors are syntactically or semantically acceptable			
Subject 18 Grade 1	24/66	36	0/66	0	38/66	58	31/66	47
Stage Two Criteria	—		at least 50 percent of total errors are no-response		—		—	
Subject 19 Grade 1	10/53	19	41/53	77	7/53	13	5/53	9
Stage Three Criteria	less than 50 percent of total errors are graphically similar		less than 50 percent of total errors are no-response		less than 50 percent of total errors are syntactically or semantically acceptable			
Subject 11 Grade 1	19/43	44	16/43	37	14/43	33	11/43	26
Stage Four Criteria	at least 50 percent of total errors are graphically similar		—		less than 50 percent of total errors are syntactically or semantically acceptable			
Subject 17 Grade 2	17/29	59	8/29	28	12/29	41	9/29	31
Stage Five Criteria	more than 50 percent of total errors are graphically similar		—		at least 50 percent of total errors are syntactically or semantically acceptable			
Subject 9 Grade 2	17/21	81	2/21	10	11/21	52	8/21	38

Table 4.6

Number and Percentage of Errors Produced by Grade One Students on Base and Total Passages on The Gray Oral Reading Test and Subsequent Developmental Stages in Reading

Grade One Subjects	Number and Percentage of Graphically Similar Errors on:				Number and Percentage of Non-Response Errors on:				Number and Percentage of Syntactilly Acceptable Errors on:				Number and Percentage of Semantically Acceptable Errors on:				Developmental Stages in Learning to Read on: Total Passages
	Base Passages		Total Passages		Base Passages		Total Passages		Base Passages		Total Passages		Base Passages		Total Passages		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
01	3/4	75	11/32	34	0/4	0	15/32	47	2/4	50	8/32	25	2/4	50	6/32	19	3
02	6/6	100	26/45	58	0/6	0	13/45	29	5/6	83	21/45	47	5/6	83	16/45	36	4
03	5/6	83	27/53	51	0/6	0	19/53	36	4/6	67	19/53	36	4/6	67	15/53	28	4
04	0/0	--*	11/14	79	0/0	--	1/14	7	0/0	--	5/14	36	0/0	--	2/14	14	4
05	1/1	100	11/31	35	0/1	0	20/31	65	1/1	100	6/31	19	1/1	100	5/31	16	2
06	1/2	50	21/30	70	1/2	50	7/30	23	0/2	0	10/30	33	0/2	0	6/30	20	4
07	9/12	75	27/43	63	0/12	0	12/43	28	7/12	58	14/43	33	7/12	58	12/43	28	4
08	4/6	67	25/44	57	0/6	0	2/44	5	2/6	33	17/44	39	2/6	33	8/44	18	4
09	3/5	60	11/42	26	1/5	20	20/42	48	3/5	60	10/42	24	3/5	60	10/42	24	3
10	2/5	40	19/52	37	0/5	0	12/52	23	3/5	60	20/52	38	2/5	40	16/52	31	3
11	3/4	75	19/43	44	0/4	0	16/43	37	2/4	50	14/43	33	2/4	50	11/43	26	3
12	3/3	100	15/29	52	0/3	0	14/29	48	1/3	33	11/29	38	1/3	33	10/29	34	4
13	1/3	33	11/33	33	2/3	67	20/33	61	1/3	33	6/33	18	1/3	33	3/33	9	2
14	5/10	50	28/48	58	0/10	0	6/48	13	7/10	70	23/48	48	6/10	60	12/48	25	4
15	6/8	75	17/50	34	0/8	0	25/50	50	6/8	75	13/50	26	3/8	38	8/50	16	2
16	0/4	0	3/33	9	3/4	75	29/33	88	1/4	25	2/33	6	0/4	0	0/33	0	2
17	4/8	50	27/55	49	1/8	13	18/55	33	7/8	88	20/55	36	6/8	75	18/55	33	3
18	4/7	57	24/66	36	0/7	0	0/66	0	2/7	29	38/66	58	2/7	29	31/66	47	1
19	4/8	50	10/53	19	3/8	38	41/53	77	3/8	38	7/53	13	2/8	25	5/53	9	2
Total No. of Errors	64/102		343/796		11/102		290/796		57/102		264/796		49/102		194/796		

*If a child produced no errors on base passages, his/her percentage of errors was marked by a blank.

Table 4.7

Number and Percentage of Errors Produced by Grade Two Students on Base and Total Passages on The Gray Oral Reading Test and Subsequent Developmental Stages in Reading

Grade Two Subjects	Number and Percentage of Graphically Similar Errors on:				Number and Percentage of Non-Response Errors on:				Number and Percentage of Syntactically Acceptable Errors on:				Number and Percentage of Semantically Acceptable Errors on:				Developmental Stages in Learning to Read on:
	Base Passages		Total Passages		Base Passages		Total Passages		Base Passages		Total Passages		Base Passages		Total Passages		Total Passages
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
01	0/0	--*	8/24	33	0/0	--	8/24	33	0/0	--	9/24	38	0/0	--	6/24	25	3
02	1/2	50	17/33	52	0/2	0	7/33	21	1/2	50	20/33	61	1/2	50	18/33	55	5
03	0/0	--	19/23	83	0/0	--	0/23	0	0/0	--	14/23	61	0/0	--	8/23	35	5
04	4/5	80	21/30	70	0/5	0	0/30	0	4/5	80	17/30	57	4/5	80	15/30	50	5
05	0/0	--	16/24	67	0/0	--	0/24	0	0/0	--	14/24	58	0/0	--	7/24	29	5
06	1/2	50	11/20	55	1/2	50	7/20	35	0/2	0	10/20	50	0/2	0	6/20	30	5
07	3/5	60	20/31	65	0/5	0	2/31	6	2/5	40	16/31	52	2/5	40	14/31	45	5
08	1/1	100	24/27	89	0/1	0	0/27	0	1/1	100	14/27	52	1/1	100	2/27	7	5
09	1/2	50	17/21	81	1/2	50	2/21	10	1/2	50	11/21	52	1/2	50	8/21	38	5
10	0/0	--	10/18	56	0/0	--	5/18	28	0/0	--	10/18	56	0/0	--	6/18	33	5
11	0/1	0	9/17	53	0/1	0	7/17	41	1/1	100	9/17	53	1/1	100	5/17	29	5
12	4/6	67	19/24	79	0/6	0	2/24	8	3/6	50	12/24	50	3/6	50	9/24	38	5
13	0/0	--	20/24	83	0/0	--	2/24	8	0/0	--	14/24	58	0/0	--	8/24	33	5
14	1/3	33	8/28	29	1/3	33	17/28	61	2/3	67	4/28	14	2/3	67	4/28	14	2
15	2/6	33	14/27	52	0/6	0	4/27	15	4/6	67	13/27	48	4/6	67	12/27	44	4
16	2/3	67	9/50	18	1/3	33	34/50	68	2/3	67	10/50	20	1/3	33	6/50	12	2
17	3/4	75	17/29	59	0/4	0	8/29	28	4/4	100	12/29	41	4/4	100	9/29	31	4
18	2/2	100	26/30	87	0/2	0	4/30	13	1/2	50	13/30	43	1/2	50	9/30	30	4
19	4/6	67	20/38	53	0/6	0	13/38	34	4/6	67	18/38	47	4/6	67	16/38	42	4
20	2/7	29	20/38	53	0/7	0	6/38	16	5/7	71	18/38	47	4/7	57	13/38	34	4
Total No. of Errors	31/55		325/556		4/55		128/556		35/55		258/556		33/55		181/556		

*If a child produced no errors on base passages, his/her percentage of errors was marked by a blank.

on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 was HIGHER than other children identified as below average in reading achievement in grade ONE will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

Research hypothesis one was analyzed by using the Pearson product-moment correlation coefficient, a one-way analysis of variance, and a Scheffé multiple comparison of means.

The Pearson product-moment correlation coefficients for grade one student performances are shown in Table 4.8. The analysis revealed significant positive correlation coefficients at the .05 level of significance between raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and (1) stages of development in reading found by the present researcher ($r = .6202$) and (2) percentage of graphically similar errors ($r = .5040$). The positive correlation coefficients indicate that as raw scores for below average readers in grade one on the Gates-MacGinitie Reading Test increased, higher stages of development in reading were reached and the percentage of graphically similar errors on total passages read on The Gray Oral Reading Test also increased.

The means and standard deviations on the student raw scores obtained on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and number of children in each developmental stage were computed for grade one and are shown in Table 4.9. The sample of grade one readers was distributed from stage one to

Table 4.8

Correlation Coefficients for Students in Grade One between Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level A, Form 1) and (1) Stages in Reading, (2) Variables in Determining Stages in Reading

	Correlations with Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level A, Form 1)	Probability Scores
	r	p
I. Stages of Development in Reading Found by the Present Researcher	.6202	.002*
II. Four Variables in Determining Stages in Reading Based on Total Errors Produced on The Gray Oral Reading Test:		
1. Percentage of Graphically Similar Errors	.5040	.014*
2. Percentage of Non-Response Errors	-.2074	.197
3. Percentage of Syntactically Acceptable Errors	.1269	.302
4. Percentage of Semantically Acceptable Errors	.1719	.241

*Significant at the .05 level.

Table 4.9

Means and Standard Deviations on the Gates-MacGinitie Reading Test Raw Scores (Comprehension Section, Level A, Form 1) and Number of Subjects for the Five Stages as Determined by Total Errors on Total Passages Read by Grade One Students

Performance on the Gates-MacGinitie Reading Test (Comprehension Section, Level A, Form 1)	Developmental Stage					Total Number of Subjects
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	
Mean	--	16.2000	18.0000	20.6250	--	
Standard Deviation	--	3.7013	3.0822	2.3867	--	
Number of Subjects	1	5	5	8	0	19

stage four inclusive based on an analysis of their oral reading errors produced while reading total passages on The Gray Oral Reading Test. Only one subject achieved in stage one and since a minimum of two children per stage is recommended for reliable statistical analysis, the subject achieving in stage one was excluded from the statistical analysis. That one child's raw score was 14. No subjects were identified in stage five based on an analysis of their oral reading errors on total passages read of The Gray Oral Reading Test. Therefore, since no subjects were identified in stage five and less than two subjects were identified in stage one, means and standard deviations for these stages could not be calculated or reported in Table 4.9. The means and standard deviations reported in that same table for other children achieving in stages two, three, and four show that below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 reached a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on total passages on The Gray Oral Reading Test. However, the standard deviations reported in Table 4.9 indicated that the raw scores of grade one subjects by stage were close.

A one-way analysis of variance was conducted to examine whether the mean raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) for grade one subjects, in each of the identified stages in reading, differed significantly among stages in reading. The results of this test for grade one students shown in Table 4.10 suggest that the differences between the raw scores on the

Table 4.10

Summary of One-Way Analysis of Variance on the Gates-MacGinitie Reading Test Raw Scores (Comprehension Section, Level A, Form 1) Over Three Stages (Two, Three, and Four) as Determined by Total Errors on Total Passages Read by Grade One Students

Source of Variance	Sum of Squares	Mean Squares	df	F	p
Between Groups	63.3282	31.6641	2	3.580	.0536
Within Groups	132.6749	8.8450	15		

Gates-MacGinitie Reading Test among developmental stages approached significance but were not statistically significant at the .05 level.

To examine where the difference between stages in reading and raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) were statistically significant for grade one, the Scheffé comparison of means was employed. This test revealed no two stages were statistically different at the .05 level of significance.

Research Hypothesis Two

The hypothesis states: Below average readers in grade one who scored higher than other below average readers in grade one on comprehension questions of The Gray Oral Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE and who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified by their teachers as below average in reading achievement in grade ONE, will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

As for research hypothesis one, research hypothesis two was analyzed by using the Pearson product-moment correlation coefficient, a one-way analysis of variance, and a Scheffé multiple comparison of means.

The Pearson product-moment correlation coefficients for grade one student performances are shown in Table 4.11. The analysis revealed significant positive correlation coefficients at the .05 level of significance between comprehension scores on The Gray Oral Reading Test and (1) stages of development in reading found by the present researcher ($r = .6008$), (2) percentage of graphically similar errors ($r = .4629$) and (3) raw scores on the Gates-MacGinitie Reading Test, Level A, Form 1 ($r = .7132$). These positive correlation coefficients indicate that as comprehension scores for the below average readers in grade one increased, stages of development in reading, percentage of graphically similar errors on total passages of The Gray Oral Reading Test and raw scores on the Gates-MacGinitie Reading Test, Level A, Form 1 also increased.

The means and standard deviations on The Gray Oral Reading Test and number of children in each developmental stage were computed for grade one and are shown in Table 4.12. As previously mentioned, the sample population of grade one readers was distributed into stages one to four with one subject achieving in stage one and no subjects achieving in stage five. That one child of stage one achieved a raw score of 43. Therefore, means and standard deviations for stages one and five could not be reported in Table 4.12. The means and standard deviations reported in that same table for other children achieving in stages two, three, and four show that below average readers in grade one who scored higher than other below average readers in grade one on comprehension questions of The Gray Oral Reading Test reached a more advanced developmental stage in

Table 4.11

Correlation Coefficients for Students in Grade One between Comprehension Scores on The Gray Oral Reading Test and (1) Stages in Reading, (2) Variables in Determining Stages in Reading, (3) Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level A, Form 1)

	Correlations with Comprehension Scores on The Gray Oral Reading Test	Probability Scores
	r	p
I. Stages of Development in Reading Found by the Present Researcher	.6008	.003*
II. Four Variables in Determining Stages in Reading Based on Total Errors Produced on The Gray Oral Reading Test:		
1. Percentage of Graphically Similar Errors	.4629	.023*
2. Percentage of Non-Response Errors	-.2128	.191
3. Percentage of Syntactically Acceptable Errors	.2668	.135
4. Percentage of Semantically Acceptable Errors	.3412	.076
Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level A, Form 1)	.7132	.000*

*Significant at the .05 level.

Table 4.12

Means and Standard Deviations on the Comprehension Questions of The Gray Oral Reading Test and Number of Subjects for Five Stages as Determined by Total Errors on Total Passages Read by Grade One Students

Performance on The Gray Oral Reading Test Comprehension Questions	Developmental Stage					Total Number of Subjects
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	
Mean	--	40.4000	47.6000	56.2500	--	
Standard Deviation	--	3.3615	6.9857	11.9970	--	
Number of Subjects	1	5	5	8	0	19

reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages. The standard deviations by stage reported for grade one students on The Gray Oral Reading Test shown in Table 4.12 were greater than the standard deviations reported for the same subjects on the Gates-MacGinitie Reading Test (Table 4.9) indicating that grade one students showed a greater range of scores by stage on The Gray Oral Reading Test than on the Gates-MacGinitie Reading Test.

The results of a one-way analysis of variance for grade one are presented in Table 4.13 and indicate that the differences between the comprehension scores on The Gray Oral Reading Test among developmental stages were statistically significant at the .05 level.

The results of the Scheffé comparison of means are shown in Table 4.14 and revealed that stage two was different from stage four but not different from stage three and that stage three was not different from stage four.

Research Hypothesis Three

The hypothesis states: Below average readers in grade two who scored higher than other below average readers in grade two on the comprehension section of the Gates-MacGinitie Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade TWO and whose raw score

Table 4.13

Summary of One-Way Analysis of Variance on The Gray Oral Reading Test Comprehension Questions over Three Stages (Two, Three, and Four) as Determined by Total Errors on Total Passages Read by Grade One Students

Source of Variance	Sum of Squares	Mean Squares	df	F	p
Between Groups	796.5425	398.2712	2	4.787	0.0247*
Within Groups	1247.8992	83.1933	15		

*Significant at the 0.05 level.

Table 4.14

The Scheffé Comparison of Means on Comprehension Questions on The Gray Oral Reading Test over Three Stages as Determined by Total Errors on Total Passages Read by Grade One Students

	Stage 2	Stage 3	Stage 4
Stage 2			
Stage 3	NS		
Stage 4	*	NS	

*Significant at 0.05 level.

NS Not significant.

on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 was HIGHER than other children identified as below average in reading achievement in grade TWO will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

As for grade one students in hypothesis one, research hypothesis three was analyzed by using the Pearson product-moment correlation coefficient, a one-way analysis of variance, and a Scheffé multiple comparison of means.

The Pearson product-moment correlation coefficients for grade two students are shown in Table 4.15. The analysis revealed significant positive correlation coefficients at the .05 level of significance between raw scores on the Gates-MacGinitie Reading Test and (1) stages of development in reading found by the present researcher ($r = .5939$), (2) percentage of graphically similar errors ($r = .4779$) and (3) percentage of syntactically acceptable errors ($r = .4794$). These positive correlation coefficients indicate that as raw scores for below average readers in grade two on the Gates-MacGinitie Reading Test increased, higher stages of development in reading were reached and the percentage of graphically similar and syntactically acceptable errors on total passages of The Gray Oral Reading Test also increased. Similar positive correlation coefficients were reported for grade one between raw scores on the Gates-MacGinitie Reading Test and stages of development and percentage of graphically similar errors on The Gray Oral Reading Test. However, the correlation coefficient reported for grade one between raw

Table 4.15

Correlation Coefficients for Students in Grade Two between Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level B, Form 1) and (1) Stages in Reading, (2) Variables in Determining Stages in Reading

	Correlations with Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level B, Form 1)	Probability Scores
	r	p
I. Stages of Development in Reading Found by the Present Researcher	.5939	.003*
II. Four Variables in Determining Stages in Reading Based on Total Errors Produced on The Gray Oral Reading Test:		
1. Percentage of Graphically Similar Errors	.4779	.017*
2. Percentage of Non-Response Errors	-.3293	.078
3. Percentage of Syntactically Acceptable Errors	.4794	.016*
4. Percentage of Semantically Acceptable Errors	.1770	.228

*Significant at the 0.05 level.

scores on the Gates-MacGinitie Reading Test and percentage of syntactically acceptable errors on The Gray Oral Reading Test was not statistically significant at the .05 level.

The means and standard deviations on the student raw scores obtained on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1) and number of children in each developmental stage were computed for grade two students and are shown in Table 4.16. The sample population of grade two readers was distributed into stages two, four, and five based on an analysis of their oral reading errors produced while reading total passages on The Gray Oral Reading Test. No subjects in grade two were achieving in stage one and only one subject in grade two was achieving in stage three. That subject's raw score was 28. Since at least two children per stage is recommended for reliable statistical analyses, the subject achieving in stage three was excluded from statistical analyses. Therefore, since no subjects were identified in stage one and less than two subjects were achieving in stage three, means and standard deviations for these stages could not be reported in Table 4.16. The means and standard deviations reported in that same table for other children achieving in stages two, four, and five show that below average readers in grade two who scored higher than other below average readers in grade two on the comprehension section of the Gates-MacGinitie Reading Test reached a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test. However, the standard deviations reported in Table 4.16 indicated that the raw scores of grade two subjects by stage were close.

Table 4.16

Means and Standard Deviations on the Gates-MacGinitie Reading Test Raw Scores (Comprehension Section, Level B, Form 1) and Number of Subjects for the Five Stages as Determined by Total Errors on Total Passages Read by Grade Two Students

Performance on the Gates-MacGinitie Reading Test (Comprehension Section, Level B, Form 1)	Developmental Stage					Total Number of Subjects
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	
Mean	--	20.0000		20.2000	27.0000	
Standard Deviation	--	4.2426	--	3.0331	1.1282	
Number of Subjects	0	2	1	5	12	20

The results of a one-way analysis of variance for grade two students are shown in Table 4.17 and suggest that the differences between the raw scores on the Gates-MacGinitie Reading Test among developmental stages were statistically significant at the .05 level of significance.

The results of the Scheffé comparison of means are shown in Table 4.18 and reveal that stages two and four are significantly different from stage five. However, stage two is not significantly different from stage four.

Research Hypothesis Four

The hypothesis states: Below average readers in grade two who scored higher than other below average readers in grade two on the comprehension questions of The Gray Oral Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade TWO and who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified by their teachers as below average in reading achievement in grade TWO will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

As for research hypothesis two, hypothesis four was analyzed by using the Pearson product-moment correlation coefficient, a one-way

Table 4.17

Summary of One-Way Analysis of Variance on the Gates-MacGinitie Reading Test Raw Scores (Comprehension Section, Level B, Form 1) over Three Stages (Two, Four, and Five) as Determined by Total Errors on Total Passages Read by Grade Two Students

Source of Variance	Sum of Squares	Mean Squares	df	F	p
Between Groups	207.9391	103.9696	2	24.179	0.0000*
Within Groups	68.8000	4.3000	16		

*Significant at the 0.05 level.

Table 4.18

The Scheffé Comparison of Means on Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level B, Form 1) over Three Stages as Determined by Total Errors on Total Passages Read by Grade Two Students

	Stage 2	Stage 4	Stage 5
Stage 2			
Stage 4	NS		
Stage 5	*	*	

*Significant at the 0.05 level.

NS Not significant.

analysis of variance, and a Scheffé multiple comparison of means.

The Pearson product-moment correlation coefficients for grade two students are shown in Table 4.19. The analysis revealed significant positive correlation coefficients at the .05 level of significance between comprehension scores on The Gray Oral Reading Test and (1) stages of development in reading found by the present researcher ($r = .7865$); (2) percentages of: graphically similar errors ($r = .4627$), syntactically acceptable errors ($r = .7377$), and semantically acceptable errors ($r = .4154$); and (3) raw scores on the Gates-MacGinitie Reading Test, Level B, Form 1 ($r = .6672$). These positive correlation coefficients indicate that as comprehension scores for below average readers in grade two on The Gray Oral Reading Test increased, stages of development in reading, percentages of graphically similar errors, syntactically acceptable errors, and semantically acceptable errors on total passages read of The Gray Oral Reading Test and raw scores on the Gates-MacGinitie Reading Test also increased.

The analysis also revealed a significant negative correlation coefficient at the .05 level of significance between comprehension scores on The Gray Oral Reading Test and percentage of non-response errors ($r = -.4224$) on total passages of The Gray Oral Reading Test. This negative correlation coefficient indicates that as comprehension scores for below average readers in grade one and two increased, the percentage of non-response errors on total passages decreased.

The means and standard deviations on The Gray Oral Reading Test and number of children per stage were computed for grade two and are shown in Table 4.20. As previously mentioned, the sample of

Table 4.19

Correlation Coefficients for Students in Grade Two between Comprehension Scores on The Gray Oral Reading Test and (1) Stages in Reading, (2) Variables in Determining Stages in Reading, (3) Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level B, Form 1)

	Correlations with Comprehension Scores on The Gray Oral Reading Test	Probability Scores
	r	p
I. Stages of Development in Reading Found by the Present Researcher	.7865	.000*
II. Four Variables in Determining Stages in Reading Based on Total Errors Produced on The Gray Oral Reading Test:		
1. Percentage of Graphically Similar Errors	.4627	.020*
2. Percentage of Non-Response Errors	-.4224	.032*
3. Percentage of Syntactically Acceptable Errors	.7377	.000*
4. Percentage of Semantically Acceptable Errors	.4154	.034*
Raw Scores on the Gates-MacGinitie Reading Test (Comprehension Section, Level B, Form 1)	.6672	.001*

*Significant at the .05 level.

Table 4.20

Means and Standard Deviations on the Comprehension Questions of The Gray Oral Reading Test and Number of Subjects for Five Stages as Determined by Total Errors on Total Passages Read by Grade Two Students

Performance on The Gray Oral Reading Test Comprehension Questions	Developmental Stage					Total Number of Subjects
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	
Mean	--	54.0000		62.0000	72.2500	
Standard Deviation	--	0.0	--	4.6368	5.0834	
Number of Subjects	0	2	1	5	12	20

grade two readers was distributed into stages two, four, and five with one subject, whose raw score was 63, in stage three and no subjects in stage one. Therefore, means and standard deviations for stages one and three could not be reported in Table 4.20. The means and standard deviations reported in that same table for other children achieving in stages two, four, and five show that below average readers in grade two who scored higher than other below average readers in grade two on comprehension questions of The Gray Oral Reading Test reached a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages. However, the standard deviations on total passages reported for grade two students by stage on The Gray Oral Reading Test shown in Table 4.20 were greater (for stages four and five) than the standard deviations reported for the same subjects on the Gates-MacGinitie Reading Test (Table 4.16) indicating that grade two students in stage four and five showed a greater range of scores on The Gray Oral Reading Test than on the Gates-MacGinitie Reading Test.

The results of a one-way analysis of variance for grade two students are reported in Table 4.21 and indicate that the differences between the comprehension scores on The Gray Oral Reading Test among developmental stages were statistically significant at the .05 level of significance.

The results of the Scheffé comparison of means are shown in Table 4.22 and reveal that stage two is statistically different from stage five but not different from stage four. Stage four is however different from stage five.

Table 4.21

Summary of One-Way Analysis of Variance on The Gray Oral Reading Test Comprehension Questions over Three Stages (Two, Four, and Five) as Determined by Total Errors on Total Passages Read by Grade Two Students

Source of Variance	Sum of Squares	Mean Squares	df	F	p
Between Groups	786.1741	393.0869	2	16.987	.0001*
Within Groups	370.2495	23.1406	16		

*Significant at the 0.05 level.

Table 4.22

The Scheffé Comparison of Means on Comprehension Questions on The Gray Oral Reading Test over Three Stages as Determined by Total Errors on Total Passages Read by Grade Two Students

	Stage 2	Stage 4	Stage 5
Stage 2			
Stage 4	NS		
Stage 5	*	*	

*Significant at the 0.05 level.

NS Not significant.

Research Hypothesis Five

The hypothesis states: Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of the Gates-MacGinitie Reading Test and below average readers in grade two who scored lower on the comprehension section of the Gates-MacGinitie Reading Test will reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE who scored at the FOURTH stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 and children identified by their teachers as below average in reading achievement in grade TWO who scored at the THIRD stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1, will all reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

Chi square was planned to analyze research hypothesis five but less than five first grade subjects and less than five second grade subjects were in stages two and three, therefore this test could not be completed. Number and percentage of subjects by stanine who were achieving in each stage were reported instead in Table 4.23. That table shows 53.8 percent of grade one subjects achieving in stanine four on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and 71.4 percent of grade two subjects achieving in

Table 4.23

Number and Percentage of Subjects by Stanine, on the Gates-MacGinitie Reading Test, Achieving in Three Stages (Two, Three, and Four) as Determined by Total Errors on Total Passages Read by Grades One and Two Students

Gates-MacGinitie Reading Test	Developmental Stage				
	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Number of Grade One Readers who Scored in Stanine Four	0	2/13	4/13	7/13	0
Percentage of Grade One Readers who Scored in Stanine Four	0	15.4	30.8	53.8	0
Number of Grade Two Readers who Scored in Stanine Three	0	2/7	0	5/7	0
Percentage of Grade Two Readers who Scored in Stanine Three	0	28.6	0	71.4	0

stanine three on that same test (comprehension section, Level B, Form 1) reached the same stage in reading: stage four.

Research Hypothesis Six

The hypothesis states: Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension questions of The Gray Oral Reading Test and below average readers in grade two who scored lower than other below average readers in grade two on the comprehension questions of The Gray Oral Reading Test will reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified by their teachers as below average in reading achievement in grade ONE and children identified by their teachers as below average in reading achievement in grade TWO who answered a LOWER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified as below average in reading achievement in grade TWO will all reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

Chi square was planned to analyze research hypothesis six but less than five first grade subjects were in stages two and three and

less than five second grade subjects were in stages two, three, and five. Therefore, this test could not be completed. Number and percentage of subjects who were achieving in each stage were reported instead in Table 4.24. That table shows that 85.7 percent of grade one subjects who scored above the grade one mean on comprehension questions on The Gray Oral Reading Test and 55.6 percent of grade two subjects who scored below the grade two mean on comprehension questions on that same test reached the same stage in reading: stage four.

Additional Analyses of Student Performances

This section reports analyses of student performances for below average reading achievers in grades one and two on: (1) self-correction rates, (2) words identified in context compared to words identified in isolation, (3) influence of instructional approach on reading strategies and (4) influence of passage difficulty on reading strategies.

Self-Correction Rates

An analysis of the number and precentage of errors corrected out of total errors minus non-responses plus self-corrections produced on total passages on The Gray Oral Reading Test for grades one and two are shown in Tables 4.25 and 4.26 respectively. Total errors, in keeping with Fleming, were defined as substitution, mispronunciation, insertion, omission, and non-response errors. The analysis revealed that below average reading achievers in grade one corrected 13.5 percent of errors produced (Table 4.25) while below average readers in grade two corrected 20.9 percent of errors produced while

Table 4.24

Number and Percentage of Subjects by Comprehension Scores on The Gray Oral Reading Test, Achieving in Four Stages (Two, Three, Four, and Five) as Determined by Total Errors on Total Passages Read by Grades One and Two Students

	Developmental Stage				
The Gray Oral Reading Test	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Number of Grade One Readers above the Grade One Mean Score	0	0/7	1/7	6/7	0
Percentage of Grade One Readers above the Grade One Mean Score	0	0	14.3	85.7	0
Number of Grade Two Readers below the Grade Two Mean Score	0	2/9	1/9	5/9	1/9
Percentage of Grade Two Readers below the Grade Two Mean Score	0	22.2	11.1	55.6	11.1

Table 4.25

Number and Percentage of Errors Corrected out of Total Errors Minus Non-Responses Plus Self-Corrections by Grade One Students on Total Passages Read on The Gray Oral Reading Test

Grade One Subjects	Number of Errors Corrected of Errors Made on Total Passages Read on The Gray Oral Reading Test	Percentage of Errors Corrected on Total Passages Read on The Gray Oral Reading Test
01	5/22*	22.7
02	2/34	5.9
03	3/37	8.1
04	5/18	27.8
05	9/20	45.0
06	2/25	8.0
07	3/34	8.8
08	6/48	12.5
09	3/25	12.0
10	2/42	4.8
11	1/28	3.6
12	6/21	28.6
13	3/16	18.8
14	6/48	12.5
15	7/32	21.9
16	4/8	50.0
17	4/41	9.8
18	2/68	2.9
19	6/18	33.3
Number and Percent of Errors Corrected by Grade One	79/585	13.5

*Errors corrected/errors made.

Table 4.26

Number and Percentage of Errors Corrected out of Total Errors Minus Non-Responses Plus Self-Corrections by Grade Two Students on Total Passages Read on The Gray Oral Reading Test

Grade Two Subjects	Number of Errors Corrected of Errors Made on Total Passages Read on The Gray Oral Reading Test	Percentage of Errors Corrected on Total Passages Read on The Gray Oral Reading Test
01	9/25*	36.0
02	6/32	18.8
03	11/34	32.4
04	3/33	9.1
05	6/20	30.0
06	15/28	53.6
07	6/35	17.1
08	2/29	6.9
09	5/24	20.8
10	7/20	35.0
11	4/14	28.6
12	4/26	15.4
13	6/28	21.4
14	5/16	31.3
15	4/27	14.8
16	3/19	15.8
17	9/30	30.0
18	3/29	10.3
19	4/29	13.8
20	1/33	3.0
Number and Percent of Errors Corrected by Grade Two	113/541	20.9

*Errors corrected/errors made.

reading total passages on The Gray Oral Reading Test (Table 4.26). The highest and lowest percentages of errors corrected by grade one subjects were 50.0 percent and 2.9 percent respectively and by grade two, 53.6 percent and 3.0 percent respectively.

A Comparison of Words Identified in Isolation and in Context

A quantitative comparative analysis of errors, produced by subjects in the present study during oral reading of words in isolation and in context is shown in Table 4.27 for grade one and 4.28 for grade two. Grade one identified 66.8 percent of words in isolation and 83.0 percent of words in context while grade two identified 84.0 percent of words in isolation and 91.6 percent of words in context. The percentage of words identified in isolation (84.0 percent) and in context (91.6 percent) by grade two exceeded the percentage of words identified in isolation (66.8 percent) and in context (83.0 percent) by grade one but the difference between the percentage of words identified in isolation and in context was greater for grade one (16.2 percent) than for grade two subjects (7.6 percent).

Influence of Passage Level Difficulty on Reading Strategies

The percentage of errors on the three base pasages and total passages minus base passages on The Gray Oral Reading Test for grade one in stages two, three, and four are shown in Table 4.29. The percentage of graphically similar, syntactically acceptable, and semantically acceptable errors produced by grade one decreased and non-response errors increased while reading passages of increasing difficulty. On

Table 4.27

Number and Percentage of Words Correctly Identified in Isolation and in Context by Grade One Students on Total Passages on The Gray Oral Reading Test

Grade One Subjects	Number of Words Identified in Isolation on Total Passages on The Gray Oral Reading Test	Percentage of Words Identified in Isolation on Total Passages on The Gray Oral Reading Test	Number of Words Identified in Context on Total Passages on The Gray Oral Reading Test	Percentage of Words Identified in Context on Total Passages on The Gray Oral Reading Test
01	122/173*	70.5	215/247**	87.0
02	117/173	67.6	202/247	81.8
03	109/173	63.0	194/247	78.5
04	139/173	80.3	233/247	94.3
05	118/173	68.2	216/247	87.4
06	119/173	68.8	217/247	87.9
07	125/173	72.3	204/247	82.6
08	115/173	66.5	203/247	82.2
09	122/173	70.5	205/247	83.0
10	114/173	65.9	195/247	79.0
11	116/173	67.1	204/247	82.6
12	135/173	78.0	218/247	88.3
13	114/173	65.9	214/247	86.6
14	120/173	69.4	199/247	80.6
15	95/173	55.0	197/247	79.8
16	125/173	72.3	214/247	86.6
17	88/173	50.9	192/247	77.7
18	104/173	60.1	181/247	73.3
19	98/173	56.6	194/247	78.5
Number and Percent of Words Identified by Grade One	2195/3287	66.8	3897/4693	83.0

* Number of words student identified correctly on list/individual number of words student read in list form.
**Number of words student identified correctly in context/individual number of words student read in passage.

Table 4.28

Number and Percentage of Words Correctly Identified in Isolation and in Context by Grade Two Students on Total Passages on The Gray Oral Reading Test

Grade Two Subjects	Number of Words Identified in Isolation on Total Passages on The Gray Oral Reading Test	Percentage of Words Identified in Isolation on Total Passages on The Gray Oral Reading Test	Number of Words Identified in Context on Total Passages on The Gray Oral Reading Test	Percentage of Words Identified in Context on Total Passages on The Gray Oral Reading Test
01	246/273*	90.1	341/365**	93.4
02	236/273	86.4	332/365	91.0
03	234/273	85.7	342/365	93.7
04	181/217	83.4	275/305	90.2
05	245/273	89.7	341/365	93.4
06	242/273	88.6	345/365	94.5
07	231/273	84.6	334/365	91.5
08	190/217	87.6	278/305	91.1
09	182/217	83.9	284/305	93.1
10	248/273	90.8	347/365	95.1
11	245/273	89.7	348/365	95.3
12	199/217	91.7	281/305	92.1
13	200/273	73.3	341/365	93.4
14	174/217	80.2	277/305	90.8
15	173/217	79.7	278/305	91.1
16	156/217	71.9	255/305	83.6
17	180/217	82.9	276/305	90.5
18	174/217	80.2	275/305	90.2
19	169/217	77.9	267/305	87.5
20	163/217	75.1	267/305	87.5
Number and Percent of Words Identified by Grade Two	4068/4844	84.0	6084/6640	91.6

*Number of words student identified correctly on list/individual number of words student read in list form.
**Number of words student identified correctly in context/individual number of words student read in passage.

Table 4.29

Percentage of Total Errors on Base Passages and Total Minus Base Passages on The Gray Oral Reading Test for Grade One Students by Stage

Grade One Students by Stage	Percentage of Graphically Similar Errors on:		Percentage of Non-Response Errors on:		Percentage of Syntactically Acceptable Errors on:		Percentage of Semantically Acceptable Errors on:	
	Base Passages	Total Minus Base Passages	Base Passages	Total Minus Base Passages	Base Passages	Total Minus Base Passages	Base Passages	Total Minus Base Passages
Stage 1 Subject*	57.1	33.9	0	0	28.6	61.0	28.6	49.2
Stage 2 Subjects	50.0	22.7	33.3	72.2	50.0	12.5	29.2	8.0
Stage 3 Subjects	57.7	36.4	7.7	39.9	65.4	27.8	57.7	23.2
Stage 4 Subjects	73.3	56.3	2.2	28.0	57.8	36.0	55.6	21.5

*Since only one subject was achieving in stage one, this subject was not included in the analysis of percentage of total errors produced by grade one readers by stage.

the more difficult passages (total minus base passages), the percentage of non-response errors produced by grade one subjects in stages two and three (72.2 and 39.9 percent) exceeded the percentage of graphically similar (22.7 and 36.4 percent), syntactically acceptable (12.5 and 27.8 percent), and semantically acceptable errors (8.0 and 23.2 percent) produced by these same subjects. In contrast, the percentage of graphically similar (56.3 percent) and syntactically acceptable errors (36.0 percent) produced by subjects in stage four exceeded the percentage of non-response errors (28.0 percent) on total minus base passages. While all subjects in stages two, three, and four produced fewer graphically similar (22.7, 36.4, and 56.3 percent), syntactically acceptable (12.5, 27.8, and 36.0 percent), and semantically acceptable errors (8.0, 23.2, and 21.5 percent) on more difficult ceiling passages than on less difficult base passages, subjects in stage four produced a higher percentage of graphically similar (56.3 percent) and syntactically acceptable errors (36.0 percent) than subjects in either stages two (22.7 and 12.5 percent) or three (36.4 and 27.8 percent). The percentage of semantically acceptable errors produced by stage four subjects (21.5 percent) exceeded the percentage of semantically acceptable errors produced by stage two subjects (8.0 percent) but did not exceed the percentage of the same errors produced by stage three subjects (23.2 percent).

The percentage of errors on base and on passages up to and including two consecutive ceiling passages on The Gray Oral Reading Test for grade two subjects in stages two, four, and five are shown in Table 4.30. The percentage of syntactically acceptable (66.7 and

Table 4.30

Percentage of Total Errors on Base Passages and Total Minus Base Passages on The Gray Oral Reading Test for Grade Two Students by Stage

Grade Two Students by Stage	Percentage of Graphically Similar Errors on:		Percentage of Non-Response Errors on:		Percentage of Syntactically Acceptable Errors on:		Percentage of Semantically Acceptable Errors on:	
	Base Passages	Total Minus Base Passages	Base Passages	Total Minus Base Passages	Base Passages	Total Minus Base Passages	Base Passages	Total Minus Base Passages
Stage 2 Subjects	50.0	19.4	33.3	68.1	66.7	13.9	50.0	9.7
Stage 3 Subject*	--	33.3	--	33.3	--	37.5	--	25.0
Stage 4 Subject	52.0	61.3	0	25.5	72.0	40.9	68.0	30.7
Stage 5 Subjects	62.5	70.1	8.3	11.9	54.2	55.2	54.2	34.7

*Since only one subject was achieving in stage three, this subject was not included in the analysis of percentages of total errors produced by grade two readers by stage.

72.0 percent) and semantically acceptable errors (50.0 and 68.0 percent) declined as grade two subjects achieving in stages two and four read passages that progressed from less difficult base passages up to and including the more difficult ceiling passages on The Gray Oral Reading Test. The percentage of syntactically acceptable errors (54.2 percent) produced by grade two students in stage five remained the same as stage five subjects read passages of increasing difficulty, while semantically acceptable errors (54.2 percent) declined on the more difficult passages. The percentage of graphically similar errors declined for stage two subjects (19.4 percent) and increased for stage four (61.3 percent) and five (70.1 percent) subjects as passages increased in difficulty. The percentage of non-response errors (33.3, 0, 8.3 percent) also increased as subjects in stages two, four, and five read more difficult passages. Subjects achieving in stage two produced a higher percentage of non-response errors (68.1 percent) compared with the same errors produced by subjects in stages four (25.5 percent) and five (11.9 percent).

Influence of Instructional Method on Reading Strategies

In order to consider the influence of instructional method on reading strategies, the percentage of graphically similar, non-response, syntactically acceptable, semantically acceptable, and mispronunciation errors out of total errors produced on total passages of The Gray Oral Reading Test were calculated and are shown in Table 4.31 for grades one and two. Of the total errors produced by subjects in grade one, the majority of errors were graphically similar (43.1 percent) followed

Table 4.31

Number and Percentage of Errors Made out of Total Errors on The Gray Oral Reading Test Total Passages Read by Grades One and Two Students

Subjects by Grade	Graphically Similar Errors out of Total Errors		Non-Response Errors out of Total Errors		Syntactically Acceptable Errors out of Total Errors		Semantically Acceptable Errors out of Total Errors		Mispronunciation Errors out of Total Errors	
	Raw Score	Percent	Raw Score	Percent	Raw Score	Percent	Raw Score	Percent	Raw Score	Percent
Grade One Subjects	343/796	43.1	290/796	36.4	264/796	33.2	194/796	24.4	9/796	1.1
Grade Two Subjects	325/556	58.5	128/556	23.0	258/556	46.4	181/556	32.6	36/556	6.5

by non-response errors (36.4 percent), syntactically acceptable errors (33.2 percent), and semantically acceptable errors (24.4 percent). A very few of the total errors were mispronunciations (1.1 percent) produced by grade one subjects.

Of the total errors produced by subjects in grade two, as in grade one, the majority of the errors were graphically similar to the text (58.5 percent). However, unlike results for grade one, the percentage of syntactically acceptable errors (46.4 percent) and semantically acceptable errors (32.6 percent) exceeded the percentage of non-response errors (23 percent) produced by these same subjects. Few mispronunciation errors (6.5 percent) of the total errors were produced by grade two, although the percentage of these errors for grade two subjects exceeded the percentage of the same errors for grade one subjects.

Summary

This chapter has presented findings relevant to research hypotheses one to six inclusive as well as findings relevant to self-correction rates of below average reading achievers, number of words read in context compared to number of words read in isolation, and the influence of passage difficulty and instructional approach on reading strategies.

Findings Relevant to Hypothesis One (Grade One)

1. Significant positive correlation coefficients were noted between the raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and stages of development in

learning to read and percentage of graphically similar errors.

2. Means on the raw scores on the Gates-MacGinitie Reading Test (comprehension section) increased across stages two, three, and four.

3. The one-way analysis of variance test indicated raw scores on the Gates-MacGinitie Reading Test among developmental stages did not differ significantly.

4. The Scheffé test indicated no two developmental stages in reading were different.

Findings Relevant to Hypothesis Two (Grade One)

1. Significant positive correlation coefficients were noted between comprehension scores on The Gray Oral Reading Test and developmental stages, percent of graphic errors, and raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1).

2. Means and standard deviations on The Gray Oral Reading Test comprehension scores increased across stages two, three, and four.

3. The one-way analysis of variance test indicated that the comprehension scores on The Gray Oral Reading Test were significantly different among stages two, three, and four.

4. The Scheffé test indicated stage two differed significantly from stage four.

Findings Relevant to Hypothesis Three (Grade Two)

1. Significant positive correlation coefficients were noted between raw scores on the Gates-MacGinitie Reading Test (comprehension

section, Level B, Form 1) and developmental stages, percent of graphic and syntactic errors.

2. Means on the Gates-MacGinitie Reading Test raw scores increased across stages two, four, and five.

3. The one-way analysis of variance indicated that raw scores on the Gates-MacGinitie Reading Test were significantly different among stages two, four, and five.

4. The Scheffé test indicated stage five was significantly different from stages two and four.

Findings Relevant to Hypothesis Four (Grade Two)

1. Significant positive correlation coefficients were noted between The Gray Oral Reading Test comprehension scores and [illegible] op-mental stages, percent of graphic, syntactic, and semantic errors and raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1). A significant negative correlation coefficient was noted between The Gray Oral Reading Test comprehension scores and non-responses.

2. Means and standard deviations on The Gray Oral Reading Test conprehension scores increased across stages two, four, and five.

3. The one-way analysis of variance test indicated that comprehension scores on The Gray Oral Reading Test were significantly different among stages two, four, and five.

4. The Scheffé test indicated stage five was significantly different from stages two and four.

Findings Relevant to Hypothesis Five

1. 53.8 percent of grade one reading achievers in stanine four on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and 71.4 percent of grade two reading achievers in stanine three on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1) reached the same developmental stage in reading: stage four.

Findings Relevant to Hypothesis Six

1. 85.7 percent of grade one reading achievers scoring above the grade one mean on The Gray Oral Reading Test comprehension scores and 55.6 percent of grade two reading achievers scoring below the grade two mean on The Gray Oral Reading Test, comprehension questions, reached the same developmental stage in reading: stage four.

Findings Relevant to Additional Analyses of Student Performance

Self correction rates

1. Grade one students corrected 13.5 percent of errors produced on total passages read on The Gray Oral Reading Test while grade two students corrected 20.9 percent of errors produced on the same test.

A comparison of words identified in context and isolation

1. Grade one students identified 66.8 percent of words read in isolation and 83.0 percent of words read in context while grade two students identified 84.0 percent of words read in isolation and 91.6 percent of words read in context.

Influence of passage difficulty on reading strategies

1. Reading strategies and subsequent qualitative errors appeared to change as grade one and two students read passages from base to more difficult ceiling passages. The majority of students processed less graphic, syntactic, and semantic information from the text as passages increased in difficulty level.

Influence of instructional approach on reading strategies

1. The percentage of graphically similar errors exceeded the percentage of other types of errors produced by both grade one and two students on total passages read on The Gray Oral Reading Test.

Chapter 5

OVERVIEW OF THE STUDY, MAJOR FINDINGS, CONCLUSIONS, IMPLICATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

Overview of the Study

Findings of Biemiller (1969) and Fleming (1974) indicated that stages of development in reading were evident for high, average, and low reading achievers in grade one. However, research has not focused exclusively on the processing strategies of below average readers as a discrete group in order to examine and more clearly describe their stages of development in learning to read. Such an examination, as reported in Chapter 1, is crucial in light of the concerns voiced by parents and educators of today's readers who are achieving at a level below their peers. In addition, researchers have not examined whether the same stages of development identified for grade one readers are evident for children at other grade levels although Fleming (1974) projected that readers beyond the grade one level may be "stuck" in a grade one stage of development in learning to read, particularly stage two where the reader has to switch strategies to move onto the next stage in reading. In support of Fleming's projection, the present study found two second grade children achieving stage two.

The purpose of this study was to examine stages of development in learning to read of children who are below average reading achievers

in grades one and two in May of the school year in order to investigate further the findings of Biemiller (1969) and Fleming (1974) and thereby obtain a clearer description of these below average readers in grades one and two.

Forty-four children, who in their teachers' judgements, were below average in reading achievement in five grade one and five grade two elementary school classrooms located in a small urban center in central Alberta were selected for further testing after parental permission and appropriate screening. Then the appropriate comprehension sections of the Gates-MacGinitie Reading Test were administered to the 44 students of which 39 students achieved the required stanine three or four on this test to quality for participation in the present study. The total sample then, consisted of 39 children; 19 children below average in reading achievement in grade one and 20 children below average in reading achievement in grade two.

Below average readers in the sample were then asked to read passages which were: the first three passages of The Gray Oral Reading Test (designated as base passages by this researcher) as well as passages up to and including two consecutive ceiling passages on which readers produced seven or more errors on The Gray Oral Reading Test. These passages read were referred to as "total" passages meaning total number of passages read. Following the reading of each passage, comprehension questions, as given in The Gray Oral Reading Test, were asked. In addition all words from passages each child read were randomly ordered in isolated lists and read by each child prior to reading each corresponding passage. The child's oral reading of

word lists and passages as well as his responses to comprehension questions were recorded and transcribed for data analyses. Oral reading miscues were analyzed to examine whether stages in reading described by Fleming (1974) and redefined by the present researcher by reference to Biemiller were evident for these readers. The reading performance of these grade one and two subjects on both the comprehension section of the Gates-MacGinitie Reading Test and the comprehension questions of The Gray Oral Reading Test was then compared to the developmental stages one to five in learning to read set out by Fleming and stages four and five of Fleming redefined by the present researcher in light of Biemiller, each stage described by types of oral reading miscues on total passages subjects read.

Research hypotheses one to four inclusive were analyzed by using the Pearson product-moment correlation coefficient, one-way analysis of variance and Scheffé multiple comparison of means.

Chi square was planned to examine the degree of association between grade one subjects who scored higher than other grade one subjects on first the Gates-MacGinitie Reading Test, comprehension section (hypothesis five), and then on The Gray Oral Reading Test, comprehension questions (hypothesis six) and grade two subjects who scored lower than other grade two subjects on first the Gates-MacGinitie Reading Test, comprehension section (hypothesis five) and then on The Gray Oral Reading Test (hypothesis six). But less than five first and second grade children were in some of the stages, therefore this test could not be used.

Major Findings

Research Hypothesis One

The hypothesis stated: Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of the Gates-MacGinitie Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE and whose raw score on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 was HIGHER than other children identified as below average in reading achievement in grade ONE will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

The analyses revealed that (1) raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) were correlated with Fleming's stages in reading and percentage of graphically similar errors of total passages read on The Gray Oral Reading Test at the .05 level of significance, (2) mean raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) increased sequentially over the stages, and (3) differences between Fleming's stages were not significantly different at the .05 level. Research hypothesis one was rejected for the relationship between raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and discrete developmental stages in learning to read as no

two developmental stages were found to be significantly different the one from the other.

While Fleming analyzed children's errors on base passages (designated as the first five passages on Diagnostic Reading Scales, Spache, 1963), passages up to and including a ceiling passage (designated as the passage in which a child exceeds the number of errors specified by Spache, 1963), and a 12 percent passage (designated as the passage in which more than 12 percent of the total number of words in a given passage on Diagnostic Reading Scales are miscued), the present researcher analyzed children's errors on total passages (designated as passages up to and including two consecutive passages on which the child produced seven or more errors on The Gray Oral Reading Test). Therefore the results of the present study were compared only to Fleming's findings while his subjects read ceiling passages.

In agreement with Fleming's (1974) findings pertaining to grade one readers' scores on the Gates-MacGinitie Reading Test (Primary A, Form 2) and stages in reading, the means and standard deviations on a different form of the same test employed by the present researcher, showed grade one below average reading achievers in a higher developmental stage of learning to read produced higher raw student scores than scores of subjects in a lower stage. However, the one-way analysis of variance conducted by the present researcher revealed no statistically significant differences between stages and raw scores of students on the Gates-MacGinitie Reading Test (Level A, Form 1) for those below average grade one readers, whereas Fleming

noted his stage two differed statistically from his stages three—four, and five. Fleming used subjects ranging in reading ability from below average to above average in contrast to the more limited group of below average readers used by this researcher. The greater range in reading ability of Fleming's grade one subjects and therefore greater range in their reading achievement scores on the Gates-MacGinitie Reading Test (Primary A, Form 2) compared to the lesser range of scores used in the present study may have accounted for significant differences noted by Fleming between stages in reading and scores on the Gates-MacGinitie Reading Test (Primary A, Form 2). The present researcher found it was possible to place a limited group, like below average reading achievers in grade one, into developmental stages in learning to read but either real differences between these groups do not exist to an appreciable degree or other factors are masking real differences. Perhaps the stage criteria set out for grade one by Fleming was not rigorous enough to show where the differences, if any, existed between a group of below average readers whose achievement range was more limited, and hence, more similar between groups.

Research Hypothesis Two

The hypothesis stated: Below average readers in grade one who scored higher than other below average readers in grade one on comprehension questions of The Gray Oral Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE and who answered a

HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified by their teachers as below average in reading achievement in grade ONE, will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

The analyses revealed that (1) comprehension scores on the total passages of The Gray Oral Reading Test were positively correlated with Fleming's stages in reading, percentage of graphically similar errors and raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) at the .05 level of significance, (2) mean comprehension scores on The Gray Oral Reading Test increased sequentially over the stages, and (3) differences between Fleming's stages two and four were statistically significant at the .05 level. Research hypothesis two was accepted in part for the relationship between mean comprehension scores on The Gray Oral Reading Test and discrete stages in reading as developmental stages two and four in learning to read were significantly different one from the other.

An analysis of oral reading errors produced by below average reading achievers in grade one made it possible to place these subjects into the first four of five developmental stages of Fleming during one testing session in May; no subjects were found to be achieving in stage five. The finding that miscue analysis facilitated placement of children into stages is in support of Fleming (1974) for grade one; he placed grade one readers into the latter four of five stages of development during one testing session in April but did not

find any children achieving in stage one. While Fleming did not find any low, average, or high reading achievers in stage one as determined by an analysis of their oral reading errors on total passages (designated as ceiling passages by Fleming) in April, this researcher found one below average reading achiever in grade one in stage one in May. Biemiller (1969) analyzed oral reading errors of low, average, and high reading achievers in grade one over a period of eight months and identified three low reading achievers in stage one in May.

The present researcher, unlike Fleming, did not find any subjects achieving in stage five. Fleming's sample population consisted of a range of reading achievers from below average to above average whereas the sample population of the present study contained only below average readers. This difference in sample populations may have reasonably accounted for no children achieving in stage five of the present study.

Stages one and two of Fleming, identified for grade one subjects in the present study, were similar to Biemiller's pre non-response stage one and non-response stage two in specifying a higher percentage of contextually constrained than graphically constrained errors in stage one and a dramatic increase in non-response errors in stage two. The final stage five of Fleming identified for subjects in the present study differed from the final post non-response stage three of Biemiller in the percentages of graphically and contextually (syntactic and semantic) constrained errors produced by subjects. While Biemiller found the percentage of contextually constrained errors exceeded the percentage of graphically constrained errors, this

researcher found opposite results for grade one; the percentage of graphically constrained errors exceeded the percentage of contextually constrained errors produced.

On the average, grade one children in the present study, who achieved a higher comprehension score than other grade one children on The Gray Oral Reading Test reached a more advanced stage in learning to read than grade one children who achieved a lower score. However, only children in stages two and four were found to have significantly different comprehension scores. Fleming, in his study of grade one readers' performance on comprehension questions on Spache Diagnostic Reading Scales, found stage two differed significantly from stage three, four, and five. No grade one children were found to be achieving in stage five of the present study and stage three did not differ from stages two or four. The percentage of errors noted for some stage three students in grade one (slightly less than 50 percent non-response errors) seem to indicate that these students may have recently progressed from stage two to stage three where non-response errors declined (compared to stage two) as the child begins to make greater use of the graphic information.

Research Hypothesis Three

The hypothesis stated: Below average readers in grade two who scored higher than other below average readers in grade two on the comprehension section of the Gates-MacGinitie Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as

below average in reading achievement in grade TWO and whose raw score on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 was HIGHER than other children identified as below average in reading achievement in grade TWO will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

The analyses revealed that (1) raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1) were positively correlated with Fleming's stages in reading, percentage of graphically similar and syntactically acceptable errors on total passages read on The Gray Oral Reading Test at the .05 level of significance, (2) mean raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1) were close for subjects in stages two and four but were not close in stage five, and (3) differences between Fleming's stages two and five and between Fleming's stages four and five were statistically significant at the .05 level of significance. Research hypothesis three was accepted in part for the relationship between raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1) and selected discrete developmental stages in learning to read as stages two and five and stages four and five were found to be significantly different the one from the other.

An analysis of oral reading errors produced by below average reading achievers in grade two made it possible to place these subjects into the latter four of five stages of development of Fleming

during one testing session in May; no subjects were found achieving in stage one.

Stage two of Fleming identified for grade two subjects in the present study was similar to Biemiller's non-response stage two in specifying a dramatic increase in non-response errors in stage two compared with stage one. In the final stage, the post non-response stage three, Biemiller found that the percentage of contextually constrained errors produced by grade one subjects in his study exceeded the percentage of graphically constrained errors produced by the same subjects. Only one subject of the present study was found achieving in the final revised stage of the present researcher, stage five, revised in light of Biemiller's findings. Since this one grade two subject produced greater than 50 percent graphic and greater than 50 percent syntactic or semantic errors, he placed, not only in the revised stage five of the present researcher, but also in stage five as defined by Fleming. Since this single subject was the only subject from the grade two sample population who placed in the revised stage five of the present researcher as well as stage five as defined by Fleming, he was classified for analyses with the rest of the grade two sample who reached stage five of Fleming. None of grade two subjects selected for the present study were achieving in the revised stage four of the present researcher which was by definition a stage distinctly different from stage four of Fleming.

On the average, grade two children in the present study, who achieved a higher raw score than other grade two children on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1)

reached a more advanced stage in learning to read than grade two children who achieved a lower raw score. However, only children in stages two and five and in stages four and five were found to have significantly different raw scores.

In summary, looking back over hypotheses one, two, and three, an analysis of below average reading achievers in both grades one and two made it possible to place these readers into one of five stages of development in the process of learning to read of Fleming. The means and standard deviations reported for grade one and two readers' performance on the Gates-MacGinitie Reading Test and The Gray Oral Reading Test showed that mean scores on these tests increased across stages suggesting that the subject achieving in a higher stage was a better reader than the subject achieving in a lower stage. Grade one readers reached stages one to four while grade two readers reached stages two to five suggesting that reading improvement was evident for grade two. Beyond stage three all subjects in grade one and all but one subject in grade two produced a higher percentage of graphically constrained errors than syntactically or semantically constrained errors suggesting that these readers in grades one and two processed the graphic information more efficiently than the contextual information from the text during oral reading.

The single grade two reader in stage five, who produced a slightly higher percentage of contextual errors than graphic errors, processed contextual information more efficiently than graphic information from the text and is in support of Biemiller (1969), Clay (1968), Allen (1969), Burke and Goodman (1970).

The findings of the present study are in agreement with those

of C. Burke (1969, 1976), Allen (1969), and Menosky (1971) pertaining to readers' use of syntactic and semantic information. The present investigator found below average reading achievers in both grades one and two produced a higher proportion of syntactically acceptable errors than semantically acceptable errors. This finding confirmed the present researcher's expectation that these readers in grades one and two would make more use of the grammatical structure than meaning of the text to identify words.

Research Hypothesis Four

The hypothesis stated: Below average readers in grade two who scored higher than other below average readers in grade two on the comprehension questions of The Gray Oral Reading Test will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade TWO and who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified by their teachers as below average in reading achievement in Grade TWO will reach a more advanced developmental stage in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

The analyses revealed (1) comprehension scores on total passages of The Gray Oral Reading Test were positively correlated with Fleming's stages in reading, percentages of graphically similar, syntactically acceptable, and semantically acceptable errors on The

Gray Oral Reading Test, and raw scores on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1), (2) comprehension scores on total passages read on The Gray Oral Reading Test were negatively correlated with non-response errors on The Gray Oral Reading Test, (3) mean comprehension scores on The Gray Oral Reading Test increased sequentially over the stages, and (4) differences between Fleming's stages two and five and four and five were statistically significant at the .05 level. Research hypothesis four was accepted in part for the relationship between comprehension scores of students in grade two on The Gray Oral Reading Test and discrete developmental stages in learning to read as stages two and five and four and five were found to be significantly different the one from the other.

As reported for hypothesis three, grade two reading achievers were placed into stages of development in learning to read as determined by their oral reading miscues on total passages read on The Gray Oral Reading Test. The reader of the present investigation will remember from the discussion of hypothesis three, no grade two readers were achieving in stage one of Fleming and only one grade two reader was achieving in the revised stage five of the present researcher. This single grade two subject who was also achieving in stage five as defined by Fleming was classified for analyses with the rest of the grade two sample who reached stage five of Fleming.

On the average, grade two children in the present study, who achieved a higher comprehension score than other grade two children on The Gray Oral Reading Test reached a more advanced developmental stage in learning to read. However, only children in stages two and five and

four and five were found to have significantly different raw scores indicating that real differences between the stages do not exist or the criteria used to separate students into stages were not rigorous enough to delineate the differences.

In view of research findings reviewed in Chapter 2 (Weber, 1970b; Clay, 1968; Coomber, 1972; Brody; 1973; Cohen, 1974; E. Burke, 1976) the present researcher expected on the basis of Fleming's research, that better below average readers in both grades one and two achieving in a higher stage of development in learning to read than other below average readers in grades one and two would produce a greater percentage of graphically similar errors than those below average reading achievers in grades one and two achieving in a lower stage. The findings of this present study support research reviewed and the expectation of the present researcher for both grades one and two. Subjects achieving in developmental stage two in grades one and two produced the lowest percentage of graphically similar errors (26.0 and 21.8 percent) while the percentage of these same errors increased for grade one (38.8 and 58.8 percent) and grade two (33.3, 59.9, and 69.5 percent) in each succeeding stage.

In view of research findings reported in Chapter 2 (Goodman, 1967; Au, 1977; Leslie, 1980; Keith, Carnine, and Carnine, 1981; Christie, 1981; Potter, 1980) the present researcher expected that the better below average readers in both grades one and two achieving in a higher stage of development than other below average readers in grades one and two would produce a greater percentage of syntactically and semantically acceptable errors than those below average reading

achievers in grades one and two achieving in a lower stage. The findings of the present study partially confirmed the expectation of the present researcher for both grades one and two. Subjects achieving in stage two produced the lowest percentage of syntactic (17.0 and 17.9 percent) and semantic errors (10.5 and 12.8 percent) and the percentage of syntactic errors increased for grade one subjects (32.1 and 39.2 percent) and grade two subjects (37.5, 45.7, and 55.1 percent) in each succeeding stage. However, the percentage of semantic errors for grade one in stages three (27.2 percent) and four (26.5 percent) were the same and the percentage of these same errors were also the same for grade two readers in stages four (36.4 percent) and five (36.3 percent) (see Appendix B).

Potter (1980) reviewed in Chapter 2 indicated that better readers who processed more syntactic and semantic information in context than poorer readers may have actually processed more of the graphic information from final word positions than poorer readers. In view of this projection the present researcher analyzed syntactic and semantic acceptability of substitution errors in isolation and in context. The analysis revealed that grade one and two readers produced similar percentages of syntactic (23.5 and 27.1 percent) and semantic (13.8 and 10.6 percent) errors while reading words in isolation but grade two students produced a greater percentage of syntactic (65.9 percent) and semantic (45.3 percent) errors than grade one (51.4 and 36.4 percent) while reading words in context. Since grade one and two students' syntactic and semantic scores were similar while reading in isolation, it did not appear that grade two

readers were processing more graphic information from final word positions than grade one readers.

Since all developmental stages in learning to read were not significantly different, one from the other, any apparent differences between some of these stages were due simply to chance so a student making more or less use of graphic, syntactic or semantic information in one stage, compared to a student in another stage, was doing so only by chance. However, although this present researcher acknowledges that differences noted between some stages were due to chance alone, other factors not rigorously controlled may be masking real differences or the developmental stage criteria were not rigorous enough to show real differences between all developmental stages in learning to read.

Research Hypothesis Five

The hypothesis stated: Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension section of the Gates-MacGinitie Reading Test and below average readers in grade two who scored lower on the comprehension section of the Gates-MacGinitie Reading Test will reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE who scored at the FOURTH stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level A, Form 1 and children identified by their teachers as below average in reading achievement in grade TWO who scored at the

THIRD stanine on the comprehension section of the Gates-MacGinitie Reading Test, Level B, Form 1 will all reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total passages read.

The analysis revealed that less than five first grade readers and less than five second grade readers were in stages two and three, therefore the Chi square test could not be completed but percentages of students achieving in each stage were reported. The majority of grade one readers (53.8 percent) who were achieving in stanine four on the Gates-MacGinitie Reading Test (comprehension section, Level A, Form 1) and the majority of grade two readers (71.4 percent) achieving in stanine three on the Gates-MacGinitie Reading Test (comprehension section, Level B, Form 1) reached the same developmental stage in reading: stage four. On this basis, research hypothesis four was accepted for the relationship between grade one and two readers' stanines on the Gates-MacGinitie Reading Test (comprehension section, Levels A and B, Form 1) and their stages in reading.

In view of this finding, it appears that a majority of below average readers in grade two who performed less well than other below average readers in grade two on the Gates-MacGinitie Reading Test (comprehension section) were demonstrating oral reading strategies similar to grade one readers who performed better than other below average grade one readers. These grade two readers who were achieving in stage four may be progressing through the developmental stages at a slower gradual rate than other grade two readers, or they may be "stuck" in stage four because as yet they haven't increased their use

of contextual information as well as graphic information to proceed onto the next stage, stage five, in reading where at least 50 percent of a reader's errors are contextually constrained (syntactic or semantic). Prior to reaching stage four, grade two readers could have been "stuck" longer in the beginning stages of reading indicating an irregular rather than slow gradual progression through the stages.

Research Hypothesis Six

The hypothesis stated: Below average readers in grade one who scored higher than other below average readers in grade one on the comprehension questions of The Gray Oral Reading Test and below average readers in grade two who scored lower than other below average readers in grade two on the comprehension questions of The Gray Oral Reading Test will reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

More specifically, children identified by their teachers as below average in reading achievement in grade ONE who answered a HIGHER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified by their teachers as below average in reading achievement in grade ONE and children identified by their teachers as below average in reading achievement in grade TWO who answered a LOWER percentage of comprehension questions correctly on The Gray Oral Reading Test than other children identified as below average in reading achievement in grade TWO will all reach the same developmental stages in reading as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test on total

passages read.

The analysis revealed that less than five grade one readers were in stages two and three and less than five grade two readers were in stages two, three, and five, therefore the Chi square test could not be completed but percentages of students in each stage were reported. The majority of the grade one readers, 85.7 percent of the grade study sample scoring higher than the grade one mean on The Gray Oral Reading Test (comprehension questions) and the majority of grade two readers, 55.6 percent of the grade two study sample scoring higher than the grade two mean on The Gray Oral Reading Test (comprehension questions) reached the same developmental stage in reading: stage four. On this basis, research hypothesis one was accepted in part for the relationship between grade one and two readers' comprehension scores on The Gray Oral Reading Test and their developmental stages in learning to read.

As stated in the discussion for hypothesis five, the grade two readers achieving in stage four may either be progressing through the developmental stages at a slower gradual rate than other grade two readers or they could be "stuck" longer in stages one, two, or three and just reached stage four indicating a different time pattern of progression through stages. A third possibility for finding grade two reading achievers in the same stage, stage four, as grade one reading achievers is that presently, these grade two readers may be "stuck" in stage four unable to process contextual and graphic information efficiently enough to advance to the next developmental stage: stage five. Another projection regarding reasons for grade two students in

stage four, mentioned previously, is that stages as set out for grade one may be inappropriate for grade two as the stage criteria may not be powerful enough to detect differences between students' performance across all stages.

Additional Analyses of Student Performances

In view of the literature reviewed in Chapter 2, the present researcher analyzed oral reading errors produced by below average reading achievers in grades one and two on The Gray Oral Reading Test to investigate informally these readers self-correction rates, percentage of words identified in isolation versus percentage of words identified in context, effect of instructional approach on reading strategies, and effect of passage difficulty on reading strategies. Findings pertaining to these four areas are discussed below.

Self-Correction Rates

An analysis of grade one and two subjects' self-correction rates on total passages read on The Gray Oral Reading Test indicated that below average reading achievers in grade two corrected a higher percentage, 20.9 percent, of errors than below average reading achievers in grade one who corrected 13.5 percent of their errors suggesting that grade two readers processed the contextual and graphic information, during oral reading, more efficiently than grade one readers. This finding is in agreement with research and with the expectations of this researcher as stated in Chapter 2 of the present study and findings reported by Clay (1968), Au (1977), King (1978), Pflaum and Bryan (1980), D'Angelo (1981), and Menosky (1972).

A Comparison of Words Identified in Isolation and in Context

Based on findings reported in Chapter 2 of the present study by K. Goodman (1965), Allington and Fleming (1978), Allington (1979), Potter (1980), and Krieger (1981) the present researcher expected below average readers in both grades one and two to make use of context to aid word identification during oral reading by identifying a greater percentage of words in context than in isolation. A quantitative analysis of errors, produced by subjects in the present study during oral reading of words in isolation and in context, supported this expectation. The grade two subjects identified a greater percentage of words in isolation (84.0 percent) and words in context (91.6 percent) than did grade one subjects who identified words in isolation (66.8 percent) and in context (83.0 percent) suggesting the grade two subjects were more accurate in word identification in both conditions. However, the difference between percentages of words identified in isolation and in context was greater for grade one than for grade two subjects indicating that grade one showed a greater difference (16.2 percent) than grade two (7.6 percent) in their ability to identify words in context compared to in isolation. This difference could be attributed to less efficient processing of graphic information in isolation by grade one than grade two.

Influence of Passage Level Difficulty on Reading Strategies

In view of the findings reported in previous research in Chapter 2 (Biemiller, 1979; Kibby; 1979; Christie and Alonso, 1980) regarding the effect of passage difficulty on errors produced while

reading orally, this researcher projected that below average reading achievers in grades one and two would produce qualitatively different errors as they read less difficult base passages (first three passages on The Gray Oral Reading Test) up to and including more difficult ceiling passages (two consecutive passages on which the reader produced seven or more errors on The Gray Oral Reading Test). Results of the present study confirmed that errors produced by subjects in grades one and two during oral reading changed as passages became more difficult.

On base passages, the percentages of graphic (50.0 percent) and syntactic errors (50.0 percent) processed by stage two subjects in grade one were equal as were the percentages of non-response (33.3 percent) and semantic errors (29.2 percent) produced by the same subjects. As passages became increasingly more difficult, non-response errors increased dramatically (72.2 percent) accompanied by a decrease in all other errors (22.7, 12.5, and 8.0 percent) suggesting that as passages became increasingly more difficult, these readers were less able to process contextual (syntactic and semantic) information to aid word identification on ceiling passages than on base passages.

Grade one subjects achieving in stage three demonstrated a similar increase in non-response errors (39.9 percent) and decrease in other errors as passages increased in difficulty. However, the percentages of graphic (36.4 percent), syntactic (27.8 percent), and semantic errors (23.2 percent) reported for stage three subjects were greater than the percentages of the same errors reported for stage two subjects and the percentage of non-response errors (39.9 percent)

reported for the subjects in stage three was less than the percentage of non-response errors reported for stage two subjects (72.2 percent). Therefore, as passages became more difficult, subjects in stage three processed information less well on total minus base passages than on base passages, but processed graphic, syntactic, and semantic information more efficiently than grade one readers in stage two during oral reading of more difficult passages on The Gray Oral Reading Test.

Stage four subjects in grade one produced a higher percentage of graphically similar errors (73.3 and 56.3 percent) than syntactic (57.8 and 36.0 percent), semantic (55.6 and 21.5 percent), and non-response errors (2.2 and 28.0 percent) on base and total minus base passages although, like subjects in stages two and three, they processed graphic information less well on total minus base passages than on base passages. Stage four subjects were also less able to process syntactic and semantic information from the text as they read passages of increasing difficulty, however these readers processed syntactic and graphic information more efficiently than stage two or three subjects. Stage four subjects processed slightly less semantic information from the text than stage three subjects but processed more information than stage two subjects. The small number of subjects in stages two, three, and four may have accounted for these results.

In summary, the reading strategies and subsequent qualitative errors produced by grade one readers achieving in stages two, three, and four seemed to change as these subjects read passages of increasing difficulty; graphic, syntactic, and semantic errors decreased while non-response errors increased.

Grade two subjects, like grade one, seemed to show a decrease in the percentage of syntactically acceptable and semantically acceptable errors and an increase in non-response errors as they read passages that progressed from the less difficult base passages to more difficult total minus base passages on The Gray Oral Reading Test. However, the decline in the production of syntactic and semantic errors was less for subjects in a higher stage than for subjects in a lower stage suggesting that subjects in each succeeding higher stage processed syntactic and semantic information more efficiently than subjects in a lower stage of development.

Grade two subjects in stage two demonstrated reading strategies similar to grade one in producing a high percentage of non-response errors and a low percentage of graphic, syntactic, and semantic errors suggesting these readers were unable to process graphic and contextual information efficiently in order to produce a response on more difficult passages.

Stages four and five subjects in grade two differed from grade one in producing a higher percentage of graphic errors on passages up to and including ceiling passages than on base passages suggesting that the grade two readers relied more on graphic information as passages increased in difficulty. Like grade one, syntactic and semantic errors decreased and non-response errors increased as passages became more difficult to read although syntactic errors for stage five students remained the same.

In summary, as passages increased in difficulty level, most subjects in grades one and two processed less of the syntactic and

semantic information and produced more non-response errors or graphic errors than on base passages. Both grades one and two reading achievers in stage two produced similar percentages of all errors on difficult passages, however grade two reading achievers in stage four produced more graphic, syntactic, and semantically constrained errors than did grade one reading achievers in the same stage four. In addition, grade two readers achieving in stage four produced less non-response errors than did grade one readers in the same stage. Findings, regarding stage four readers, suggest that grade two readers, achieving in stage four, were more able than grade one readers achieving in the same stage to use graphic and contextual cues from the text during oral reading, therefore, grade two readers appeared to be more advanced within stage four than grade one readers. It would seem then, that grade two subjects who were promoted from grade one to grade two have shown reading improvement during nine months of grade two. In view of this finding, it may be desirable to promote below average reading achievers in grade one to grade two provided that grade two teachers are aware of the stage each child has reached and that they utilize reading material which is not at the child's frustration level since the present study showed that children in both grades one and two gained less meaning from print by processing less of the contextual information on more difficult passages than on less difficult base passages. What developmental stage the child is in is most important for the teacher to know because then he/she can facilitate movement to the next stage without penalizing the child personally by denying normal social learning context.

Influence of Instructional Approach on Reading Strategies

As reported previously in Chapter 2, the below average reading achievers in the present study were taught primarily by the Nelson Language Development Reading Program which emphasizes learning units of meaning, beginning with the largest unit (the whole selection) and proceeding to smaller units (paragraphs, sentences, words, and word parts).

Based on research reviewed in Chapter 2 (Elder, 1971; Barr, 1972, 1974; Cohen, 1974; DeLawter, 1975; Norton, 1976; Dank, 1977; Ramig and Hall, 1980) this researcher expected subjects in grades one and two of the present study to demonstrate reading strategies similar to those of children taught by a word method approach producing real word substitutions and few nonsense words (mispronunciations). An analysis of grade one and two subjects reading errors supported this expectation in that very few nonsense words (mispronunciations) were produced by grades one (1.1 percent) and two (6.5 percent). However, the high number of graphically constrained errors (43.1 and 58.5 percent) as well as the low number of semantically constrained errors (24.4 and 32.6 percent) and non-response errors produced by subjects in grades one and two seems to indicate phonics instruction in combination with a word method approach. Although the students selected for the present study were probably taught primarily by a word method (Nelson Language Development Reading Program) as required by the school board, phonics instruction was added independently by teachers to enrich or supplement this program. Therefore readers in grades one and two of the present study demonstrated reading strategies

associated with both a word method and phonic method of instruction.

Conclusions

The following conclusions were drawn from the findings of this study, in light of the limitations noted in Chapter 1 and the nature of the sample of grade one and two from a small urban central Alberta school system.

1. It could be expected that below average readers in grade one who scored higher than other below average readers in grade one on The Gray Oral Reading Test (comprehension questions) would reach a more advanced stage in reading of Fleming as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

2. It could be expected that below average readers in grade two who scored higher than other below average readers in grade two on the Gates-MacGinitie Reading Test (comprehension section) would reach a more advanced stage in reading of Fleming as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

3. It could be expected that below average readers in grade two who scored higher than other below average readers in grade two on The Gray Oral Reading Test (comprehension questions) would reach a more advanced stage in reading of Fleming as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

4. It could be expected that below average readers in grade one who scored higher than other below average readers in grade one on the Gates-MacGinitie Reading Test (comprehension section) and below average readers in grade two who scored lower on the comprehension

section of the Gates-MacGinitie Reading Test would reach the same developmental stage in reading of Fleming as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

5. It could be expected that below average readers in grade one who scored higher than other below average readers in grade one on The Gray Oral Reading Test (comprehension questions) and below average readers in grade two who scored lower than other below average readers in grade two on The Gray Oral Reading Test (comprehension questions) would reach the same stage in reading of Fleming as determined by an analysis of their oral reading miscues on The Gray Oral Reading Test.

6. It could be expected that the percentage of graphically similar miscues produced by below average grade one or two readers would increase for these readers in each succeeding developmental stage two, three, four, and five of Fleming.

7. It could be expected that the percentage of syntactically acceptable miscues produced by below average grade one or two readers would increase for these readers in each succeeding stage in reading of Fleming.

8. It could be expected that the percentage of non-response miscues produced by below average grade one or two readers would be highest in stage two and decline in each succeeding stage in reading of Fleming.

9. It could be expected that the percentage of graphically similar errors produced by below average readers in grade one or two would exceed the percentage of syntactically or semantically acceptable errors produced by the same subjects.

10. It could be expected that the percentage of syntactically acceptable miscues produced by below average grade one or two readers would exceed the percentage of semantically acceptable miscues produced by the same subjects.

11. It could be expected that below average readers in grade two would correct more miscues than below average readers in grade one.

12. It could be expected that below average readers in grades one or two would identify more words in context than in isolation thereby demonstrating use of syntactic and semantic constraints of the text.

13. It could be expected that passage difficulty would influence reading strategies of below average readers in grades one or two. These children, while reading more difficult passages beyond their base level, could be expected to produce more non-response errors and less syntactic and semantic errors thereby using less of the contextual information to identify words than on base passages. Children in grades one or two could be expected to produce a higher proportion of graphically constrained errors than syntactically or semantically constrained errors on passages up to and including ceiling passages indicating a greater reliance on graphic information as passages increased in difficulty.

14. It could be expected that instructional method would influence reading strategies of below average readers in grades one and two. Those children taught by a word method approach could be expected to produce real word substitutions and few nonsense words.

Children taught by a phonic method could be expected to produce graphically constrained errors and fewer semantically acceptable errors.

15. Fleming's stages in reading actually exist and were better than the revised stages of the present researcher in that they appear to describe more accurately the processing strategies of below average reading achievers in grades one and two.

Implications

From the findings of this study and the resulting conclusions, the following implications are suggested for the teaching of beginning reading to similar populations of children.

1. It would seem appropriate for teachers to pinpoint developmental stages in learning to read in order to obtain a clearer description of reading strategies employed by below average readers. An analysis of oral reading errors produced by below average reading achievers in grades one and two would provide information to pinpoint five stages of development in reading of Fleming. Such a description would facilitate grouping children for instruction by stage as well as facilitate development of instructional approaches designed to promote progression of these readers to more advanced developmental stages in learning to read.

2. Phonic instruction would seem most appropriate for children achieving in stage two in order to facilitate mastery of the graphic

information contained in the text. The present study found that children achieving in stage two produced at least 50 percent non-response errors out of the total number of errors. Although these children achieving in stage two appeared to be attending to the graphic information in the text, they were unable to produce a response. Following stage two, children in each succeeding stage produced more graphically constrained errors and fewer non-response errors as they processed the graphic information more efficiently than children in each lower stage.

An instructional method emphasizing reading for meaning as well as continued use of phonic skills for children achieving in stages three and four would seem beneficial to facilitate increased use of syntactic and semantic information demonstrated by readers who had advanced to stage five. Use of graphic information by below average reading achievers in grades one and two during oral reading increased over developmental stages three, four, and five indicating that better readers in a more advanced stage were subsequently making more efficient use of graphic information in the text during oral reading than poorer readers in a lower stage of development in reading. Use of contextual information by the same subjects did not increase across stages to the same degree that use of graphic information did. In fact, use of contextual information decreased following stage one while the reader was attempting to master the graphic information.

3. It may be desirable for social or psychological reasons to promote a below average grade one reading achiever to grade two provided the teacher uses appropriate reading material at the child's

instructional level and not material designated for that grade if unsuited.

The majority of the better below average grade one reading achievers and the majority of poorer below average grade two reading achievers of the present study reached the same developmental stage, stage four. However, the grade two readers in stage four were processing graphic and contextual information more efficiently than grade one readers in the same stage suggesting improvement in reading of grade two compared with grade one.

4. It would seem appropriate that teachers consider the instructional reading approach when interpreting oral reading test results. The instructional approach under consideration in the present study appeared to have influenced subjects' oral reading strategies and subsequent error patterns. Therefore, strengths and weaknesses diagnosed on the basis of oral reading error patterns may be indicative of the instructional reading program and not necessarily indigenous to a particular student.

5. Teachers should be aware of the difficulty level of passages when interpreting oral reading test results and group errors made at instructional and frustration levels for separate analysis by level. The level of passage difficulty seemed to affect subjects' oral reading strategies and subsequent errors produced during oral reading in the present study. Strengths and weaknesses diagnosed on the basis of an analysis of oral reading errors may be a function of the passage level difficulty and not typical of the below average reader.

Suggestions for Further Research

The following suggestions are made for further research into children's stages of development in the process of learning to read.

1. It is suggested that oral reading errors of average and above average readers in both grade one and two be analyzed further to investigate: (a) whether Fleming's five stages are evident and whether the same pattern of development is apparent for these readers, or (2) whether stages in reading beyond the original five are evident for grade two, or (3) if stages should be redefined for different achieving groups of readers at each grade level. The findings of the present study suggested that below average reading achievers in grades one and two could be placed into one of Fleming's five stages on the basis of oral reading miscues.

2. A study exploring stages in reading earlier in the year is warranted to examine further the findings of Biemiller (1969) and projections of Fleming (1974) pertaining to reading strategies of children in the first stage of development. The present study placed below average readers into stages of development in May and found only one child achieving in stage one in reading.

3. A study begun much earlier in the year and continuing throughout the year is suggested in order to examine children's rate of progression through stages of development. As previously mentioned by the present researcher, grade two readers presently achieving in stage four may have progressed more slowly than other grade two readers through the stages or may have been "stuck" in stage one or two prior to reaching stage four.

4. It is suggested that the influence of instructional approaches designed to move children onto a higher stage in reading be examined. The percentage of errors produced by children in stage one of Biemiller (1969) and of the present researcher suggest that children in the beginning stage of reading [illegible] their knowledge of the grammatical structure of language in producing syntactically acceptable miscues, however these readers are less proficient in processing graphic information from the text. Biemiller (1969) suggested the child who mastered the graphic information and moved through stages one and two earlier in the year was a better reader at year end than the child who progressed slowly through stages one and two. A study early in the year, while children are achieving in beginning developmental stages in reading, investigating a phonic instructional approach emphasizing the teaching of sounds represented by letters and letter combinations for word identification may be enlightening.

5. A study examining stages of development in learning to read at students' instructional level apart from frustration level is warranted since the present investigator found qualitative errors changed as passages increased in difficulty. The present researcher analyzed oral reading errors on total passages of The Gray Oral Reading Test which included base passages (first three passages of The Gray Oral Reading Test) and passages up to and including ceiling passages (two consecutive passages on which the reader produced seven or more errors on the same test) in order to examine stages of development in reading.

Concluding Statement

This study found that below average reading achievers in grades one and two were achieving in one of Fleming's five stages of development in learning to read as determined by an analysis of their oral reading miscues on total passages on The Gray Oral Reading Test. Pinpointing developmental stages in reading and subsequent reading strategies employed by students in each developmental stage would enable teachers to group students by stage for instruction and develop better programs aimed at facilitating movement of these readers to a more advanced developmental stage in learning to read.

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APPENDICES

APPENDIX A

WORD LISTS, PASSAGES, AND COMPREHENSION QUESTIONS OF THE GRAY ORAL READING TEST, FORM D

WORD LISTS FOR BASE PASSAGES ON THE GRAY ORAL READING TEST, FORM D

Passage One Word List	Passage Two Word List	Passage Three Word List
mother	eat	and
here	can	find
run	for	are
want	make	laughed
play	are	the
see	help	saw
with	like	mew
and	now	help
is	want	she
we	said	cat
come	look	a
can	is	saw
I	mother	could
to	girl	kittens
	the	over
	will	not
	good	soon
	a	in
	you	look
	something	coming
	I	her
	here	your
	me	to
	it	girl
	to	you
		all
		my
		said
		house
		mother
		them
		but
		farm
		looked
		wanted
		me

WORD LISTS FOR PASSAGES BEYOND THE BASE LEVEL ON THE GRAY ORAL READING TEST, FORM D

Passage Four Word List		Passage Five Word List		Passage Six Word List	Passage Seven Word List	
home	are	water	waiting	vegetables	swim	slowly
street	and	excited	dropped	and	cool	little
time	pet	then	away	damage	rapidly	flapping
small	have	summer	into	attack	familiar	forth
said	do	brothers	quickly	rain	often	waddles
good	you	their		extreme	child	of
found	walking	laughed		farm	the	animals
want	by	got		of	country	city
last		swam		growing	always	who
him		bite		face	attention	and
one		sat		over	native	in
down		bright		weather	pools	lakes
black		the		however	playful	he
feed		with		in	walk	
tired		looked		also	back	
was		and		crops	woodchuck	
for		time		insects	fat	
came		lake		would	zoo	
am		fish		all	children	
because		it		cold	to	
boy		pole		excellent	both	
city		his		succeed	paying	
no		finally		heat	as	
pretty		soon		fruit	bears	
or		boy		any	friends	
Saturday		uncle		harm	all	
soon		twin		many	a	
I		for		other	visit	
one		still		most	love	
short		at		year	does	
to		disappeared		grain	in	
dog		to		having	water	
a		walked		may	their	
had		a		difficult	all	
glad		surprised		at	home	
lay		day		farmers	people	
so		long		animals	seals	
at		one		problems	his	
sleep		they		or	finds	
to		so		usually	polar	
he		became		season	flippers	
for		he		birds	there	
lost		that		the	outdoor	
				ruin		

BASE PASSAGES ON THE GRAY ORAL READING TEST, FORM D

PASSAGE ONE

Mother / is here./

See Mother / run./

I / want / to play./

We / can play with mother./

Come / and play./

Run, / run./

PASSAGE TWO

"Look here," / said Mother./

"I / can make something for you./

It / is good / to eat./

You / will like it."/

"Mother," / said the girl./

"I / want / to help you."/

"You / are a good girl," / said Mother./

"You / can help me now."/

PASSAGE THREE

A cat / wanted / to find her kittens./ She / looked in the house and all over the farm./ But she / could not find them./ Soon the mother cat / saw a girl./ "Mew,"/ she said./ "Help me / find my kittens."/ "Look," / laughed the girl./ "Your kittens / are coming / to find you."/

PASSAGES BEYOND THE BASE LEVEL ON THE GRAY ORAL READING TEST, FORM D

PASSAGE FOUR

One Saturday / a black dog / was walking down / a pretty city street./ He / had no home / and no one / to feed / or to pet him./ At last he / was so / tired he / lay down / to sleep for a short time./

Soon a small boy / came by./ "Are you / lost?" / he said./ "Do you / have a good home?/ I / am glad I / found you / because I / want a dog for a pet."/

PASSAGE FIVE

One bright summer day / twin brothers / walked to a lake with their uncle / to fish./ They / sat still for a long time / waiting for the fish / to bite./ Finally one boy / got a bite./ He / became so excited that he / dropped his pole into the water./ The fish / quickly swam away with it./ Soon the pole / disappeared./ The surprised boy / looked at his uncle / and then laughed./

PASSAGE SIX

All over the world farmers / face many difficult problems./ Insects, / birds, / and other animals / attack most of the farm crops / and harm / growing vegetables / and fruit./ At any season of the year the weather / may also damage crops./ Extreme heat, / cold, / or rain / may ruin fruit, / vegetables, / or grain./ However, most farmers / usually succeed / in having excellent crops./

PASSAGE SEVEN

Both city / and country children / love / to visit the zoo./ A child / who / likes animals / often finds all his familiar outdoor friends there./ The fat woodchuck / waddles as / he / always does in his native home./ The playful seals / swim in pools of cool water, / flapping their flippers rapidly./ Polar bears / walk slowly back and forth / paying little attention to people./

COMPREHENSION QUESTIONS AND CORRECT ANSWERS ON THE GRAY READING TEST, FORM D, BASE PASSAGES

PASSAGE ONE

Questions	Answers
1. In this story who was running?	Mother (1)
2. Who wanted to play?	The boy (1)
3. Who did he ask to play?	A girl (sister) (1)
4. How many people were to play?	Three (1)

PASSAGE TWO

Questions	Answers
1. Who was Mother speaking to?	A (little) girl (1)
2. What was Mother making?	Something (good) to eat (1) Something good (1/2)
3. What did the girl want to do?	Help (Mother) (1)
4. When could the girl help Mother?	Now (1) Right away or then (1/2)

PASSAGE THREE

Questions	Answers
1. What was the cat looking for?	(Her) kittens (1)
2. In what did she look?	(The) house (1)
3. Who did the cat ask help from?	(A) girl (1)
4. Who came to find the cat?	(The) kittens (1)

COMPREHENSION QUESTIONS AND CORRECT ANSWERS ON THE GRAY ORAL READING TEST, FORM D, PASSAGES BEYOND THE BASE LEVEL

PASSAGE FOUR

Questions	Answers
1. What was walking down a city street?	A (black) dog (1)
2. Why wasn't the dog at home?	He had no home (1) He had nowhere to live (1/2)
3. What did a boy ask the dog?	Are you lost or do you have a good home (1) If he had a home (1/2)
4. Why was the boy glad he found the dog?	(He) wanted a dog (for a pet) or wanted a pet (1) He didn't have a pet (1)

PASSAGE FIVE

Questions	Answers
1. How did the boys and their uncle get to the lake?	Walked (1)
2. What did they do while waiting for the fish to bite?	Sat still or quietly (1)
3. What did one of the boys do when he got a bite and became excited?	Dropped his pole (1)
4. What did the surprised boy do when his pole went out of sight?	Looked at his uncle and laughed (1) (Either idea gets 1/2)

PASSAGE SIX

Questions	Answers
1. Whose problems does this paragraph discuss?	Farmers (1) Farmer (1/2)
2. What living things harm farm crops and vegetables?	Insects, birds, and other animals (any two) (1)
3. When may the weather do much harm?	Any time or season (1) All year round (1/2)
4. In spite of the difficulties faced, how many of the farmers usually have excellent crops?	Most (of them) (1) Many (1/2)

PASSAGE SEVEN

Questions	Answers
1. Who loves to visit a zoo?	(Both) city and country children (1) City and country boys (1/2); children
2. What animals, according to the story, are found at the zoo?	Woodchucks, seals, (polar) bear (any two) (1)
3. What word in the story describes the way a woodchuck moves about?	Waddles (1)
4. Which animal, according to the story, pays little attention to people?	Polar bears (1) (Bears 1/2)

APPENDIX B

STUDENT PERFORMANCES ON THE GRAY ORAL READING TEST, FORM D, ON BASE PASSAGES, TOTAL MINUS BASE PASSAGES, AND TOTAL PASSAGES

Number of Errors on Base Passages, Total Minus Base Passages, and Total Passages on The Gray Oral Reading Test for Grade One Students by Stage

Grade One Subjects by Stage	Number of Graphically Similar Errors on:			Number of Non-Response Errors on:			Number of Syntactically Acceptable Errors on:			Number of Semantically Acceptable Errors on:		
	Base Passages	Total Minus Base Passages	Total Passages	Base Passages	Total Minus Base Passages	Total Passages	Base Passages	Total Minus Base Passages	Total Passages	Base Passages	Total Minus Base Passages	Total Passages
Stage 1 Criteria	Less than 50 percent of total errors are graphically similar			—			At least 50 percent of total errors are syntactically or semantically acceptable					
N = 1 18	4/7	20/59	24/66	0/7	0/59	0/66	2/7	36/59	38/66	2/7	29/59	31/66
Stage 2 Criteria	—			At least 50 percent of total errors are no response			—			—		
N = 5 05	1/1	10/30	11/31	0/1	20/30	20/31	1/1	5/30	6/31	1/1	4/30	5/31
13	1/3	10/30	11/33	2/3	18/30	20/33	1/3	5/30	6/33	1/3	2/30	3/33
15	6/8	11/42	17/50	0/8	25/42	25/50	6/8	7/42	13/50	3/8	5/42	8/50
16	0/4	3/29	3/33	3/4	26/29	29/33	1/4	1/29	2/33	0/4	0/29	0/33
19	4/8	6/45	10/53	3/8	38/45	41/53	3/8	4/45	7/53	2/8	3/45	5/53
Total Errors	12/24	40/176	52/200	8/24	127/176	135/200	12/24	22/176	34/200	7/24	14/176	21/200
Stage 3 Criteria	Less than 50 percent of total errors are graphically similar			less than 50 percent of total errors are no response			Less than 50 percent of total errors are syntactically or semantically acceptable					
N = 5 01	3/4	8/28	11/32	0/4	15/28	15/32	2/4	6/28	8/32	2/4	4/28	6/32
09	3/5	8/37	11/42	1/5	19/37	20/42	3/5	7/37	10/42	3/5	7/37	10/42
10	2/5	17/47	19/52	0/5	12/47	12/52	3/5	17/47	20/52	2/5	14/47	16/52
11	3/4	16/39	19/43	0/4	16/39	16/43	2/4	12/39	14/43	2/4	9/39	11/43
17	4/8	23/47	27/55	1/8	17/47	18/55	7/8	13/47	20/55	6/8	12/47	18/55
Total Errors	15/26	72/198	87/224	2/26	79/198	81/224	17/26	55/198	72/224	15/26	46/198	61/224
Stage 4 Criteria	At least 50 percent of total errors are graphically similar			—			Less than 50 percent of total errors are syntactically or semantically acceptable					
N = 8 02	6/6	20/39	26/45	0/6	13/39	13/45	5/6	16/39	21/45	5/6	11/39	16/45
03	5/6	22/47	27/53	0/6	19/47	19/53	4/6	15/47	19/53	4/6	11/47	15/53
04	0/0	11/14	11/14	0/0	1/14	1/14	0/0	5/14	5/14	0/0	2/14	2/14
06	1/2	20/28	21/30	1/2	6/28	7/30	0/2	10/28	10/30	0/2	6/28	6/30
07	9/12	18/31	27/43	0/12	12/31	12/43	7/12	7/31	14/43	7/12	5/31	12/43
08	4/6	21/38	25/44	0/6	2/38	2/44	2/6	15/38	17/44	2/6	6/38	8/44
12	3/3	12/26	15/29	0/3	14/26	14/29	1/3	10/26	11/29	1/3	9/26	10/29
14	5/10	23/38	28/48	0/10	6/38	6/48	7/10	16/38	23/48	6/10	6/38	12/48
Total Errors	33/45	147/261	180/306	1/45	73/261	74/306	26/45	94/261	120/306	25/45	56/261	81/306

Percentage of Total Errors on Total Passages on The Gray Oral Reading Test for Grade One Students by Stage

Grade One Students by Stage	Percentage of Graphically Similar Errors on Total Passages	Percentage of Non-Response Errors on Total Passages	Percentage of Syntactically Acceptable Errors on Total Passages	Percentage of Semantically Acceptable Errors on Total Passages
Stage 1 Subject	36.4	0	57.6	47.0
Stage 2 Subjects	26.0	67.5	17.0	10.5
Stage 3 Subjects	38.8	36.2	32.1	27.2
Stage 4 Subjects	58.8	24.2	39.2	26.5

Number of Errors on Base Passages, Total Minus Base Passages, and Total Passages on The Gray Oral Reading Test for Grade Two Students by Stage

Grade Two Subjects by Stage	Number of Graphically Similar Errors on:			Number of Non-Response Errors on:			Number of Syntactically Acceptable Errors on:			Number of Semantically Acceptable Errors on:		
	Base Passages	Total Minus Base Passages	Total Passages	Base Passages	Total Minus Base Passages	Total Passages	Base Passages	Total Minus Base Passages	Total Passages	Base Passages	Total Minus Base Passages	Total Passages
Stage 2 Criteria		—		At least 50 percent of total errors are no response				—			—	
N = 2 14	1/3	7/25	8/28	1/3	16/25	17/28	2/3	2/25	4/28	2/3	2/25	4/28
16	2/3	7/47	9/50	1/3	33/47	34/50	2/3	8/47	10/50	1/3	5/47	6/50
Total Errors	3/6	14/72	17/78	2/6	49/72	51/78	4/6	10/72	14/78	3/6	7/72	10/78
Stage 3 Criteria	Less than 50 percent of total errors are graphically similar			Less than 50 percent of total errors are no response			Less than 50 percent of total errors are syntactically or semantically acceptable					
N = 1 01	0/0	8/24	8/24	0/0	8/24	8/24	0/0	9/24	9/24	0/0	6/24	6/24
Stage 4 Criteria	At least 50 percent of total errors are graphically similar				—		Less than 50 percent of total errors are syntactically or semantically acceptable					
N = 5 15	2/6	12/21	14/27	0/6	4/21	4/27	4/6	9/21	13/27	4/6	8/21	12/27
17	3/4	14/25	17/29	0/4	8/25	8/29	4/4	8/25	12/29	4/4	5/25	9/29
18	2/2	24/28	26/30	0/2	4/28	4/30	1/2	12/28	13/30	1/2	8/28	9/30
19	4/6	16/32	20/38	0/6	13/32	13/38	4/6	14/32	18/38	4/6	12/32	16/38
20	2/7	18/31	20/38	0/7	6/31	6/38	5/7	13/31	18/38	4/7	9/31	13/38
Total Errors	13/25	84/137	97/162	0/25	35/137	35/162	18/25	56/137	74/162	17/25	42/137	59/162
Stage 5 Criteria	More than 50 percent of total errors are graphically similar				—		At least 50 percent of total errors are syntactically or semantically acceptable					
N = 12 02	1/2	16/31	17/33	0/2	7/31	7/33	1/2	19/31	20/33	1/2	17/31	18/33
03	0/0	19/23	19/23	0/0	0/23	0/23	0/0	14/23	14/23	0/0	8/23	8/23
04	4/5	17/25	21/30	0/5	0/25	0/30	4/5	13/25	17/30	4/5	11/25	15/30
05	0/0	16/24	16/24	0/0	0/24	0/24	0/0	14/24	14/24	0/0	7/24	7/24
06	1/2	10/18	11/20	1/2	6/18	7/20	0/2	10/18	10/20	0/2	6/18	6/20
07	3/5	17/26	20/31	0/5	2/26	2/31	2/5	14/26	16/31	2/5	12/26	14/31
08	1/1	23/26	24/27	0/1	0/26	0/27	1/1	13/26	14/27	1/1	1/26	2/27
09	1/2	16/19	17/21	1/2	1/19	2/21	1/2	10/19	11/21	1/2	7/19	8/21
10	0/0	10/18	10/18	0/0	5/18	5/18	0/0	10/18	10/18	0/0	6/18	6/18
11	0/1	9/16	9/17	0/1	7/16	7/17	1/1	8/16	9/17	1/1	4/16	5/17
12	4/6	15/18	19/24	0/6	2/18	2/24	3/6	9/18	12/24	3/6	6/18	9/24
13	0/0	20/24	20/24	0/0	2/24	2/24	0/0	14/24	14/24	0/0	8/24	8/24
Total Errors	15/24	188/268	203/292	2/24	32/268	34/292	13/24	148/268	161/292	13/24	93/268	106/292

Percentage of Total Errors on Total Passages on The Gray Oral Reading Test for Grade Two Students by Stage

Grade Two Students by Stage	Percentage of Graphically Similar Errors on Total Passages	Percentage of Non-Response Errors on Total Passages	Percentage of Syntactically Acceptable Errors on Total Passages	Percentage of Semantically Acceptable Errors on Total Passages
Stage 2 Subjects	21.8	65.4	17.9	12.8
Stage 3 Subject	33.3	33.3	37.5	25.0
Stage 4 Subjects	59.9	21.6	45.7	36.4
Stage 5 Subjects	69.5	11.6	55.1	36.3