

EVALUATION OF SELECTED FOURTH GRADE READING
TEXTBOOKS AND GEOGRAPHY TEXTBOOKS BASED ON
THE LORGE READING FORMULA

RESEARCH PROJECT

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Science in Education

by

Sister John Clare Beris, S. C.

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Approved by:

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TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
Chapter	
I INTRODUCTION	1
Statement of the Problem	
Significance of the Problem	
Purpose of the Study	
Assumptions and Limitations	
Definition of Important Terms	
II REVIEW OF RELATED LITERATURE	10
History of Reading Formulas	
Content Area	
Sentence Structure	
III DESIGN OF THE STUDY	47
IV PRESENTATION AND ANALYSIS OF DATA	51
V SUMMARY AND CONCLUSIONS	63
BIBLIOGRAPHY	69

CHAPTER I

INTRODUCTION

Reading, more than any other discipline, has for years undergone extensive experimentation in the field of research. Chall states that "educational researchers have, after all, devoted more time and effort to the study of reading than to any other school subjects."¹ The years between 1900-1910 saw the emergence of reading research in the United States. It was during this period that attention to the cause of reading disability was developed.² In the years that followed from 1910 to 1924, a spurt in scientific investigation of reading began when standardized tests were made available. It is noteworthy that the first reading test--The Gray Standardized Oral Reading Paragraphs--published in 1915, was oral in its nature. Not until the years 1915 to 1918 did numerous silent reading tests appear on the market.³

As this period proceeded broader interests were reflected in the problems chosen for investigation. A few studies dealt with

¹Jeanne S. Chall, Learning to Read: The Great Debate (New York: McGraw-Hill Book Company, 1967), p. 88.

²Nila Banton Smith, American Reading Instruction (Newark, Delaware: International Reading Association, 1965), p. 186.

³Ibid., p. 157.

the topics of diagnosis and remedial instruction, and with correlation between reading achievement and achievement in other subject areas.⁴

If the preceding years of research had influenced both the methods and the content of reading instruction, those that followed from 1924 to 1935 were remarkable for producing a greater quantity and scope of reading research. Out of all the topics that were investigated, reading interest, reading disability, and reading readiness by far received the greatest amount of research. On the other hand, reading as a subject was not only considered, but most conspicuous were the number of studies concerned with reading in the different curriculum areas.⁵

Research in reading was reaching a peak in the years extending from 1935 to 1940. Articles published about reading readiness reached a zenith during this period. New professional books and basal reader programs began to devote more space to the content subjects. According to Gray:

I wish to refer to the urgent need for reading in the content fields. Herein lies one of the great possibilities for developing mature, competent readers in the future.⁶

⁴Ibid., pp. 255-56.

⁵Ibid., p. 186.

⁶William S. Gray, "Looking Ahead in Reading," Educational Digest, XXVI (February, 1961), 28.

Other significant topics researched were: evaluation of reading tests, effective reading and study habits, and remedial and diagnostic reading. The topic of readability emerged as a new research interest. The Yoakam, Lorge, and Flesch readability formulas were published at this time.⁷

During the war years, between 1940-1950, little or no research was done. Nevertheless, fresh ideas regarding the importance of reading were brought forward. The war made its impact on the need for more extensive research because of the illiteracy problem which manifested itself through the men in the Armed Services. This led to new investigations concerning reading deficiencies discovered in large numbers of our high schools and colleges throughout the nation. The outgrowth of this research brought about the start of developmental reading. In the Thirty-Sixth Yearbook, Part I, of the National Society for the Study of Education, we find several statements in regard to the systematic teaching of reading. Two of these statements are quoted:

The basic instruction given should be organized so as to provide more widely than in the past for continuous, successful progress from one stage of development to another.⁸

⁷Smith, op. cit., p. 299.

⁸William S. Gray, "A Decade of Progress," The Teaching of Reading: A Second Report, The Thirty-Sixth Yearbook of the National Society for the Study of Education, Part I (Bloomington, Ill.: Public School Publishing Co., 1937), p. 14.

Until further evidence develops, the Yearbook Committee recommends the use of specific periods for carefully planned guidance in reading throughout the elementary-school, secondary-school, and college periods.⁹

Reading instruction during the latter part of the Forties revealed another trend. Courses of study in reading advocated systematic instruction with the use of basal readers. To strengthen this program, publishing companies revised teachers' manuals for basal series readers and also introduced first-grade readiness books. Besides these teacher aides, teachers' guides resulted which listed language skills that could be developed with specific reading lessons and offered suggestions in teaching other language art skills.¹⁰ Guides that accompanied basal readers which contained social studies content offered suggestions for integrating reading with this subject area. Austin maintains that:

Each teacher, whether his special field is English, science, or social studies, should be a teacher of reading when the occasion demands that his students develop specific skills related to his field of study: the vocabulary peculiar to that subject; special study techniques, such as outlining, note taking, the reading of maps, graphs, charts, diagrams, and tables; using appropriate reference sources in locating relevant information for a particular unit of study.¹¹

⁹Ibid., p. 19.

¹⁰Nila Banton Smith, American Reading Instruction (Newark, Delaware: International Reading Association, 1965), p. 288.

¹¹Mary C. Austin, Reading Evaluation (New York: The Ronald Press Company, 1961), p. 222.

From the above issues the writer believes the need for integrating reading with the other content subjects to be as important today as in the past. The fact that children still find reading materials difficult to comprehend both in basal readers and in the content subjects indicates a need for more research in the above areas. This study hopes to add some significant measures for educators in the field of reading research.

Statement of the Problem

The purpose of this study is to evaluate recent fourth grade readers and geography texts based on the Lorge Reading Formula. The writer will attempt to determine the possibility of sentence structure as being partly responsible for current reading difficulties.

Significance of the Problem

Though many experimental studies have been published in the language arts and the content subjects about reading, one topic that seems of little repute is the readability of textbooks. Not that publishers are not cognizant of the need for readable books. Many have attempted to improve textbooks with the aid of readability formulas. How many administrators, supervisors, and teachers are familiar with the necessary criteria for evaluating recent textbooks? It seems significant that these educators should have an

understanding of the crucial period when fourth graders encounter an added burden of vocabulary and new concepts in the content subjects as compared to the basal reader. In the Thirtieth Yearbook of the Claremont Reading Conference, the authors point out that:

The intermediate grades represent the period of greatest emphasis. . . . It is at this level that the child is introduced to textbooks in the subject matter areas. Here he first meets a text in history or geography, an informative text in science, a basic text in arithmetic and many others.¹²

Purpose of the Study

The writer's role as reading co-ordinator in the intermediate grades involves the evaluation and selection of appropriate reading materials for fourth and fifth grade pupils. Besides this, the co-ordinator should guide teachers in the proper use of these textbooks. Teachers must be made aware of the reading problems that develop, particularly in the fourth grade, because of the difficulty of the various content textbooks.

Because the writer encountered reading problems involving sentence length in a third grade basic reader with slow fifth graders and the children's dislike for social studies, it was decided that a study of fourth grade textbooks should be researched to find wherein the difficulty lies.

¹²Claremont Reading Conference, ed. Malcolm P. Douglass, The Thirtieth Yearbook (Claremont, California: The Claremont Graduate School Curriculum Laboratory, 1966), p. 166.

Therefore, this study will evaluate fourth grade reading textbooks and geography textbooks using the Lorge Reading Formula to ascertain the degree of readability of these texts. Through this study, the writer hopes to acquaint educators with the problem of the relative difficulty of reading materials which may be the cause of reading disabilities.

Assumptions and Limitations

In our schools today, many teachers use one basic textbook for each major subject. This can present reading problems, particularly when children are first introduced to the content subjects. In a fourth grade classroom the reading range may be quite extensive. Harris found that:

In most schools, middle grade teachers have to deal with a wide range of reading skills. The grade scores on a recent Metropolitan Reading test given at the beginning of the fourth grade showed a range from grade 2.0 to 7.9+, approximately six grades.¹³

Because of this problem, the writer believes that since children are confined to specific basic textbooks, allowing for no individual differences, the readability of textbooks may account for many of the existing reading disabilities prevalent in our intermediate grades today. However, it may be assumed that if the fault does not lie in

¹³ Albert J. Harris, Effective Teaching of Reading (New York: David McKay Company, Inc., 1962), p. 99.

this area, then educators should take a hard look as to the teaching methods in the major subjects.

The study will be limited to evaluating the sentence structure of three basal readers and three geography textbooks. Geography texts were chosen because the content material is composed of many sentences similar to basal readers.

The readers under examination will be: This is Our Land, Ginn and Company, 1965; Open Highways, Scott-Foresman and Company, 1965; High Roads, Houghton-Mifflin and Company, 1966. The geography textbooks are: In All Our States, Scott-Foresman and Company, 1965; Geography Gateways, Allyn and Bacon, 1967; and My World of Neighbors, Sadlier and Company, 1962.

Definition of Important Terms

Content Subjects: These subjects whose material is different than the basal reader in vocabulary load, concept burden, and certain specific skills pertinent to that content area.

Readability: This term is restricted to the relative difficulty of the reading material, judged according to structural features in the text sentences, e. g., the vocabulary, literary style, and complexity of the sentences.

Readability Formula: A measurement whereby reading materials can be judged as to their reading content to better ascertain

the grading and preparation of materials for use at different levels of readership.

Sentence Structure: This term will be used to signify the number of words in a sentence, the phrases used, types of sentences, and the length of the sentence.

CHAPTER II

REVIEW OF RELATED LITERATURE

History of Reading Formulas

Today, more than ever before, the tremendous volume of books placed at the disposal of educators and the public is unparalleled in history. The attractive features and the latest concepts contained in modern textbooks point out the progress research has contributed to the various school disciplines. This, of course, was not true of the books on the market years ago. In the 1940's Gray stated:

The demand for readable books was never greater than today. It comes from children and young people who are still pursuing their formal education. It is voiced by a very large proportion of our adult population . . . who are unable to read with ease and understanding materials above sixth- and seventh-grade levels in difficulty. It reflects the sentiment of all of us as we attempt to extend our horizons to new fields . . . and to understand better the forces that are molding civilization and shaping our destinies. Somehow this demand must be met more efficiently and more fully than it has been thus far.¹

In the field of children's literature, the effort to increase the readability of books began years ago with the development of simpler and more attractive books based on themes of genuine interest

¹William S. Gray, "Progress in the Study of Readability," Elementary School Journal, XLVII (May, 1947), 491-99.

to children. Paralleling this trend, there has been continuous effort to develop better-graded, and more attractive school readers, and more readable books for use in the content fields.² It should be noted, though, with all the research that has been set forth to the present time, the problem of readability of books remains a challenge to many. The numerous textbooks on the market today embody the most up-to-date methods and concepts, but still present a problem of readability. Many students are unable to read and comprehend the written page because the text assigned to their reading level is not readable. In one of her books Hildreth states that

. . . studies of readability have been made disclosing the disparity in many cases between children's reading achievement and the difficulty level of assigned books, suggesting the need for better fitting books and the need to supplement learning from texts with other resources for learning.³

Russell has said that "teachers do not want a text to be so hard that it dismays everyone or so easy that few children are challenged to read better."⁴

Teachers, supervisors, principals, and superintendents have all been concerned that textbooks and other materials for the

²Ibid., 491.

³Gertrude Hildreth, Teaching Reading (New York: Holt, Rinehart and Winston, 1960), p. 370.

⁴David H. Russell, Children Learn to Read (New York: Blaisdell Publishing Company, 1961), pp. 130-31.

different grades be suited to the abilities of the children. The authors, editors, and publishers of texts are also confronted with the problem of readability. Chall has said:

The idea underlying readability measurement is the appropriate matching of reader and printed material. It assumes that readers differ in their ability to read and that the printed material in turn varies in readability, that is, in the amount and kind of ability required to read and understand it. Suitable matching is essentially a problem of prediction and control. It implies that the teacher, librarian, or editor knows something about the factors that make for ease and difficulty, how these factors can be estimated and how they can be related to the ability of the reader.⁵

Therefore, studies that have explored this field of researching readability will be considered in this paper. The writer hopes to find some criteria for use in judging the readability of books as a means of putting the right book in the hands of the right child. Before attempting this line of thought a few questions concerning readability should be clarified. What is readability? What studies have been made to improve the readability of textbooks? What are reading formulas? The writer will endeavor to answer these questions in the following pages.

What is Readability?

Consider first of all the term "readability." It has been defined by many reading experts, each seeming to stress a particular

⁵Jeanne S. Chall, "Readability: An Appraisal of Research and Application," Bureau of Educational Research, Ohio State University, Columbus, Ohio, 1958, p. 9.

phase of reading. Irving Lorge defines it in this manner. "Readability, however, must be measured in terms of the success that persons have in comprehending the text."⁶ Dale and Chall proposed a comprehensive definition of readability:

In the broadest sense, readability is the sum total (including the interactions) of all those elements within a given piece of printed material that affects the success that a group of readers have with it. The success is the extent to which they understand it, read it at an optimum speed and find it interesting.⁷

In a book devoted to the problem of the measurement of readability Klare states:

- The term 'readability' has come to be used in three ways:
1. To indicate legibility of either handwriting or typography.
 2. To indicate ease of reading due to either the interest-value or the pleasantness of writing.
 3. To indicate ease of understanding or comprehension due to the style of writing.⁸

Readability of textbooks is a subject that should be of prime importance to teachers of today. With more than 1,500 new books for children coming from the presses yearly, teachers face an overwhelming task when they attempt to know the content, appeal, and

⁶Irving Lorge, "Predicting Readability," Teachers College Record, XLV (March, 1944), 404.

⁷Edgar Dale and Jeanne S. Chall, "Techniques for Selecting and Writing Readable Materials," Elementary English, XXVI (May, 1949), 259.

⁸George R. Klare, The Measurement of Readability (Ames, Iowa: Iowa State University Press, 1963), p. 1.

reading level of books for children. They nevertheless need to know these facts when they attempt to determine how appropriate certain books or other materials are for certain children. They need to know a book's readability level in order to ensure effective reading on the part of the pupil.⁹

In former years when school reading was largely limited to graded prescribed texts, the question of readability of materials scarcely arose; but now with the growing trend toward the use of diversified books and nonstandardized publications, all teachers need to become familiar with the principles of readability as they apply to book selection and the guidance of children's reading interests.¹⁰ Two such educators, Smith and Dechant, have this to say:

We wish to put the right book in the right hands at the right time. To accomplish this, we need to know how to recognize the materials that best fit the needs of each child. A knowledge of readability formulas, which gauge the difficulty level of reading materials, will be useful to us. We also need to know the legibility factors which either promote or hinder reading. Readability and legibility have been studied extensively and the data that have accrued should be useful in detecting and eliminating some of the barriers to effective reading.¹¹

⁹Mary C. Austin, Clifford L. Bush, and Mildred H. Huebner, Reading Evaluation (New York: The Ronald Press Company, 1961), p. 125.

¹⁰Hildreth, op. cit., p. 371.

¹¹Henry P. Smith and Emerald V. Dechant, Psychology in Teaching Reading (New Jersey: Prentice-Hall, Inc., 1961), p. 243.

What Studies Have Been Done to Improve the Readability of Textbooks?

Numerous studies have been made on readability, but only a few will be examined in this paper. Before any type of measurement was devised to grade the level of a book, teachers and librarians made recommendations and selections that were often influenced by editors and publishers who assigned grade and age designations to books. This may, at the time, have seemed feasible, but more often than not children were given materials that were too hard to read and comprehend. It was due to the inadequate predictions of difficulty that gave rise to the search for objective measures. Chall has remarked that:

The search for objective techniques sought to reach three major goals: the discovery of those factors that validly distinguish easy from hard materials; a reliable means of measuring such factors; and an expression of some combination of them in terms of the reading ability essential to comprehension.¹²

With these objectives in mind studies in readability were given an impetus to investigate the various facets proposed as possible criteria to improve the problems of readability in books. To reach these goals, researchers employed three types of studies: surveys of experts' and readers' opinions, experimental studies of one factor, and quantitative associational studies. Each method contributed certain factors that distinguished easy material from hard. Of the

¹²Chall, op. cit., p. 9.

three studies used, the quantitative associational studies made contributions to all three of these goals. They uncovered significant factors in difficulty, found reliable means of measuring them, and expressed the factors in terms of the reading ability of children and adults. The quantitative associational studies are the most typical of readability research. They are the ones that produced the readability formulas.¹³

Some researchers set out to study such factors as vocabulary, style, topic, sentence length, pictorial aids, organization of material, and size of type in reading materials which make them easy or hard to read. Others have stressed the concept of readability in understanding and comprehension of the printed text. Chall has commented that:

Studies of this kind report that such elements as vocabulary and sentence structure distinguish writing which can be easily read by almost all who are literate, from writing which is understandable only to those who are highly literate. In other words materials that contain a larger percentage of hard words, long sentences, and other crucial factors are more difficult than materials that have smaller percentages of such characteristics.
 . . .¹⁴

One of the first surveys of opinion on readability was conducted by William S. Gray and Bernice E. Leary. The results reported in What Makes a Book Readable was designed to find the factors which

¹³Chall, op. cit., p. 10.

¹⁴Chall, op. cit., pp. 6-7.

publishers, librarians, and teachers considered important in judging a book readable for adults of limited ability. Included in the survey were hundreds of descriptive statements obtained from approximately one hundred respondents. With this data these four major categories were used to classify the criteria: format or mechanical features, organization, style of expression and presentation and content. After viewing the results, librarians, teachers, and publishers agreed that factors of content were most important, those of style next, format third, and organization last. The only difference found between the readers and experts as to what makes a book easy and pleasant to read was the rank of the above factors. The adult readers considered style first, content second, format, and finally organization.¹⁵

The surveys of experts' and readers' opinions had a sober effect on research in readability. These studies called attention to the importance of other factors not yet measured by formulas--content, format and organizational features. Studies of this nature brought to light the fact that readability involves more than a check against a word list. They defined readability in broader terms and spurred

¹⁵William S. Gray and Bernice Leary, What Makes a Book Readable? (Chicago, Illinois: University of Chicago Press, 1935).

investigators who devised readability formulas to consider a larger number of factors than previously.¹⁶

In the following paragraphs one experimental study will be reviewed. It is important to note that the approach in experimental studies is a comparison of two or more versions of a selection. The versions differ only in the one variable which is being studied. Readers of similar ability are tested on the different versions to determine the effect of the one variable.

In 1948, Mary C. Wilson reported an experiment using social studies materials for the upper grades. It was designed to show the effect additional details and facts have on the reader's comprehension. The experiment selected three articles of approximately 300 words each dealing with the making of paper. These selections contained many general and abstract statements which provided insufficient detail for pupils with limited experience and linguistic background. Each was then expanded into first a 600 word version and then one of 1,200 words. The statements in the 300 word versions were retained in the 600 word versions, and those in the 1,200 word versions contained all of the 600 word versions. Each version contained additional supporting details and illustrations of the general statements. The versions were checked against the Gray-

Leary formula and found to be well below the reading levels for the children participating in the experiment.¹⁷

The results of the experiment showed that the children achieved higher scores on the longer versions. The study gave evidence for what is probably one of the most important factors contributing to difficulty of social-studies materials. When the page and a half is expanded by the addition of important details, explanations and examples, children will get more from the text even though no conscious effort is made to simplify the vocabulary or sentence structure. This study has given some indirect evidence of the importance of idea density in reading difficulties.¹⁸

To afford an understanding of the purpose of quantitative associational studies one finds the goals similar to the survey of experts' studies: "What makes some materials easy and some hard?" In a study of this type it is essential to have a criterion; books, short passages, or articles that vary in difficulty. The degree of difficulty is established either by judgment, by tests of comprehension, or by the average reading ability of the readers. The material is then analyzed for the internal factors which may account for this variation

¹⁷Mary C. Wilson, "The Effect of Amplifying Material Upon Comprehension," Journal of Experimental Education, XIII (September, 1944), 5-8.

¹⁸Chall, op. cit., p. 16.

in difficulty. The internal factors are usually expressed in quantitative terms: that is some scheme is set up for measuring the degree of vocabulary difficulty, sentence complexity, and the like.¹⁹

The first to attempt a quantitative associational study on readability were Bertha A. Lively and S. L. Pressey, whose paper on vocabulary burden was published in 1923. As a base for the study Lively and Pressey chose as a criterion fifteen books and one newspaper. Using these sources a method was designed to determine the vocabulary difficulty, based on a sample of one-thousand words systematically selected from the books. The analysis time per book was about three hours. The authors point out that such a systematic method of sampling has possibilities in investigating the vocabulary burden throughout a book. Lively and Pressey contend that many books seem to have a vocabulary load at the beginning. In this case, a thousand-word count in each chapter should make possible interesting comparisons regarding this matter. In their summary they suggest that the general procedure has decided possibilities as a basis for a study of vocabulary burden.²⁰

Another significant research in readability was carried out at the Winnetka, Illinois schools. The study, directed by

¹⁹Chall, op. cit., p. 16.

²⁰Bertha L. Lively and S. L. Pressey, "A Method for Measuring the Vocabulary Burden of Textbooks," Education Administration and Supervision, IX (October, 1923), pp. 389-398.

Carleton W. Washburne and Mabel Vogel, showed a thorough methodology in determining what books were read and liked by children in certain grades. Later the problem of grading newer books had to be considered. The need led Washburne and Vogel to undertake a readability study that would express the reading difficulty through the internal characteristics of books. However, the criterion used was more extensive; the internal characteristics studied were more comprehensive and the method of analysis was more refined. The one hundred and fifty-two books used in this study were selected from the Winnetka book list and represented a normal curve of difficulty from grades three to nine. The criterion comprised one thousand word samples from these books and were analyzed for those factors that would distinguish books used in the lower grades from those used in the higher grades. Ten factors were studied which measured not only vocabulary difficulty, but such factors as the relative number of different words in books, kinds of sentences used, the relative number of prepositions, and other elements of structure investigated within books. Of the ten factors examined only four were finally used in their formula to estimate the grade index. These were: (1) the number of different words per thousand words of text, (2) the number of uncommon words per thousand, (3) the number of simple sentences

in seventy-five successive sentences, and (4) the number of prepositions per thousand words.²¹

In comparing the Washburne and Vogel readability study with the others that preceded it, significant changes in the approach are noticed: (1) the factors studied, (2) the nature of the criterion, and (3) the method of analysis and the formula. Washburne and Vogel were the first to study the influence of the structural characteristics of the text and use a criterion based on an empirical evaluation of difficulty. The Winnetka formula was also the first to predict difficulty by grade-level. The research not only established the fundamental concept of readability, but provided the general method of measuring it. Washburne and Vogel believed that the readability index of a text is the average amount of reading ability needed to understand the text.²²

Many more quantitative studies were researched in regard to readability. However, these cannot all be reviewed here. The above surveys give the reader an idea of some variable used in predicting readability of certain types of reading materials. The field of research in readability has by no means been exhausted. Many

²¹Carleton W. Washburne and Mabel Vogel, "An Objective Method of Determining Grade Placement of Children's Reading Material," Elementary School Journal, XXVIII (January, 1928), 376-77, 381.

²²Chall, op. cit., p. 21.

newer studies are being carried out that embrace such variables as conceptual difficulty, organization of the material, format and abstractness of subject matter. Some of these criteria will be discussed later on in the content area, therefore an analysis of what readability formulae are, their reliability, validity, and limitations will be examined next.

What Is a Readability Formula?

It is difficult to answer this question because the description of what constitutes a formula has never been clearly stated by many researchers. George Klare in his book The Measurement of Readability offers this definition:

In this book, 'readability formula' refers to a method of measurement intended as a predictive device that will provide quantitative, objective estimates of the style difficulty of writing. The method must be general enough to provide estimates over a range of applicability and difficulty, and must be capable of providing these estimates without involving the use of readers in any way.²³

Another idea of a readability formula is given by Peterson:

Research in the field of readability has been approached from many points of view and with many ingenious techniques. The most popular method in use is the readability formula. Certain aspects are emphasized in these formulas such as: (1) vocabulary level, (2) sentence length and structure, and (3) human-interest. Though the authors of recent formulas have demonstrated the practicability of the formula procedure

²³Klare, op. cit., p. 2.

in estimating reading difficulty, they also recognize the limitations of this type of procedure and have warned against indiscriminate application.²⁴

As the reader will note, the criterion used in readability formulas are usually certain elements that can be measured objectively in judging the grade level of books. Most of these deal primarily with the style in which a book is written. The elements such as vocabulary, sentence length and sentence structure are counted or analytically examined. Many other important elements contained in textbooks, however, are not measured by these formulas. Researchers are still attempting to find a formula that is capable of measuring such elements as concepts, organization, format, interests, and the like. In a recent article Botel had this to say:

No formula has yet been devised to take into account such variables as motivation, format, illustrations, adult assistance, and so forth. . . . No responsible educator would accept any readability formula as a satisfactory substitute for trained judgment which weighs all the myriad factors that influence the readability of specific materials by a specific child.²⁵

Some investigators feel that since these formulas give a quantitative, objective evaluation they probably are misused to a large extent. While these formulas help determine the grade level

²⁴Eleanor M. Peterson, Aspects of Readability in the Social Studies (New York: Bureau of Publications, Teachers College, Columbia University, 1954), p. 2.

²⁵Morton Botel, Botel Predicting Readability Levels (Chicago, Illinois: Follett Publishing Company, 1963), Preface.

of books, they do not indicate anything about the appropriateness of the topics discussed; the difficulty of the concepts involved, or the extent to which new words are explained. Dale and Chall explain the use of the formulas as follows:

A readability formula can be used to get a rough estimate of the difficulty of a book, pamphlet or article. However, we must realize that the available formulas measure only one aspect of difficulty--expressional or structural difficulty. Only such factors as vocabulary and sentence structure are measured. The readability formulas do not directly measure conceptual difficulty, organization of material, abstractness of subject matter--all known to effect comprehensibility. Results from formulas should, therefore, be interpreted cautiously.²⁶

The reader, therefore, may question the reliability and validity of readability formulas in selecting the appropriate materials for use in the classroom. Klare has examined the majority of formulas in use today and presents excellent data of each. The book The Measurement of Readability presents a brief history of each formula. The variables are analyzed for reliability, validity, and limitations and recommendations are offered as to which formula best suits the level of the book being judged.²⁷

After studying the various readability formulas in Klare, the writer selected the Lorge Readability Formula which is designed

²⁶Dale and Chall, op. cit., p. 254.

²⁷Klare, op. cit., II, Chapter II.

specifically to analyze children's materials from grades four through twelve. According to Klare:

Lorge used efficiency of application as a major basis for the retention or rejection of formula elements. He was able to reduce his formula to three elements, yet retain predictive accuracy, primarily because he used the McCall-Crabbs Standard Test Lessons in Reading as a criterion. This extensive set of passages has been more often used since Lorge's time than any other single criterion. And Lorge's formula, probably at least partly due to its efficiency of application, was the first to be used rather generally in fields other than education.²⁸

In the pamphlet The Lorge Formula for Estimating Difficulty of Reading Materials, Irving Lorge has the following to say:

The Lorge Formula is designed to appraise the relative difficulty of both printed and spoken texts. Reading difficulty is based upon the comprehension of reading passages. Comprehension is judged by the correctness and completeness of responses to questions about the passage. Such questions may deal with specific details, general import, appreciation, knowledge of vocabulary, and understanding of concepts.

It is obvious that the purpose of the reader in reading and the kinds of questions asked in estimating reading comprehension will influence greatly the estimate of reading difficulty. The Lorge Formula is based on a criterion derived from responses to questions of five types. It tends, therefore, to overestimate the difficulty of passages to be read primarily for appreciation or for general import; and it tends to underestimate the difficulty of passages to be read primarily for specific details or for following directions. Nevertheless, the Lorge Formula provides an over-all estimate which should be useful in grading materials. As an estimate, it should not be considered definitive, nor should it be used blindly. The readability index of the Lorge Formula is an estimate, and not a rigorous determination.

As developed on the work sheet, the readability index is an estimate of the reading grade at which the average school child will be able to answer about 55 per cent of the questions concerning

²⁸Klare, op. cit., p. 53.

detail, appreciation, import, vocabulary, and concept with adequate completeness and correctness. The reading grade so obtained may be thought of in terms of reading-grade scores on a test of reading comprehension. A readability index of 5.2 for a passage may be considered indicative of the material at the fifth grade; it may be thought of in terms of placement of the material as within the reading comprehension of average fifth-grade children. Such placement, however, should consider the interests of pupils, the suitability of subject matter, and other factors.²⁹

Though the formula analyzes more elements than the writer needs for the study, the important element, sentence structure, will be considered the most significant in the final evaluation.

Content Area

Of the many problems faced by publishers of textbooks today, the readability of content materials continues not only to present a challenge but remains an issue not fully resolved. Publishers of basal readers and content books are finding that the use of readability formulas have both advantages and disadvantages in determining the readability levels of books. In a study on social-studies materials Peterson advances the following comment:

Approaches to a solution of the readability problem are currently being made with special formulas, vocabulary check lists, standardized reading tests and other procedures mainly statistical or objective for gauging reading difficulty. Useful as these methods and their results have proved, they have not been adapted to study all the complex skills involved in reading

²⁹Irving Lorge, The Lorge Formula For Estimating Difficulty of Reading Materials (New York: Teachers College Press, 1969), pp. 1-2.

comprehension or to provide textbook authors with an adequate basis for improving the less easily measured aspects of the reading process.³⁰

In an article concerning the content of textbooks Gray queries:

What are the aspects of the content of textbooks that influence their ease or difficulty? This has been one of the most challenging problems faced in preparing readable textbooks. The need for further research in this area grows daily more urgent as pupils in ever increasing numbers are encountering serious difficulty in reading assigned materials with reasonable understanding.³¹

Textbook preparation today reveals the painstaking attention being given to such matters as vocabulary, organization, style of presentation, concept density, simplicity of ideas, and accuracy of text and illustrations.³² Some textbook publishers indicate in their literature that the grade level of their books has been checked against one or more readability formulas. This is a trend to be encouraged. The application of one or more formulas by a publishing company who can make results available to everyone removes the necessity of repetition for busy educators. Though these formulas are an aid in book selection, they should not be the sole measurement in evaluation of books. Other criteria, such as content, format, organization, and

³⁰Peterson, op. cit., p. 1.

³¹William S. Gray, "Needed Research on Textbooks," Phi Delta Kappan, XXXIII (January, 1952), pp. 297-98.

³²Ralph C. Preston, Teaching Social Studies in the Elementary School (New York: Holt, Rinehart and Winston, Inc., 1968), pp. 254-55.

the like, must be given careful consideration since reading formulas do not measure these elements of writing.

The writer, therefore, intends to show from research what comprises the readability content material found in both content subjects and basal readers. What, if any, reading problem may develop from the basal reader to the content area? Before this is undertaken, a pertinent question needs answering. Just what is meant by the content subjects? The term "content area," "content field," and "content subjects," are all synonymous. To attempt a definition possibly a comparison would be in order. Reading content material in order to gain information about a subject may be distinguished from reading solely for recreation; or the content subjects may be identified by their distinguishing names, as literature, social-studies, mathematics, and science to differentiate them from material to read for recreation. ³³

Volumes of books and articles today contain numerous studies exploring this area of the content subjects. Though this field has been under heavy research in the past, there is still room for further experimentation and investigation in the problem of readability. Consider, first, the importance reading has in teaching children the content subjects. Harris makes this comment "many children pass successfully

³³ Guy L. Bond and Miles A. Tinker, Reading Difficulties-- Their Diagnosis and Correction (New York: Appleton-Century-Crofts, 1967), p. 394.

through school without ever developing a deep, abiding love for reading as a recreational activity, but nobody can succeed in school without learning to read for information."³⁴ The ability to read and to comprehend are skills that no child can afford not to have if he intends to make his way successfully through school. The intellectual demands made on pupils today plus the fact that school curriculums have been greatly enriched presents a challenge to the average and gifted pupils, but an added burden for the below-average child. Greater ability is needed in the use of reading skills and pupils are required to adjust these skills to each of the various content subjects. McSwain provides an interesting idea of the content fields when he says:

Content fields are of two kinds: (1) the recorded thought and findings of competent persons, and (2) the emerging content of mind acquired by the pupil as he interacts psychologically with books, magazines, newspapers, and other mediums of recorded thought. The only content fields that the pupil knows and can use consist of the ideas, information, and attitudes that he has accepted to make his own. The only reality of things, situations, and materials that the learner comprehends is determined by the meaningful content of his own mind. In the degree that the pupil reads poorly and often without meaning, he builds faulty content of mind. He may accept as valid much false-to-facts information and ideas regarding social reality in our modern society. The quality of reading done in the recorded content fields conditions greatly the emerging social intelligence of the pupil.³⁵

³⁴Albert Harris, Readings on Reading Instruction (New York: David McKay Company, 1963), p. 164.

³⁵E. T. McSwain, "Nature and Extent of Content Reading in the Middle and Upper Grades," Improving Reading in Content Fields, Vol. VIII, ed. William S. Gray (Chicago, Illinois: The University of Chicago Press, 1947), pp. 18-19.

Because understanding the material in the content fields depends on reading, social-studies teachers should be concerned with what makes a book readable. Two aspects that fall within this problem area are the difficulty of the subject-matter or content and its inherent interest to the student, and the style of writing. To find an easy method by which the readability level of books in social-studies may be determined is still uncertain. Many social-studies textbooks contain materials that are filled with numerous verbalisms. Authors of textbooks today attempting to meet the needs of teachers and pupils sometimes try to cover too many topics or cover problems too quickly. Many abstract ideas are oversimplified and much of the supporting detail which could make an idea more interesting and comprehensible is omitted. It is understandable that social-studies textbooks cannot be expected to explain every concept to every student. Therefore, educators should keep in mind that because of the difficulty in content, social-studies books are readable only after a considerable amount of teaching has been done.³⁶

The above information leads the writer to investigate the importance of the readability of content material found in fourth grade readers and geography textbooks. The researcher seeks to discover

³⁶William E. Gardner, "In Social Studies," Material for Reading, ed. Helen M. Robinson (Chicago, Illinois: The University of Chicago Press, 1957), p. 171.

why many pupils find the transition from third to fourth grade reading so difficult, particularly in the content area. Many educators know that children in the primary grades are gradually taught basic reading skills that prepare them for the heavy content subjects in the upper grades. These skills of course should continue to be strengthened not only in the special reading class but also in the content subjects. In speaking on this subject, Heilman states:

Teachers agree that ideally the process of learning to read progresses smoothly without perceptible breaks through a series of grade levels. There are certain factors in the total school framework, however, which cause many teachers to feel that abrupt transition occurs between third and fourth grades. The end of the third grade and the beginning of the fourth is often designated as the period of 'independent reading.' There is evidence in classroom behavior that some teachers do succumb to the philosophy that the intermediate grades should be characterized by a shift in emphasis from 'learning to read' to 'reading to learn' in the various subject-matter areas. The use of non-integrated textbooks in various content areas tends to substantiate the idea that this is a transitional period.³⁷

Unfortunately, studies of children's interests have shown a tendency for reading interests to decline as the pupils move through the upper elementary grades, due in part to the fact that other activity interests are crowding in. The interest children showed in reading in the primary grades, Hildreth maintains, seems to diminish in the upper grades as they associate reading with school lessons and texts for study.³⁸

³⁷Arthur W. Heilman, Principles and Practices of Teaching Reading (Columbus, Ohio: Charles E. Merrill Books, Inc., 1967), p. 311.

³⁸Hildreth, op. cit., p. 401.

She continues:

Reading which was activity centered and language related in the primary grades has now become formal study of text-book, something remote from the children's lives and purposes. . . . Any sharp break between types of reading expression in the fourth grade as compared to the third grade should be avoided because most of the pupils have not yet reached the point of mid-literacy and they still need training in all the basic skills. . . . The pupil whose reading skills fail to mature during this transition period faces difficulties in school studies as well as in personal and social adjustment.³⁹

This transition from third to fourth grade reading materials is an important task for any intermediate teacher. If teachers are aware of the reading problems involved, they will seek remedies that will prevent reading difficulties before they occur among the pupils.

Skills that have been taught in the primary grades are refined in the middle grades and made stronger through the study of the specific materials found in the content areas. Douglas agrees with the quote "every teacher is a teacher of reading," when he points out that:

For years we have been saying it is the job of the special subject teacher to develop reading skills as needed in the subject-matter area. So long as the child does his learning all under one teacher, there is a good chance that these skills might be taught in their natural setting, and that the teacher will help the child make the transfer. But when the work is departmentalized, or when the intermediate grade child has a teacher who is subject-matter-minded, or one who does not see the transfer of skills, or who does not recognize the different skills needed, then the child does not get the help he needs in reading in the content subjects. . . . The intermediate grades represent the period of greatest emphasis.

³⁹Hildreth, op. cit., p. 401.

It is at this level that the child is introduced to textbooks in the subject-matter areas. Here he first meets a text in history, or geography, an informative text in science, a basic text in arithmetic and many others.⁴⁰

Just how teachers assist pupils in developing the necessary reading skills is a task difficult even for the most experienced instructors. Due to the wide reading ranges prevalent in many classrooms, teachers have an added burden of finding materials that meet the needs of all her pupils. Therefore, the use of carefully graded textbooks that take into consideration vocabulary and concept load should be examined. Russell, a noted author, is primarily concerned with the vocabulary difference found in primary and intermediate grade books. He says:

Most basic readers in the primary grades are nicely graded in their vocabulary and other sources of reading difficulties. Not all readers, and fewer textbooks, however, continue this gradual growth into the fourth-grade materials. The mere fact that the pupil has met a restricted vocabulary in his primary books will serve to make the fourth-grade books more difficult than they would otherwise be. The solution would seem to be in adjusting fourth-grade readers, and particularly other fourth-grade texts, to build upon the primary program rather than in making primary books more difficult. A number of fourth-grade readers meet this requirement, but in general, textbooks in social-studies and other content fields are much too difficult.⁴¹

⁴⁰Malcolm P. Douglas (ed.), Claremont Reading Conference, Thirtieth Yearbook (Claremont, California: The Claremont Graduate School Curriculum Laboratory, 1966), p. 222.

⁴¹David H. Russell, Children Learn to Read (New York: Ginn and Company, 1961), p. 222.

In dealing with adjusting the vocabulary to meet specific needs, another problem arises. The social-studies content contains a certain amount of technical language and the terms used are those necessary to meet the specific aims of the particular discipline. This type of vocabulary is needed if the social-studies concepts are to be learned by students. Therefore, if children are expected to use the vocabulary proper to the subject area being studied, then the specific vocabulary must be presented to them in meaningful ways. Many words when used in the various content fields may have entirely different connotations. Pupils must be made cognizant of these problems if they are to derive meaning from materials assigned to be read. In understanding the importance of word meanings Jarolimek states:

The vocabulary load of social-studies reading material is undeniably heavy. It is one of the major causes of poor comprehension and faulty reading in social-studies. Even with the more careful grading and attention contemporary authors have given to word difficulties, the social-studies vocabulary remains a stumbling block for many children although a degree of simplification is possible, it is perhaps true that there are definite limits beyond which the use of a specialized vocabulary cannot be avoided. . . . if one is speaking or writing about social-studies concepts he is forced to use the vocabulary appropriate to that field.⁴²

All teachers should be concerned with making permanent the vocabulary which is pertinent in any content area. Vocabulary

⁴²John Jarolimek, Social-Studies in Elementary Education (New York: The Macmillan Company, 1967), pp. 184-85.

to be understood must be made meaningful to the pupils.⁴³ Teachers can be most helpful to pupils, if they understand the nature of the word difficulties to expect. Jarolimek discusses some of the word difficulties children meet in content reading:

1. Technical Words. These are words, terms or expressions peculiar to social-studies and will not be found when reading selections from other organized fields of knowledge. Examples are meridian, latitude, hemisphere, plateau.
2. Figurative Terms. Figurative expressions are those that have a different connotation from the literal meaning usually associated with the work themselves. They are confusing to the young child because he is likely to visualize the literal meaning rather than the one intended. Examples are soil bank, political platform, banana republics.
3. Words with Multiple Meanings. It is well known that some words have a number of different meanings, the appropriate one depending on the context within which the word is used. Examples are cabinet, belt, bell, fork, mouth.⁴⁴

If teachers are aware of these difficulties, they will anticipate any problems the children may have and make appropriate adjustments before they are encountered in the reading situation. Supporting the above concepts, Klausmeir and associates discuss the vocabulary problems faced by the elementary school child as follows:

⁴³Guy L. Bond, "How Clear, Vivid Meanings Are Acquired and Implications For Improving Reading In Content Fields," Improving Reading in Content Fields, Vol. VIII (ed.) William S. Gray, (January, 1947), p. 83.

⁴⁴Jarolimek, op. cit., pp. 185-86.

Although authors of textbooks in arithmetic, social-studies, language, science, and other subject areas generally attempt to base their choice of words on reading difficulty, new words are frequently used which are extremely difficult for children. Children need preparation for this kind of reading. Each new key word should be presented in concrete, meaningful ways so that the children can gain the meaning intended by the authors. Unless attention is given to vocabulary load and unless they have assistance with difficult words and ideas many children do not obtain maximum profit from reading. Some say the new words without understanding their meaning, others 'skip' any new words they cannot identify, and still others come to dislike reading because they do not understand what they read.⁴⁵

Teachers who see the importance of this area of difficulty will help children in broadening, enriching, and clarifying word meanings. They will provide rich and varied firsthand experiences and guide the child in his study of words. By teaching pupils to use words in giving discussions and reports, as well as in reading, they will become more familiar to the child. Therefore, teachers, by improving their methods of instruction, will strengthen the skills of their pupils in the content areas.

How does the vocabulary of the social-studies materials compare with the vocabulary of the basal readers? Though many of the new readers today have a controlled vocabulary this does not necessarily indicate that all are readable. In examining some basal reader series, Huck found:

⁴⁵Herbert J. Klausmeir, Katherine Dresden, Helen D. Davis, and Walter A. Wittich, Teaching in the Elementary School (New York: Harper and Brothers, 1956), p. 195.

One series⁴⁶ maintained systematic vocabulary control including word count and many repetitions for each reinforcement through the third grade reader. Starting with the fourth, each selection must test at the appropriate grade level according to different readability formulas. . . . Another company⁴⁷ has added a fifth section to each of its readers in the 1962 Edition. This section does not have the vocabulary controls which the other sections of the book do. There is then a decided step-up in both vocabulary and the skills taught in the newer editions of these basic readers.⁴⁸

The fact that publishers are aware of the need for vocabulary control in the newer basal reader series, yet not sacrificing other important elements which keep books interesting, informative, and readable shows the amount of research that is continually taking place. Another series that Huck studied gives this view of readers:

One series⁴⁹ of books is based entirely upon reading in the content fields, with materials being drawn from social-studies . . . and literature. Children are helped with study skills such as practice in note-taking, outlining . . . and establishing time concepts in conjunction with their reading rather than the social-studies program.⁵⁰

In most basal readers today, the content is primarily narrative in character. Biography, fiction, science stories are

⁴⁶The Scott, Foresman Basal Reading Series.

⁴⁷The Houghton Mifflin Basal Reading Series.

⁴⁸Charlotte S. Huck, "The Changing Character of Basic Reading Materials," (ed.) Joe L. Frost, Issues and Innovations in the Teaching of Reading (Glenview, Illinois: Scott, Foresman and Company, 1967), p. 238.

⁴⁹From Actors to Astronauts, etc. New York: Harper and Row.

⁵⁰Huck, op. cit., p. 239.

found more frequently than poems and plays. The vocabulary is usually controlled to meet the needs of the designated grade level.

Harris gives an overall view of basal readers:

In grades four through six readers are in very large part collections of short stories. Each reader tends to have about six to eight centers of interest, or units. Some of the themes used are humorous stories, animal stories, adventure tales, myths and legends, . . . At the fourth grade level the typical stories are six to twelve pages long. . . .⁵¹

In discussing the vocabulary of these readers, he continues:

One series that has a very limited primary grade vocabulary, with a total of fewer than 1,200 different words in the third grade material, has a fifteen-page story in its fourth-grade reader in which seventy-five 'new' words are introduced.⁵²

It is evident, as children progress through the grades and are introduced to the content subjects, a change takes place in both of the above areas. Children must learn to adjust from narrative readings to reading for information. Besides this they are presented with technical words pertinent to the content area under study. This change makes heavy demands on pupils, especially fourth graders who suddenly have the various content subjects thrust upon them without warning. Is it any wonder that more children do not develop a dislike not only for reading but also a repugnance for the content subjects, particularly the social-studies.

⁵¹ Albert J. Harris, Effective Teaching of Reading (New York: David H. McKay Company, 1962), p. 95.

⁵² Ibid., p. 96.

In a recent article on social-studies textbooks, Ohles states:

What is there about this hallowed social-studies textbook (this foundation upon which attitudes of citizenship and appreciation of our most perfect experiment in democratic living are built, this key to the preservation of our way of life) that causes pupils to treat it with disrespect, to decorate its pages with 'Bored of Education' and 'In case of fire, throw this in,' to cover opened pages with other reading or to stare through the printed page into a world of fantasy?⁵³

He continues by giving a solution to the problem:

The key to a textbook acceptable to our clients lies not alone in reading level, attractiveness of make-up, profuseness of illustrations, or width of reading line. The heart of our reading material lies in the skill with which it is written (and herein lies our most unpalatable reform). We must surrender the authorship of our texts to those steeped in techniques of writing for children and adolescents; we must become accustomed to seeking writers of skills not of pedigree.⁵⁴

Sentence Structure

Of the numerous studies undertaken on readability of textbooks, the problem of sentence structure seems to take precedence over other elements. Sentence structure is an important part of our language. Men are able to communicate their thoughts to others by speaking and writing. In order that children may gain knowledge of the world, books have been written for this specific purpose. It

⁵³John F. Ohles, "Needed: Living Texts," The Social Studies, XLVIII (November, 1957), pp. 235-37.

⁵⁴Ibid.

behooves authors, then, to study the problem of sentence structure to make books as readable as possible. The writer proposes to give the reader an idea of what sentence structure is, and how important it is when writing books for classroom use.

Our language consists of sentences. Sentences are composed of words by which man communicates his ideas orally or in writing. Now the question is, what is a sentence? In his book The Art of Plain Talk Flesch gives this definition: "A sentence means a set of words complete in itself, having either expressed or understood in it a subject and a predicate, and conveying a statement or question or command or exclamation."⁵⁵ He continues:

. . . ordinarily a sentence expresses one thought and you need two sentences to express two thoughts. You can, however, work one sentence into another in place of a noun or adjective or adverb: it then becomes a clause and the other sentence a complex sentence. You can also work more ideas into a sentence by putting in more phrases or words.⁵⁶

In considering the above and the following ideas, authors of basal readers and content textbooks are given some excellent guide lines when writing readable books. Flesch suggests that sentences be kept short so that "the reader gets enough chances for breathing

⁵⁵ Rudolf Flesch, The Art of Plain Talk (New York: Harper and Brothers Publishers, 1946), p. 32.

⁵⁶ Ibid.

spells and doesn't get caught in invisible strings between words."⁵⁷

As a further help, he proposes a set of standards that show what sentence length the average American will read with ease. It reads as follows:

First, sentence length is measured in words because they are the easiest units to count: you just count everything that is separated by white space on the page. But don't forget that you might just as well count syllables, which would give you a more exact idea of sentence length: a sentence of twenty one-syllable words would then appear shorter than a sentence of ten one-syllable words and six two-syllable words. Keep that in mind while counting words.

Second, remember. . . . Count two sentences where there are two, even if there is no period between them but only a semicolon or colon. But don't bother about sorting out sentences with conjunctions between them: the difference is not worth the added effort.

Now look at the table:

AVERAGE SENTENCE LENGTH IN WORDS

Very Easy	8 or less
Easy	11
Fairly Easy	14
Standard	17
Fairly Difficult	21
Difficult	25
Very Difficult	29 or more

. . . notice that an average reader will have no trouble with an average sentence of 17 words. (In a book or article, shorter sentences will, of course, cancel out the longer ones.) Easy prose is often written in 8-word sentences or so. . . . On the upper half of the scale, literary English runs to about 20 words a sentence, and scientific English to about 30 words. The average sentence in this book has 18 words. If you write for people who are just average, measure it against the 17-word standard. If

⁵⁷Ibid., p. 33.

the sentences are longer, look for the joints in their construction and break them into smaller pieces until they are of the right average length.⁵⁸

Following these guidelines will not insure authors that their book will always be readable. Instead these guides should serve as a challenge to improve reading materials. This will be brought about by further investigation and experimentation in this field of research.

Another author, Lefevre, is concerned with the reading problem of students. He has searched to find why many adults, college, high and elementary school pupils often read below their reading levels. The investigation showed that students are deficient "in sentence sense," the essential key to meaning-bearing structures both in reading and writing.⁵⁹ The term "sentence sense" is interpreted by Lefevre in this manner:

Word order, or function order in sentence patterns, is a most important clue to structure in American English sentences, since order can be clearly seen in print, and corresponds to speech intonation patterns, it should be stressed from the beginning in reading instruction . . . reading at any level of sophistication will require recognition of noun groups and verb groups and of noun and verb clusters in these functions; these groups and clusters may include not only adjectives and adverbs, but prepositional phrases and subordinate clauses; and clauses may be connected in ways other than by modification in the usual sense. . . . Children should be taught to read sentences as

⁵⁸Ibid., pp. 38-39.

⁵⁹Carl A. Lefevre, Linguistics and the Teaching of Reading (New York: McGraw-Hill Book Company, 1964), p. 15.

series or sequences of structural functions signaled and patterned by structure words, and to a lesser extent, by word-form changes. This would be truly reading by structures; it should yield maximum comprehension of reading.⁶⁰

Attention then should be given to developing sentence sense in reading and writing and less to learning individual words. For individual words will never give meaning to sentences no matter the number used. The construction of the sentence determines the use of words which produces a meaning-bearing language pattern.⁶¹

As a result of the above views on sentence structure and sentence sense, the writer hopes that a clearer idea as to the meaning of readability has been set forth. The style of writing used by many authors may now be analyzed for certain sentence elements that make for more readable materials. In an article on social-studies materials Kelty found:

The second type of difficulty consists in unnecessary complications caused by an author's style: attempts to use literary devices, such as figures of speech or inverted order; needlessly long and complicated sentence structure; use of long and hard words where simple words would do just as well; etc. Books or other reading materials should be selected carefully with the aim of avoiding such needless complications. . . . This criticism of author's embroidering of their diction should not be interpreted as implying that they should write only terse and bold summaries. . . . Many studies have shown that such statements do little to arouse interest and therefore do not assist in a mastery of

⁶⁰Ibid., pp. 10-11.

⁶¹Ibid., p. 23.

reading . . . stories should be fairly long, rather than only a few paragraphs in length. Such details can be told in short easy sentences, simple in structure.⁶²

Bond and Tinker believe that understanding the meanings of words is not the only skill needed in sentence comprehension. They advance the following:

In addition to knowing the meaning of words, there are many other skills needed for satisfactorily understanding sentences. These include the grasping of relations between words and groups of words, reading by thought units, proper interpreting of punctuation, comprehending figures of speech and symbolic expressions. . . . Ability to understand the relation between various parts of a sentence may be termed sentence sense. Reading by thought units promotes comprehension of sentences. . . . The inability of readers to sort out and properly relate the meanings in different parts of a sentence is sometimes complicated by sentence structure. For instance, difficulties may arise when the subject is last, or between two parts of the predicate rather than at the beginning. . . .

Authors are not without fault in providing handicaps to sentence comprehension. Too frequently, sentences are excessively long and too complex for clear exposition. Sometimes they are just poorly written.⁶³

This we know to be true of much of the material found in textbooks today. But recognition must be given to those authors and publishers who have attempted to improve instructional materials today. To bear this out, Hill found:

Improvements are being made with respect to readability in the newer volumes. Sentences are shorter and less complex.

⁶²Mary G. Kelty, "Reading the Materials of the Social-Studies in Middle Grades," Elementary School Journal, XXXIX (January, 1939), 343-44.

⁶³Bond and Tinker, op. cit., p. 291.

Paragraphing is better with more attention to topic sentences and other signals to help the reader identify important ideas. The authors are using simpler vocabularies with fewer new words and increased repetition of the words used. The publishers are using shorter lines of print and are selecting type with great care in an effort to make reading easier.

Reading difficulty is still a major problem with many social-studies texts, especially those for the intermediate grades. Slow readers and even children of average reading ability often have great difficulty in reading many of these books with satisfactory comprehension. But considerable progress is being made in some of the new editions.⁶⁴

The writer, therefore, intends examining certain reading and geography texts in the light of the specific elements of readability. Because style of writing is the problem under study, the researcher hopes to discover if a readability problem exists between the reading and the geography texts that would prove difficult for fourth grade pupils. If so, recommendations as to which texts would be right for the right child will be determined from the results of the study.

⁶⁴Whilhelmina Hill, "Social Studies Textbooks for Children," Social Education, XVIII (February, 1954), p. 74.

CHAPTER III

DESIGN OF THE STUDY

The present study was undertaken to discover if a readability problem exists between fourth-grade basal readers and geography texts. A survey of literature on the various elements that cause readability problems was made to serve as a background for this study. Using the above information and the results of the research, an evaluation will be made on the findings. The appraisal is meant to focus attention on the sentence structure in fourth-grade reading materials which may cause some reading problems.

In this study, the following fourth-grade books will be examined to estimate the difficulty of the reading materials:

BASAL READERS

This Is Our Land	1962	Ginn and Company
High Roads	1966	Houghton Mifflin Company
Open Highways	1965	Scott, Foresman Company

GEOGRAPHY TEXTS

In All Our States	1965	Scott, Foresman Company
Our World of Neighbors	1961	William Sadlier
Geography Gateways	1967	Allyn and Bacon

The three basal readers would fit the following pupils: Open Highways is designed for the reluctant readers; This Is Our Land is for the

average and above pupils; High Roads is for the average and above-average students.

As for the geography texts, these were designed for the fourth-grade pupil, but whether every fourth-grade pupil is able to read them is what this study hopes to determine.

To estimate the difficulty of the above textbooks, the Loge Formula For Estimating Difficulty Of Reading Materials was used. The manual gives directions as to how to appraise books, articles, and passages. In the appraisal, five samples were selected throughout the books. The method of selection was as follows:

- (1) the number of pages of the text divided by five to obtain a five per cent sample. The sample must start with the beginning of a sentence and stop at the end of a sentence;
- (2) a work sheet was tabulated giving certain information about each text;
- (3) words in samples were counted beginning with the first sentence and ending with a sentence. Rules are given in the manual to assist in the word count;
- (4) sentences were counted: count began with the first complete sentence and ended with the last complete sentence on the page;
- (5) the number of propositional phrases were counted: the manual lists common prepositions and also gives rules for counting them;
- (6) counted the number of hard words: the manual uses the Dale List of 769 Easy Words. All words not found on the list are considered hard words.

The manual again gives guides as to how to determine the many variances of word patterns.¹

After each element was counted, the information was tallied on the Work Sheets under Basic Item. Then computation of each was worked according to the following formula:

1. For average sentence length:
Divide Item 1 by Item 2. Multiply the quotient by the weighted score of .06 to obtain a Value score.
2. For ratio of prepositional phrases:
Divide Item 3 by Item 1. Multiply the quotient by the weighted score of 9.55 to obtain a Value score.
3. For ratio of hard words:
Divide Item 4 by Item 1. Multiply the quotient by the weighted score of 10.43 to obtain a Value score.²

Each of the Values was then totaled to obtain a sum. Then the sum of the Values and the Constant--1.9892--were added to obtain the Readability Index of the sample. Because books were used in the study, the five Readability Indices from each book were then totaled and divided by five to obtain an average. This sum is then the final Readability Index for each book.

At the bottom of the work sheet a section is given to add any notes pertinent to the sample under study. The writer found it necessary

¹Irving Lorge, The Lorge Formula For Estimating Difficulty Of Reading Materials (New York: Teachers College Press, Columbia University, 1969), pp. 3-8.

²Ibid., p. 10.

to do two samplings for one book because of a problem that occurred in the choice of the first five samples. This problem is considered in the analysis of the study.

After the computation for each book was completed, the work sheets were given to a computer and a checker to examine the samples for mathematical errors. When this part was completed and returned for correction, the writer was then able to begin an analysis of the data.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Before an analysis of data can be given, it is necessary to present the findings of the study by examining the following work sheets. The first three sheets review the basic readers and the last three the geography texts. A second sampling of Open Highways was taken because of the high readability index found on the first sampling. An explanation of this is given more attention on page 52 of this study.

Each sampling page was calculated separately. The individual calculations in each step of the computation for each page were added together. The sum was then divided by five to get the average of the five sample pages in each step of the computation. The result was then multiplied by the weighted constant stipulated for that step. The three results for the individual steps of the computation were then added together along with a constant, 1.9892, and the final total was the readability index for the particular book.

The basic data on the work sheet is a total from all the samples used in a text while the computations are the averages of the computations done on the individual pages. Therefore, if the basic data on the work sheet is used for these computations, the resultant

readability index will differ no more than one-tenth of a grade level from the individual page samplings.

The results of the computation from each work sheet reveals the following readability index or grade level of the texts examined:

BASIC READERS		GEOGRAPHY TEXTS	
Open Highways	6.3 and 4.1	Geography Gateways	5.2
This Is Our Land	5.1	In All Our States	4.9
High Roads	4.3	My World of Neighbors	4.8

Upon studying these scores, the reader may question the fact that the geography texts appear easier to read when observing the first sampling of the Open Highways reader which has a readability index of 6.3. In Table I it should be noted that on page 267 of the first sampling of Open Highways the ratio of hard words is extremely high. This is due to the fact that of the 30 words on that page, 21 of them are classified as hard words. On examining the page, the writer found the reason for the high ratio of difficult words. The text contains the oath of office for the President of the United States. Any teacher using this text would have to interpret the meaning of the oath or make sure the pupils had a clear understanding of the vocabulary used.

In order to correct the readability index problem of Open Highways, another set of samplings was taken from this text. This second sampling (Table I) offers a completely different readability index of 4.1. This grade level is more in keeping with the other texts under study. With this explanation of the above samplings completed, the

writer will now attempt to present the meaning of the study's other findings.

Of the six texts examined only two have a reading range for fourth grade. These are Open Highways and High Roads. The other four tend to be geared to the end of the fourth and the beginning of the fifth-grade reading levels. It was noted earlier in the study that:

Most basic readers in the primary grades are nicely graded in their vocabulary and other sources of reading difficulties. Not all readers, and fewer textbooks, however, continue this gradual growth into the fourth-grade materials. The mere fact that the pupil has met a restricted vocabulary in his primary books will serve to make the fourth-grade books more difficult than they would otherwise be. The solution would seem to be in adjusting fourth-grade readers, and particularly other fourth-grade texts, to build upon the primary program rather than in making primary books more difficult. A number of fourth-grade readers meet this requirement, but in general, textbooks in social studies and other content fields are much too difficult.¹

If the above statement is certain, then it appears that pupils using these texts may find the content of the geography texts more difficult than that of the reading texts. This may be due to the sentence structure which varies in both groups. In Table II the averages of the statistics from the geography texts seem to indicate that the sentence lengths are longer and that there are more prepositional phrases per page. Although the percentage of hard words in the samplings taken

¹Russell, loc. cit.

in both the readers and the geography texts seem to be about the same, the complexity of the sentences in which they are used may make the comprehension of the reading matter more difficult. The fact that the geography texts use a more technical vocabulary could present a problem for the fourth-grade pupil. In most cases this is his first encounter with content material and the above analysis may be of value to general educators and especially to fourth-grade teachers.

WORK SHEET

R. I. 4.9Title of Book: This Is Our Land Edition RevisedName of Author: Sister M. Sheila and Sister M. Margaret MichaelPublisher: Ginn and Company Date of Publication 1965Location of samples in text: 77, 156, 234, 312, 390Basic Data

1. Number of words in the samples	<u>810</u>
2. Number of sentences in the samples	<u>70</u>
3. Number of prepositional phrases in the samples	<u>58</u>
4. Number of hard words in the samples	<u>114</u>

Computation

Values

For average sentence length: Divide Item 1 by Item 2	= <u>12.550 x .06</u> = <u>.7530</u>
For ratio of prepositional phrases: Divide Item 3 by Item 1	= <u>.0727 x 9.55</u> = <u>.6943</u>
For ratio of hard words: Divide Item 4 by Item 1	= <u>.1454 x 10.43</u> = <u>1.5165</u>
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>4.9530</u>

Notes: _____

Name of Analyst Sr. John Clare Davis S.C. Date of analysis Jan. 19, 1970
 Name of Computer Sister Jerome Marie Hartman Date of computing Feb. 20, 1970
 Name of Checker Sister Mary Jean Hill Date of checking Feb. 24, 1970

WORK SHEET

R. I. 6.3Title of Book: Open Highways Edition Curriculum Foundation SeriesName of Author: Helen M. Robinson, Marion Monroe, A. Sterl Artley,
Charlotte S. Huck, William A. Jenkins, Ira E. AaronPublisher: Scott, Foresman and Company Date of Publication 1965Location of samples in text: 89, 178, 267, 356, 445Basic Data

1. Number of words in the samples	<u>668</u>
2. Number of sentences in the samples	<u>87</u>
3. Number of prepositional phrases in the samples	<u>57</u>
4. Number of hard words in the samples	<u>112</u>

Computation

	Values
For average sentence length: Divide Item 1 by Item 2	$= 7.967 \times .06 = \underline{.4780}$
For ratio of prepositional phrases: Divide Item 3 by Item 1	$= .1174 \times 9.55 = \underline{1.1212}$
For ratio of hard words: Divide Item 4 by Item 1	$= .2611 \times 10.43 = \underline{2.7233}$
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>6.3117</u>

Notes: _____

Name of Analyst Dr. Ingham Clark Bess L.C. Date of analysis Jan. 19, 1970
 Name of Computer Miss Jeanne Marie Heintouse Date of computing Feb. 20, 1970
 Name of Checker Miss Mary Jean Hill Date of checking Feb. 24, 1970

WORK SHEET

R. I. 4.1Title of Book: Open Highways Edition Curriculum Foundation SeriesName of Author: Helen M. Robinson, Marion Monroe, A. Sterl Artley,
Charlotte S. Huck, William A. Jenkins, Ira E. AaronPublisher: Scott, Foresman and Company Date of Publication 1965Location of samples in text: 96, 185, 274, 364, 452Basic Data

1. Number of words in the samples	<u>1,002</u>
2. Number of sentences in the samples	<u>125</u>
3. Number of prepositional phrases in the samples	<u>60</u>
4. Number of hard words in the samples	<u>98</u>

Computation

	Values
For average sentence length: Divide Item 1 by Item 2	$= \frac{8.366}{125} \times 100 = \underline{.5020}$
For ratio of prepositional phrases: Divide Item 3 by Item 1	$= \frac{60}{1000} \times 100 = \underline{.5826}$
For ratio of hard words: Divide Item 4 by Item 1	$= \frac{98}{1000} \times 100 = \underline{1.0576}$
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>4.1315</u>

Notes: _____

Name of Analyst Dr. John Clare Davis, L.C. Date of analysis Jan. 19, 1970
 Name of Computer Miss Jeanne Marie Harrison Date of computing Feb. 20, 1970
 Name of Checker Miss Mary Jean Hill Date of checking Feb. 24, 1970

WORK SHEET

R. I. 5.2Title of Book: Geography Gateways Edition FirstName of Author: Sister Mary Ursula, R. S. M., Ph. D.Publisher: Allyn and Bacon, Inc. Date of Publication 1967Location of samples in text: 67, 134, 201, 268, 335Basic Data

- | | |
|---|--------------|
| 1. Number of words in the samples | <u>1,200</u> |
| 2. Number of sentences in the samples | <u>101</u> |
| 3. Number of prepositional phrases in the samples | <u>119</u> |
| 4. Number of hard words in the samples | <u>169</u> |

Computation

	Values
For average sentence length: Divide Item 1 by Item 2	= <u>11.977 x .06 = .7186</u>
For ratio of prepositional phrases: Divide Item 3 by Item 1	= <u>.1076 x 9.55 = 1.0276</u>
For ratio of hard words: Divide Item 4 by Item 1	= <u>.1409 x 10.43 = 1.4696</u>
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>5.2050</u>

Notes: _____

Name of Analyst Dr. John Clare Beris S.C. Date of analysis Jan. 19, 1970
 Name of Computer Sister Jeanne Marie Houton Date of computing Feb. 20, 1970
 Name of Checker Sister Mary Joan Hill Date of checking Feb. 24, 1970

WORK SHEET

R. I. 4.9Title of Book: In All Our States Edition DiamondName of Author: Paul R. Hanna, Clyde F. Kohn, Robert A. LivelyPublisher: Scott, Foresman and Company Date of Publication 1965Location of samples in text: 44, 88, 132, 176, 220Basic Data

1. Number of words in the samples	<u>1,289</u>
2. Number of sentences in the samples	<u>98</u>
3. Number of prepositional phrases in the samples	<u>161</u>
4. Number of hard words in the samples	<u>124</u>

Computation

	Values
For average sentence length: Divide Item 1 by Item 2	= <u>13.21</u> x <u>.06</u> = <u>.7926</u>
For ratio of prepositional phrases: Divide Item 3 by Item 1	= <u>.1244</u> x <u>9.55</u> = <u>1.1880</u>
For ratio of hard words: Divide Item 4 by Item 1	= <u>.0962</u> x <u>10.43</u> = <u>1.0034</u>
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>4.9732</u>

Notes: _____

Name of Analyst Dr. John Claude Davis, Jr. Date of analysis Jan. 19, 1970
 Name of Computer Kate Virginia Marie Hutchins Date of computing Feb. 20, 1970
 Name of Checker Sister Mary Joan Hill Date of checking Feb. 24, 1970

WORK SHEET

R. I. 4.3Title of Book High Roads Edition FourthName of Author: Paul McKee, Annie McCowen, M. Lucille Harrison,
Elizabeth Lehr, William K. DurrPublisher: Houghton Mifflin Company Date of Publication 1966Location of samples in text: 71, 143, 213 (But maybe... finished.), 284, 355Basic Data

1. Number of words in the samples	<u>1,410</u>
2. Number of sentences in the samples	<u>96</u>
3. Number of prepositional phrases in the samples	<u>93</u>
4. Number of hard words in the samples	<u>108</u>

Computation

	Values
For average sentence length: Divide Item 1 by Item 2	$= \frac{15.43}{96} \times .06 = .9258$
For ratio of prepositional phrases: Divide Item 3 by Item 1	$= \frac{93}{1,410} \times 9.55 = .6446$
For ratio of hard words: Divide Item 4 by Item 1	$= \frac{108}{1,410} \times 10.43 = .7697$
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>4.3293</u>

Notes: _____

Name of Analyst Dr. John Clark Beris, Jr. Date of analysis Jan. 19, 1970
 Name of Computer Luther James Marie Hotchner Date of computing Feb. 20, 1970
 Name of Checker Sister Mary Joan Hill Date of checking Feb. 24, 1970

WORK SHEET

R. I. 4.7Title of Book: My World of Neighbors Edition FirstName of Author: Sister Marion, S.C.H., George H. McVey,
Sister M. Juliana, O.P., Don SharkeyPublisher: W. H. Sadler, Inc. Date of Publication 1961Location of samples in text: 52, 145, 156, 208, 260Basic Data

1. Number of words in the samples	<u>1,703</u>
2. Number of sentences in the samples	<u>135</u>
3. Number of prepositional phrases in the samples	<u>139</u>
4. Number of hard words in the samples	<u>176</u>

Computation

	Values
For average sentence length: Divide Item 1 by Item 2	= <u>13.172 x .06 = .7903</u>
For ratio of prepositional phrases: Divide Item 3 by Item 1	= <u>.0865 x 9.55 = .8261</u>
For ratio of hard words: Divide Item 4 by Item 1	= <u>.1088 x 10.43 = 1.1348</u>
Add the Values and the Constant	Constant = <u>1.9892</u>
Readability Index	= <u>4.7404</u>

Notes: _____

Name of Analyst Sr. John Clare Beris S.C. Date of analysis Jan. 19, 1970
 Name of Computer Sister Jeanne Marie Hawthorne Date of computing Feb 20, 1970
 Name of Checker Sister Mary Joan Hill Date of checking Feb. 24, 1970

TABLE I

Title	Page	Average Sentence Length	Average Prepositional Phrases	Average Hard Words
Open Highways (1st Sampling)	89	9.89	.0856	.1245
	178	10.73	.0763	.1356
	267	7.50	.2667	.7000
	356	7.50	.0253	.1266
	445	4.20	.1333	.2190
Open Highways (2nd Sampling)	96	7.68	.0558	.0884
	185	10.75	.0775	.1395
	274	8.63	.0580	.0821
	364	7.13	.0421	.1168
	452	7.65	.0717	.0802
This Is Our Land	77	16.18	.1124	.0674
	156	16.88	.0370	.1037
	234	10.50	.0857	.2190
	312	9.48	.0547	.1602
	390	9.71	.0735	.1765
High Roads	71	18.50	.0991	.0450
	142	12.00	.0580	.0906
	213	13.96	.0489	.0749
	284	19.29	.0630	.0481
	355	13.40	.0686	.1104
In All Our States	44	12.05	.1028	.1028
	88	13.95	.1245	.1094
	132	15.56	.1286	.0857
	176	11.74	.1166	.0897
	220	12.76	.1493	.0933
Geography Gateways	67	11.75	.1206	.0993
	134	10.83	.0769	.1333
	201	13.00	.1012	.0972
	268	9.93	.1477	.1879
	335	14.37	.0916	.1868
My World Of Neighbors	52	12.87	.1216	.0676
	104	16.11	.0965	.1586
	156	12.03	.0831	.1421
	208	12.58	.0718	.0744
	260	12.27	.0596	.1014

TABLE II

Title	Average Sentence Length	Average Prepositional Phrases	Average Hard Words	Readability Index
Open Highways (1st Sampling)	7.967	.1174	.2611	6.3
Open Highways (2nd Sampling)	8.366	.0610	.1014	4.1
This Is Our Land	12.550	.0727	.1454	4.9
High Roads	15.428	.0675	.0738	4.3
In All Our States	13.210	.1244	.0962	4.9
Geography Gateways	11.977	.1076	.1409	5.2
My World of Neighbors	13.172	.0865	.1088	4.7

CHAPTER V

SUMMARY AND CONCLUSIONS

In the foregoing study the writer has evaluated recent fourth-grade readers and geography texts to determine the possibility of sentence structure as being partly responsible for reading difficulties in content subjects. The Lorge Reading Formula was used to present evidence of objective measurement.

Having decided on the instrument to be used in the evaluation, the writer followed the procedure outlined in the formula's manual. In the appraisal, five samplings were chosen from each reading and geography text. On each page of the five samplings, the number of words, the number of sentences, the number of prepositional phrases, and the number of hard words had to be counted. After each element was counted, it was then divided by another of the elements to obtain the average number per page. The five averages were added together. These sums were then divided by five to obtain the average of all five samplings. The result from this computation was then multiplied by a weighted score to obtain a value. To the sum of the three separate computations, a constant, 1.9892, was added which resulted in the readability index for each textbook.

With these final results, it was evident that of the three readers evaluated, two of them, Open Highways, 4.1, and High Roads, 4.3, were at/on a fourth-grade reading level. The other reader, This Is Our Land, 5.1, was at a beginning fifth-grade reading level. The geography text scores were geared to late fourth and early fifth-grade reading levels--Geography Gateways, 5.1, In All Our States, 4.9, and My World of Neighbors, 4.8. After studying these readability index scores, the writer examined the individual samplings of each text to determine what elements in the basic data tended to make the scores of the geography texts higher than the two above readers. By checking the results from Table II, the reader will note that the scores of the average sentence lengths, the average prepositional phrases, and the average hard words tend to be higher than those of the readers. This Is Our Land scores high in both sentence length and hard words but is comparably lower in percentage of prepositional phrases. High Roads, although it scores high in sentence length, is more readable to the fourth-grade pupil because of the low percentage of prepositional phrases and hard words.

It may be assumed from the above results that the geography texts do seem to appear more difficult not only in the complexity of sentence structure due to the large number of prepositional phrases but also in the use of the type of hard words. This would be expected

because of the need for a more technical vocabulary in social-studies textbooks.

It was noted earlier in the study that pupils in the primary grades have not been previously exposed to this type of vocabulary or complex sentence structure. The transition from primary reading to the more advanced fourth-grade content subjects appears to present problems for many pupils. Heilman stated previously that many teachers believe that an abrupt transition occurs between the third and fourth grades. Many intermediate teachers are of the opinion that since the reading skills were taught in the primary grades, these skills have been mastered by pupils. The emphasis is then not on learning to read, but reading to learn.¹ Unfortunately, these students are confronted by curricular materials that contain numerous unknown and relatively difficult concepts. Sentence structures become more complex and a variety of organizational patterns tend to frustrate the pupils. Meaningful reading at the intermediate level depends on the acquisition and continual extension of concepts. Therefore, it seems necessary that the gap which exists between the third and fourth grades be bridged smoothly. The amount of knowledge a child has acquired and the demands made by the curricular materials must in some way be met.² Another author, Hildreth, reports that any sharp break in

¹Heilman, loc. cit.

²Heilman, loc. cit., pp. 307-08.

types of reading expression between the third and fourth grades should be avoided because many pupils have not reached the point of mid-literacy and need training in all the basic skills.³ It would seem that if educators were more aware of the importance of this transition period in the fourth grade, better educational materials would be sought to fit the needs of these pupils. Today it is possible to meet pupils' needs through a multi-text program. Informed teachers are eager to help children discover and use books with enough difficulty to challenge them, but books that they can use independently. Uniform sets of books cannot possibly benefit all the members of a fourth-grade class among whom may be several retarded children, one or two linguistically handicapped, and a few brighter-than-average who were beyond fourth-grade reading when they entered the class. In former years when school reading was largely limited to graded prescribed texts, the question of readability of material scarcely arose; but now with the growing trend toward the use of diversified books, a multi-texted educational program could be more effective in reaching the needs of more pupils.⁴

The problem, though, may not necessarily be the textbooks. What should really be given serious attention is the method of

³Hildreth, loc. cit., p. 27.

⁴Hildreth, loc. cit., p. 371.

instruction in the content areas, particularly that of social-studies. Every teacher teaches reading throughout the day. How many, though, are actually aware of the need for integrating the reading skills in the content areas? Why are skills only taught during the formal reading class and not developed and encouraged in the other subjects?

The writer believes that many reading problems could be resolved early in the fourth grade if teachers would give serious attention to better methods of instruction in the content subjects. This, of course, would necessitate more preparation on his or her part to make the vocabulary more meaningful and the text material more easily comprehended. Teachers should also realize that in dealing with pupils they are not teaching material, but persons. Therefore, the attitudes they display in various subjects will be absorbed by their pupils. If teachers are interested in their work and make their subject matter appealing then pupils, too, will be eager to learn.

Though no definite answers were attained in this study, the writer feels that more research is needed in this field of readability. In an article on needed research on textbooks, Gray states that the need for further research in the area of readable textbooks grows daily more urgent as pupils in ever increasing numbers are encountering serious difficulty in reading assigned materials with reasonable understanding.⁵

⁵William S. Gray, "Needed Research on Textbooks," Phi Delta Kappan, XXXIII (January, 1952), 297.

Since the computation in this study was completed, it has been brought to the writer's attention that The Lorge Readability Formula needs revision.⁶ If this is true, then the readability index scores on all the texts examined may produce entirely different results. Then, too, the writer used only five samplings from each text. This also may have had some bearing on the results of the study.

Therefore, it is recommended that in the future more research in the field of readability of textbooks be conducted to bring about better quality material and better methods of instruction.

⁶Walter H. MacFinitie and Richard Tretial, "Measures of Sentence Complexity as Predictors of the Difficulty of Reading Materials," Proceedings, 77th Annual Convention A. P. A., 1969.

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