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A COMPARISON OF WRITTEN DISCOURSE WITHIN
FOUR ELEMENTARY SOCIAL STUDIES SERIES WITH
REGARD TO SYNTACTIC COMPLEXITY, CONCEPTUAL
DENSITY, CONCEPTUAL ABSTRACTNESS,
AND VOCABULARY DIFFICULTY
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Lynne Anne Harned

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FOUR ELEMENTARY SOCIAL STUDIES SERIES
WITH REGARD TO SYNTACTIC COMPLEXITY,
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ABSTRACTNESS, AND VOCABULARY
DIFFICULTY

By

Lynne Anne Harned

A DISSERTATION

Submitted to
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ABSTRACT

A COMPARISON OF WRITTEN DISCOURSE WITHIN
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REGARD TO SYNTACTIC COMPLEXITY, CONCEPTUAL
DENSITY, CONCEPTUAL ABSTRACTNESS,
AND VOCABULARY DIFFICULTY

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Purpose

The purpose of this study was to examine the written discourse within four elementary social studies series with regard to variables which may affect reading difficulty. More specifically, the purpose was to compare four aspects of language: syntactic complexity, conceptual density, conceptual abstractness, and vocabulary difficulty.

Sample

The series selected for inspection were Windows on Our World, Houghton Mifflin Company; The Holt Databank System, Holt, Rinehart and Winston; Concepts and Values, Harcourt, Brace, and Jovanovich; and Concepts and Inquiry, Allyn and Bacon. From each of the four series, two levels of materials, grade six and grade three, were examined.

Procedure

To analyze materials for syntactic complexity, concept density, and concept abstractness, five samples of ten consecutive sentences were randomly selected from each text for each variable.

Two variables which may affect syntactic complexity were tabulated for each sample: (1) prepositional phrases used as modifiers of nouns or verbs, and (2) complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause. To determine concept density, the total number of concepts represented by words naming a person, place, animal, thing, quality, or idea was tabulated. To measure concept abstractness, the number of concepts represented by words naming a quality or idea which cannot be perceived by the senses was tabulated for each sample. To determine vocabulary difficulty, five samples of one hundred running words were selected from each text at each level. Vocabulary difficulty was measured by using The High Frequency Word List for Grades Three Through Nine and The American Heritage Word Frequency Book.

Analysis of variance was used to test for differences among upper and lower texts and between upper and lower elementary levels. Post hoc comparisons permitted close inspections of the means.

Findings

Significant differences were found in:

1. Syntactic complexity among the four series at each level and between levels within specific series as determined by the number of prepositional phrase modifiers.
2. Concept density among the four series at each level and between levels within specific series.
3. Concept abstractness among the four series at the upper elementary level and between levels within specific series.
4. Vocabulary difficulty among the four series at the lower elementary level and between levels within specific series as determined by a word frequency list.
5. Vocabulary difficulty between levels within specific series as determined by a word frequency table.

Conclusions

This study demonstrates the feasibility of a procedure for examining social studies materials for specific syntactic, conceptual, and vocabulary factors. The study also indicates the need for such an analysis, since the instructional materials which were examined did vary significantly in important factors which may affect readability.

Lynne Anne Harned

Recommendations

1. Textbook writers and publishers need to go beyond the use of readability formulas in analyzing social studies materials for factors which may contribute to reading difficulty.
2. Teachers need to learn how to examine instructional materials for syntactic, conceptual, and vocabulary factors, and to adjust their instruction accordingly.
3. More research is needed to identify other features of written discourse which may contribute to reading difficulty.

DEDICATION

To Bud and Jill, who have
brought me a lifetime
of happiness

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The writer wishes to express her most fond and sincere thanks to her chairperson and academic advisor, Dr. Lois A. Bader, whose outstanding professionalism, expertise, and trust greatly contributed to the successful completion of this doctoral program. The author is further indebted to Dr. Louise Sause, Dr. Ben Bohnhorst, and Dr. Eugene Pernell, members of the doctoral committee, for their guidance and support throughout this academic endeavor.

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CHAPTER I

THE PROBLEM

Background

Many reading authorities agree that students should be provided with instructional materials which match their reading ability levels. Generally, teachers are confronted with a number of obstacles in their attempts toward achieving this goal. Teachers not only need to accurately determine the students' levels of reading ability, but they also need to be aware of potential reading difficulties inherent in the texts and materials which will be utilized by students during instruction. The reading difficulty levels of instructional materials are of particular concern in the area of elementary social studies.

In past years, there has been a growing amount of evidence indicating that elementary social studies texts may be too difficult for levels recommended by textbook companies. Smith and Dechant (1961), upon summarizing a number of readability findings, reported that readability levels of one or two grades above designated grade levels were characteristic of elementary content area texts.

Arnsdorf (1963), analyzing four basal social studies series, discovered that the range of difficulty within

social studies texts was often greater than the range between texts assigned to different grade levels.

In a more recent study by Johnson and Vardian (1973), four readability formulas were utilized in the assessment of sixty-eight social studies texts from grades one through six. Their findings indicated that the majority of the textbooks were appropriate for above average readers only. Similar results were obtained by Bader and Harned (1978). From their examination of four sets of elementary social studies materials, it was revealed that readability levels were generally higher than expected for most texts examined.

In reviewing the results of such studies, however, one might note that data have been compiled mainly through the use of readability formulas. While readability formulas may be useful in providing indices of difficulty, they usually utilize basically one or two easily quantified variables--generally word length and/or sentence length--in estimating the difficulty levels of the materials. This practice has provided educators with no precise information regarding the status of other variables which may affect reading difficulty levels of instructional materials. Dale and Chall (1949) have defined readability as the total of all elements within a specific piece of printed material which affects the success of a group of readers may have with it. Chall (1956) cautioned that readability formulas should not be accepted as precise measures of reading difficulty, but

rather as approximations, since they consider only limited aspects of difficulty.

Harris (1969) reported in the Encyclopedia of Educational Research that readability formulas are concerned mainly with components which are easily quantified, but that investigators have noted that other more intangible factors also affect readability. It is suggested that factors such as conceptual difficulty and organizational structure of the materials be considered in assessing readability,

...particularly of those materials dealing with highly abstract content, yet written in a deceptively simple style (p. 1073).

Likewise, Lunstrum and Taylor (1977) note that a variety of factors may influence the readability of a set of instructional materials, and that such factors

...include not only linguistic elements but also interest and purpose of the reader, format of materials, and so on (p. 15).

Because some of these factors are difficult to incorporate into formulas, Lunstrum and Taylor (1977) conclude:

...there has developed a practice of utilizing basically two simple variables--word length and sentence length--to derive estimates of the level of difficulty of printed materials (p. 15).

Estes (1972) suggests that readability formulas do not provide any help in determining concept loading or in assessing the complexity and ambiguity of conceptual patterns, both of which may prove troublesome for students in comprehending social studies materials.

Cohen (1975), using the cloze procedure, found some content area passages easier for junior high school students to comprehend than others, regardless of comparable readability ratings. She notes the need for further research to:

...analyze the variety of linguistic structures used in content textbooks, as the interaction between "language" and "information" poses distinctive problems for the reader (p. 250).

In summary, the literature and research indicate that information about the reading difficulty level of elementary social studies materials has been compiled mainly through the use of readability formulas, which generally utilize one or two easily quantified variables--word length and/or sentence length--to estimate difficulty. This implies a need for further research which will elicit much more precise information about other factors which may have a considerable effect on the reading difficulty levels of elementary social studies materials.

Importance of the Study

The difficult reading levels of texts and instructional materials in the area of elementary social studies constitute a major problem for both teachers and students. While readability formulas have yielded information about some variables which affect readability--namely word length and sentence length--there have been few attempts to elicit precise data about the status of other influential variables. It is anticipated that this study will provide

evidence that precise data about many different variables which affect readability can be extracted from elementary social studies materials. The author hopes that this information will constitute a step toward the goal of producing texts and other instructional materials which are more suitable for students in terms of reading difficulty levels. Of equal importance is the possibility that the results from this study can be used to aid teachers in textbook selection and lesson preparation by creating an awareness of reading problems inherent in texts and instructional materials.

Statement of Purpose

The purpose of this study was to demonstrate the feasibility of examining the written discourse within four social studies series published for elementary school children with regard to the status of variables, other than word length and sentence length, which may affect the reading difficulty levels of instructional materials. More specifically, the purpose was to compare four aspects of the language: syntactic complexity, conceptual density, conceptual abstractness, and vocabulary difficulty. From each of the four series, two levels of materials, upper elementary and lower elementary, were examined.

Research Questions

The purpose of this study was to demonstrate the feasibility of comparing the written discourse within four

elementary social studies series with regard to syntactic complexity, conceptual density, conceptual abstractness, and vocabulary difficulty. The major research questions are as follows:

1. Will the four series differ significantly in syntactic complexity at the upper elementary level as determined by the number of prepositional phrase modifiers?
2. Will the four series differ significantly in syntactic complexity at the lower elementary level as determined by the number of prepositional phrase modifiers?
3. Will the four series differ significantly in syntactic complexity at the upper elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause?
4. Will the four series differ significantly in syntactic complexity at the lower elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause?
5. Will the four series differ significantly in concept density at the upper elementary level?

6. Will the four series differ significantly in concept density at the lower elementary level?
7. Will the four series differ significantly in concept abstractness at the upper elementary level?
8. Will the four series differ significantly in concept abstractness at the lower elementary level?
9. Will the four series differ significantly in vocabulary difficulty at the upper elementary level as determined by a word frequency list?
10. Will the four series differ significantly in vocabulary difficulty at the lower elementary level as determined by a word frequency list?
11. Will the four series differ significantly in vocabulary difficulty at the upper elementary level as determined by a word frequency table?
12. Will the four series differ significantly in vocabulary difficulty at the lower elementary level as determined by a word frequency table?
13. Will the upper and lower levels differ significantly in syntactic complexity as

determined by the number of prepositional phrase modifiers?

14. Will the upper and lower levels differ significantly in syntactic complexity as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause?
15. Will the upper and lower levels differ significantly in concept density?
16. Will the upper and lower levels differ significantly in concept abstractness?
17. Will the upper and lower levels differ significantly in vocabulary difficulty as determined by a word frequency list?
18. Will the upper and lower levels differ significantly in vocabulary difficulty as determined by a word frequency table?

The above research questions were restated in null hypothesis form for statistical testing. These are presented in Chapter III.

Delimitations

1. This study was limited to the examination of four social studies series which are widely used in Michigan schools.
2. The grade levels of the texts examined were limited to grade six, designated as an upper

elementary level text; and, grade three, designated as a lower elementary text.

3. The syntactic factors for which each series was examined were limited to two: (a) prepositional phrase modifiers, and (b) complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.
4. The instruments used to determine vocabulary difficulty for each of the series were limited to a word frequency list and a word frequency table.

Generalizability

The data from this study were drawn from only four elementary social studies series. Further, only two levels from each series, level six and level three, were examined. Therefore, the findings from this study cannot be generalized to all elementary social studies materials published for grades one through six. However, the findings may be suggestive of what may be found in samples of similar materials.

Definition of Terms

In order that the reader may better understand this study, an explanation of relevant terms is provided.

Syntax

Syntax refers to the manner in which words are put together to form the phrases, clauses, or sentences in a language.

Syntactic Complexity

Syntactic complexity refers to the difficulty of written materials with regard to specific syntactic variables which may negatively affect the readability of that material. Materials in this study were examined for two variables, selected because they were found by Marcus (1971) to be among the most difficult for students to understand.

1. Prepositional phrases used as noun or verb modifiers.

Example: Jill gave the letter on the table to her mother.

2. Complex sentences in which a relative clause interrupts the subject-verb-object sequence of the independent clause.

Example: The boy who won the most prizes ran quickly home.

Concepts

Carroll (1964) defines concepts as:

...the abstracted and often cognitively-structured classes of "mental" experiences learned by organisms in the course of their life histories (p. 80).

This study is concerned with only those concepts which are represented by a word which names a person, place, animal, thing, quality, or idea. For the purposes of this study,



the investigator further distinguishes between the following types of concepts:

1. Concrete concepts are those which are represented by a word which names a person, place, animal, thing, or class of things, having a physical existence. Concrete concepts are those underlined in the following sentences:

Jim had never been on a train before. He realized that the ways of a pullman differed immensely from those of a farmhand. He knew, as he walked up the platform toward the engine, that he would make many blunders, but he counted on his speed of perception to see him through. On the platform stood an intimidating fellow, clothed in dirty jeans, a rain slicker, and leather boots. Jim thought the man to be of the lowest rank on board. But to his surprise, it was Charles Bennet, engineer of the diesel which would be headed for New Orleans.

2. Abstract concepts are those concepts which are represented by words naming a quality, abstraction, or idea; something which cannot be perceived by the senses; something having no physical existence. The abstract concepts are underlined in the following sentences:

Jane had a reputation for absolute honesty. The thought that she would even attempt to tell a lie seemed simply unbelievable. So, for her welfare, I decided to look into this accusation against Jane and abolish it. Conceptualize my surprise upon my arrival at her house, to find my friend in a mood of deceptiveness and evasion.

Concept Density

Concept density refers to the number of concrete and abstract concepts found within a designated sample of written material.

Vocabulary Difficulty

Vocabulary difficulty refers to the number of difficult words found in a selected sample of written material as determined by a word frequency table or word frequency list.

Word Frequency Table

The word frequency table used in this study is The American Heritage Word Frequency Book (1971) which was compiled by John Carroll, Peter Davies, and Barry Richman. This is a detailed report of a word frequency study involving over five million running words. In compiling the word frequency table, more than ten thousand samples of five hundred words were selected from more than a thousand publications that American school students are expected to read by assignment or voluntarily in grades three through nine.

Word Frequency List

The word frequency list used in this study is a list of the one thousand words of the highest frequency in The American Heritage Word Frequency Book (1971).

Organization of Chapters

The content of Chapter I included a background of the problem, the importance of the study, the purpose of the study, research questions, the limitations of the study, the generalizability of the study, the definition of terms

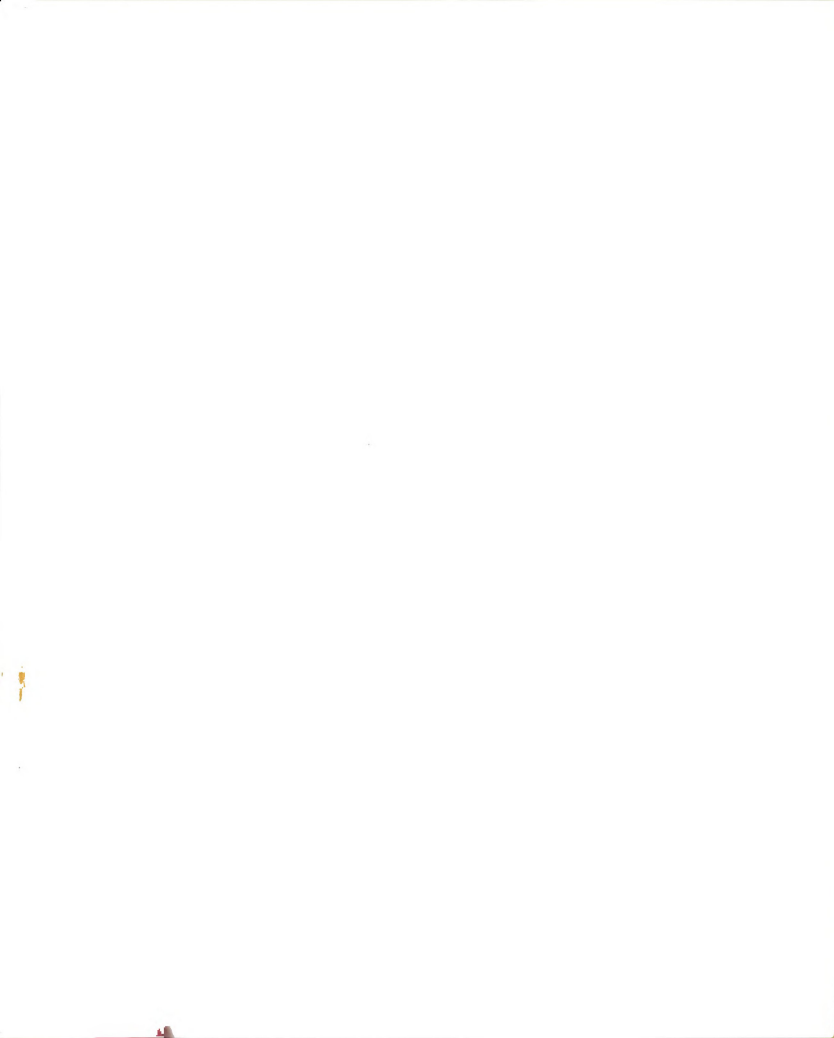
pertinent to the study, and a presentation of the organization of subsequent chapters.

In Chapter II, a review of the literature related to the study is presented. It includes sections on relationships between syntactic structures and comprehension, the relationship between concept presentation and comprehension in social studies materials, and the relationship between word frequency and readability.

Chapter III describes the methodology used in this study.

Chapter IV organizes, analyzes, and presents the data and findings of the study.

Chapter V presents the conclusions, implications, and recommendations of the study as based on the findings.



CHAPTER II

RELATED LITERATURE AND RESEARCH

The review of related literature and research in this chapter is organized under three major headings: (1) relationships between syntactic structures and comprehension, (2) relationship between concept presentation and comprehension in social studies materials, and (3) relationship between word frequency and readability.

Relationships Between Syntactic Structures and Comprehension

In the past two decades, interest in syntactic structures as they relate to reading comprehension has noticeably increased. It appears that this occurrence is due primarily to the influence of transformational-generative grammar. Chomsky (1957, 1965), in his theory of transformational-generative grammar, proposed that every sentence could be represented on two levels--a surface structure level and a deep structure level. The surface structure level is the spoken or written form of a sentence; the deep structure level is the meaning representation of a sentence. Syntax, or the arrangement of the smallest units of meaning, functions as an intermediary between sound and meaning. According to the theory of transformational-generative grammar, a set of transformational rules provides for

the manipulation of syntax, and the complexity of a sentence is ascertained by the number of transformations required to reach the deep structure or meaning level.

A number of studies has affirmed the idea that a sentence becomes more complex as more transformations are added. In a study by Miller (1962), sixty subjects were required to match sentences identical in meaning but varied in syntactic complexity. Findings indicated a relationship between the number of transformations and the reaction time involved in processing a sentence. Similar findings were obtained by Miller and McKean (1964) where the time required to convert one type of sentence into another was measured. Sentences which were more complex syntactically required greater conversion time.

In two studies by Gough (1965, 1966), it was concluded that the time involved in the verification of a statement was affected by the number of transformations. Also, Fodor and Garret (1967) noted that sentences with fewer transformations were more quickly and accurately paraphrased than those of greater complexity.

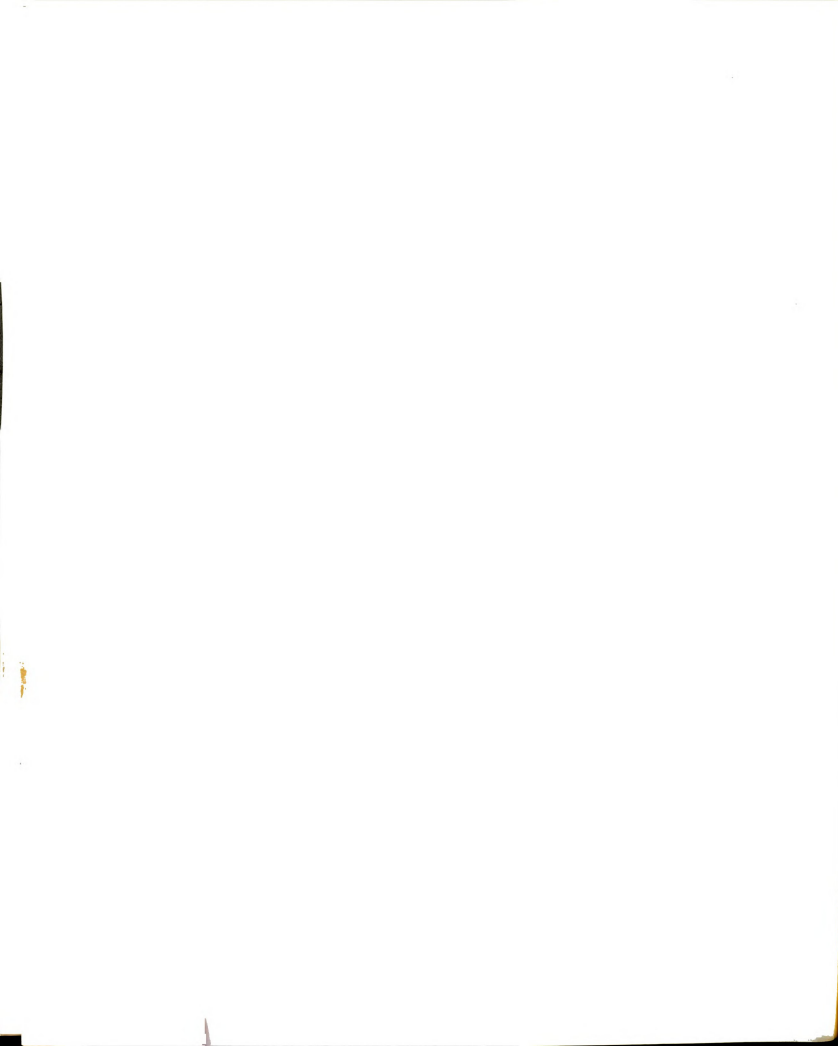
Mehler, Bever, and Carey (1967) conducted a study involving the effects of syntactic structures on the eye movements of a reader. As subjects read sentences of varying syntactic complexity, their visual scanning patterns were recorded. An examination of the readers' eye movement patterns revealed a relationship between grammatical structures and duration of fixations. Also, Klein and Kurkowski

(1974), in a similar study involving the use of an eye movement camera, noted that syntactic structures affected the number of eye movements produced by readers.

As indicated by the aforementioned studies, researchers have upheld the idea that a sentence becomes more complex as more transformations are added. In addition, there have been many investigations conducted to determine the surface structure variables which contribute to difficulties in reading comprehension.

In a study with older subjects, Coleman (1962), using a cloze test, observed that technical passages divided into short sentences were significantly more comprehensible than those composed of longer sentences. Coleman and Blumenfeld (1963), also using older subjects and a cloze test, measured (1) the comprehension of materials containing a high percentage of abstract nouns nominalized from verbs, and (2) sentences where nominalizations were transformed to active verbs. Statistical data indicated sentences using active verbs were less difficult to comprehend than those using nominalizations of active verbs.

Ruddell (1965) investigated the effect of the similarity of oral and written patterns of language structure on the reading comprehension of 131 fourth grade students. He found that reading comprehension scores on cloze tests which utilized high frequency patterns of oral language structure were significantly greater than scores over



materials that utilized low frequency patterns of oral language structure.

Fagan (1971) conducted a study to establish whether the reading comprehension of 440 fourth, fifth, and sixth grade pupils was influenced by the number of types of transformations in the language of passages they were asked to read. Forty-three transformations were identified for analysis. The findings seemed to indicate that deletion or omitting unnecessary repetitious words, and embedding or inserting one clause into another increased the difficulty of the passages. Also, Fagan (1971) noted that it was the type of transformations rather than the number of transformations which affected the comprehension difficulty of a particular sentence.

Using fourth grade students, Bormuth, Manning, Pearson and Carr (1970) conducted a study to determine the effects of fifty-five types of syntactic structures on reading comprehension. From a taxonomy of fifty-two types of sentence structures, the twenty-five judged to be the most difficult were selected for testing. Also, sixteen intersentence and fourteen anaphoric structures were identified for testing. Four types of questions were employed in testing the comprehension of the structures studied. The mean percentages of pupils correctly responding to the sentence comprehension questions was .73; to anaphoric comprehension questions, .77; and to intersentence questions, .58. In analyzing the subjects' responses, the authors concluded that the

skills involved in comprehending these structures may be hierarchically related and noted the fourth grade students showed an unexpectedly low level of performance on skills which seemed to the authors to be very simple and very basic.

Richek (1976-77) tested 220 third grade students to further investigate the relationship of anaphoric structures and comprehension. Sentences were composed containing equivalent anaphoric structures in three forms--noun, pronoun, and null. The difficulty of the test sentences was methodically varied with respect to several contextual variables --kernels, length, parallelism, and question. The children were requested to read the sentences and furnish antecedents for the anaphoric forms. Findings indicated that noun forms were the easiest to comprehend, followed by pronoun forms, and, finally, by null forms. Of the four complexity variables, only the question variable, where the anaphoric form questioned was the non-subject referent, significantly affected difficulty.

In another study by Richek (1976), an investigation was conducted to discern the effects of sentence complexity on reading comprehension of the Minimal Distance Principle (MDP), a psycholinguistic principle which states that the subject of a subordinate complement clause is the noun referent which most nearly precedes that clause. The subjects consisted of one hundred two students in the third, fourth, and fifth grades who were achieving slightly above national norms on a standardized reading test. Students were asked

to name subjects of subordinate clauses in sentences which conformed to or violated the MDP. Students were also assigned to read "simple" sentences, where a locative statement was inserted at the end of a sentence, or "complex" sentences, where the locative statement was inserted directly before the subordinate clause. The results of the study indicated that sentences which conformed to the MDP were easier to comprehend, and that comprehension was affected adversely when sentential relationships were interrupted.

In studying the relationship of syntactic structures and reading comprehension, Marcus (1971) developed a diagnostic instrument to measure the understanding of syntactic clues by intermediate-grade students. Marcus (1971) compiled a list of twenty-seven types of grammatical structures which, according to numerous researchers, may cause difficulty in reading comprehension. This list was then decreased to seventeen structures which seemed to be representative of the four basic English syntactic structures described by Francis (1958): modification, predication, complementation, and coordination. Test items were ^edivided using the theory of transformational grammar. Sentences were factored into their underlying kernels and transformations with equivalent meanings compared. Test items were written in a multiple-choice format with vocabulary and punctuation controlled. The test was administered to 421 students from disadvantaged and middle-class area schools. Only those subjects who attained a minimum of 5.0 on the Huelsman Word

Discrimination Test were chosen for the study. For the total test, the mean percent correct at each grade level increased from the fifth to the eighth grade. A rank order of the seventeen structures measured in the study revealed that the most difficult structures to comprehend, as determined by the mean, were prepositional phrase modifiers, such as "Jane gave the cookie behind the jar to the boy." The data also revealed that sentences containing a relative clause in the subject-verb-object sequence of independent clauses were difficult for students to grasp. Marcus (1971) reports:

In deriving the meaning of complicated sentences, some students mistakenly thought that a coincidental noun-verb-noun sequence of words was a subject-verb-object sequence and thus a kernel sentence of the larger sentence (p. 58).

Data supportive of the Marcus (1971) study was obtained by Baldwin (1977), who conducted an investigation using third grade students. He found that canonical sentences, or sentences where the noun phrase/verb phrase/noun phrase pattern was, in fact, the subject/main verb/object of a common clause, were easier to comprehend than non-canonical sentences, or those which falsely confirmed the reader's expectations for such a pattern.

In summary, the introduction of Chomsky's theory of transformational-generative grammar has aroused interest in syntactic structures as they relate to reading comprehension. Investigators have provided support for the idea that a sentence becomes more complex as more transformation are added to it. In addition, researchers have identified many

surface structure variables which may contribute to problems in reading comprehension.

The Relationship Between Concept Presentation
and Comprehension in Social Studies Materials

A review of the literature and research indicates that the presence of large numbers of concepts in text materials, coupled with the abstract nature of many of these concepts, may contribute to comprehension problems for students.

Taylor and Lunstrum (1977) expressed concern for the problem of concept loading in social studies materials. According to Taylor and Lunstrum (1977):

Concept loading may occur when the complexity, pattern, and the number of concepts presented the reader markedly exceed his capacity to comprehend them (p. 8).

Carroll (1964), in his comparison of concept learning in school and the laboratory, states that concepts learned in school depend on attributes which are in most cases unfamiliar and which themselves represent difficult concepts. He notes that:

...concepts learned in school often depend upon a network of related prerequisite concepts. Further, the attributes on which school-learned concepts depend are frequently verbal, depending on meaning that cannot easily be represented in terms of simple sensory qualities...(p. 190).

This problem seems particularly applicable to social studies materials which deal with numerous abstract concepts. Gagne (1965) attests to this in his discussion of concept learning:

Most difficult of all are likely to be abstract concepts like "family" and "legislature," of the type that make up the social sciences (p. 187).

There have been many investigations conducted concerning children's understanding of abstract concepts which are likely to appear in social studies materials. In an early study, Friedman (1944), using 697 subjects in kindergarten and in grades one through six, investigated the variety, extent, and importance of children's concepts about time. Two sets of tests were administered. The first, for kindergarten through grade three, designated as the primary test, was an oral test aimed mainly at finding facts about the pupils' understanding of our conventional time system. The second, for grades four through six, designated as the intermediate test, consisted of a written test on those items not correctly answered by at least ninety percent of the third grade pupils and on a variety of other time concepts. Percentages of correct responses were used in tabulating the results. Friedman noted a marked increase in the percentage of correct responses for all test items given by pupils of successively higher grades. He also reported that the understanding of our conventional time system was not complete until grade four and that the meanings of concepts concerning "nearness" and "remoteness" in time and place varied greatly and were often inaccurate and vague, even at the intermediate level. Time lines were understood by only a small percentage of pupils, and students at the sixth grade level exhibited an incomplete understanding of time words, dates, and the chronological sequence of events.

Carner and Sheldon (1954) drew increased attention to concepts encountered in social studies materials when they reported that in the social science field "the social studies, in particular, appear to contain an abundance of terms which serve to hinder comprehension" (p. 228). Types of concepts which were noted to be more difficult to comprehend were those which are more abstract by nature, such as chronological concepts, including hours, seasons, and historic events; spatial concepts involving geographical and spatial organization; and social concepts, comprising understanding, attitude, and adjustment to the environment.

Findings supportive of Carner and Sheldon were reported by Gill (1962). Using 254 randomly selected history students from college, high school, junior high, and intermediate grade levels, Gill conducted an investigation to discover whether significant difficulties and differences existed among these various grade levels in the interpretation of indefinite expressions of time commonly found in textbooks and used in class discussions. The subjects were requested to write a "definite" date for each of eighteen "indefinite" expressions of time listed in column form. Upon analyzing specific items, Gill (1962) found that while students at higher grade levels generally exhibited a superior grasp of the meaning of indefinite time expressions, there was no clear progression from the fifth to the twelfth grade on many items. Indefinite time expressions were interpreted loosely at all grade levels, and terms like "ancient times,"

"Middle Ages," and "modern times," had no precise meaning for many students and were particularly difficult for younger students. Gill concluded:

When the textbook or the teacher uses indefinite time expressions, it should be realized that they convey widely different meanings to pupils (p. 456).

Arnsdorf (1963) examined the ability of students in grades four, five, and six to comprehend basal social studies materials. Two forms of two tests were randomly distributed to the subjects whose scores as measured by the Gates Reading Survey indicated above average abilities in vocabulary and comprehension. One form was a verbatim reproduction of the textbook copy; the other was rewritten, replacing indefinite expressions with more specific terms whenever possible. The readability of the adjusted materials was controlled to coincide with the basal materials. The subjects were tested by means of open-ended questions based on the vocabulary and content of the selections. Mean scores from the two social studies tests basically indicated a gradual increase in understanding from grade to grade. The averages also revealed that children's understanding of these social studies concepts were severely limited. Arnsdorf concluded that:

...student performance at each level of each selection seemed to be inadequate to meet the demands encountered in the independent reading activities of a social studies program (p. 70).

In addition, it was reported that in five of the six comparisons, the students reading the more precise materials

averaged higher scores than those given basal textbook selections.

These conclusions coincide with those of Smith (1963) who, upon examining similar studies, noted that children showed various degrees of understanding and misunderstanding of terminology of the type found in social studies material. She reports:

Children were confused by the indefinite expression which they met, such as "a long time ago," "many bushels," and "several acres," as well as by particular terminology of the subjects, such as "A.D.," "B.C.," "decade," "plateau," "glacier," "forty acres," "98 percent of the population," and "average rainfall" (pp. 443-444).

Jarolimek and Foster (1959) tested five hundred fifth grade children on their ability to understand six types of quantitative concepts occurring often in social studies materials: definite and indefinite references to space, time, and quantities of objects. A multiple choice test was devised in which eight items were selected to represent each of the six categories of quantitative concepts. Vocabulary in the responses was comparable in difficulty to that used in the textbook passages chosen for inclusion in the test. For analysis of responses, the subjects were divided into two groups: (1) those who had grade placement scores in reading of 5.0 or above, with intelligence scores of ninety or higher; and (2) those with lower scores in each of these categories. Upon examining percentages of the subjects' correct responses, Jarolimek and Foster concluded that students who are average or better in intellectual capacity and

reading ability may be expected to understand only about half the concepts encountered in social studies textbooks. It was anticipated that children who read below grade level or who are below average in intellectual ability would understand less than a third of the concepts.

In a similar study, Lyda and Robinson (1964) tested forty-seven second grade subjects on their comprehension of the same quantitative concepts used by Jarolimek and Foster. On the basis of results from the Otis Quick Scoring Mental Abilities Test and the reading section of the Stanford Achievement Test, the pupils were divided into above average, average, and below average groups. A multiple choice format was utilized. An examination of the data revealed that pupils in the above average group comprehended three-fourths of the quantitative concepts, pupils in the average group understood a little less than half of the quantitative concepts, and the low group understood less than one-fourth of the concepts.

Not only do the types of concepts found in social studies materials cause problems for young readers, but the methods employed in discussion and defining concepts in social studies textbooks may hinder comprehension. Martorella (1971) points out that while evidence indicates the desirability of prominently featuring only critical attributes in the development of concept illustrations, such a procedure may be extremely difficult for many social science concepts. He states that generally:



...what occurs in the development of textual material is included in a concept illustration for the sake of integrating a narrative. As an instructional sequence develops, coordinate and subconcepts are discussed along with the feature concept; hence they may function as distractors or extraneous material and thus divert the learner from the intended concept (p. 67).

While research into the methods employed by textbook publishers in presenting concepts has been limited, a few studies suggest several factors which appear to affect concept comprehension. Ratcliffe (1966) and Johnson (1967), after examining fifth, eighth, and eleventh grade American history books, concluded that most of the concepts in the texts were insufficiently presented due to the lack of definitions, details, and concrete examples. Both authors considered the treatment given the concepts represented in the texts to be inadequate, thereby affecting student comprehension. Likewise, Dimitroff (1961), upon analyzing thirty intermediate grade texts with regard to the presentation of fifteen social science generalizations which had been judged important by scholars, concluded that, in most cases, the texts provided "inadequate" information about the concepts.

Peters (1975-6) conducted a study to investigate whether ninth grade social studies material rewritten according to the Frayer Model would significantly improve comprehension for good and poor readers when compared to the method employed by many social studies textbooks. The concepts utilized in the study were related to specific periods

in United States history: federalism, confederation, and states' rights. In presenting concepts, the textbook approach only used one example, while the Fruyer Model provided a systematic procedure for concept presentation. The Gates MacGinitie Reading Test was used to distinguish good and poor readers. The subjects were randomly assigned to read selections from one of the arrangements and to respond to a multiple choice test. Mean scores indicated that both good and poor readers who utilized the Fruyer Model had a higher degree of comprehension than those using the textbook approach.

In an early study, Wilson (1944) tested 475 intermediate students to determine the effects of amplification of general conceptual statements upon reading comprehension. Three articles, each three hundred words in length, using general conceptual statements similar to those found in textbooks, were written on some aspect of paper. Each article was then expanded into two lengths: six hundred and twelve hundred words. Details for amplified versions were determined on the basis of what added information might enable a child to use his/her experiential background to comprehend the concepts presented. After reading each version, subjects were administered written and oral tests. Averages for the percentages of correct items computed for the written tests were significantly higher for the groups that read the amplified versions of the articles with only one

exception. Upon examination of oral-interview responses, Wilson concluded:

Greater interest and more logical reasoning were shown by pupils' responses to oral-interview questions in the case of concepts that the children could relate to their experiential backgrounds (p. 7).

In summary, it appears that abstract concepts of the type found in social studies texts, may be quite difficult for students to understand, although results from some studies indicate that the ability to grasp certain abstract concepts may increase with the grade level of the student. The problem is further compounded by the presence of large numbers of such concepts in social studies materials. It seems, too, that concepts which are clearly defined--with critical details and in concrete terms which can easily be related to the reader's own experience--may be more easily understood by the young reader.

The Relationship Between Word Frequency and Readability

For many years different aspects of the relationship between word frequency and readability have been studied by educational scholars. The research in this area will be reviewed in the sequence utilized by Klare (1968) in his discussion of readability. The relationship between word frequency and readability will be described in terms of reading efficiency, reader preference, learning, and comprehension.

Some very early studies served to establish the connection between word frequency and the ease of word recognition for the reader. One study which appears to have precipitated a great deal of interest in this area was that conducted by Bruner and Postman (1947). Nineteen college students were first tested in a typical word association experiment, consisting of ninety-nine words which varied in emotional impact. Associative reaction times were recorded. In a second test, six words, each with the fastest, slowest, and midmost associative reaction time, were presented tachistoscopically to individual subjects. Times required for recognition of these eighteen words were recorded. Upon inspecting the data, the researchers noted that as the associative reaction time for a word increased, so did the time required for its recognition. Bruner and Postman explained this relationship as follows:

The bulk of experimental and clinical evidence points to blockage as the process producing increase in association time to emotionally charged stimuli. Such blocking in association represents a defense against anxiety-laden stimuli. A basically similar process is at work in perception. With increase in emotionality of stimuli, recognition may lead to anxiety and is to be avoided as long as possible (p. 74).

After the Bruner and Postman study, a number of investigations were initiated concerning the effect of personal values and value-related words on recognition thresholds. The results of a study by McGinnies (1949) served to strengthen the support for the notion of perceptual defense. Subjects for his experiment, eight male and eight female

undergraduates, were instructed to read a tachistoscopically presented list of eleven neutral and seven emotionally-toned words while recognition thresholds and galvanic skin responses were recorded. An analysis of statistical data revealed that emotionality, as measured by the galvanic skin response, was significantly greater during pre-recognition exposures to the critical than the neutral words. Further, the mean thresholds of recognition were greater for the emotionally-laden than the neutral stimuli. McGinnies suggested that these findings were due to the "socially taboo" nature of the emotionally-laden words. He did not, however, control for differences in word frequency between the two types of words. Howes and Solomon (1950) pointed out that McGinnies' taboo words might be expected to have far higher duration thresholds than his neutral words because "the relative frequencies of the former are fewer" (P. 229).

In several experiments by Howes and Solomon (1951), the relationship between word frequency and visual duration threshold was clearly established. Twenty subjects were exposed to a list of sixty words by means of a tachistoscope. The list was composed of thirty fairly common words--five each from six different value or interest categories--and thirty words of relative rarity mainly synonyms of the common ones, selected from the Lorge-Thorndike word frequency tables. Product moment correlation coefficients between word frequency and visual duration threshold ranged from $-.68$ to $-.75$, indicating a strong inverse relationship.

Words of high frequency of occurrence required shorter exposure durations than words of low relative frequency.

Because such word frequency lists as the Lorge-Thorn-dike tables cannot ensure the frequency with which a given subject will have seen a given word, Solomon and Postman (1952) conducted an investigation using nonsense words as stimuli. Frequency of usage was controlled experimentally by requiring subjects to read and pronounce nonsense words with frequencies ranging from one to twenty-five. The subjects' tachistoscopic recognition thresholds were later determined for these as well as for control words which had a zero frequency of prior usage. The statistical findings indicated that recognition thresholds varied inversely with frequency of prior usage. Findings supportive of Solomon and Postman were provided in many similar studies, including one by King-Ellison and Jenkins (1954). Upon analyzing statistical data, these investigators noted a correlation of $-.99$ between mean tachistoscopic exposure times of nonsense words and the logarithm of the frequency of presentation.

In a more recent study involving elementary school children, Johnson (1973) reported that the number of reading words recognized by third and sixth graders at an exposure duration of one hundred milliseconds was affected by their frequency of occurrence in the English language. The more frequent words were recognized more often.

Klare (1968) notes that words tend to become shortened with increased frequency of use in a language which, in

turn, affects reading efficiency through the fact that shorter words have a lower recognition threshold than longer words. Several studies lend support for this idea. In an investigation by McGinnies, Comer, and Lacy (1952), thresholds of recognition for words varying in length and frequency were determined for twenty subjects. The authors reported that regression equations determined for each subject indicated that duration thresholds for neutrally-toned words were a linear, decreasing function of word frequency and a linear, increasing function of word length. An increase in frequency lowered recognition thresholds more for long words than for short words, while an increase in word length increased thresholds more for low frequency than high frequency words. Newbigging and Hay (1962), in a similar study involving forty-five subjects, reported the same relationship between recognition threshold, word frequency, and word length.

As indicated by the studies thus far summarized, an increase in word frequency produces an increase in reading efficiency, or the ease of word recognition. Frequency further influences reading efficiency through its relationship with word length, inasmuch as increased usage produces shorter words, and shorter words have a lower recognition threshold than longer words. A few studies have also shown that word frequency may affect readability by enhancing a reader's preference for a particular piece of reading material. Johnson, Thompson, and Frincke (1960) conducted a

series of experiments investigating the relationship word value and frequency and the relation of these to word recognition thresholds. From findings in three of their experiments, the authors concluded that the more often a word or nonsense syllable occurs in the English language, the more positively it is likely to be rated on the good-bad scale of the Semantic Differential. An examination of statistical data from a subsequent experiment revealed that when the frequency of nonsense words was manipulated, a systematic variation in the rated "goodness" of the nonsense words was produced. Words that were frequent were also very likely to be rated as "good." In a fifth experiment, Johnson, Thompson, and Frincke attempted to separate out the influence of word value and word frequency on visual duration threshold. Lists of words which were matched in frequency and varied in goodness, and matched in goodness and varied in frequency, were tachistoscopically presented to subjects. Subjects reported the good words at significantly lower visual duration thresholds than matched bad words. Likewise, the frequent words were reported at significantly lower thresholds than those matched infrequent words. The authors concluded that both frequency and value appeared to affect visual duration thresholds for words.

In a similar study, Newbigging (1961) confirmed the results obtained by Johnson, Thompson, and Frincke. Eighteen words which differed in connotative meaning as discerned by rating on the good-bad scale of the Semantic

Differential were tachistoscopically presented to eighteen subjects for recognition. Words rated toward the "bad" end of the Semantic Differential had a significantly higher threshold than "good" and "neutral" words.

The findings of the studies described above indicate a substantial relationship between word frequency and reader preference. Klare (1968) summarizes this relationship as follows:

The effects of frequency of occurrence of words upon preference for a more readable over a less readable version appears to result from one or the other of two possible effects or from both. First, the frequency of occurrence of a word is related to its rated goodness, thus producing a possible direct effect upon preference. Second, the rated goodness of a word is related to its visual duration threshold, thus producing a possible indirect effect upon preference by affecting the reading ease of a text since ease and preference are themselves related (p. 19).

Noble has conducted several studies (1952, 1953, 1955) which indicated a substantial relationship between word frequency and the learning of written material. In one of his studies (1955), Noble used 240 subjects to find whether or not performance in serial verbal learning was affected by the frequency of the items to be learned. Each independent treatment group of thirty subjects was visually presented with a set of six relatively unfamiliar and meaningless verbal stimuli in random sequence and in the frequencies of 0, 1, 2, 3, 4, 5, 10, and 20. On each presentation, the subject pronounced the item aloud to insure stimulus reception and to exercise the response. After a two-minute rest, the

six experimental items were encountered in serial lists to be learned by the anticipation method. The master criterion was set at two successive error-free trials. The findings revealed that the effect of familiarization was a significant reduction in the number of trials required for mastery.

In a more recent study, Marks, Doctorow, and Wittrock (1974) examined the effects of word frequency on comprehension. It was hypothesized by the authors that by varying fifteen percent of the words in elementary reading materials, gains in the comprehension of the meaning of entire passages could be generated. The subjects, 222 sixth graders with a score of at least two on the SRA Reading Placement Test, were randomly assigned to two reading treatments simultaneously administered in the same room. Based on the scores from the SRA tests, students were placed in a high, medium, or low level reading group. Each student read two stories: the first at his/her reading level and the second, one or two years above his/her reading level. The reading materials were constructed to vary only in the frequency value of approximately fifteen percent of the words in the experimental passages. Syntactical and grammatical variables and readability were held constant across treatments. Two multiple-choice comprehension tests constructed by the authors were administered to students in each reading level. Results revealed that reading comprehension was significantly increased ($p < .001$) with high frequency story passages. Findings indicated that increases in the frequency of a small

percentage of words enhanced story comprehension, while reductions of the number of familiar words inhibited comprehension of the total passage.

Findings supportive of Marks, Doctorow, and Wittrock were reported by Coleman (1966), who found a high correlation between the frequency of content words and comprehension in twelve passages as summed by cloze scores.

To summarize, researchers have studied the relationship between word frequency and readability for several decades. Studies have shown that an increase in word frequency increases the ease of word recognition for the reader. There also appears to be a relationship between word frequency and reader preference for a specific piece of reading material. Further, findings from the studies which have explored the relationship between word frequency and comprehension suggest that an increase in word frequency positively affects comprehension.

Chapter Summary

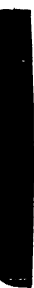
This chapter reviewed the related literature and research in three sections. In the first section, literature and research were summarized which reported the relationship between understanding syntactic structures and comprehending sentences. In addition, several studies were reviewed which identified syntactic structures which may contribute to reading comprehension problems.



The second section in this chapter cited research and literature concerned with concepts found within social studies materials. There appeared to be a general agreement that large numbers of concepts, especially those concepts of an abstract nature presented in a brief or ambiguous manner, may contribute to comprehension problems for students' reading social studies materials.

The research and literature in the third section of this chapter reviewed studies which indicated that increased word frequency may positively affect the ease of word recognition for the reader, the reader's preference for a reading selection, and the reader's comprehension of written materials.

Since social studies materials are generally analyzed for reading difficulty by means of readability formulas which usually examine word length and/or sentence length, it appears there is a need for further research which will elicit more precise information about other factors which may affect reading difficulty levels of social studies materials. This study was designed to demonstrate that social studies can be analyzed for syntactic, conceptual, and vocabulary factors which may affect comprehension. The following chapter describes the methodology of the study.



CHAPTER III

METHODOLOGY OF THE STUDY

Introduction

This chapter explains the methodology employed in conducting the study. The population is identified and the method of sample selection is presented. The procedure used for the collection of data is described and the constructed hypotheses are stated. The method of analyzing the data is presented, followed by a brief chapter summary.

Population

The parent population consisted of all elementary social studies textbooks used in classrooms in the state of Michigan.

Selection of the Sample

The sample series selected for examination consisted of the following: Windows on Our World, Houghton Mifflin Company; The Holt Databank System, Holt, Rinehart and Winston; Concepts and Values, Harcourt, Brace and Jovanovich; Concepts and Inquiry, Allyn and Bacon, Inc. These specific series were selected for study because of their prominence in the social studies field as judged by a panel of experts associated with the State of Michigan Department of

Education. Two levels of each textbook series were examined: (1) upper elementary level texts, which consisted of those texts recommended by the publisher for use with sixth grade students; and (2) lower elementary level texts, which consisted of those intended by the publisher for use with third grade students.

Procedure

The written discourse of the texts were compared with regard to four aspects of the language: syntactic complexity, conceptual density, conceptual abstractness, and vocabulary difficulty.

Two variables which may affect syntactic complexity were tabulated: (1) prepositional phrases used as modifiers of nouns or verbs, and (2) complex sentences with relative clauses which interrupt the subject-verb-object pattern of the independent clause. These specific syntactic structures were selected because of findings of Marcus (1971). Based on a list of seventeen syntactic structures, which seemed to be representative of the four basic syntactic structures described by Francis (1958), Marcus developed a diagnostic instrument to measure the understanding of these structures by intermediate grade students. The findings revealed that the more difficult structures for students to understand were the prepositional phrase modifiers and complex sentences where a relative clause interrupted the subject-verb-object sequence of the independent clause.

To analyze materials for syntactic complexity with regard to the number of prepositional phrase modifiers, five samples from the upper elementary level texts and five samples from the lower elementary texts were selected from each series using a table of random numbers. Each sample consisted of ten consecutive sentences. The investigator then counted the number of prepositional phrase modifiers found in each individual sentence. The number of prepositional phrase modifiers in each sentence was then recorded on a data collection sheet (see appendix for sample of data collection sheet).

To examine texts for syntactic complexity with regard to the number of complex sentences where the subject-verb-object sequence of the independent clause was interrupted by a relative clause, additional samples of ten consecutive sentences were randomly chosen. Five samples from each upper elementary text and five from each lower elementary text were selected. For each sentence, the number of complex sentences where the subject-verb-object pattern of an independent clause was interrupted by a relative clause, was recorded on a data collection sheet (see appendix for sample of data collection sheet).

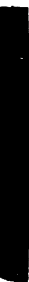
To determine concept density, five additional samples of ten consecutive sentences were randomly selected from each series at both the upper and lower elementary levels. For each sentence, the total number of concepts which were represented by a word naming a person, place, animal, thing

quality, or idea was tabulated and recorded on a data collection sheet (see appendix for sample of data sheet).

Five additional samples of ten consecutive sentences for each series at the upper and lower elementary levels were extracted to measure concept abstractness. For individual sentences, the number of concepts which were represented by words naming a quality or idea which could not be perceived by the senses was tabulated on a data collection sheet (see appendix for sample of data collection sheet).

To compare vocabulary difficulty by means of a word frequency list, the High Frequency Word List for Grades Three Through Nine, was employed. This is a list of the one thousand words having the highest frequency of occurrence in The American Heritage Word Frequency Book. Five samples of one hundred words each were selected from each of the upper and lower elementary texts. Any word which appeared on the list or any regularly formed variants of such words was given a value of "1." Words which did not appear on the list or those which were not regularly formed variants of list words were given a value of "0." The value for each word, either "1" or "0," was then recorded on a data collection sheet (see appendix for sample of data collection sheet).

The American Heritage Word Frequency Book was used to compare vocabulary difficulty as measured by a word frequency table. This is a computer-assembled selection of over five million words drawn in five hundred word samples



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from 1,045 published materials to which students are exposed in school grades three through nine in the United States. The frequency of occurrence for each word at particular grade levels is reported in this word frequency table. Every graphic form of each word (the, The, THE) comprises a separate entry. For this portion of the investigation, five random samples of one hundred words were chosen from each of the upper and lower elementary level texts. The frequency listed for each word at each particular grade level was recorded by the investigator on a data collection sheet. The frequencies of all graphic forms of each word (the, The, THE) were combined to yield a total word frequency score for each word at each grade level (see appendix for sample of data collection sheet).

Hypotheses

The following null hypotheses were constructed from the research questions presented in Chapter I.

1. There is no significant difference in syntactic complexity among the four series at the upper elementary level as determined by the number of prepositional phrase modifiers.
2. There is no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of prepositional phrase modifiers.

3. There is no significant difference in syntactic complexity among the four series at the upper elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.
4. There is no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.
5. There is no significant difference in concept density among the four series at the upper elementary level.
6. There is no significant difference in concept density among the four series at the lower elementary level.
7. There is no significant difference in concept abstractness among the four series at the upper elementary level.
8. There is no significant difference in concept abstractness among the four series at the lower elementary level.

9. There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency list.
10. There is no significant difference in vocabulary difficulty among the four series at the lower elementary level as determined by a word frequency list.
11. There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency table.
12. There is no significant difference in vocabulary difficulty among the four series at the lower elementary level as determined by a word frequency table.
13. There is no significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of prepositional phrase modifiers.
14. There is no significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

15. There is no significant difference in concept density between the upper and lower elementary levels.
16. There is no significant difference in concept abstractness between the upper and lower elementary levels.
17. There is no significant difference in vocabulary difficulty between the upper and lower elementary levels as determined by a word frequency list.
18. There is no significant difference in vocabulary difficulty between the upper and lower elementary levels as determined by a word frequency table.

Method of Analyzing Data

The information tabulated on the data collection sheets for each variable was keypunched on IBM computer cards.

The analysis of results was reported in the form of analysis of variance and post hoc comparisons. The analysis of variance tested for differences among upper and lower elementary texts and then within each series tested for differences between upper and lower elementary levels. The post hoc comparisons permitted the researcher to observe exact differences in means among the four series and between levels for each series.

Summary

The methodology employed in this investigation was described in this chapter.

The parent population consisted of all the social studies series used in Michigan schools. The sample consisted of four social studies series considered to be prominent in the social studies field by a panel of experts associated with the State of Michigan Department of Education. Two levels from each series, an upper and a lower elementary level, were examined.

The written discourse of the texts was compared with regard to syntactic complexity, concept density, concept abstractness, and vocabulary difficulty. Comparisons were made among the four series and between the upper and lower levels.

The statistical procedures were designed in conjunction with the research consultants at Michigan State University. In Chapter IV, the data are presented, analyzed, and organized.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

Introduction

The purpose of this study was to examine the written discourse within four social studies series published for elementary school children with regard to the status of variables, other than word length and sentence length, which may affect the reading difficulty levels of instructional materials. More specifically, the purpose was to compare four aspects of the language: syntactic complexity, conceptual density, conceptual abstractness, and vocabulary difficulty. From each of the four series, two levels of materials, upper elementary and lower elementary, were examined.

The methodology for the collection and treatment of data was described in the previous chapter. The investigator will present in this chapter the statistical analysis of the findings as they relate to the hypotheses constructed for the study.

Hypotheses and Statistical Tests

All hypotheses were analyzed by a one-way analysis of variance. In addition, hypotheses one through twelve were subjected to statistical analysis by Duncan's Multiple Range Test to clarify the differences among means.



The analysis for all hypotheses were run using the SPSS (Statistical Package for the Social Sciences) at the Michigan State University Computer Center.

The First Hypothesis

Ho 1: There is no significant difference in syntactic complexity among the four series at the upper elementary level as determined by the number of prepositional phrase modifiers.

This hypothesis was analyzed by using a one-way analysis of variance and Duncan's Multiple Range Test to clarify differences among the means (see Tables 1 and 2).

Table 1. Analysis of Variance
of Prepositional Phrase Modifiers
at the Upper Elementary Level

<u>Prepositional Phrase Modifiers at the Up- per Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	3.2242	3	2.6419
p > .05.			

No evidence of significant differences was found among the four series in the number of prepositional phrase modifiers at the upper elementary level ($F = 2.6419$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. To compare differences among means, the Duncan post hoc analysis was run.

An examination of Table 2 would indicate that the Allyn and Bacon series is notably different in the number of prepositional phrases per sentence from the other three series.

Table 2. Homogeneous Subsets of Means
of Prepositional Phrase Modifiers
at the Upper Elementary Level
(Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Allyn and Bacon	.8000
B	Houghton Mifflin	1.2400
	Holt, Rinehart, Winston	1.3137
	Harcourt, Brace, Javanovich	1.3469

The Second Hypothesis

Ho 2: There is no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of prepositional phrase modifiers.

This hypothesis was analyzed by a one-way analysis of variance and Duncan's Multiple Range Test (see Tables 3 and 4).

Table 3. Analysis of Variance of
Prepositional Phrase Modifiers
at the Lower Elementary Level

<u>Prepositional Phrase Modifiers at the Low- er Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	2.7482	3	2.7218
p < .05			

There was a significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of prepositional phrase modifiers

($F = 2.7218$, $df = 3$, $p < .05$). The null hypothesis could not be accepted. In order to clarify the nature of the differences among means, a post hoc analysis was run.

Table 4. Homogeneous Subsets of Means of
Prepositional Phrase Modifiers at
the Lower Elementary Level
(Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Houghton Mifflin	.5000
	Harcourt, Brace,	
	Jovanovich	.7347
	Holt, Rinehart, Winston	.8600
B	Harcourt, Brace,	
	Jovanovich	.7347
	Holt, Rinehart, Winston	.8600
	Allyn and Bacon	1.0600

Examination of Table 4 would indicate that the Houghton Mifflin series and the Allyn and Bacon series varied more from one another with regard to the average number of prepositional phrase modifiers per sentence than from the other two series.

The Third Hypothesis

Ho 3: There is no significant difference in syntactic complexity among the four series at the upper elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

To evaluate this hypothesis, an analysis of variance was used. In addition, the Duncan post hoc analysis was run to allow for comparison among the means (see Tables 5 and 6).



Table 5. Analysis of Variance of Complex Sentences
Containing Relative Clauses which Interrupt
the Subject-Verb-Object Sequence
of the Independent Clause
at the Upper Elementary Level

<u>Complex Sentences with Relative Clauses at Upper Elementary Level</u>	<u>Square</u>	<u>df</u>	<u>Ratio</u>
	.0400	3	2.0632
p > .05			

No evidence of significant differences was found in syntactic complexity among the four series at the upper elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause ($F = 2.0632$, $df = 3$, $p > .05$). The null hypotheses could not be rejected. The Duncan post hoc analysis was run so that differences among the means might be observed.

Table 6. Homogeneous Subsets of Means
of Complex Sentences with Relative
Clauses at the Upper
Elementary Level
(Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Harcourt, Brace,	
	Jovanovich	0
	Allyn and Bacon	0
	Holt, Rinehart, Winston	.0200
B	Holt, Rinehart, Winston	.0200
	Houghton Mifflin	.0600

The data in Table 6 suggests that at the upper elementary level, the Houghton Mifflin series is more similar to the Holt, Rinehart, Winston series than to the remaining series, when considering the number of complex sentences with relative clauses which interrupt the subject-verb-object pattern of the independent clause.

The Fourth Hypothesis

Ho 4: There is no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

This hypothesis was statistically analyzed by an analysis of variance and Duncan's Multiple Range Test to show differences among the means (see Tables 7 and 8).

Table 7. Analysis of Variance of Complex Sentences
Containing Relative Clauses which Interrupt
the Subject-Verb-Object Sequence
of the Independent Clause
at the Lower Elementary Level

<u>Complex Sentences with Relative Clauses at Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	.0983	3	2.3221
p > .05			

No evidence of significant differences was found among the four series at the lower elementary level in the number of complex sentences containing relative clauses which

interrupt the subject-verb-object pattern of the independent clause ($F = 2.3221$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. The Duncan test was used to allow for a closer inspection of the means.

Table 8. Homogeneous Subsets of Means
of Complex Sentences with Relative
Clauses at the Lower
Elementary Level
(Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Allyn and Bacon	0
	Holt, Rinehart, Winston	.0200
	Harcourt, Brace,	
	Jovanovich	.0600
B	Holt, Rinehart, Winston	.0200
	Harcourt, Brace,	
	Javanovich	.0600
	Houghton Mifflin	.1000

Table 8 implies that the Houghton Mifflin and the Allyn and Bacon series varied more from each other than from the other two series, in the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

The Fifth Hypothesis

Ho 5: There is no significant difference in concept density among the four series at the upper elementary level.

An analysis of variance was used to statistically evaluate this hypothesis. The Duncan post hoc analysis was run

to enable observation of differences among means (see Tables 9 and 10).

Table 9. Analysis of Variance of Concept Density among the Four Series at the Upper Elementary Level

<u>Concept Density at the Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	8.6183	3	4.1311
p < .05			

There was a significant difference in concept density among the four series at the upper elementary level ($F = 4.1311$, $df = 3$, $p < .05$). The null hypothesis could not be rejected. In order to clarify these differences, Duncan's post hoc analysis was used; results are shown in Table 10.

Table 10. Homogeneous Subsets of Means of Concept Density at the Upper Elementary Level (Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Allyn and Bacon	2.5400
	Houghton Mifflin	2.6800
B	Holt, Rinehart, Winston	3.2800
	Harcourt, Brace, Jovanovich	3.3600

The data presented in Table 10 shows that the Allyn and Bacon series and the Houghton Mifflin series are similar

to one another in concept density. Likewise, the Holt, Rinehart, and Winston series is very similar to the Harcourt, Brace, and Jovanovich series with regard to concept density.

The Sixth Hypothesis

Ho 6: There is no significant difference in concept density among the four series at the lower elementary level.

In analyzing this hypothesis, an analysis of variance was used. In addition, Duncan's Multiple Range Test was used in studying differences among means (see Tables 11 and 12).

Table 11. Analysis of Variance of Concept Density among the Four Series at the Lower Elementary Level

<u>Concept Density at the Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	11.0200	3	5.6184
p < .05			

There was a significant difference in concept density among the four series at the lower elementary level ($F = 5.6184$, $df = 3$, $p < .05$). The null hypothesis could not be accepted. In order to clarify the nature of the difference, Duncan's post hoc analysis was used.

An examination of Table 12 indicates that the greatest difference in concept density was found between the Houghton Mifflin series and the Holt, Rinehart and Winston series.



Table 12. Homogeneous Subsets of Means of
Concept Density at the Lower
Elementary Level
(Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Houghton Mifflin	1.9000
	Harcourt, Brace, Jovanovich	2,3600
B	Harcourt, Brace, Jovanovich	2,3600
	Allyn and Bacon	2,5000
C	Allyn and Bacon	2.5000
	Holt, Rinehart, Winston	3.0400

An examination of Table 12 indicates that the greatest difference in concept density was found between the Houghton Mifflin series and the Holt, Rinehart and Winston series. The Harcourt, Brace and Jovanovich series and the Allyn and Bacon series are very similar in concept density at the lower elementary level.

The Seventh Hypothesis

Ho 7: There is no significant difference in concept abstractness among the four series at the upper elementary level.

This hypothesis was statistically treated using an analysis of variance and Duncan's Multiple Range Test to allow for a comparison of differences among means (see Tables 13 and 14).

There was a significant difference in concept abstractness among the four series in the upper elementary level tests ($F = 3.8726$, $df = 3$, $p .05$). The null hypothesis could

Table 13. Analysis of Variance of Concept Abstractness at the Upper Elementary Level

<u>Concept Abstractness at the Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	6.1400	3	3.8726
p < .05			

not be accepted. In order to note the nature of these differences, Duncan's post hoc analysis was run, the results of which are shown in Table 14.

Table 14. Homogeneous Subsets of Means of Concept Abstractness at the Upper Elementary Level (Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Houghton Mifflin	1.0600
	Holt, Rinehart, Winston	1.0600
	Allyn and Bacon	1.2400
B	Harcourt, Brace, Jovanovich	1.8000

An inspection of Table 14 suggests that the Harcourt, Brace, and Jovanovich series is notably different from the other three series in concept abstractness at the upper elementary level.

The Eighth Hypothesis

Ho 8: There is no significant difference in concept abstractness among the four series at the lower elementary level.



This hypothesis was studied by using a one-way analysis of variance. To allow for a comparison of means, the Duncan procedure was used (see Tables 15 and 16).

Table 15. Analysis of Variance of Concept Abstractness at the Lower Elementary Level

Concept Abstractness at the Lower Elementary Level	Mean Square	df	F Ratio
	1.0983	3	1.0111
p > .05			

No evidence of significant differences was found in concept abstractness among the four series at the lower elementary level ($F = 1.0111$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. Duncan's Multiple Range Test was used to allow for an inspection of the means.

Table 16. Homogeneous Subsets of Means of Concept Abstractness at the Lower Elementary Level (Duncan Procedure)

Subset	Series	Mean
A	Holt, Rinehart, Winston	.6600
	Allyn and Bacon	.8000
	Harcourt, Brace,	
	Jovanovich	.9200
	Houghton Mifflin	1.0000



The data in Table 16 suggest that all four series are very similar in concept abstractness in the lower elementary level texts.

The Ninth Hypothesis

Ho 9: There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency list.

A one-way analysis of variance was used to test this hypothesis, and Duncan's post hoc analysis provided for an examination of the means (see Tables 17 and 18).

Table 17. Analysis of Variance of Vocabulary Difficulty at the Upper Elementary Level as Determined by a Word Frequency List

<u>Vocabulary Difficulty/ Word Frequency List Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	.0744	3	.4545
p > .05			

No evidence of significant differences was found among the four series in vocabulary difficulty as determined by a word frequency list at the upper elementary level ($F = .4545$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. In order to observe any differences which might be present among means, the Duncan procedure for post hoc analysis was used.

The data in Table 16 suggest that all four series are very similar in concept abstractness in the lower elementary level texts.

The Ninth Hypothesis

Ho 9: There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency list.

A one-way analysis of variance was used to test this hypothesis, and Duncan's post hoc analysis provided for an examination of the means (see Tables 17 and 18).

Table 17. Analysis of Variance of Vocabulary Difficulty at the Upper Elementary Level as Determined by a Word Frequency List

<u>Vocabulary Difficulty/ Word Frequency List Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	.0744	3	.4545
p > .05			

No evidence of significant differences was found among the four series in vocabulary difficulty as determined by a word frequency list at the upper elementary level ($F = .4545$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. In order to observe any differences which might be present among means, the Duncan procedure for post hoc analysis was used.



Table 18. Homogeneous Subsets of Means of Vocabulary
Difficulty at the Upper Elementary Level as
Determined by a Word Frequency List
(Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Allyn and Bacon	.7840
	Holt, Rinehart, Winston	.7877
	Harcourt, Brace,	
	Jovanovich	.8020
	Houghton Mifflin	.8101

An examination of Table 18 shows that all series are very similar in vocabulary difficulty in upper elementary texts as determined by a word frequency list.

The Tenth Hypothesis

Ho 10: There is no significant difference in vocabulary difficulty among the four series at the lower elementary level as determined by a word frequency list.

This hypothesis was statistically treated using an analysis of variance and Duncan's Multiple Range Test (see Tables 19 and 20).

Table 19. Analysis of Variance of Vocabulary
Difficulty at the Lower Elementary Level
as Determined by a Word Frequency List

<u>Vocabulary Difficulty/ Word Frequency List Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	1.2598	3	8.9750
p < .05			

There was a significant difference in vocabulary difficulty at the lower elementary level as determined by a word frequency list ($F = 8.9750$, $df = 3$, $p < .05$). The null hypothesis could not be accepted. To clarify the nature of the differences, Duncan's post hoc analysis was run. The results are reported in Table 20.

Table 20. Homogeneous Subsets of Means of Vocabulary Difficulty at the Lower Elementary Level as Determined by a Word Frequency List (Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Harcourt, Brace,	
	Jovanovich	.7900
	Holt, Rinehart, Winston	.8000
	Allyn and Bacon	.8240
B	Houghton Mifflin	.9012

Examination of Table 20 indicates that the Houghton Mifflin series is notably different from the other three series in vocabulary difficulty at the lower elementary level as determined by a word frequency list.

The Eleventh Hypothesis

Ho 11: There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency table.

In analyzing this hypothesis, a one-way analysis of variance was used. Also, Duncan's post hoc analysis was used to allow for an inspection of the means (see Tables 21 and 22).



Table 21. Analysis of Variance of Vocabulary Difficulty at the Upper Elementary Level as Determined by a Word Frequency Table

<u>Vocabulary Difficulty/ Word Frequency Table Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	322670574.8226	3	1.8665
p > .05			

No evidence of significant differences was found among the four series in vocabulary difficulty at the upper elementary level as determined by a word frequency table ($F = 1.8655$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. The Duncan post hoc analysis was used to note any differences among the means.

Table 22. Homogeneous Subsets of Means of Vocabulary Difficulty at the Upper Elementary Level as Determined by a Word Frequency Table (Duncan Procedure)

<u>Subset</u>	<u>Series</u>	<u>Mean</u>
A	Harcourt, Brace, Jovanovich	5639.1412
	Houghton Mifflin	6157.0673
	Allyn and Bacon	7035.3747
	Holt, Rinehart, Winston	7388.6660

The data shown in Table 22 indicates that the four series are very similar in vocabulary difficulty at the upper elementary level as determined by a word frequency table.

The Twelfth Hypothesis

Ho 12: There is no significant difference in vocabulary difficulty among the four series at the lower elementary level as determined by a word frequency table.

An analysis of variance was used in evaluating this hypothesis. In addition, Duncan's Multiple Range Test permitted a close inspection of differences among the means (see Tables 23 and 24).

Table 23. Analysis of Variance of Vocabulary Difficulty at the Lower Elementary Level as Determined by a Word Frequency Table

<u>Vocabulary Difficulty/ Word Frequency Table Upper Elementary Level</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
	330057239.8044	3	1.1965
p > .05			

No evidence of significant differences was found among the four series in vocabulary difficulty at the lower elementary level as determined by a word frequency table ($F = 1.1965$, $df = 3$, $p > .05$). The null hypothesis could not be rejected. The Duncan Multiple Range Test was run to allow for an inspection of the means.

An inspection of Table 24 reveals that all the series are very similar to one another in vocabulary difficulty at the lower elementary level as determined by a word frequency table.



The Thirteenth Hypothesis

- Ho 13.0: There is no significant difference in syntactic complexity between the upper and lower elementary level as determined by the number of prepositional phrase modifiers.
- Ho 13.1: There is no significant difference in syntactic complexity between the upper and lower elementary level of the Houghton Mifflin series as determined by the number of prepositional phrase modifiers.
- Ho 13.2: There is no significant difference in syntactic complexity between the upper and lower elementary level of the Holt, Rinehart, and Winston series as determined by the number of prepositional phrase modifiers.
- Ho 13.3: There is no significant difference in syntactic complexity between the upper and lower elementary level of the Harcourt, Brace, and Jovanovich series as determined by the number of prepositional phrase modifiers.
- Ho 13.4: There is no significant difference in syntactic complexity between the upper and lower elementary level of the Allyn Bacon series as determined by the number of prepositional phrase modifiers.

The hypotheses were statistically treated using an analysis of variance (see Table 25).

There was a significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of prepositional phrase modifiers ($F = 6.5000$, $df = 1$, $p < .05$). The null hypothesis was rejected. There was a significant difference in syntactic complexity between the two levels of the Houghton Mifflin series as determined by the number of prepositional phrase



Table 25. Analysis of Variance Table for
Significant Differences of Syntactic
Complexity Between Levels as
Determined by the Number of
Prepositional Phrase Modifiers

<u>Series</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
Entire population	7.4334	1	6.5000*
Houghton Mifflin	13.6900	1	15.3118*
Holt, Rinehart, Winston	5.1976	1	3.5983
Harcourt, Brace, Jovanovich	4.5927	1	4.6580*
Allyn and Bacon	1.6900	1	1.4945

* $p < .05$

modifiers ($F = 15.3118$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidence of significant differences was found in syntactic complexity between the two levels of the Holt, Rinehart and Winston series as determined by the number of prepositional phrase modifiers ($F = 3.5983$, $df = 1$, $p > .05$). The null hypothesis could not be rejected. There was a significant difference in syntactic complexity between the two levels of the Harcourt, Brace and Jovanovich series as determined by the number of prepositional phrase modifiers ($F = 4.6580$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidences of significant differences was found in syntactic complexity between the two levels of the Allyn and Bacon series as determined by the

number of prepositional phrase modifiers ($F = 1.4945$, $df = 1$, $p > .05$). The null hypothesis could not be rejected.

To allow for the observation of specific differences between means, a mean summary table is provided (Table 26).

Table 26. A Mean Summary Table of Syntactic Complexity Between Levels as Determined by the Number of Prepositional Phrase Modifiers

<u>Series</u>	<u>Level</u>	<u>Sum</u>	<u>Mean</u>
Entire population	Upper	235.0000	1.1750
	Lower	157.0000	.7889
Houghton Mifflin	Upper	62.0000	1.2400
	Lower	25.0000	.5000
Holt, Rinehart, Winston	Upper	67.0000	1.3137
	Lower	43.0000	.8600
Harcourt, Brace, Jovanovich	Upper	66.0000	1.3469
	Lower	36.0000	.7347
Allyn and Bacon	Upper	40.0000	.8000
	Lower	53.0000	1.0600

The Fourteenth Hypothesis

Ho 14.0: There is no significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

Ho 14.1: There is no significant difference in syntactic complexity between the upper and lower elementary levels of the Houghton Mifflin series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

- Ho 14.2: There is no significant difference in syntactic complexity between the upper and lower elementary levels of the Holt, Rinehart, and Winston series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.
- Ho 14.3: There is no significant difference in syntactic complexity between the upper and lower elementary levels of the Harcourt, Brace, and Jovanovich series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.
- Ho 14.4: There is no significant difference in syntactic complexity between the upper and lower elementary levels of the Allyn and Bacon series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

To analyze these hypotheses, an analysis of variance was used (see Table 27).

No evidence of significant differences was found in syntactic complexity between the upper and lower elementary levels as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause ($F = 1.9875$, $df = 1$, $p > .05$). The null hypothesis could not be rejected. No evidence of significant difference was found in syntactic complexity between the upper and lower elementary levels of the Houghton Mifflin series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object pattern of the independent clause



Table 27. Analysis of Variance Table for Significant Differences of Syntactic Complexity Between Levels as Determined by the Number of Complex Sentences Containing Relative Clauses which Interrupt the Subject-Verb-Object Sequence of the Independent Clause

<u>Series</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
Entire population	.0625	1	1.9875
Houghton Mifflin	.0400	1	.5355
Holt, Rinehart, Winston	.0000	1	.0000
Harcourt, Brace, Jovanovich	.0900	1	3.1277
Allyn and Bacon	.0000	0	.0000
p > .05			

($F = .5355$, $df = 1$, $p > .05$). The null hypothesis could not be rejected. No evidence of significant differences was found in syntactic complexity between the upper and lower elementary levels of the Holt, Rinehart and Winston series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object pattern of the independent clause ($F = 0$, $df = 0$, $p > .05$). The null hypothesis could not be rejected. No evidence of significant differences was found in syntactic complexity between the upper and lower elementary levels of the Harcourt, Brace and Jovanovich series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequences of the independent clause ($F =$



3.1277, $df = 1$, $p > .05$). The null hypothesis could not be rejected. No evidence of significant differences was found in syntactic complexity between the upper and lower elementary levels of the Allyn and Bacon series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clauses ($F = .0000$, $df = 0$, $p > .05$). The null hypothesis could not be rejected.

So that specific differences between means may be noted, a mean summary table is presented in Table 28.

Table 28. A Mean Summary Table of Syntactic Complexity Between Levels as Determined by the Number of Complex Sentences Containing Relative Clauses which Interrupt the Subject-Verb-Object Sequence of the Independent Clause

<u>Series</u>	<u>Level</u>	<u>Sum</u>	<u>Mean</u>
Entire population	Upper	4.0000	.0200
	Lower	9.0000	.0450
Houghton Mifflin	Upper	3.0000	.0600
	Lower	5.0000	.1000
Holt, Rinehart, Winston	Upper	1.0000	.0200
	Lower	1.0000	.0200
Harcourt, Brace, Jovanovich	Upper	.0000	.0000
	Lower	3.0000	.0600
Allyn and Bacon	Upper	.0000	.0000
	Lower	.0000	.0000

The Fifteenth Hypothesis

Ho 15.0: There is no significant difference in concept density between the upper and lower elementary levels.

Ho 15.1: There is no significant difference in concept density between the upper and lower elementary levels of the Houghton Mifflin series.

Ho 15.2: There is no significant difference in concept density between the upper and lower elementary levels of the Holt, Rinehart, and Winston series.

Ho 15.3: There is no significant difference in concept density between the upper and lower elementary levels of the Harcourt, Brace, and Jovanovich series.

Ho 15.4: There is no significant difference in concept density between the upper and lower elementary levels of the Allyn and Bacon series.

These hypotheses were evaluated statistically by using an analysis of variance (see Table 29).

Table 29. Analysis of Variance Table for Significant Differences in Concept Density Between Upper and Lower Elementary Levels

<u>Series</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
Entire population	26.5225	1	12.3859*
Houghton Mifflin	15.2100	1	8.3096*
Holt, Rinehart, Winston	1.4400	1	.6031
Harcourt, Brace, Jovanovich	25.0000	1	12.4340*
Allyn and Bacon	.0400	1	.0214

*p < .05

There was a significant difference in concept density between the upper and lower elementary levels ($F = 12.3859$,



df = 1, $p < .05$). The null hypothesis could not be accepted. There was a significant difference in concept density between upper and lower elementary levels of the Houghton Mifflin series ($F = 8.3096$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidence of significant difference was found in concept density between upper and lower elementary levels of the Holt, Rinehart and Winston series ($F = .6031$, $df = 1$, $p > .05$). The null hypothesis could not be rejected. There was a significant difference in concept density between upper and lower elementary levels of the Harcourt, Brace and Jovanovich series ($F = 12.4340$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidence of significant differences was found in concept density between upper and lower elementary levels of the Allyn and Bacon series ($F = .0214$, $df = 1$, $p > .05$). The null hypothesis could not be rejected.

In order to permit an examination of the means, a mean summary table is included (Table 30).

Table 30. A Mean Summary Table of Concept Density Between Upper and Lower Elementary Levels

<u>Series</u>	<u>Level</u>	<u>Sum</u>	<u>Mean</u>
Entire population	Upper	593.0000	2.9650
	Lower	490.0000	2.4500
Houghton Mifflin	Upper	134.0000	2.6800
	Lower	95.0000	1.9000
Holt, Rinehart, Winston	Upper	164.0000	3.2800
	Lower	152.0000	3.0400
Harcourt, Brace, Jovanovich	Upper	168.0000	3.3600
	Lower	118.0000	2.3600
Allyn and Bacon	Upper	127.0000	2.5400
	Lower	125.0000	2.5000

The Sixteenth Hypothesis

- Ho 16.0: There is no significant difference in concept abstractness between the upper and lower elementary levels..
- Ho 16.1: There is no significant difference in concept abstractness between the upper and lower levels of the Houghton Mifflin series.
- Ho 16.2: There is no significant difference in concept abstractness between the upper and lower levels of the Holt, Rinehart, and Winston series.
- Ho 16.3: There is no significant difference in concept abstractness between the upper and lower levels of the Harcourt, Brace, and Jovanovich series.
- Ho 16.4: There is no significant difference in concept abstractness between the upper and lower levels of the Allyn and Bacon series.

An analysis of variance was used to evaluate these hypotheses (see Table 31).

Table 31. Analysis of Variance Table for
Significant Differences in Concept
Abstractness Between Upper and
Lower Elementary Levels

<u>Series</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
Entire population	19.8025	1	14.4513*
Houghton Mifflin	.0900	1	.0618
Holt, Rinehart, Winston	4.0000	1	3.8416
Harcourt, Brace, Jovanovich	19.3600	1	10.2180*
Allyn and Bacon	4.8400	1	5.0936*

*p < .05

There was a significant difference in concept abstractness between the upper and lower elementary levels ($F = 14.4513$, $df = 1$, $p .05$). The null hypothesis could not be accepted. No evidence of significant differences was found in concept abstractness between the upper and lower elementary levels of the Houghton Mifflin series ($F = .0618$, $df = 1$, $p .05$). The null hypothesis could not be rejected. No evidence of significant differences was found in concept abstractness between the upper and lower elementary levels of the Holt, Rinehart, and Winston series ($F = 3.8416$, $df = 1$, $p .05$). The null hypothesis could not be rejected. There was a significant difference in concept abstractness between the upper and lower elementary levels of the Harcourt, Brace, and Jovanovich series ($F = 10.2180$, $df = 1$, $p .05$). The null hypothesis could not be accepted. There was a significant difference in concept density between the upper and lower elementary levels of the Allyn and Bacon series ($F = 5.0936$, $df = 1$, $p .05$). The null hypothesis could not be accepted.

A summary table of means (Table 32) is presented in order that exact differences between means may be observed.

Table 32. A Mean Summary Table of Concept Abstractness Differences Between Upper and Lower Elementary Levels

<u>Series</u>	<u>Level</u>	<u>Sum</u>	<u>Mean</u>
Entire population	Upper	258.0000	1.2900
	Lower	169.0000	.8450
Houghton Mifflin	Upper	53.0000	1.0600
	Lower	50.0000	1.0000
Holt, Rinehart, Winston	Upper	53.0000	1.0000
	Lower	33.0000	.6600
Harcourt, Brace, Jovanovich	Upper	90.0000	1.8000
	Lower	46.0000	.9200
Allyn and Bacon	Upper	62.0000	1.2400
	Lower	40.0000	.8000

The Seventeenth Hypothesis

- Ho 17.0: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels as determined by a word frequency list.
- Ho 17.1: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Houghton Mifflin series as determined by a word frequency list.
- Ho 17.2: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Holt, Rinehart, and Winston series as determined by a word frequency list.
- Ho 17.3: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Harcourt, Brace, and Jovanovich series as determined by a word frequency list.
- Ho 17.4: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Allyn

and Bacon series as determined by a word frequency list.

These hypotheses were studied statistically by using an analysis of variance (see Table 33).

Table 33. Analysis of Variance Table for Significant Differences in Vocabulary Difficulty Between Upper and Lower Elementary Levels as Determined by a Word Frequency List

<u>Series</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
Entire population	.5823	1	3.8142*
Houghton Mifflin	1.0594	1	8.7264*
Holt, Rinehart, Winston	.0380	1	.2289
Harcourt, Brace, Jovanovich	.0360	1	.2213
Allyn and Bacon	.4000	1	.1113

*p < .05

There was a significant difference in vocabulary difficulty between upper and lower elementary levels as determined by a word frequency list ($F = 3.8142$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. There was a significant difference in vocabulary difficulty between upper and lower elementary levels of the Houghton Mifflin series as determined by a word frequency list ($F = 8.7264$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidence of significant differences was found in vocabulary difficulty between upper and lower elementary levels of the



Holt, Rinehart, and Winston series ($F = .2289$, $df = 1$, $p .05$). The null hypothesis could not be rejected. No evidence of significant differences was found in vocabulary difficulty between the upper and lower elementary levels of the Harcourt, Brace, and Jovanovich series as determined by a word frequency list ($F = .2213$, $df = 1$, $p .05$). The null hypothesis could not be rejected. No evidence of significant differences was found in vocabulary difficulty between upper and lower elementary levels of the Allyn and Bacon series ($F = .1113$, $df = 1$, $p .05$). The null hypothesis could not be rejected.

To provide for a closer inspection of the difference between means, a means summary table is presented (see Table 34).

Table 34. A Mean Summary Table of Vocabulary Difficulty Between Upper and Lower Elementary Levels as Determined by a Word Frequency List

<u>Series</u>	<u>Level</u>	<u>Sum</u>	<u>Mean</u>
Entire population	Upper	1593.0000	.7961
	Lower	1654.0000	.8287
Houghton Mifflin	Upper	401.0000	.8101
	Lower	407.0000	.9012
Holt, Rinehart, Winston	Upper	397.0000	.7877
	Lower	400.0000	.8000
Harcourt, Brace, Jovanovich	Upper	401.0000	.8020
	Lower	395.0000	.7900
Allyn and Bacon	Upper	392.0000	.7840
	Lower	412.0000	.8240

The Eighteenth Hypothesis

- Ho 18.0: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels as determined by a word frequency table.
- Ho 18.1: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Houghton Mifflin series as determined by a frequency table.
- Ho 18.2: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Holt, Rinehart, and Winston series as determined by a word frequency table.
- Ho 18.3: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Harcourt, Brace, and Jovanovich series as determined by a word frequency table.
- Ho 18.4: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels of the Allyn and Bacon series as determined by a word frequency table.

An analysis of variance was used in statistically treating these hypotheses (see Table 35).

There was a significant difference in vocabulary difficulty between upper and lower elementary levels as determined by a word frequency table ($F = 14.2124$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. There was a significant difference in vocabulary difficulty between upper and lower elementary levels of the Houghton Mifflin series as determined by a word frequency table ($F = 7.8657$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidence of significant difference was found in vocabulary



Table 35. An Analysis of Variance Table of
Vocabulary Difficulty Between the
Upper and Lower Elementary Levels
as Determined by a
Word Frequency Table

<u>Series</u>	<u>Mean Square</u>	<u>df</u>	<u>F Ratio</u>
Entire population	.319E + 10	1	14.2124*
Houghton Mifflin	.188E + 10	1	7.8657*
Holt, Rinehart, Winston	.194E + 06	1	.0010
Harcourt, Brace, Jovanovoch	.300E + 10	1	14.0142*
Allyn and Bacon	.226E + 09	1	.9432

*p < .05

difficulty between upper and lower levels of the Holt, Rinehart, and Winston series as determined by a word frequency table ($F = .0010$, $df = 1$, $p > .05$). The null hypothesis could not be rejected. There was a significant difference in vocabulary difficulty between upper and lower levels of the Harcourt, Brace, and Jovanovich series as determined by a word frequency table ($F = 14.0142$, $df = 1$, $p < .05$). The null hypothesis could not be accepted. No evidence of significant differences was found in vocabulary difficulty between upper and lower elementary levels of the Allyn and Bacon series as determined by a word frequency table ($F = .9432$, $df = 1$, $p > .05$). The null hypothesis could not be rejected.



The following mean summary table (Table 36) is presented to permit the observation of specific differences between means.

Table 36. A Mean Summary Table of Vocabulary Difficulty Differences Between Upper and Lower Elementary Levels as Determined by a Word Frequency Table

<u>Series</u>	<u>Level</u>	<u>Sum</u>	<u>Mean</u>
Entire population	Upper	.13097E+08	6522.2311
	Lower	.16677E+08	8338.8265
Houghton Mifflin	Upper	3016963	6157.0673
	Lower	4458534	8917.0680
Holt, Rinehart, Winston	Upper	3694333	7388.6660
	Lower	3680382	7360.7640
Harcourt, Brace, Jovanovich	Upper	2875962	5639.1412
	Lower	4545377	9090.7540
Allyn and Bacon	Upper	3510652	7035.3747
	Lower	3993360	7986.7200



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The purpose of this study was to demonstrate that the written discourse within four social studies series published for elementary school children can be examined for variables, other than word length and sentence length, which may affect the reading difficulty levels of instructional materials. More specifically, the purpose was to compare four aspects of the language: syntactic complexity, concept density, concept abstractness, and vocabulary difficulty. From each of the four series, two levels of materials, upper elementary and lower elementary, were examined.

The previous chapters presented a description of the problem, a discussion of the related literature and research, an explanation of the methodology, and a presentation and analysis of the data generated by this study.

The present chapter is organized as follows: (1) major results and discussions, (2) implications, and (3) recommendations.

Major Results and Discussions

Ho 1: There is no significant difference in syntactic complexity among the four series at the upper elementary level as determined

by the number of prepositional phrase modifiers.

1. There was no significant difference among the four series in the number of prepositional phrase modifiers at the upper elementary level. However, while the difference was not statistically significant, the Allyn and Bacon series did have notably fewer prepositional phrase modifiers per sentence than did the other three series. This particular syntactic variable was selected for tabulation because it was found by Marcus (1971) to be one of the more difficult structures for students to comprehend.

Ho 2: There is no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of prepositional phrase modifiers.

2. There was a significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of prepositional phrase modifiers. The Allyn and Bacon series was found to have had the highest average number of prepositional phrase modifiers per sentence (1.06), while the Houghton Mifflin series was found to have the lowest average number of prepositional phrase modifiers per sentence (.5). This syntactic structure was selected for tabulation because it was found by Marcus (1971) to be the most difficult for students to comprehend.

Ho 3: There is no significant difference in syntactic complexity among the four series at the upper elementary level as determined by the number of complex sentences

containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

3. There was no significant difference in syntactic complexity among the four series as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object pattern of the independent clause. The occurrence of this syntactic structure was minimal in the samples extracted from the four series. The Harcourt, Brace, and Jovanovich series and the Allyn and Bacon series had no sentences which contained this structure. This structure was selected for tabulation because it was found by Marcus to be one of the more difficult structures for students to comprehend. Marcus found that sentences whose basic components were not separated were more easily understood by students.

Ho 4: There is no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-objective sequence of the independent clause.

4. There was no significant difference in syntactic complexity among the four series at the lower elementary level as determined by the number of complex sentences with relative clauses which interrupt the subject-verb-object pattern of the independent clause. As in the upper elementary levels, this syntactic structure seldom occurred in sample sentences. In the Allyn and Bacon series, no such structures were found. Marcus found this to be one of the



more difficult structures for students to grasp. Some students automatically assumed a noun-verb-noun pattern to be a subject-verb-object sequence.

Ho 5: There is no significant difference in concept density among the four series at the upper elementary level.

5. There was a significant difference in concept density among the four series at the upper elementary level. The Allyn and Bacon series contained the least number of concepts per sentence (2.5), while the Holt, Rinehart, and Winston series presented the greatest number of concepts per sentence to the reader (3.4). Some researchers, including Taylor and Lunstrum (1977), have expressed concern that large numbers of concepts are likely to present difficulties for young readers.

Ho 6: There is no significant difference in concept density among the four series at the lower elementary level.

6. There was a significant difference in concept density among the four series at the lower elementary level. The Houghton Mifflin series contained only 1.9 concepts per sentence. The Holt, Rinehart, and Winston series contained an average of 3.0 concepts per sentence, which was the highest average among the four series.

Ho 7: There is no significant difference in concept abstractness among the four series at the upper elementary level.

7. There was a significant difference in concept abstractness among the four series at the upper elementary level. The Houghton Mifflin series presented an average of



1.0 abstract concepts per sentence, which was the lowest average. The highest mean, 1.8, was recorded for the Harcourt, Brace, and Jovanovich series. Several researchers have reported that abstract terms tend to be more difficult for young readers to comprehend. Carner and Sheldon (1954), among others, report that in the social science field, "... the social studies in particular appear to contain an abundance of terms which serve to hinder comprehension" (p. 228). Concepts noted by Carner and Sheldon (1954) to be most difficult to grasp were those which were of a more abstract nature.

Ho 8: There is no significant difference in concept abstractness among the four series at the lower elementary level.

8. There was no significant difference in concept abstractness among the four series at the lower elementary level. The Holt, Rinehart, and Winston series had the lowest average number of abstract concepts per sentence (.67), while the Houghton Mifflin series had the highest average number (1.0) per sentence.

Ho 9: There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency list.

9. There was no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency list. The assumption was made that a series using large numbers of words which did not appear on the high frequency word list would



be more difficult to read than those using large numbers of words which appeared on the list. The Allyn and Bacon series had the most difficult vocabulary with seventy-eight percent of the words from the sample passages found on the word frequency list. The series having the least difficult vocabulary was the Houghton Mifflin series. Eighty-one percent of the words in the sample passages were found on the word frequency list.

Ho 10: There is no significant difference in vocabulary difficulty among the four series at the lower elementary level as determined by a word frequency list.

10. There was a significant difference in vocabulary difficulty at the lower elementary level as determined by a word frequency list. The Harcourt, Brace, and Jovanovich series had the most difficult vocabulary, with seventy-nine percent of its vocabulary words included on the word frequency list. The Houghton Mifflin series had the least difficult vocabulary, with ninety percent of its vocabulary words included on the word frequency list.

Ho 11: There is no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency table.

11. There was no significant difference in vocabulary difficulty among the four series at the upper elementary level as determined by a word frequency table. The Holt, Rinehart, and Winston series had the vocabulary with the highest word frequency, while the Harcourt, Brace, and Jovanovich series had the lowest word frequency.



Ho 12: There is no significant difference in vocabulary difficulty among the four series at the lower elementary level as determined by a word frequency table.

12. There was no significant difference in vocabulary difficulty as determined by a word frequency table among the four series at the lower elementary level. The Harcourt, Brace, and Jovanovich series utilized the vocabulary with the highest word frequency, while the Holt, Rinehart, and Winston series utilized a vocabulary with the lowest word frequency.

Ho 13: There is no significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of prepositional phrase modifiers.

13. There was a significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of prepositional phrase modifiers. In examining data for the entire upper and lower level populations, the researcher found significantly more prepositional phrase modifiers used in the upper level texts. This was also the case for the Houghton Mifflin series and the Harcourt, Brace, Jovanovich series. However, there was no significant difference in the number of prepositional phrase modifiers between the upper and lower levels of the Holt, Rinehart, and Winston and the Allyn and Bacon series. The researcher was surprised to find that within the Allyn and Bacon series, there were more prepositional phrase modifiers used in the lower elementary level text than in the



upper elementary text. Marcus (1971), in his study using intermediate grade students, found this syntactic structure to be one of the more difficult for students to comprehend.

Ho 14: There is no significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause.

14. There was no significant difference in syntactic complexity between the upper and lower elementary levels as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause. This structure appeared rarely in sample sentences. In the entire population, this syntactic structure appeared only thirteen times and was found more frequently within the lower level texts. Within both levels of the Allyn and Bacon series, and within the upper level of the Harcourt, Brace, and Jovanovich series, there were no sentences containing this structure; Marcus found this to be one of the more difficult structures for students to comprehend.

Ho 15: There is no significant difference in concept density between the upper and lower elementary levels.

15. There was a significant difference in concept density between the upper and lower elementary levels for the entire population. There was also a significant difference in concept density between levels of the Houghton Mifflin series and the Harcourt, Brace, and Jovanovich

series. For all texts, the number of concepts found within upper elementary passages exceeded the number found within lower level texts. However, the difference was not significant within the Holt, Rinehart, and Winston and Allyn and Bacon series. While collecting data involving concept presentation, the researcher noticed that meanings of concepts sometimes changed, which might tend to be confusing for young readers. For example, the concept "country" might be mentioned in a context which contrasts it with "city." In the same text, "country" may be used to name a particular place, as in a description of the United States as a great "country."

Ho 16: There is no significant difference in concept abstractness between the upper and lower elementary levels.

16. There was a significant difference in concept abstractness between the upper and lower elementary levels for the entire population. There were also significant differences between levels for the Harcourt, Brace, and Jovanovich series and Allyn and Bacon series. This significant difference did not occur within the Houghton Mifflin and Holt, Rinehart, and Winston series. In every case, concept abstractness was greater in upper level texts than in lower level texts.

Ho 17: There is no significant difference in vocabulary difficulty between the upper and lower levels as determined by a word frequency list.

17. There was a significant difference in vocabulary difficulty between the upper and lower elementary levels as determined by a word frequency list for the entire population. When the data for individual series were examined, a significant difference was found only within the Houghton Mifflin texts. For three of the four series, the greatest number of high frequency words was found in the lower elementary texts. However, it was surprising to find that the Harcourt, Brace, and Jovanovich texts contained the greatest number of high frequency words in the upper level text.

Ho 18: There is no significant difference in vocabulary difficulty between the upper and lower elementary levels as determined by a word frequency table.

18. There was a significant difference in vocabulary difficulty between the upper and lower elementary texts as determined by a word frequency table when the entire population was considered. This difference was also found within the Houghton Mifflin series and the Harcourt, Brace, and Jovanovich series. The investigator expected to find the vocabulary with the highest word frequency at the lower elementary levels. This occurred within all series except that published by Holt, Rinehart, and Winston. An examination of the means for this series showed the vocabulary with the highest word frequency to be used in the upper level text.

Implications

The presentation of data collected for this study illustrates that the written discourse of social studies



materials can be examined for various factors which may affect the reading difficulty levels of these materials. Researchers, including Chall (1950), Estes (1972), and others, have noted that readability formulas leave many questions concerning the reading difficulty levels of materials unanswered, since these formulas generally involve the study of only one or two variables. The evidence presented here indicates that it is possible to inspect the discourse of social studies materials for precise data about many different variables which may affect readability.

It has been further demonstrated that it is possible to make comparisons both between different series and between levels within the same series with regard to certain factors which may affect the readability levels of social studies materials.

The data collected in this study concerning syntactic structures indicate, in the opinion of the researcher, that prepositional phrase modifiers occur quite frequently within the written discourse of social studies materials. Marcus (1971) found this syntactic structure to be one of the most difficult for students to comprehend. For some series, there was very little difference between the upper and lower level texts in the number of prepositional phrase modifiers used per sentence. In the case of the Allyn and Bacon series, it was surprising to find that more prepositional phrase modifiers were used in the lower level text than in the upper level text. In the opinion of the

researcher, this syntactic structure, because of its high frequency, should be studied further for its possible effects on the reading difficulty levels of social studies materials.

According to the data presented in this investigation, syntactic complexity as determined by the number of complex sentences containing relative clauses which interrupt the subject-verb-object sequence of the independent clause, did not appear to be a prominent factor in any of the four series. This syntactic structure rarely occurred in sample sentences and, in several of the texts, did not occur at all. In this researcher's opinion, further study of this particular syntactic structure and its effect on the readability of social studies materials would be of lesser importance, since this structure appears so infrequently.

The data compiled in this study pertaining to concept density appears to indicate that this is a factor which warrants further study. There was a considerable discrepancy in the average number of concepts found in sample sentences from each series. In addition, in the Holt, Rinehart, and Winston series and the Allyn and Bacon series, there was almost no difference in the number of concepts mentioned in the upper level text and the number of concepts found in the sample sentences of lower level texts. This implies a possible assumption on the part of these publishing companies that sixth and third grade students can comprehend

equally well an equal number of concepts in an equal number of sentences.

The data pertinent to concept abstractness indicate, in the opinion of this researcher, that a large number of concepts with which students are confronted in social studies materials are of an abstract nature at both the upper and lower elementary levels. Carroll (1964) notes that abstract concepts are the most difficult for students to comprehend, since they cannot be defined in terms of sensory qualities. The data also suggest that some publishing companies assume that third grade students can effectively assimilate approximately the same number of abstract concepts per sentence as sixth graders. Some of the research in this area, such as the studies by Gill (1962) and Arnsdorf (1963), suggests that the ability to understand selected abstract concepts increases from grade to grade.

It is the view of this researcher that presentation of large numbers of concepts, and the abstractness of many of these concepts, should be studied further for effects on the comprehension of social studies materials by young readers. In addition, teachers' awareness of the presence of large numbers of concepts, many of which are abstract, may help them to better prepare students for the reading of social studies materials.

The data collected in this investigation revealed that vocabulary difficulty as determined by a word frequency list or a word frequency table does not necessarily differ

greatly from the lower to the upper level texts. The researcher expected to find a greater number of high frequency words utilized in the lower level texts, but in the case of the Harcourt, Brace, and Jovanovich series and the Allyn and Bacon series, the opposite proved to be true. While investigators have found that a high frequency vocabulary affects comprehension in a positive way, more research appears to be needed in the area of social studies specifically. In addition, the use of a word frequency list and a word frequency table clarified which series presented the most frequent vocabulary. However, in the opinion of this investigator, more research is necessary to determine the point at which an unfamiliar vocabulary begins to seriously hamper comprehension of social studies materials. The researcher also found that while a word frequency table may be more precise in measuring word frequency, the word frequency list is more practical as far as time and effort is concerned.

In the opinion of this researcher, the data pertinent to this investigation suggests two important implications for practice: (1) consumers of social studies materials need to be aware that there are many factors within these materials which may affect readability, and (2) textbook publishers should also be aware of these factors and their possible effects on readability as they produce social studies materials for use by elementary school students.



Recommendations

Some recommendations for further study which were generated from this study are:

1. This study should be extended using other variables which were not used in this study, but which may also negatively affect the reading difficulty levels of social studies materials.
2. A study should be conducted to investigate the effects of prepositional phrase modifiers on the comprehension of social studies materials by young readers.
3. More research is needed to determine the effects on comprehension of the presentation of large numbers of social studies concepts, especially those which are abstract in nature, and to determine whether or not the ability to comprehend such concepts increases from grade to grade.
4. More research should be conducted to determine the point at which an unfamiliar vocabulary seriously begins to hamper the comprehension of social studies materials by elementary students.



APPENDIX

SAMPLES OF DATA COLLECTION SHEETS FOR
SYNTACTIC COMPLEXITY, CONCEPTUAL DENSITY,
CONCEPTUAL ABSTRACTNESS, AND
VOCABULARY DIFFICULTY



SAMPLES OF DATA COLLECTION SHEETS FOR
SYNTACTIC COMPLEXITY, CONCEPTUAL DENSITY,
CONCEPTUAL ABSTRACTNESS, AND
VOCABULARY DIFFICULTY

Syntactic Complexity

Sample I: Prepositional Phrase Modifiers

1. Suddenly, I turned my head.
2. I ran on the beach and I swam in the surf.

<u>Series</u>	<u>Level</u>	<u>Prepositional Phrase Modifiers</u>	<u>Series</u>	<u>Level</u>	<u>Prepositional Phrase Modifiers</u>
1	2	0	1	2	2
	Sentence 1			Sentence 2	

Key: Series 1 = Houghton Mifflin
Level 2 = Lower Level



Sample II: Complex Sentences with Relative Clauses which Interrupt the Subject-Verb-Object Sequence of the Independent Clause

1. One important group that you belong to is your community.
2. What do the members of your community share?

<u>Series</u>	<u>Level</u>	<u>Relative Clause</u>		<u>Series</u>	<u>Level</u>	<u>Relative Clause</u>
1	2	1		1	2	0
	Sentence 1				Sentence 2	

Key: Series 1 = Houghton Mifflin
Level 2 = Lower Level

Conceptual Density

Sample I: Concept Density

1. The man driving the car is lost.
2. So is the puppy.

<u>Series</u>	<u>Level</u>	<u>Concepts</u>		<u>Series</u>	<u>Level</u>	<u>Concepts</u>
1	2	2		1	2	1
	Sentence 1				Sentence 2	

Key: Series 1 = Houghton Mifflin
Level 2 = Lower Level

Conceptual Abstractness

Sample I: Concept Awareness

1. The awful feeling did not go away, so I ran to my bed and lay across it.
2. I banged my fists down on my bed several times.

<u>Series</u>	<u>Level</u>	<u>Abstract Concepts</u>		<u>Series</u>	<u>Level</u>	<u>Abstract Concepts</u>
1	2	1		1	2	1
Sentence 1				Sentence 2		

Key: Series 1 = Houghton Mifflin
 Level 2 = Lower Level

Vocabulary Difficulty

Sample I: Vocabulary Difficulty as Determined by a Word Frequency List

1. ¹ Communities ^{2 3} in a country need services.

<u>Series</u>	<u>Level</u>	<u>Word Value</u>		<u>Series</u>	<u>Level</u>	<u>Word Value</u>		<u>Series</u>	<u>Level</u>	<u>Word Value</u>
1	2	0		1	2	1		1	2	1
Word 1				Word 2				Word 3		

Key: Series 1 = Houghton Mifflin
 Level 2 = Lower Level
 Word Value 1 = Included in high frequency word list
 Word Value 0 = Not included in high frequency word list

Sample II: Vocabulary Difficulty as Determined by a Word Frequency Table

1. ¹ ² ³
All the planets are like spaceships traveling

<u>Series</u>	<u>Level</u>	Word Fre- quen- cy	<u>Series</u>	<u>Level</u>	Word Fre- quen- cy	<u>Series</u>	<u>Level</u>	Word Fre- quen- cy
1	2	3497	1	2	16745	1	2	59
Word 1			Word 2			Word 3		

Key: Series 1 = Houghton Mifflin
 Level 2 = Lower Level



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