

INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.
2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.
3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.
4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.
5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms

300 North Zeeb Road
Ann Arbor, Michigan 48106

75-26,934

DAGDIGIAN, Elisabeth Ann, 1930-
READING DIFFICULTY AND THE RELATIONSHIP
AMONG COMPREHENSION, PRODUCTION, AND
PERCEIVED DIFFICULTY OF VERBALS.

The University of Arizona, Ed.D., 1975
Education, general

Xerox University Microfilms, Ann Arbor, Michigan 48106

© COPYRIGHTED

BY

ELISABETH ANN DAGDIGIAN

1975

iii

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED.

READING DIFFICULTY AND THE RELATIONSHIP AMONG COMPREHENSION,
PRODUCTION, AND PERCEIVED DIFFICULTY OF VERBALS

by

Elisabeth Ann Dagdigian

A Dissertation Submitted to the Faculty of the

DEPARTMENT OF READING

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF EDUCATION

In the Graduate College

THE UNIVERSITY OF ARIZONA

1 9 7 5

THE UNIVERSITY OF ARIZONA

GRADUATE COLLEGE

I hereby recommend that this dissertation prepared under my
direction by Elisabeth Ann Dagdigian
entitled Reading Difficulty and the Relationship Among
Comprehension, Production, and Perceived Difficulty
of Verbals
be accepted as fulfilling the dissertation requirement of the
degree of Doctor of Education

[Signature] April 15, 1975
Dissertation Director Date

After inspection of the final copy of the dissertation, the
following members of the Final Examination Committee concur in
its approval and recommend its acceptance:*

<u>Will L. Hale</u>	<u>April 14, 1975</u>
<u>Elizabeth M. Antley</u>	<u>April 14, 1975</u>
<u>Sarah Malinowski</u>	<u>April 15, 1975</u>
<u>Ruth W. Kingisley</u>	<u>April 15, 1975</u>
<u>[Signature]</u>	<u>April 15, 1975</u>

*This approval and acceptance is contingent on the candidate's
adequate performance and defense of this dissertation at the
final oral examination. The inclusion of this sheet bound into
the library copy of the dissertation is evidence of satisfactory
performance at the final examination.

STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the copyright holder.

SIGNED: Elisabeth A. Dagdizian

ACKNOWLEDGMENTS

Each of my committee members has contributed to my doctoral program and dissertation in his own distinctive manner. My sincere thanks to each of you, Dr. Sarah Dinham, Dr. William Valmont, and Dr. Elizabeth Antley.

Dr. Kenneth J. Smith, my dissertation director, and Dr. Ruth Kingsley, my minor advisor, have been the major factors in my accomplishing this project. I shall always be indebted to Dr. Smith for the opportunities he has provided. His well-timed suggestions of areas to explore, provocative questions about accepted practices, and low-key direction throughout the years have been greatly appreciated. My debt to Dr. Kingsley is of another kind. Her enthusiasm, warm encouragement, and confidence in me have made her a significant force in my life. Thank you, both.

I should also like to acknowledge the contribution of the people of Reading, Massachusetts. Through their continued support of a strong public school system they have provided me with the kind of education that emphasized questions rather than answers, and thinking rather than memorizing; they granted me a sabbatical year so I could think and ask; and they allowed me to ask our children the all-important questions. I sincerely appreciate the opportunities I have been given.

TABLE OF CONTENTS

	Page
LIST OF TABLES	vii
ABSTRACT	viii
CHAPTER	
1. INTRODUCTION	1
Background and Need for the Study	1
Comprehension	2
Production	2
Perceived Difficulty	3
Statement of the Problem	3
Definition of Terms	5
Assumptions	6
2. REVIEW OF THE LITERATURE	7
3. DESIGN OF THE STUDY	15
The Sample	15
The Instruments	17
Comprehension Instrument	17
Production Instrument	19
Perceived Difficulty Instrument	20
Administration of the Instruments	21
Scoring of the Instruments	22
Comprehension	22
Production	22
Perceived Difficulty	23
Analysis of the Data	23
Comprehension	23
Production	25
Perceived Difficulty	26
Delimitations	27
Limitations	27
4. FINDINGS OF THE STUDY	29
Comprehension	29
Hypothesis 1.0--Findings	30
Hypothesis 1.0--Discussion	30
Hypothesis 1.1--Findings	34
Hypothesis 1.2--Findings	36

TABLE OF CONTENTS--Continued

	Page
Hypotheses 1.1 and 1.2--Discussion	38
Comprehension--Summary	40
Production	41
Hypothesis 2.1--Findings	41
Hypothesis 2.2--Findings	42
Hypothesis 2.0--Findings	44
Production Findings--Discussion	44
Production--Summary	45
Perceived Difficulty	46
Hypothesis 3.1--Findings	46
Hypothesis 3.2--Findings	47
Hypothesis 3.0--Findings	49
Perceived Difficulty--Discussion	49
Perceived Difficulty--Summary	50
Summary of Findings	50
 5. SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS	 53
Summary	53
Comprehension	55
Production	55
Perceived Difficulty	55
Conclusions	56
Comprehension	56
Production	56
Perceived Difficulty	57
Implications for Education	57
Recommendations for Further Research	58
 APPENDIX A. PASSAGE SOURCES AND READABILITY DATA	 59
APPENDIX B. COMPREHENSION INSTRUMENTS	61
APPENDIX C. PRODUCTION INSTRUMENT	87
APPENDIX D. PERCEIVED DIFFICULTY INSTRUMENT	89
APPENDIX E. DIRECTIONS TO STUDENTS AT EACH GRADE LEVEL	91
REFERENCES	98

LIST OF TABLES

Table	Page
1. Cloze Test Means	31
2. Comprehension Difficulty Means	35
3. ANOVA--Comprehension Difficulty by Grade Levels	36
4. ANOVA--Comprehension Difficulty by Ability Levels	37
5. Production Means	42
6. ANOVA--Production by Grade Levels	43
7. ANOVA--Production by Ability Levels	43
8. Perceived Difficulty Means	47
9. ANOVA--Perceived Difficulty by Grade Levels . .	48
10. ANOVA--Perceived Difficulty by Ability Levels .	48

ABSTRACT

The purpose of this study was to determine which groups of children find verbals a factor in their ability to comprehend written material. Inquiry was also made into the possible relationship between the production of verbals and their effect on reading comprehension. Further, the question of whether children's perception of verbals as difficult for them to understand might be related to reading comprehension was investigated.

The nine hypotheses covered three areas: comprehension, production, and perceived difficulty of verbals. Comprehension hypotheses considered whether (1) passages containing verbals were more difficult for students in grades five, seven, nine, and eleven to comprehend than certain parallel passages; (2) comprehension difficulty of passages containing verbals decreased as grade level increased; and (3) comprehension difficulty of passages containing verbals decreased as overall reading ability increased at a given grade level.

Production hypotheses included whether (1) production of verbals was related to comprehension of passages containing verbals, (2) production of verbals increased as grade level increased, and (3) production of verbals

increased as overall reading ability increased at a given grade level.

Perceived difficulty hypotheses included whether (1) perceived difficulty of sentences containing verbals was related to comprehension of passages containing verbals, (2) perceived difficulty of verbals decreased as grade level increased, and (3) perceived difficulty of verbals decreased as overall reading ability increased at a given grade level.

The 240 subjects were students in the public schools of Reading, Massachusetts, a middle-class suburban community. Twenty students of each of three levels of overall reading ability as measured by a standardized reading test were drawn from the total population of grades five, seven, nine, and eleven.

Cloze tests were used to test comprehension. Two passages of approximately 250 words from a social studies text at each grade level were rewritten so the original passage and the new version differed by the inclusion of eight verbals. The verbals added were participles, gerunds, and adverbial uses of infinitives. Cloze tests deleting every fifth word were prepared. In each case one cloze test from an original passage and one from the other passage containing added verbals were paired. Production was measured through an instrument containing ten sets of kernel sentences, which were to be combined into single sentences. The perceived difficulty instrument contained ten pairs of

parallel sentences. Both sentences in each pair had been derived from the same kernel sentences.

Each student completed the production instrument, the perceived difficulty instrument, and two cloze tests, one from the original passage and one with added verbals from the other passage. All instruments were administered and scored by the investigator.

The data were subjected to statistical analysis, using the .05 level of significance. The findings related to comprehension were as follows: paragraphs containing a greater number of verbals were more difficult for students at grades five, seven, nine, and eleven to comprehend than parallel passages; the contribution of verbals to comprehension difficulty decreased from grade five to grade seven, and from the high ability group to the low group in grade eleven. Production findings included the following: production of verbals was related to comprehension of passages containing verbals in grade eleven, high and low ability groups; production of verbals increased from grade nine to grade eleven; and production of verbals increased from low to high ability groups in grades five and eleven. Perceived difficulty was not related to comprehension. Perceived difficulty of verbals decreased as overall reading ability increased in grade nine.

CHAPTER 1

INTRODUCTION

Although much research has been done on reading comprehension and readability, relatively little attention has been paid to elements of syntax as possible causes of difficulty (Russell and Fea, 1963). Far more emphasis has been placed on semantics. Developments in computer translation, however, point to the possibility that syntax can be more easily encoded and decoded than the lexical constituents of the language (Yngve, 1964). It would seem equally possible that the human decoder, the reader, could more efficiently process written language if the syntactic structures which cause him difficulty can be identified and interpreted.

Background and Need for the Study

A preliminary step in the identification of a potential area of language difficulty has already been taken. Studies of the written language of school children reveal that one of the major differences in language written by twelfth graders compared to that of their intermediate grade contemporaries is an increased use of verbals (Hunt, 1964). Though the levels at which these syntactic elements are produced by varying proportions of children have been

identified, there is little evidence available to suggest the levels at which the elements are easily comprehended.

Comprehension

The researcher's classroom observation of junior high students of average and below average ability suggests that verbals do, in fact, impede comprehension of written material. It is equally possible that older and younger children may share in the problem to varying degrees. If the levels at which these syntactic elements cause difficulty can be identified, reading instruction might well include consideration of them (Briggs, 1968). Work done with college students suggests that direct teaching of grammatical constructions can improve the comprehension of written material which embodies those constructions (Blumenfeld, Miller, and Coleman, 1965). Identification of the elements and grade levels would be a preliminary step to improving reading instruction.

Production

Studies of the acquisition of oral language in pre-school children suggest the possibility that comprehension precedes production (Fraser, Bellugi, and Brown, 1963). A corresponding parallel may exist in the ability of school age children to process syntax in written language. Should that be the case, the timing of instruction might well be affected.

Perceived Difficulty

A related issue is whether children think written verbals are difficult for them to understand. The accuracy of their perception could affect the manner in which instruction is offered.

Statement of the Problem

The problem which arises, therefore, is whether the researcher's observation that verbals, in particular participial phrases, gerunds, and adverbial uses of infinitives, cause difficulty in comprehension of written material by average and below average ninth graders can be supported by empirical evidence. A logically allied problem is the extension of the query to include above average ninth graders as well as older and younger students. Since the educational value of such evidence would be enhanced by information establishing the same students' facility in producing verbals and attitude toward them, the problem becomes a three-fold investigation to determine the relationship among comprehension, production, and perceived difficulty of verbals by students in the intermediate and upper grades.

Therefore, the problem investigated in this research study was as follows:

To identify which, if any, groups of readers at the fifth, seventh, ninth, and eleventh grade levels find verbals a factor in their ability to comprehend written

material, and to determine whether any relationships exist among the students' ability to comprehend verbals, to produce them in writing, and to perceive their difficulty.

The following hypotheses were examined:

1. Passages containing a greater number of verbals are more difficult for readers to comprehend than certain parallel passages.
 - 1.1 The contribution of verbals to comprehension difficulty decreases as the grade level increases.
 - 1.2 The contribution of verbals to comprehension difficulty decreases as overall reading comprehension ability at a given grade level increases.
2. Production of verbals is related to comprehension of passages containing verbals.
 - 2.1 Production of verbals increases as the grade level increases.
 - 2.2 Production of verbals increases as the overall reading comprehension ability at a given grade level increases.
3. Perceived difficulty of verbals is related to comprehension of passages containing verbals.
 - 3.1 Perceived difficulty of verbals decreases as the grade level increases.

3.2 Perceived difficulty of verbals decreases as the overall reading comprehension ability at a given grade level increases.

Definition of Terms

Throughout this study the following definitions applied (Christ, 1968):

1. Verbal--a participle, a gerund, or an infinitive, or a phrase containing one of them, its modifiers, and its completers.
2. Phrase--a group of related words having neither a subject nor a predicate.
3. Participle--the -ed or the -ing form of a verb used as an adjective to modify a noun or pronoun.
4. Gerund--the -ing form of a verb used as a noun.
5. Infinitive--the to form of a verb.
6. Adverb--a word which modifies a verb, an adjective, or another adverb.
7. Clause--a group of words containing a subject and a verb.
8. Simple sentence--a sentence containing only one clause.
9. Subordinate clause--a clause which is used as a noun, an adverb, or an adjective within a sentence.
10. Cloze comprehension test--a passage of written material in which every nth word has been deleted

and replaced by a blank. Comprehension of the passage is determined by the number of blanks successfully filled in (Bormuth, 1968).

Assumptions

The following assumptions underlay this study:

1. A percentile score on the reading comprehension portion of a standardized test indicates the relative ability of students within a grade level to comprehend written material.
2. Students at the fifth grade level and above are able to complete a cloze passage.
3. Students at the fifth grade level and above are able to combine two sentences into one.
4. Students at the fifth grade level and above are able to judge which of a pair of sentences they consider more difficult for them to understand.

CHAPTER 2

REVIEW OF THE LITERATURE

Research on the relationship between syntax and reading comprehension has begun to be reported. It is, however, difficult to compare findings from study to study as many different types of syntactical analysis and description are being used. The Strickland (1962) study established a schema of linguistic analysis which did not isolate certain grammatical constructions such as verbals. Her system has been used for subsequent studies on the relationship between reading comprehension and the similarity of the language of children's books to their oral language (Ruddell, 1963; Riling, 1965). Allen (1964) devised another system, sector analysis, which emphasizes the important units of the sentence. Yngve (1960) suggested a theory of mean word depth, based on the number of grammatical facts which must be kept in mind during the reading process. Generative transformational grammar, often used as a means of discussing children's acquisition of oral language (Chomsky, 1969) and development of written language (Hunt, 1964), also offers a framework for discussing reading comprehension (Coleman, 1964).

Occasionally researchers have used more than one model in their discussion of language complexity and comprehension. In his study of the relationship between sentence structure and the reading process, Schlesinger (1968) discusses both the mean word depth model and the transformational model. He finds both inadequate as sole descriptors of the complexity of language in relationship to reading comprehension, since sentences complex enough to provide a range of results with adults are rarely found in natural language. The possibility that other results might have obtained with less mature readers is open for consideration.

Nurss (1966) studied syntactic complexity and reading comprehension with primary grade children, using Yngve's mean word depth model, Allen's sector analysis, and traditional grammar. None of the complexity models correlated with the results of the comprehension tests. It is possible, however, that the single-sentence-story aspect of the research could account for the lack of discrimination. Perhaps longer selections embodying varied degrees of complexity would result in compounded difficulties and show different results.

To date few grammatical structures have been isolated for study as potential contributors to reading difficulty. Bormuth's (1964) study on the relationship of language variables and comprehension suggests several

possibilities for further study. Blumenfeld et al. (1965) studied passive constructions and nominalizations, nouns used in place of verb forms. Olds (1968) isolated several structures for study, including some uses of the infinitive, but his data did not provide enough examples of any one construction to make possible an analysis of its effect on comprehension. Bloomer (1966), using cloze tests in which specific parts of speech were deleted, found specific modifiers, nouns, and verbs more difficult for his fifth, seventh, ninth, and eleventh grade subjects to replace than prepositions, conjunctions, and noun determiners.

Robertson (1968) determined that children in grades four through six improved in their ability to understand seventeen connectives (subordinate and coordinate conjunctions). They had the greatest difficulty with however, and, thus, although, which, and yet. The inclusion of and in the list is surprising and may be a result of the design of her Connectives Reading Test instrument

Stoodt (1972), using a multiple choice test and cloze test, found that the comprehension of conjunctions correlated with reading comprehension for the fourth grade subjects. Certain conjunctions (when, so, but, or, where, while, how, that, and if) were more difficult than others (and, how, for, and as). The specific findings of the Robertson and Stoodt studies are difficult to equate as different specific conjunctions were considered, and

difficulty was considered a relative matter within the body of conjunctions studied. The studies do point up, however, a relationship between mastery of connectives and reading comprehension.

The relationship between syntax and reading comprehension occasionally is reported in studies of readability. Bormuth (1964) noted the high correlation of reading difficulty and the ratio of pronouns to conjunctions, and he discussed the possibility of improving the accuracy of readability predictors through the use of various types of linguistic variables.

Botel, Dawkins, and Granowsky (1973) have made the most extensive use, to date, of syntax as an indicator of readability. Their Syntactic Complexity Formula for the primary grades analyzes all the syntactic structures of sentences, giving varying weights to each. Passage difficulty is determined by the average total scores of the sentences in the passage. The very inclusiveness of the formula makes any extension of it to upper grade reading impractical. It does, however, provide a frame of reference for recognizing the relative difficulty of syntactic structures.

It is interesting to note that, within an assigned weight range of zero to three, the adverbial use of the infinitive is weighted one; the gerund as subject is weighted one, otherwise zero; and participles are weighted

one if they appear in normal adjective noun order, but have a count of two if they follow the noun or are separated from it by commas. No distinction is made between participles and participial phrases. The only three count structures are absolutes and clauses used as subjects, both relatively rare at any level of prose.

A recent development closely related to the subject of this research study is a change in the Spache Readability Formula (Spache, 1974). In the revision, users are instructed to consider any verb forms which function as nouns or adjectives to be unfamiliar words. The earlier version made no such distinction, allowing any use of the inflected form of a familiar verb to be considered as familiar.

The concern with syntax as a possible variable in reading comprehension has been the subject of several research studies which have presented subjects with passages written at different levels of syntactic complexity.

Ruddell (1963) followed up the results of the Strickland studies by investigating the ability of fourth grade students to comprehend a series of passages written with variations in the ratio of common oral and written structures. Using cloze tests, he determined that comprehension is a function of the similarity of oral and written patterns of language structures.

The same topic was investigated by Tatham (1970) with second and fourth grade subjects. Using separate

sentences instead of paragraphs, she found that students at both grade levels were better able to comprehend written sentences expressed in syntactic patterns which were more common in oral language than those which were less common. She also found that fourth graders were better able to comprehend the less frequently used oral language patterns than were the second graders.

Using the Hunt descriptions of syntactic maturity, Smith (1970) prepared paragraphs at the fourth, eighth, twelfth, and skilled adult levels and administered cloze tests made from them to students in grades four through twelve. He found that fourth graders read fourth grade writing best; that eighth through twelfth graders read eighth grade writing best; and that tenth and eleventh grade graders had the most difficulty with fourth grade writing. From this he concluded that there is a relationship between syntax and comprehension, and that a subject's level of productive syntactic maturation and the syntax he reads best are related. An interesting sidelight to this study is that the fourth graders' ranking of the passages about bees directly paralleled the number of verbals in those passages. They handled best the fourth grade passage, which was written with two verbals; then the twelfth with three; next the eighth with five; and finally the skilled adult with ten verbals.

Studying students in grades four through six, Fagan (1971) determined that deletion transformations and embedding were characteristic of the language the children found more difficult to read. Deletions and embedding are characteristic of verbals, as well as of other syntactic structures such as relative clauses.

Peltz (1974) analyzed writing samples of thirty-four tenth grade students and rewrote social studies text materials to match the means of the patterns he observed in the students' writing. He found that students performed better on cloze tests over the repatterned passages than over the original texts. On multiple choice tests, however, there was no significant difference in the results.

Seventh grade students were the subjects of the Hansell (1974) study. He modified the syntax and the vocabulary of good and poor literature samples to determine which versions would be most easily understood and most enjoyed by good, average, and poor readers. Using cloze tests, he determined that simplified syntax was easier to comprehend than the original version but that simplified vocabulary was even easier. It is interesting to note that the low ability group gave a higher enjoyability rating to the versions with the simplified syntax though their comprehension was greater on the versions with the simplified vocabulary.

Thus, the background work of Chomsky, Strickland, and Hunt have provided current researchers with tools to help them identify syntactic structures which may cause difficulty for students of varying levels of reading comprehension. The use to which the research is put will probably be determined after experimental studies involving instruction in syntax for readers have been conducted. Should such instruction not prove effective, further efforts to write material syntactically closer to children's oral and written patterns of syntax can be expected.

CHAPTER 3

DESIGN OF THE STUDY

The descriptive study to determine which, if any, groups of readers find verbals a factor in their ability to comprehend written material focused its attention on pupils of above average, average, and below average reading ability in grades five, seven, nine, and eleven. They were exposed to three instruments involving contrasts between verbals and other syntactic structures expressing the same thoughts. Information gathered from their performance with the instruments was used to test the hypotheses.

The Sample

The study was conducted in the public schools of Reading, Massachusetts, during the spring of 1972. All subjects spoke English as their native language, and English was the only language regularly spoken in their homes.

In order to check the language background and test results, the cumulative records of all students in grades five, seven, nine, and eleven were examined. The reading comprehension portion of the appropriate level of the Stanford Achievement Test had been administered and recorded by the school system's administration or guidance staff for

all students in grades five, seven and nine. Grade eleven students had been given the Co-operative Reading Test.

At each grade level (five, seven, nine and eleven) three lists were drawn up. List A contained the names of all students whose comprehension scores fell from the eightieth through the ninety-fifth percentile. List B contained the names of all students whose scores fell from the forty-third through the fifty-eighth percentile. List C contained the names of all students whose scores fell from the fifth through the twentieth percentile.

With the use of a table of random numbers (Wert, Neidt, and Ahmann, 1954, pp. 416-417), a sample of twenty subjects and eight alternates was drawn from each list. Cumulative records were examined to ascertain that English was the only language spoken regularly in the home. Two subjects who were regularly exposed to another language were dropped from the sample and replaced by alternates. Absentees on the testing date were also dropped from the sample and replaced by alternates.

The samples were designated by the grade number and the letter of the list from which they had been drawn. There were sixty subjects at each grade level and 240 in the study as a whole.

The Instruments

A separate instrument was prepared to test each of the general hypotheses. Comprehension of written material containing verbals was tested through the use of cloze passages. Production of verbals was assessed by the use of a sentence-combining instrument. Perceived difficulty was indicated through an instrument involving pairs of sentences, one with and one without a verbal.

Comprehension Instrument

Cloze comprehension tests were used in measuring students' comprehension of passages containing verbals. The advantage of this type of comprehension test is that it measures comprehension of the passage itself, without introducing uncontrolled variables such as the kinds of questions and the syntax of the questions. Bormuth's (1968) study has established procedures which appear to be valid and economical and which measure comprehension to the same degree that the reliabilities of the test with which the cloze test is compared will allow. His procedures are endorsed by Potter's (1969) report and are also consistent with MacGinitie's (1961) observation of the relative unimportance of context more than five words distant from the word to be restored.

For each grade level, four cloze tests were prepared. Two passages were selected from a social studies

text appropriate to the grade level but unfamiliar to the students. In some cases, verbals appearing in the original text were rephrased as other syntactic structures. The passages had minimum lengths of 250 words. The actual length of the passage was determined by the last word of the sentence in which the 250th word fell. Of the first 250 words, every fifth word was deleted and replaced with a blank fifteen spaces long. Thus, each passage had fifty blanks, with the portion of the last sentence running beyond the last blank intact.

The other two cloze tests were constructed in the same manner from passages prepared by the examiner. These passages differed from the parallel passages only in that eight syntactic structures were rephrased as verbals. Concept load and vocabulary were held constant. The total number of words in the passages, however, varied slightly, since condensation is an inherent feature of verbal constructions. Because concept load, vocabulary, and number of words in the passages cannot all be held constant when verbals are employed, it seemed preferable to keep constant those elements which could introduce an uncontrolled variable, in this case concept load and vocabulary, and allow the variation in the number of words, since that is the factor inherently related to the use of verbals. Nevertheless, each cloze test made from a passage with added verbals also had at least 250 words incorporating

fifty blanks, with the portion of the last sentence running beyond the last blank intact.

All passages had Dale-Chall readability levels appropriate to the grade level placement of the students (Dale and Chall, 1948).

Each cloze test was designated with a three part label. The first item was the grade level; next, the selection from which it was prepared; then A if it contained added verbals, or P if it was the original parallel passage. Hence the fifth grade cloze tests were labelled 5-1-A, 5-1-P, 5-2-A, and 5-2-P.

To prevent any subject from having two tests prepared from the same passage, the tests were paired. Each pair included (1) a cloze test prepared from one of the passages with added verbals, and (2) a cloze test prepared from the other parallel passage. The order of the tests within each pair was systematically rotated. Data relating to the passage are included in Appendix A. The cloze instruments are in Appendix B.

Production Instrument

To assess production of verbals, an instrument was prepared which contained ten pairs of simple sentences. In each case the content of the sentences was such that the pair of sentences could be combined into one sentence by using a verbal or another construction. Vocabulary for the

sentences was controlled by using only words which appeared on the EDL word list, grade four or below (Taylor and Frackenpohl, 1960). The same instrument was used for all grade levels. A copy of the instrument is included in Appendix C.

Perceived Difficulty Instrument

Perceived difficulty was examined by direct questioning. Good and Scates (1954) list direct rating as one of the less satisfactory data gathering devices but acknowledge its importance as a technique for gathering evidence in many practical problems. They further suggest that problems and procedures of this type should not be avoided because they cannot be done perfectly; researchers should get started on their work, on the assumption that less sophisticated beginnings may provide leads to later, more sophisticated research. Strang (1967) also encourages the use of direct questioning in research.

An instrument was prepared which contained ten pairs of parallel sentences. Both sentences in each pair had been derived from the same simple sentences. One sentence in the pair contained a verbal. The other sentence contained the same idea expressed in a subordinate clause. The order of the sentences in each pair was randomly established. Subjects were directed to check the sentence in each pair which they felt was easier for them to understand. Choice of the

sentence containing the subordinate clause was construed as perceived difficulty of the sentence containing the verbal.

Once again, only words which appeared on the EDL word list, grade four or below, were used. The same instrument was used for all grade levels. A copy of the instrument is included in Appendix D.

Administration of the Instruments

Prior to the main study, the researcher conducted a pilot study with a group of twenty volunteers from a neighboring community. The students ranged from grades four through eleven. The purposes of the pilot study were to test the instruments, to ascertain the kind of directions needed, and to determine the approximate length of time needed to administer the instruments. These students were not used in the main study.

During the study, the researcher administered all instruments to each sample group within its own school setting.

To insure independence of observations, the instruments were administered in the following order:

1. Sentences for Combining--to measure production.
2. Paired Sentences--to measure perceived difficulty.
3. Cloze Passages--to measure comprehension.

Directions for the administration of each instrument were printed for each grade level. All were read aloud by

the researcher when each instrument was presented. Each instrument was collected before the next was distributed. The directions are included in Appendix E.

Scoring of the Instruments

Comprehension

To determine whether passages containing a greater number of verbals are more difficult for readers to comprehend than parallel passages, the cloze passages were corrected and the number of correct responses counted. An answer was considered correct only if it was the exact word of the original passage, except that faulty spelling was accepted (Bormuth, 1968).

The scores obtained on each passage were listed in descending order. Comprehension difficulty scores were obtained by subtracting scores on the passages containing verbals from scores on the original parallel passages. Thus no possible difference in difficulty of the two original passages at each grade level affected the results. The number of correct responses and the comprehension difficulty scores were used in the statistical analysis.

Production

To determine whether production of verbals is related to comprehension of passages containing verbals, the sentences which subjects produced by combining pairs of

simple sentences were examined. The number of sentences in which a verbal appeared was counted and the score thus obtained represented the production of verbals. These scores were used in the statistical analysis.

Perceived Difficulty

To determine whether perceived difficulty of verbals is related to actual difficulty in the comprehension of passages containing verbals, ten pairs of sentences, one containing a subordinate clause and the other a verbal, were examined. The number of choices of the sentence containing the subordinate clause was counted, and the scores thus obtained represented the perceived difficulty of sentences containing verbals. These scores were used in the statistical analysis.

Analysis of the Data

Statistical analysis of the data was carried out by established procedures described by Hays (1963), Downie and Heath (1965), and Glass and Stanley (1970). All tests were conducted at the .05 level of probability.

Comprehension

The general hypothesis, that passages containing a greater number of verbals are more difficult for readers to comprehend than certain parallel passages, was tested in two steps. At each grade level a test of means was conducted on

the cloze test scores from the two types of passages. ANOVA's were administered to test the two sub-hypotheses.

The scores of the cloze tests made from the passages with added verbals and the cloze tests made from the parallel passages were compared for all ability groups at all grade levels. Tests for the significance of the difference between means for correlated data were conducted (Downie and Heath, 1965). The comprehension difficulty scores from the sample groups whose mean differences met the .05 level of probability were used to test Hypotheses 1.1 and 1.2.

Hypothesis 1.1, that the contribution of verbals to comprehension difficulty decreases as the grade level increases, was tested by conducting a one way analysis of variance, fixed effects model (Hays, 1963), on the comprehension difficulty scores obtained at the four grade levels. Tukey's method of multiple comparisons (Glass and Stanley, 1970) was used to determine which grade levels were different.

Hypothesis 1.2, that the contribution of verbals to comprehension difficulty decreases as overall reading comprehension ability at a given grade level increases, was tested by conducting a one way analysis of variance, fixed effects model, on the comprehension difficulty scores obtained in each of the three reading ability levels at a given grade.

Tukey's post hoc procedure was used to determine which ability levels contributed to the difference.

Production

The general hypothesis, that production of verbals is related to comprehension of passages containing verbals, was tested through its two component sub-hypotheses and the comparison of the results of those tests with the results of the tests of the first general hypothesis.

Hypothesis 2.1, that production of verbals increases as the grade level increases, was tested by conducting a one way analysis of variance, fixed effects model, on the production scores obtained at the four grade levels. Tukey's post hoc procedure was used to determine which grade levels supported the hypothesis.

Hypothesis 2.2, that production of verbals increases as the overall reading comprehension ability at a given grade level increases, was tested by conducting a one way analysis of variance, fixed effects model, on the production scores obtained in each of the three reading ability levels at a given grade. This was done for each of the four grade levels. Tukey's post hoc procedure was used to determine which ability levels contributed to the difference.

The results of the production tests-of-significance were considered with the results of the comprehension tests-of-significance, and the relationship was reported.

Perceived Difficulty

The general hypothesis, that perceived difficulty of verbals is related to comprehension of passages containing verbals, was tested through its two component sub-hypotheses and the comparison of the results of those tests with the results of the tests of the first and the second general hypotheses.

Hypothesis 3.1, that perceived difficulty of verbals decreases as grade level increases, was tested by conducting a one way analysis of variance, fixed effects model, on the perceived difficulty scores obtained at the four grade levels. Tukey's post hoc procedure was used to determine which grade levels contributed to the difference.

Hypothesis 3.2, that perceived difficulty of verbals decreases as the overall reading comprehension ability at a given grade level increases, was tested by conducting a one way analysis of variance, fixed effects model, on the perceived difficulty scores obtained in each of the three reading ability levels at a given grade. This was done for each of the four grade levels. Tukey's post hoc procedure was used to determine which ability levels contributed to the difference.

The results of the perceived difficulty tests-of-significance were considered along with the results of the comprehension tests-of-significance, and the relationship was reported.

Delimitations

The proposed study was undertaken within the following delimitations:

1. The sample was drawn from students in one school system of a suburb of Boston, Massachusetts.
2. The sample consisted of students who speak English as their native language, with English the only language regularly spoken in their homes.
3. The syntactic structures under investigation were the participial phrase, the gerund, and the adverbial use of the infinitive.
4. The structures were considered as a group. No distinction was made of the relative difficulty of the items within the group.

Limitations

The proposed study was subject to the following limitations:

1. The tests which classify students in different grades into levels of general reading comprehension ability were different at one of the grade levels.
2. The tests which classify students in different grades into levels of general reading comprehension ability were given by different people, under varying conditions, and at different times before the research was undertaken.

3. The results of the study were limited by the appropriateness, the validity, and the reliability of the instruments prepared by the researcher.

CHAPTER 4

FINDINGS OF THE STUDY

This chapter reports findings for the study of the effect of verbals on the reading comprehension of students in grades five, seven, nine, and eleven. A discussion of the findings follows. Then the findings of the study of the production of verbals are reported and discussed. Next come the findings regarding the perceived difficulty of verbals, followed by a discussion. At the end of the chapter the findings are summarized.

Comprehension

The study of comprehension involved three hypotheses. Hypothesis 1.0, that paragraphs containing a greater number of verbals are more difficult for readers to comprehend than certain parallel passages, was confirmed at each grade level. Hypothesis 1.1, that the contribution of verbals to comprehension difficulty decreases as grade level increases, was supported for grades five and seven. Hypothesis 1.2, that the contribution of verbals to comprehension difficulty decreases as overall reading comprehension ability at a given grade level increases, was supported in grade eleven high and low groups. A detailed report and discussion of the findings for each hypothesis follows.

Hypothesis 1.0--Findings

Hypothesis 1.0, that paragraphs containing a greater number of verbals are more difficult for readers to comprehend than certain parallel passages, was confirmed at each grade level. Total cloze test scores on the two types of passages at each grade level, when subjected to a one-tailed test of means, were shown to be different at the .01 level (Table 1). At each grade level, the cloze scores on passages with added verbals were lower than the scores on the parallel passages. Cells within the grades, however, were not consistent. Below is a discussion of the inconsistencies.

Hypothesis 1.0--Discussion

Grade Five. In grade five, all ability levels had lower scores on both of the passages with added verbals than they did on the parallel passages. As seen in Table 1, each cell mean is lower for the 5-1-A and 5-2-A passages than for the 5-1-P and 5-2-P passages. This is the only grade level in which all cells were consistent.

Grade Seven. Further examination of Table 1 shows that seventh grade high ability students had lower cloze scores on the parallel passage 7-1-P than on the version with added verbals, 7-1-A. The 2.5 difference between the means was greater than the 1.7 combined differences of the

Table 1. Cloze Test Means

Subjects	Passages ^a				Totals	
					A	P
<u>Grade 5</u>	<u>5-1-A</u>	<u>5-1-P</u>	<u>5-2-A</u>	<u>5-2-P</u>		
Low	7.0	9.4	8.5	10.3		
Middle	11.8	13.9	14.5	17.6		
High	<u>15.4</u>	<u>19.5</u>	<u>20.2</u>	<u>21.1</u>		
Total	<u>11.4</u>	<u>14.3</u>	<u>14.4</u>	<u>16.3</u>	12.9	15.3
					p ≤ .01	
<u>Grade 7</u>	<u>7-1-A</u>	<u>7-1-P</u>	<u>7-2-A</u>	<u>7-2-P</u>		
Low	14.8	16.2	16.2	15.3		
Middle	21.2	21.5	19.8	18.8		
High	<u>25.8</u>	<u>23.3</u>	<u>22.4</u>	<u>29.0</u>		
Total	<u>20.6</u>	<u>20.3</u>	<u>19.5</u>	<u>21.0</u>	20.0	20.7
					p ≤ .01	
<u>Grade 9</u>	<u>9-1-A</u>	<u>9-1-P</u>	<u>9-2-A</u>	<u>9-2-P</u>		
Low	12.6	10.5	12.1	13.4		
Middle	22.1	16.2	17.4	25.1		
High	<u>25.4</u>	<u>21.7</u>	<u>22.3</u>	<u>29.0</u>		
Total	<u>20.3</u>	<u>15.9</u>	<u>17.1</u>	<u>22.8</u>	18.6	19.3
					p ≤ .01	
<u>Grade 11</u>	<u>11-1-A</u>	<u>11-1-P</u>	<u>11-2-A</u>	<u>11-2-P</u>		
Low	16.7	22.4	15.5	17.4		
Middle	23.2	30.1	20.2	19.8		
High	<u>28.9</u>	<u>33.6</u>	<u>27.9</u>	<u>26.9</u>		
Total	<u>23.1</u>	<u>28.5</u>	<u>21.0</u>	<u>21.5</u>	22.1	25.1
					p ≤ .01	

^aPassages are designated by grade level (5, 7, 9, 11), selection (1, 2), and verbal load (A = added verbals, P = parallel passage).

middle and low ability students, who had higher scores on 7-1-P than on 7-1-A. As a result, the total mean (20.6) for 7-1-A, the passage with added verbals, is higher than the total mean (20.3) for 7-1-P, the parallel passage.

Examination of the cloze tests in Appendix B suggests the possibility that the number of specific geographic replacements needed in 7-1-P, which were not needed in 7-1-A, may have depressed the 7-1-P scores by establishing an artificial ceiling. The middle and lower ability groups would not have been affected as their scores would not have approached the ceiling.

The results on passage 7-2 include a different set of inconsistencies. The data recorded in Table 1 show that the low and middle ability students had slightly lower cloze scores on the parallel passage 7-2-P than they did on the 7-2-A passage with added verbals. Their combined mean difference of 2.1, however, was less than the 6.6 difference attained by the high ability students, who had higher scores on the parallel passage than they did on the version with added verbals. The total results on passage 7-2, therefore, were consistent with the study as a whole.

Examination of the cloze tests covering the 7-2 passages (Appendix B) suggests the possibility that the number of high level semantic replacements needed in 7-2-P, which were not needed in 7-2-A, may have been a disadvantage

to the low and middle ability youngsters, though they would not have affected the high ability students.

Grade Nine. In grade nine, all ability levels had lower scores on 9-1-P, the parallel passage, than they did on 9-1-A, the passage with added verbals (Table 1). The difference, however, when combined with the results of all ability levels on passages 9-2-P and 9-2-A, did not affect the grade as a whole.

Examination of the cloze tests themselves reveals no probable explanation for the results, but an examination of the scoring pattern of the particular youngsters who worked on 9-1-P and 9-2-A suggests that the cloze test scores of this particular group of students deviated enough from the overall pattern from grades four through eleven to account for the results. Whereas at the other grade levels the differences between the means of students working on the various combinations were .5 for grade five, .9 for grade seven, and 2.45 for grade eleven, in grade nine the difference was 5.05. Since the particular combination of low-scoring pupils worked on 9-1-P, and the higher-scoring students worked on 9-1-A, the results on passage 9-1 appear to contradict the overall findings of the study. This apparent contradiction is accounted for, however, when the other half of the work of these pupils is examined in

passage 9-2, where the results on 9-2-P are far higher than on 9-2-A.

Grade Eleven. Examination of the data in Table 1 shows that grade eleven high and middle ability students had lower scores on the parallel passage 11-2-P than they did on 11-2-A, the version with added verbals. These differences were not enough to affect the overall results for passage 11-2, as the low ability students had substantially lower scores on the version with added verbals.

Examination of the cloze tests in Appendix B suggests that here, as in grade seven, the specific replacements needed in passage 11-2-P demanded far more in terms of specific historic information, including three dates, than were required in passage 11-2-A.

Hypothesis 1.1--Findings

Hypothesis 1.1, that the contribution of verbals to comprehension difficulty decreases as the grade level increases, was supported for grades five and seven. This finding was determined in three steps, which are detailed below.

First, comprehension difficulty scores were determined by ranking scores of the tests over each set of passages in descending order and subtracting the differences. These scores, whose means are reported in Table 2, varied from cell to cell. By grades, comprehension

Table 2. Comprehension Difficulty Means

Ability Levels	Grades				Total
	5	7	9	11	
Low	2.1	.3	-.5	4.1	1.5
Middle	2.6	-.4	.9	3.3	1.6
High	<u>2.5</u>	<u>2.1</u>	<u>1.5</u>	<u>1.9</u>	2.0
Total	2.4	.7	.6	3.1	

difficulty scores decreased from grade five to grade seven to grade nine, but then increased in grade eleven to a point higher than grade five.

Second, the differences in the comprehension difficulty scores at the four grade levels were found to be significant at the .01 level of probability when the data were subjected to a one-way analysis of variance (Table 3).

Third, application of the Tukey post hoc procedure revealed that the comprehension difficulty difference between grades five and seven was significant at the .01 level; the difference between grades seven and nine did not meet the .05 level. The difference between grades nine and eleven was also significant at the .01 level. However, examination of the data in Table 2 shows that the difference

Table 3. ANOVA--Comprehension Difficulty by Grade Levels

Source	SS	df	MS	F	Probability
Grade Levels	352.8	3	117.6	31.4	$\leq .01$
Within	883.8	236	3.74		

is in the opposite direction from that stated in the hypothesis.

The discussion of the findings concerning Hypothesis 1.1 involves Hypothesis 1.2 as well. Therefore, the combined discussion follows the report of the Hypothesis 1.2 findings.

Hypothesis 1.2--Findings

Hypothesis 1.2, that the contribution of verbals to comprehension difficulty decreases as overall reading comprehension ability at a given grade level increases, was supported in grade eleven high and low groups. This finding was determined in three steps which are detailed below.

First, examination of the data in Table 2 revealed that the comprehension difficulty means for the three ability levels in grade eleven were the only ones which reflected the trend stated in the hypothesis. The trends in grades five, seven, and nine were in the opposite direction.

Second, when the data for each grade level were subjected to a one way analysis of variance, the results for grade eleven were significant at the .01 level (Table 4). The results for grades seven and nine were also significant at the .01 level.

Table 4. ANOVA--Comprehension Difficulty by Ability Levels

Source	SS	df	MS	F	Probability
<u>Grade Five</u>					
Ability Levels	2.8	2	1.4	.71	ns
Within	111.6	57	1.96		
<u>Grade Seven</u>					
Ability Levels	58.23	2	29.12	14.34	$\leq .01$
Within	115.95	57	2.03		
<u>Grade Nine</u>					
Ability Levels	41.63	2	20.82	5.91	$\leq .01$
Within	200.55	57	3.52		
<u>Grade Eleven</u>					
Ability Levels	85.83	2	42.92	9.15	$\leq .01$
Within	267.15	57	4.69		

Third, the Tukey post hoc procedure identified the difference in grade eleven comprehension difficulty scores between the high ability group and the low ability group as significant at the .01 level. Thus, the grade eleven data support Hypothesis 1.2.

Tukey tests also showed that in grades seven and nine the differences between the high ability group scores and the middle and low group scores were significant at the .01 level. Referring back to Table 2, however, one can see that these differences are in the opposite direction from the one stated in the hypothesis.

Hypotheses 1.1 and 1.2--Discussion

Possible explanations of the results affecting the sub-hypotheses lie in at least three areas, which may be functioning independently or in combination. First, the curriculum of the school system in which the study was conducted includes a systematic study of syntax in grades seven through nine only. Whether the awareness of specific syntactic structures, although they have not been presented from a reader-processing point of view, is an asset in helping a reader to process syntax would have to be determined through an experimental study. Some work has been done in this area (Blumenfeld et al., 1965; Stoodt, 1972). Why the eleventh grade pattern differed in means from the grade nine results and in distribution from the grade five

results might be accounted for by the learning loss in awareness of the structures being greater for low ability level pupils than for high.

A second possible explanation lies in the cloze passages themselves. Since so many cells were found where the specific replacements may have demanded a higher level of semantic and content knowledge than other passages, it may be that a broader selection of passages at any one level or systematic rotation of the cloze items on the existing passages is necessary for a more accurate picture. This explanation would seem to be more applicable to grades seven, nine, and eleven than to grade five where performance on both passages was consistent in all cells.

The third possible explanation may be related to the second. It involves the constraints upon writing style inherent in the Dale-Chall readability formula when applied to content area material which deals with subjects beyond the concept areas describable in the vocabulary of the Dale list. Since authors must use words classed as unfamiliar in the Dale-Chall approach, sentence length, the only other variable, must be rigidly controlled. This often results in a choppy style of writing. The search for 250 word passages which met the Dale-Chall standards at grades seven, nine, and eleven exemplified the problem. The texts considered have been read successfully by students at the appropriate grade levels, but it became apparent that only

home-oriented topics such as coal and potatoes would fit the formula for grade seven because the main word, which would be repeated often, was a familiar word from the Dale list. Similar problems arose in grades nine and eleven.

Another problem related to the structure of the readability formula is that the inclusion of verbals rather than relative clauses in a passage may reduce the readability score. This did not happen in the current study, as concept load and vocabulary were held constant and total number of words was allowed to vary, but it would be true if passages were of the same length with the concomitant increase in vocabulary. The change in the Spache (1974) formula can be cited as recognition of the anomaly. It now considers participles and gerunds as unfamiliar words although the same word used as a verb would be familiar. For research involving syntactic complexity, a combination of formulae assessing a variety of indices of difficulty may be necessary.

Comprehension--Summary

In summary, students in grades five, seven, nine, and eleven found verbals a factor in their ability to comprehend written material. The extent of the contribution of verbals to comprehension difficulty decreased from grade five to grades seven and nine, but increased from grade nine to grade eleven. The extent of the contribution of verbals

to comprehension difficulty was equal for all ability students in grade five; it was less for low ability students than for high in grades seven and nine; and it was greater for low ability students than for high in grade eleven.

Production

The study of production involved three hypotheses. The general hypothesis, Hypothesis 2.0, that the production of verbals is related to the comprehension of passages containing verbals, was supported for grade eleven high and low ability groups. Hypothesis 2.1, that production of verbals increases as grade level increases, was supported in grades nine and eleven. Hypothesis 2.2, that production of verbals increases as overall reading comprehension ability at a given grade level increases, was supported in grades five and eleven for high and low ability levels.

A detailed report and discussion of the findings follows. Since the general hypothesis, Hypothesis 2.0, is dependent on the findings relative to the two sub-hypotheses, its detailed report follows the reports of 2.1 and 2.2. A general discussion of all three production hypotheses and a summary of the production findings conclude this section.

Hypothesis 2.1--Findings

Examination of Table 5 shows that the number of verbals produced increased as the grade level of the

Table 5. Production Means

Ability Levels	Grades				Total
	5	7	9	11	
Low	.10	.65	.65	1.60	.75
Middle	.45	1.20	.85	2.95	1.36
High	<u>.70</u>	<u>.75</u>	<u>1.40</u>	<u>4.25</u>	1.78
Total	.42	.87	.97	2.93	

subjects increased and as the ability level of the subjects increased.

Hypothesis 2.1, that production of verbals increases as grade level increases, was confirmed at the .01 level (Table 6). The Tukey post hoc procedure identified the differences between grades five and seven, and between grades seven and nine, as inadequate to meet the .05 level; the difference between grades nine and eleven was significant at .01.

Hypothesis 2.2--Findings

Hypothesis 2.2, that production of verbals increases as general reading comprehension ability within a grade increases, was supported in grades five and eleven where ANOVA's were accepted at the .05 level (Table 7). In both cases the Tukey tests identified the means of the high

Table 6. ANOVA--Production by Grade Levels

Source	SS	df	MS	F	Probability
Grade Levels	218.97	3	72.99	26.54	$\leq .01$
Within	649.76	236	2.75		

Table 7. ANOVA--Production by Ability Levels

Source	SS	df	MS	F	Probability
<u>Grade Five</u>					
Ability Levels	3.63	2	1.815	3.34	$\leq .05$
Within	30.95	57	.543		
<u>Grade Seven</u>					
Ability Levels	3.43	2	1.715	.86	ns
Within	113.5	57	1.99		
<u>Grade Nine</u>					
Ability Levels	6.03	2	3.015	1.62	ns
Within	105.9	57	1.86		
<u>Grade Eleven</u>					
Ability Levels	67.9	2	33.95	6.095	$\leq .05$
Within	317.5	57	5.57		

ability groups as different from the means of the low ability groups ($p \leq .05$). Although the means of the middle ability groups fell between the two extremes, they were not sufficiently different from either to represent separate stages.

Hypothesis 2.0--Findings

Hypothesis 2.0, that production of verbals is related to comprehension of passages containing verbals, finds limited support in the data. Grade five students tended neither to produce nor to comprehend verbals; grades seven and nine students did not produce significantly more verbals but their comprehension was greater than that of the fifth graders; and grade eleven students produced significantly more verbals but had greater difficulty comprehending passages containing them than did the younger students. The only clear parallel lies within grade eleven, where high ability pupils produced more verbals and had less difficulty comprehending passages written with them than low ability pupils.

Production Findings--Discussion

The results in this area are not inconsistent with other research studies on these age groups. The increase in production of verbals would be expected from Hunt's (1964) study of syntactic complexity. The lag in the increase noted in grades seven and nine might be accounted for by

Lenneberg's (1967) theory that organisms undergo major growth in only one area at a time. It is readily observable that children of the junior high years are undergoing growth spurts and sexual maturation which reflect far greater organismic changes than occur at other periods within the school years. Their lag in language control is also consistent with data in Loban's (1966) longitudinal study.

From another point of view, sharper results might have emerged had the study been conducted in a slightly different manner. Since a child who produces one verbal can probably produce more, instructions to combine the stimulus sentences in two different ways might have elicited a more significant spread of data; students might well have used a relative clause for embedding in one response and a verbal in the second. Although the instrument was adequate to measure the gross differences, improvement might have made identification of finer distinctions possible.

Production--Summary

In summary, production of verbals was related to comprehension of passages containing verbals with students of high and low reading ability in grade eleven, where high ability students produced more verbals and better comprehended passages containing verbals than their low ability classmates. Production of verbals increased in each grade

from five to eleven, although the increase was statistically significant only from grade nine to grade eleven. Production of verbals increased as the overall reading ability increased in grades five and eleven.

Perceived Difficulty

The study of perceived difficulty involved three hypotheses. The general hypothesis, Hypothesis 3.0, that perceived difficulty of verbals is related to comprehension of passages containing verbals, was not supported by the data. Hypothesis 3.1, that perceived difficulty of verbals decreases as the grade level increases, was not supported by the data. Hypothesis 3.2, that perceived difficulty of verbals decreases as the overall reading comprehension ability at a given grade level increases, was supported in grade nine for high and low ability levels.

A detailed report and discussion of the findings follows. Hypotheses 3.1 and 3.2 are reported first. Hypothesis 3.0, because it depends on the results of the two sub-hypotheses, comes last. A general discussion of the perceived difficulty aspect of the study concludes this section.

Hypothesis 3.1--Findings

Examination of Table 8 shows that the number of sentences perceived as difficult because they contained verbals decreased as the general level of reading ability

Table 8. Perceived Difficulty Means

Ability Levels	Grades				Total
	5	7	9	11	
Low	3.75	3.50	5.15	3.60	4.00
Middle	3.95	3.30	3.55	3.45	3.56
High	<u>2.96</u>	<u>3.75</u>	<u>2.95</u>	<u>2.80</u>	3.11
Total	3.55	3.52	3.88	3.28	

increased; no pattern was discernable as the grade level of the subjects increased.

Hypothesis 3.1, that perceived difficulty of sentences containing verbals decreases as grade level increases, was not supported by the data at the .05 level (Table 9).

Hypothesis 3.2--Findings

Hypothesis 3.2, that perceived difficulty of sentences containing verbals decreases as the overall reading comprehension ability within a grade level increases, was supported in grade nine (Table 10). The Tukey post hoc procedure identified the difference between the high ability group scores and the low ability scores as significant at the .01 level. The middle ability

Table 9. ANOVA--Perceived Difficulty by Grade Levels

Source	SS	df	MS	F	Probability
Grade Levels	10.98	3	3.66	1.03	ns
Within	838.2	236	3.55		

Table 10. ANOVA--Perceived Difficulty by Ability Levels

Source	SS	df	MS	F	Probability
<u>Grade Five</u>					
Ability Levels	11.2	2	5.6	1.32	ns
Within	241.65	57	4.24		
<u>Grade Seven</u>					
Ability Levels	2.03	2	1.015	.346	ns
Within	116.95	57	2.93		
<u>Grade Nine</u>					
Ability Levels	51.73	2	25.865	5.79	$\leq .01$
Within	254.45	57	4.464		
<u>Grade Eleven</u>					
Ability Levels	7.23	2	3.615	2.00	ns
Within	102.95	57	1.806		

scores, although between the two extremes, did not differ enough from either to represent a separate stage.

The results for grades five, seven, and eleven failed to meet the requirements for significance at the .05 level.

Hypothesis 3.0--Findings

Hypothesis 3.0, that perceived difficulty of verbals is related to comprehension of passages containing verbals, is not supported by the data. Comparing the findings of Hypothesis 1.1 and Hypothesis 3.1, one notes that comprehension difficulty decreased from grade five to grade seven, but perceived difficulty of verbals did not. A similar comparison of the findings of Hypothesis 1.2 and Hypothesis 3.2 shows that comprehension difficulty decreased from the grade eleven high ability group to the grade eleven low ability group, but perceived difficulty of verbals did not.

Perceived Difficulty--Discussion

This aspect of the study produced little of value. Possible reasons lie in two areas. Children may be unable to identify syntactic structures which cause them difficulty, or the instrument used to assess that ability was inadequate.

Limited support for the former position may be inferred from the Hansell (1974) study with seventh graders.

His low ability group rated passages with simplified syntax as more enjoyable than parallel passages with simplified vocabulary. However, their comprehension scores showed that the passages with simplified vocabulary were easier for them to comprehend. To the extent that one might regard lower enjoyability and perceived difficulty as indicating similar reactions, the two studies appear to support the same position, namely that children are unable to identify the elements that cause them comprehension difficulty.

The adequacy of the assessment instrument might also be a factor. As was noted in the design chapter, direct questioning is not rated very highly as a research technique but is encouraged as a possible start to a line of research (Good and Scates, 1954). In this case, use of the technique failed to point up areas for further investigation.

Perceived Difficulty--Summary

In summary, no relationship was established between the perceived difficulty of verbals and their comprehension difficulty. No decrease in the perceived difficulty of verbals as grade levels increased was observed. In grade nine, only, the perceived difficulty of verbals decreased as overall reading ability increased.

Summary of Findings

The problem investigated in this study was to identify which, if any, groups of readers at the fifth,

seventh, ninth, and eleventh grade levels find verbals a factor in their ability to comprehend written material, and to determine whether relationships exist among the students' ability to comprehend verbals, to produce them, and to perceive their difficulty.

The problem was studied through the following hypotheses, the findings for which are summarized below.

1.0 Paragraphs containing a greater number of verbals are more difficult for readers to comprehend than certain parallel passages. This hypothesis was supported at all grade levels.

1.1 The contribution of verbals to comprehension difficulty decreases as the grade level increases. This hypothesis was supported for grades five and seven.

1.2 The contribution of verbals to comprehension difficulty decreases as overall reading comprehension at a given grade level increases. This hypothesis was supported in grade eleven high and low ability groups.

2.0 The production of verbals is related to comprehension of passages containing verbals. This hypothesis was supported in grade eleven high and low ability groups.

2.1 Production of verbals increases as grade level increases. This hypothesis was supported in grades nine and eleven.

2.2 Production of verbals increases as overall reading comprehension ability at a given grade level

increases. This hypothesis was supported in grades five and eleven for high and low ability levels.

3.0 Perceived difficulty of verbals is related to comprehension of passages containing verbals. The evidence does not support this hypothesis.

3.1 Perceived difficulty of verbals decreases as the grade level increases. The evidence does not support this hypothesis.

3.2 Perceived difficulty of verbals decreases as the overall reading comprehension ability at a given grade level increases. This hypothesis was supported in grade nine for high and low ability levels.

Students in grades five, seven, nine, and eleven found verbals a factor in their ability to comprehend written material. A relationship existed among high and low ability pupils in grade eleven between their ability to produce verbals and their ability to comprehend them. The ability to perceive their difficulty was unrelated.

CHAPTER 5

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Summary

This study was undertaken to determine which, if any, groups of children find verbals a factor in their ability to comprehend written material. Inquiry was also made into the possible relationship between the production of verbals and their effect on reading comprehension. Further, the question of whether children's perception of verbals as difficult for them to understand might be related to reading comprehension was investigated.

The research was designed to test hypotheses in three areas: comprehension difficulty, production, and perceived difficulty of verbals. Subjects were children in grades five, seven, nine, and eleven; twenty from each of three levels of general reading comprehension ability, low, middle, and high. The 240 subjects spoke English as their native language and were randomly selected from the total school population of Reading, Massachusetts, a middle-class suburban community.

Comprehension difficulty was measured through the results of cloze tests over two forms of two social studies passages appropriate to each grade level. The forms

differed in that one form had eight more verbals than the other, where the same ideas were expressed in other syntax. Each student completed the form with added verbals for one passage and the other form for the second passage. Comprehension difficulty scores were established for the passages for each ability group at each grade level.

Production was measured through the scores on an instrument consisting of ten sets of sentences. Each set could be combined by use of verbals and by other syntactic structures. Subjects were instructed to combine the sentences into one sentence. Scores were obtained by counting the number of verbals produced.

Perceived difficulty was measured through the scores on an instrument containing ten pairs of sentences. Both sentences of the pair had been derived from the same kernel sentences. One sentence of the pair contained a verbal. The other sentence had the same idea expressed in another syntactic structure. Subjects were instructed to mark the sentence in the pair which they considered easier for them to understand. Scores were obtained by counting the number of sentences without verbals which had been marked.

The data collected in all three areas were subjected to analyses of variances and Tukey tests of multiple comparisons. Results were accepted at the .05 level of probability. The findings of the study follow.

Comprehension

1. Passages containing a greater number of verbals were more difficult for students in grades five, seven, nine, and eleven to comprehend than certain parallel passages.
2. The contribution of verbals to comprehension difficulty decreased from grade five to grades seven and nine.
3. The contribution of verbals to comprehension difficulty decreased as overall reading ability increased for grade eleven low and high ability groups.

Production

1. Production of verbals was related to comprehension of passages containing verbals in grade eleven, where students of high reading ability produced more verbals as well as comprehending them better than pupils of low ability.
2. Grade eleven students produced more verbals than students in grades five, seven, and nine.
3. In grades five and eleven, high ability students produced more verbals than low ability students.

Perceived Difficulty

1. Perceived difficulty of verbals was not related to comprehension of passages containing verbals.

2. Perceived difficulty of verbals did not decrease as grade level increased.
3. Grade nine low ability students perceived more verbals as difficult than high ability students.

Conclusions

Comprehension

1. Verbals appear to be an inhibiting factor in reading comprehension at grades five, seven, nine, and eleven.
2. In grade five, pupils of all reading ability levels find verbals equally inhibiting.
3. In grade eleven, pupils of varying levels of reading ability find verbals an inhibiting factor to a degree comparable to the difference in general reading ability. As the study of syntax is included in the curriculum between grades five and eleven, the study of syntax may affect the comprehension of verbals.

Production

1. A greater increase in the production of verbals can be expected beyond grade nine as compared with the increase in prior years.
2. At some grade levels, students with higher general reading ability can be expected to produce more

verbals than students with lower general reading ability.

3. The possibility of competence (i.e., comprehension) preceding performance (i.e., production) may be indicated by the lower comprehension difficulty scores in grades seven and nine and the higher production scores in grade eleven.

Perceived Difficulty

1. Children may be unable to identify constructs which are difficult for them to comprehend.

Implications for Education

Since verbals can be shown to be a factor in reading comprehension, educational programs should be designed to allow for attention to them.

1. Teachers at all levels should be alert to verbals as possible causes of reading difficulty and should be prepared to help children interpret them.
2. Teacher preparation should include an awareness of verbals and their possible effect on reading comprehension.
3. Textbook evaluation should include consideration of the number and treatment of verbals at various grade levels.

Recommendations for Further Research

This descriptive study can be considered only a first step in a relatively unexplored area of reading research. Further studies might consider the following problems:

1. Can the effect of verbals on reading comprehension within grades be assessed through the use of more sophisticated instruments?
2. Are there varying degrees of difficulty caused by different types of verbals?
3. To what extent can the comprehension difficulty of verbals be minimized by a study of syntax? What approach to such a study, at what grade level, would be most effective?
4. To what extent do verbals affect the reading comprehension of the non-native speaker of English?
5. How extensively are verbals used in elementary texts?
6. Can a readability formula be developed for the upper grades which will take into consideration syntax as well as vocabulary, sentence length, and concept load?

APPENDIX A

PASSAGE SOURCES AND READABILITY DATA

<u>Source</u>	<u>Pages</u>	<u>Selection</u>	<u>Words</u>	<u>Dale-Chall Readability</u>	
				<u>Raw Score</u>	<u>Grade Levels</u>
Center for the Study of Instruction (1970)	64-65	5-1-P	269	5.2	5-6th
		5-1-A	263	5.2	5-6th
	65-67	5-2-P	258	5.1	5-6th
		5-2-A	254	5.1	5-6th
Saveland et al. (1968)	43-44	7-1-P	270	6.1	7-8th
		7-1-A	253	6.2	7-8th
	75-76	7-2-P	266	6.1	7-8th
		7-2-A	259	6.1	7-8th
Clark et al. (1965)	341	9-1-P	261	7.2	9-10th
		9-1-A	254	7.3	9-10th
	214-215	9-2-P	271	7.1	9-10th
		9-2-A	258	7.2	9-10th
Madgic et al. (1971)	58-59	11-1-P	272	8.0	11-12th
		11-1-A	261	8.2	11-12th
	99	11-2-P	268	8.0	11-12th
		11-2-A	260	8.1	11-12th

APPENDIX B

COMPREHENSION INSTRUMENTS

5-1-P

Hopi corn sends out _____ long roots to reach _____ moisture that may be _____. The small plants _____ the ears with colored _____ might look strange to _____ other farmers. But this _____ was the most important _____ of the Hopi. Because _____ gave them life, they _____ it "Mother Corn."

Even _____ corn would die if _____ were not planted in _____ good spot. A Hopi _____ looked for a place _____ a lot of rain _____ might run off the _____ --at the foot of _____ slope, perhaps, or the _____ of a canyon or _____. But some years there _____ be no rain at _____. When he could, he _____ another plot of corn _____ a spring, where it _____ be irrigated with spring _____.

Corn formed the main _____ of the Hopi diet. _____ also grew beans, pumpkins, _____, and squash. They hunted _____ rabbits, ate their

meat, _____ used their skins and _____.
 After Europeans brought sheep _____ the Southwest,
 the Hopi _____ sheep. These animals require
 _____ care and can live _____ the low,
 scattered plants _____ a dry country. How
 _____ the Hopi use sheep _____ supply
 some of their _____?

From spring until fall, _____ men spent
 most of _____ days in their fields--_____
 weeding, hoeing, or watering _____ plants. As soon
 as _____ boy was six _____ seven years
 old, he _____ with his father and _____
 beside him to learn _____ skills of farming. Boys
 _____ stayed out from sunrise to sunset while they
 kept crows from stealing the corn or watched their father's
 sheep.

5-1-A

Hope corn sends out _____ long roots to
 reach _____ moisture that may be _____
 underground. The small plants _____ the ears with
 colored _____ might look strange to _____
 other farmers. But this _____ was the most impor-
 tant _____ of the Hopi, giving _____ life.
 They called it " _____ Corn."

Even Hopi corn _____ die if it were
 _____ planted in a good _____. A Hopi
 farmer looked _____ a place with a _____
 of rain water running _____ the land--at the
 _____ of a slope, perhaps, _____ the
 mouth of a _____ or gully. But some _____
 there might be no _____ at all. When he
 _____ he planted another plot _____ corn
 below a spring, _____ it could be irrigated
 _____ spring water.

Corn formed _____ main part of the
 _____ diet. They also grew _____,
 pumpkin, melons, and squash. _____ hunted wild
 rabbits, eating _____ meat and using their
 _____ and fur. After Europeans _____
 sheep into the Southwest, _____ Hopi raised sheep.
 These _____ require little care, living
 _____ the low scattered plants _____ a
 dry country. How _____ the Hopi use sheep
 _____ supply some of their _____ ?

From spring until fall, _____ men spent
 most of _____ days in their fields--
 _____, weeding, hoeing, or watering
 _____ plants. As soon as _____ boy was
 about six _____ seven years old, he
 _____ with his father, working _____

him to learn the _____ of farming. Boys often _____ out from sunrise to _____ to keep crows from stealing the corn or to watch their father's sheep.

5-2-P

The Hopi built their _____ on high land to _____ protect them from enemies. _____ tribes were a problem, _____ they had to keep _____ constant lookout. The earliest _____ villages may have been _____ into cliffs in the _____. Later, the Hopi built _____ homes on mesas. They _____ to be near a _____ so the women could _____ water every day and _____ it home.

According to _____ custom, houses belonged to _____. A woman got her _____ from her mother. When _____ married, her husband came _____ live in her house. _____ woman wanted a daughter _____ whom she could pass _____ house along.

Because there _____ little rain to wear _____ the buildings, Hopi houses _____ many years. When repairs _____ needed, women made them. _____ usually built new houses, _____, but men did the _____ work.

The Hopi built _____ homes from materials in _____ environment. Walls were usually _____ of large, flat stones _____ were held together by _____ mud. Cedar logs held _____ the roof. Men made _____ to faraway mountains for _____ since few trees grow _____ a dry mesa. One _____ two small holes high _____ the walls let in _____ and air. Long ago, _____ Hopi usually made no _____. People had to enter _____ room by a hole _____ the roof. Ladders were _____ to reach rooms on _____ levels.

Each household had _____ room which was used _____ store corn. The women _____ girls did most of _____ work in the main room of the house.

5-2-A

The Hopi built their _____ on high land to _____ protect them from enemies. _____ tribes were a problem, _____ they had to keep _____ constant lookout. The earliest _____ villages may have been _____ into cliffs in the _____. Later, the Hopi built _____ homes on mesas. They _____ to be

near a _____ for the women to _____
water every day and _____ it home.

According to _____ custom, houses belonged
to _____. A woman got her _____ from
her mother. When _____ married, her husband came
_____ live in her house. _____ woman
wanted to have _____ daughter to whom she
_____ pass the house along.

_____ there was little rain _____
wear away the buildings, _____ houses lasted many
years. _____ made any needed repairs.
_____ usually built new homes, _____,
with men doing the _____ work.

The Hopi built _____ from materials in
_____ environment. Walls were usually
_____ of large, flat stones _____ to-
gether by dried mud. _____ logs held up the
_____. With few trees growing _____ a
dry mesa, men _____ trips to faraway mountains
_____ logs. One or two _____ holes
high in the _____ let in light and _____.
Long ago, the Hopi _____ made no doors. People
_____ to enter a room _____ a hole in
the _____. Ladders were used to _____
rooms on other levels.

_____ household had one room
 _____ to store corn. The _____ and
 girls did most _____ their work in the
 _____ room of the house.

7-1-P

One of the places _____ is well suited for
 _____ potatoes is Aroostook County,
 _____, the large, northernmost county
 _____ the state. Seed potatoes _____
 have been cut up _____ two or three "eyes"
 _____ each piece are put _____ the
 ground in the _____. The northern location helps
 _____ the control of blight _____
 insects, but the vines _____ must be dusted during
 _____ growing season. The potatoes
 _____ dug by machines in _____ late
 summer. Large labor _____ are hired to harvest
 _____ crop.

Potatoes require very _____ in the way of
 _____ for market. They must _____
 graded by size and _____ in bags. However, they
 _____ not bruise easily and _____ keep
 well without refrigeration. _____ the Aroostook
 potatoes are _____ dug about the same
 _____, many of them must _____ stored

for a time _____ they can be sent _____ market. When the market _____ needs replenishing, whole trainloads _____ potatoes move southward to _____, New York, and Philadelphia _____ distribution along the Atlantic _____ and inland.

Idaho competes _____ Maine in potato production _____ is especially famous for _____ baking potato. Other northern _____, especially Michigan, Wisconsin, and _____ York, are important potato _____. Potatoes are also grown _____ the Central Valley of _____. The several crops which _____ harvested in Florida and _____ each year help to _____ northern markets.

In addition _____ its table use, the _____ is used in making _____. It can also be _____ in making alcohol. The _____ of "instant" potatoes not only helps the busy housewife, but also makes the storing and shipping of potatoes somewhat easier.

7-1-A

One of the places _____ suited for growing potatoes _____ Aroostook County, Maine, the _____, northernmost county of the

_____. Seed potatoes, cut up _____ two or three "eyes" _____ each piece, are put _____ the ground in the _____. The northern location helps _____ the control of blight _____ insects, but the vines _____ must be dusted during _____ growing season. The potatoes _____ dug by machines in _____ late summer. Large labor _____ are hired to harvest _____ crop.

Potatoes require very _____ in the way of _____ for market. Graded by _____, and placed in bags, _____ do not bruise easily _____ will keep well without _____. Since the Aroostook potatoes _____ all dug about the _____ time, many of them _____ be stored for a _____ before being sent to _____. When the market supply _____ replenishing, whole trainloads of _____ move southward to Boston, _____ York, and Philadelphia for _____ along the Atlantic Seaboard _____ inland.

Competing with Maine _____ potato production, Idaho is _____ famous for its baking _____. Other northern states, especially _____, Wisconsin, and New York, _____ important potato producers. Potatoes _____ also

grown in the _____ Valley of California. The _____ crops harvested in Florida _____ California each year help _____ supply northern markets.

In _____ to its table use, _____ potato is used in _____ starch. It can also _____ used in making alcohol. _____ development of "instant" potatoes, _____ helping the busy housewife, _____ the storing and shipping _____ somewhat easier.

7-2-P

Coal lost important markets. _____ was once widely used _____ heating homes in parts _____ the United States. Trucks _____ deliver loads of coal _____ houses and apartments where _____ would be stored in _____ in the basements. In _____ mornings, the man of _____ house would shake the _____ from the furnace grates _____ put more coal on _____ fire. During cold winter _____ more shovelfuls would have _____ be added. The last _____ at night, the fire _____ to be banked. Even _____ automatic stokers were introduced, _____ was still the problem _____ ashes. It is little _____ that

people turned to _____, gas, and electricity for _____ home heating when these _____ of energy became widely _____.

Another common use for _____ was to provide power _____ hauling freight and passengers. _____, too, oil was substituted _____ coal as railroads replaced _____ steam locomotives with diesel _____. On the sea, ships _____ turned to oil for _____ gained several advantages over _____ ships. The oil took _____ less space, was more _____ loaded, required fewer crewmen, _____ permitted longer trips without _____.

What happens to an _____ when it begins to _____ its market? If no _____ markets are found the _____ coal is sold. Fewer _____ mean that men are _____ off, mines and factories _____, and stockholders go without _____. For years the coal _____ was known as a _____, or sick, industry.

New _____ for coal have been _____. A large amount of _____ electricity which is produced in this country comes from steam power-plants that use coal for fuel.

7-2-A

Coal lost important markets. _____ was once widely used _____ heating homes in parts _____ the United States. Trucks _____ deliver loads of coal _____ houses and apartments where _____ would be stored in _____ in the basements. In _____ mornings, after shaking the _____ from the furnace grates, _____ man of the house _____ put more coal on _____ fire. During cold winter _____ more shovelfuls would have _____ be added. The last _____ at night, the fire _____ to be banked. Even _____ automatic stokers were introduced, _____ was still the problem _____ ashes. It is little _____ that people turned to _____, gas, and electricity for _____ home heating when these _____ of energy became widely _____.

Another common use for _____ was to provide power _____ hauling freight and passengers. _____, too, oil was substituted _____ coal as railroads replaced _____ steam locomotives with diesel _____. On the sea, ships _____ to oil for fuel _____ several advantages over coal-burning _____. The oil took up _____ space, was more easily _____,

required fewer crewmen, and _____ longer trips without refueling.

_____ happens to an industry _____ to lose its markets? _____ no new markets are _____ then less coal is _____. Fewer sales mean men _____ laid off, mines and _____ closing, and stockholders going _____ dividends. For years the _____ industry was known as _____ de-pressed, or sick, industry.

_____ markets for coal have _____ found. A large amount _____ the electricity produced in _____ country comes from steam power-plants using coal for fuel.

9-1-P

The United States carries _____ trade with many nations. _____ exports cotton, tobacco, wheat, _____ many other farm products _____ dozens of other countries. _____ typewriters, electronic equipment, automobiles, _____, and innumerable other kinds _____ manufactured goods are used _____ the world. On the _____ hand, many Americans wear _____ which are made of _____ silk and of British _____. They drink South American _____

in Japanese cups, admire _____ Irish linens, tell time _____ their Swiss watches, and _____ it easy to park _____ foreign cars on crowded _____ streets. Such activities illustrate _____ interdependence of nations. We _____ dependent on other countries _____ as they are dependent _____ us.

The most vital _____ product in our modern _____ life is steel. Our _____ factories, construction firms, railroad _____, and automobile plants are _____ the many enterprises that _____ have steel. The steel _____ of the United States _____ almost half the world's _____. Yet it could make _____ high-grade steel without the _____ which is imported from _____ countries.

Indeed, the United _____ must import large quantities _____ many minerals essential for _____ manufacture of arms which _____ used in defense. Besides _____ we import from foreign _____ countless other products that _____ use in everyday life. _____ means, of course, that _____ jobs of thousands of _____ workers depend on our _____ with foreign countries. Such _____ benefits the foreign countries _____, since they could not

_____ from us if we _____ not buy from them. _____ we can see how greatly modern nations depend upon one another.

9-1-A

Carrying on trade with _____ nations, the United States _____ cotton, tobacco, wheat, and _____ other farm products to _____ of other countries. American-made _____, electronic equipment, automobiles, tractors, _____ innumerable other kinds of _____ goods are used around _____ world. On the other _____, many Americans wear suits _____ of Italian silk and _____ British wool. Drinking their _____ American coffee in Japanese _____ admiring their Irish linens, _____ telling time by their _____ watches, they also find _____ easy to park their _____ cars on crowded city _____. Such activities illustrate the _____ of nations. We are _____ on other countries just _____ they are dependent on _____.

The most vital single _____ in our modern business _____ is steel. Our defense _____, construction firms, railroad companies, _____ automobile plants are among _____

many enterprises that must _____ steel. The steel industry _____ the United States produces _____ half the world's supply. _____ it could make no _____ steel without the tungsten _____ from distant countries.

Indeed, _____ United States must import _____ quantities of many minerals _____ for the manufacture of _____ used in defense. Besides _____ we import from foreign _____ countless other products used _____ everyday life. This means, _____ course, that the jobs _____ thousands of American workers _____ on our trade with _____ countries. Such trade benefits _____ foreign countries also, since _____ could not buy from _____ if we did not _____ from them. Thus we _____ see how greatly modern _____ depend upon one another.

9-2-P

The governments of New _____ towns perform many duties _____ are assigned to counties _____ other local governments outside _____ England. The chief feature _____ town governments is the _____ meeting, which is held _____ least once a year, _____

sometimes more often. Generally, _____ the town voters may _____ and participate. In the _____ meetings they discuss town _____ and problems, arrange the _____, levy taxes, and pass _____ local ordinances. Also they _____ the town officers, usually _____ a year's term.

In _____ New England town the _____ themselves cast the votes _____ pass their laws and _____ their leaders. This is _____ important example of direct _____ at work in the _____ States.

In recent years _____ urban towns have become _____ large that only a _____ percentage of the citizens _____ attend the town meetings. _____ towns now hold town _____ which are made up _____ elected representatives. The town _____ elect a group of _____ fellow citizens to be _____ representatives and vote on _____ behalf at the town _____.

Chief among the officers _____ are elected at a _____ meeting to enforce state _____ local laws is a _____, usually three in number. _____ members are generally called "_____." In many New England

_____ the selectmen now employ _____ managers who are especially _____ to take over many _____ their duties.

Exactly what _____ a town gives its _____ depends on the type _____ town it is. Rural _____ are responsible for roads _____ streets, schools, and care of the poor, while urban towns provide additional services such as fire protection, lights, water, and parks.

9-2-A

The governments of New _____ towns perform many duties _____ to counties and other _____ governments outside New England.

_____ chief features of town _____ is the town meeting, _____ at least once a _____, and sometimes more often. _____

All the town voters _____ may participate. In the _____ meetings they discuss town _____ and problems, arrange the _____, levy taxes, and pass _____ local ordinances. Also they _____ the town officers, usually _____ a year's term.

In _____ New England town the _____ themselves cast the votes _____ their laws and electing _____ leaders. This is an

_____ example of direct democracy _____
work in the United _____.

In recent years many _____ towns have
become so _____ that only a small _____
of the citizens can _____ town meetings. Some
towns _____ hold town meetings made
_____ of elected representatives. The
_____ voters elect a group _____ their
fellow citizens to _____ their representatives
and vote _____ their behalf at the _____
meetings.

Chief among the _____ elected at a town
_____ to enforce state and _____ laws is
a board, _____ three in number. The
_____ are generally called "selectmen."
_____ many New England towns _____
selectmen now employ town _____ specially trained
to take _____ many of their duties.
_____ what services a town _____
its citizens depends on _____ type of town it
_____. Rural towns are responsible
_____ roads and streets, schools, _____
care of the poor, _____ urban towns provide
additional _____ such as fire protection, lights,
water, and parks.

11-1-P

On December 1, 1955, _____ Negro seamstress, Mrs. Rosa _____, boarded a bus in _____, Alabama, to ride home. _____ was tired and sat _____ in a section which _____ reserved for whites. Soon _____ driver ordered her to _____ her seat to a _____ man. She refused and _____ arrested. Mrs. Parks' fatigue _____ refusal to do as _____ seemed to symbolize the _____ of many Negroes with _____ slow pace of integration. _____ news of her arrest _____ through the Negro community _____ Montgomery, cries for action _____ raised. The following day, _____ group of Negroes met _____ planned a boycott of _____ city's buses and chose _____ young Baptist minister, Dr. _____ Luther King, Jr., to _____ and direct the boycott. _____ Montgomery bus boycott involved _____ blacks who chose to _____ to work or to _____ car pools rather than _____ in buses which were _____. At first they asked _____ for decent treatment on _____. When this was denied _____, they demanded full integration. _____ a thirteen-month boycott and

_____ federal court order which _____
segregated seating, they won _____ demands.

The Montgomery bus _____ brought inter-
national fame to _____ Luther King. The son
_____ an Atlanta Baptist minister, _____
was gifted with the _____ ability to move men
_____ action. As the leader _____ the
non-violent, civil rights _____, he urged his
followers _____ protest, with calmness, love
_____ peace in the face _____ white
hatred. Soon after _____ success of the bus
_____, he organized the Southern Christian
Leadership Conference and continued civil rights efforts
through marches, demonstrations, economic boycotts, and
increased Negro political activity.

11-1-A

On December 1, 1955, _____ Negro
seamstress, Mrs. Rosa _____ boarded a bus in
_____, Alabama, to ride home. _____,
she sat down in _____ section reserved for whites.
_____ the driver ordered her _____
vacate her seat for _____ white man. Refusing,
she _____ arrested. Mrs. Parks' fatigue
_____ refusal to do as _____ seemed to
symbolize the _____ of many Negroes with

_____ slow pace of integration. _____
 the news of her _____ swept through the Negro
 _____ in Montgomery, cries for _____
 were raised. The following _____, a group of
 Negroes _____ and planned a boycott
 _____ the city's buses, choosing _____
 young Baptist Minister, Dr. _____ Luther King,
 Jr., to _____ and direct the boycott.
 _____ Montgomery bus boycott involved
 _____ blacks who chose to _____ to work
 or to _____ car pools rather than _____
 in segregated buses. At _____ they asked only for
 _____ treatment on buses. When _____
 was denied them, they _____ full integration.
 After a _____ boycott and a federal
 _____ order prohibiting segregated seating,
 _____ won their demands.

The _____ bus boycott brought international
 _____ to Martin Luther King, _____ son
 of an Atlanta _____ minister. Gifted with the
 _____ ability to move men _____ action,
 King, as the _____ of the non-violent, civil
 _____ movement, urged his followers _____
 protest, with calmness, love, _____ peace in the
 face _____ white hatred. Organizing the
 _____ Christian Leadership Conference soon

_____ the success of the _____
 boycott, he continued civil _____ efforts through
 marches, demonstrations, economic boycotts, and increased
 Negro political activity.

11-2-P

The existence of free _____ in the South
 was _____ constant challenge to those
 _____ argued that Negroes were _____
 unfit to live free _____ society and that their
 _____ role was that of _____ or servant.
 Beginning in _____ 1790's and continuing through-
 out _____ first half of the _____
 century, restrictions were gradually _____ upon
 the rights of _____ Negroes. They were forbidden
 _____ own or carry arms, _____ obtain
 loans without permission _____ a guardian, to
 travel _____ one state to another, _____
 testify in court against _____ white man, and to
 _____ in elections.

In the _____ fears of slave rebellions
 _____ the South and made _____ more
 determined to protect _____ interests by pre-
 venting free _____ from inciting slaves to
 _____. If they restricted free _____
 privileges and opportunities, they _____ they

could convince slaves _____ winning freedom was not _____ the effort. In the _____ and 1850's several southern _____ were preparing legislation for _____ expulsion of enslavement of _____ Negroes. In Arkansas, for _____, an 1859 law ordered _____ free Negroes in that _____ to leave. Those who _____ to do so were _____ be sold into slavery. _____ of these setbacks, and _____ of the general prejudice _____ them, free Negroes found _____ difficult to achieve economic _____. White workers pressured state _____ to bar Negroes from _____ skilled trades and initiated _____ against employers who hired _____ to work at the _____ task as whites. Many _____ Negroes did work as _____, masons, carpenters, shopkeepers, and even as office clerks; and there were a few Negroes who accumulated substantial wealth.

11-2-A

The existence of free _____ in the South was _____ constant challenge to those _____ that Negroes were inherently _____ to live free in _____, their natural role being _____ of slave or servant. In the 1790's and

_____ throughout the first half _____
 the nineteenth century, restrictions _____
 gradually placed upon the _____ of free Negroes.
 They _____ forbidden to own or _____
 arms, to obtain loans _____ permission of a
 guardian, _____ travel from one state
 _____ another, to testify in _____
 against any white man, _____ to vote in elections.

_____ the 1820's fears of _____
 rebellion swept the South, _____ whites more
 determined to _____ their interests by preventing
 _____ Negroes from inciting slaves _____
 violence. They hoped that _____ restricting free
 Negroes' privileges _____ opportunities they could
 convince _____ that winning freedom was
 _____ worth the effort. In _____
 1840's and 1850's several _____ states were pre-
 paring legislation _____ the expulsion or enslave-
 ment _____ free Negroes. In Arkansas,
 _____ example, an 1859 law _____ all
 free Negroes in _____ state to leave. Those
 _____ to do so were _____ be sold into
 slavery.

_____ of these setbacks, and
 _____ of the general prejudice _____
 them, free Negroes found _____ difficult to

achieve economic _____. White workers, pressuring state _____ to bar Negroes from _____ skilled trades, initiated strikes _____ employers hiring blacks to _____ at the same tasks _____ whites. Many free Negroes _____ work as barbers, masons, _____ shopkeepers, and even as _____ clerks; and there were a few Negroes accumulating substantial wealth.

APPENDIX C

PRODUCTION INSTRUMENT

1. The astronaut crouched in the chair. He examined the straps.

2. The battle disappointed the general. He gave up hope of victory.

3. The professor imitated a magician. He grasped the handkerchief in his hand.

4. The lady settled into a convenient chair. She balanced the glass of lemonade on her knee.

5. The news horrified the engineer. He scolded my nephew.

6. The scout prayed for shelter. He staggered into the stockade.

7. The customer was cured of curiosity. She was filled with dismay.

8. The nervous ghost giggled. He beamed his lantern at the playful giraffe.

9. The musician paused at the laughter. He lifted his head.

10. The messenger murmured to the maid. He reported the accident.

APPENDIX D

PERCEIVED DIFFICULTY INSTRUMENT

1. _____ Braided together, the cables were drawn through the furnace to the opposite side.
_____ The cables, which had been braided together, were drawn through the furnace to the opposite side.
2. _____ The Eskimo, shifting the supplies to his shoulders, trudged off into the wilderness.
_____ The Eskimo, who shifted the supplies to his shoulders, trudged off into the wilderness.
3. _____ The nervous editor, who was horrified at the honesty of the general's answer, interrupted and reminded him who would be responsible for the statement.
_____ Horrified at the honesty of the general's answer, the nervous editor interrupted and reminded him who would be responsible for the statement.
4. _____ My nephew rescued his favorite goose from the knife of the starving musician.
_____ My nephew rescued his favorite goose from the knife of the musician who was starving.
5. _____ The gypsy, who had been gradually persuaded by the shepherd to scout for the vanished hog, limped toward the swamp.
_____ The gypsy, who had been gradually persuaded by the shepherd to scout for the hog which had vanished, limped toward the swamp.
6. _____ The sheriff, who had been bruised by the fall from the stallion and who was insisting on examining the whole area, needed help.

- _____ Bruised by the fall from the stallion, the sheriff, who was insisting on examining the whole area, needed help.
7. _____ They blamed the accident on the furnace which was bulging with broken furniture, a parachute, and part of a rake.
- _____ They blamed the accident on the furnace bulging with broken furniture, a parachute, and part of a rake.
8. _____ The postman will deliver an envelope containing a check.
- _____ The postman will deliver an envelope which contains a check.
9. _____ Pleasantly greeting the grocery boy in the hall, the chimpanzee helped himself to the grapes.
- _____ The chimpanzee who pleasantly greeted the grocery boy in the hall helped himself to the grapes.
10. _____ When the blizzard ended, we destroyed the dragon.
- _____ The blizzard having ended, we destroyed the dragon.

APPENDIX E

DIRECTIONS TO STUDENTS AT EACH GRADE LEVEL

Directions--Grades 5 and 7

Exercise 1.

This is an exercise in putting sentences together. On your sheet you will find ten pairs of sentences and a blank line under each pair.

1. Please read both sentences.
2. Think how you can put the two sentences together into one sentence.
3. Write your sentence on the blank line.

Then go to the next pair and do the same thing. When you have finished the page, raise your hand.

Exercise 2.

In this exercise I am trying to find out the kinds of sentences that you think are hard for you to understand, and the kinds of sentences that are easy for you to understand. On your sheet you will find pairs of sentences with blanks in front of them.

1. Read both sentences of the pair.
2. If you think one of them is easier to understand than the other one, put a check in the blank before the EASIER sentence.

3. If there is no difference, make NO mark.

Remember, mark the EASIER sentence in each pair. When you have finished the page, raise your hand. (If you need help to read any of the words, please raise your hand.)

Directions--Grade 5

Exercise 3

In this exercise I am trying to find out how many words you can put back into a section of a social studies book. On your sheets I have copied several paragraphs from a book. I left out every fifth word and put a blank in its place. All the blanks are the same length.

1. Please read the whole page first.
2. Then start at the beginning again and try to fill in the words which have been left out. Put ONE word in each blank.
3. You may have to skip some blanks and go back to them later.
4. Try your best to put in the word you think was in the book.
5. Don't worry about spelling. If you are afraid I won't be able to tell what you are saying, raise your hand and I will tell you how to spell the word that bothers you.
6. When you have filled in all the blanks, go on to the next page. Be sure to start that page by reading the whole thing first.

Your paragraphs are about the Hopi Indians who live in the southwestern part of the United States.

Directions--Grade 7

Exercise 3

In this exercise I am trying to find out how many words you can put back into a section of a social studies book. On your sheets I have copied several paragraphs from a book. I left out every fifth word and put a blank in its place. All the blanks are the same length.

1. Please read the whole page first.
2. Then start at the beginning again and try to fill in the words which have been left out. Put ONE word in each blank. (A hyphenated word like ping-pong is considered one word.)
3. You may have to skip some blanks and go back to them later.
4. Try your best to put in the word you think was in the book.
5. Don't worry about spelling. If you are afraid I won't be able to tell what you are saying, raise your hand and I will tell you how to spell the word that bothers you.
6. When you have filled in all the blanks, go on to the next page. Be sure to start that page by reading the whole thing first.

Your paragraphs are about potatoes and coal, two of our important national products.

Directions--Grade 9

Instrument 1

This is an exercise in combining sentences. On your sheet you will find ten pairs of sentences and a blank line under each pair.

1. Please read both sentences.
2. Think how you would combine the two sentences into one.
3. Write your sentence on the blank line.

When you have finished the page, raise your hand.

Instrument 2

In this exercise I am trying to determine the kinds of sentences that you think are easier for you to understand. On your sheet you will find pairs of sentences with blanks in front of them.

1. Read both sentences in the pair.
2. If you think one of them is easier for you to understand than the other one, put a check in the blank before the EASIER sentence.
3. If you find no difference in difficulty, make NO mark.

Remember, mark the EASIER sentence in each pair. When you have finished the page, raise your hand.

Instrument 3

In this exercise I am trying to determine how many words you can put back into a section of a social studies book. On your sheets I have copied several paragraphs from a book. I left out every fifth word and put a blank in its place. All the blanks are the same length.

1. Please read the whole page first.
2. Then start at the beginning again and try to fill in the words which have been left out. Put ONE word in each blank. (A hyphenated word like ping-pong is considered one word.) You may have to skip some blanks and return to them later.
3. When you have filled in all the blanks, go on to the next page. Be sure to start that page by reading the whole thing first.

Your pages are about local government and international trade.

Directions--Grade 11

Instrument 1

This is an exercise in combining sentences. On your sheet you will find ten pairs of sentences and a blank line under each pair.

1. Please read both sentences.
2. Think how you would combine the two sentences into one.

3. Write your sentence on the blank line.

When you have finished the page, raise your hand.

Instrument 2

In this exercise I am trying to determine the kinds of sentences that you think are easier for you to understand. On your sheet you will find pairs of sentences with blanks in front of them.

1. Read both sentences in the pair.
2. If you think one of them is easier for you to understand than the other one, put a check in the blank before the EASIER sentence.
3. If you find no difference in difficulty, make NO mark.

Remember, mark the EASIER sentence in each pair. When you have finished the page, raise your hand.

Instrument 3

In this exercise I am trying to determine how many words you can put back into a section of a social studies book. On your sheets I have copied several paragraphs from a book. I left out every fifth word and put a blank in its place. All the blanks are the same length.

1. Please read the whole page first.
2. Then start at the beginning again and try to fill in the words which have been left out. Put ONE word in each blank. (A hyphenated word like ping-pong is

considered one word.) You may have to skip some blanks and return to them later.

3. When you have filled in all the blanks, go on to the next page. Be sure to start that page by reading the whole thing first.

Your pages are about the Negro in United States history.

REFERENCES

- Allen, Robert L. "An Approach to Better Reading Through the Recognition of Grammatical Relationships," Improvement of Reading Through Classroom Practice. International Reading Association Conference Proceedings, 9:224-225, 1964.
- Bloomer, Richard H. Non-Overt Reinforced Cloze Procedure. U. S. Department of Health, Education, and Welfare, Office of Education, 1966.
- Blumenfeld, J. P., Gerald Miller, and E. B. Coleman. Improving Reading Skills by Teaching Rules of Grammar. Report to the U. S. Office of Education, Cooperative Research Project 2599, Alpine, Texas, 1965.
- Bormuth, John R. Relationships Between Selected Language Variables and Comprehension Ability and Difficulty. Report to the U. S. Office of Education, Cooperative Research Project 2082, Los Angeles, California, 1964.
- Bormuth, John R. "The Cloze Readability Procedure," Elementary English, 45:429-436, 1968.
- Botel, Morton, John Dawkins, and Alvin Granowsky. "A Syntactic Complexity Formula," in Walter H. MacGinitie (Ed.), Assessment Problems in Reading. Newark, Delaware: International Reading Association, 1973, pp. 77-86.
- Briggs, F. Allen. "'Grammatical Sense' as a Factor in Reading Comprehension," 1968 Yearbook of the National Reading Conference, 1968.
- Center for the Study of Instruction. The Social Sciences: Concepts and Values (Purple). New York: Harcourt Brace Jovanovich, Inc., 1970.
- Chomsky, Carol. The Acquisition of Syntax in Children from Five to Ten. Cambridge: Massachusetts Institute of Technology Press, 1969.

- Christ, Henry I. Modern English in Action, Twelve. Boston: D. C. Heath and Company, 1968.
- Clark, Nadine, W. L. Gruenwald, James Edmonson, and Arthur Dondineau. Civics for Americans. New York: Macmillan, 1965.
- Coleman, E. B. "The Comprehensibility of Several Grammatical Transformations," Journal of Applied Psychology, 48:186-190, 1964.
- Dale, Edgar, and Jeanne S. Chall. "A Formula for Predicting Readability: Instructions," Educational Research Bulletin, 27:37-54, February 18, 1948.
- Downie, N. M., and R. W. Heath. Basic Statistical Methods. New York: Harper & Row, 1965.
- Fagan, William T. "The Relationship Between Reading Difficulty and the Number and Type of Sentence Transformations." Paper presented at Annual Meeting of IRA, Atlantic City, New Jersey, April, 1971.
- Fraser, Colin, Ursula Bellugi, and Roger Brown. "Control of Grammar in Imitation, Comprehension, and Production," Journal of Verbal Learning and Verbal Behavior, 2:121-135, 1963.
- Glass, Gene V., and Julian C. Stanley. Statistical Methods in Education and Psychology. Englewood Cliffs, N. J.: Prentice-Hall, 1970.
- Good, Carter V., and Douglas E. Scates. Methods of Research. New York: Appleton, Century and Crofts, 1954.
- Hansell, Thomas S. K. "The Effect of Manipulation of Syntax and Vocabulary on Reading Comprehension." Unpublished doctoral dissertation, University of Virginia, 1974.
- Hays, William L. Statistics. New York: Holt, Rinehart and Winston, 1963.
- Hunt, Kellogg W. Differences in Grammatical Structures Written at Three Grade Levels. Report to the U. S. Office of Education, Cooperative Research Project 1998, Tallahassee, Florida, 1964.

- Lenneberg, Eric H. Biological Foundations of Language. New York: Wiley, 1967.
- Loban, Walter. Language Ability Grades Seven, Eight, and Nine. U. S. Department of Health, Education, and Welfare, Office of Education, 1966.
- MacGinitie, W. H. "Contextual Constraints in English Prose Passages," Journal of Psychology, 51:121-130, 1961.
- Madgic, Robert F., Stanley S. Seaberg, Fred H. Stopsky, and Robin W. Winks. The American Experience. Menlo Park: Addison Wesley Publishing Company, 1971.
- Nurss, Joanne R. "Children's Reading: Syntactic Structure and Comprehension Difficulty." Unpublished doctoral dissertation, Columbia University, 1966.
- Olds, Henry F., Jr. "An Experimental Study of Syntactical Factors Influencing Children's Comprehension of Certain Complex Relationships." Cambridge: Harvard University Center for Research and Development on Educational Differences, 1968.
- Peltz, Fillmore Kenneth. "The Effect upon Comprehension of Repatterning Based on Students' Writing Patterns," Reading Research Quarterly, 9(4):603-621, 1974.
- Potter, Thomas C. "A Taxonomy of Cloze Research, Part I: Readability and Reading Comprehension." Southwest Regional Educational Laboratory, Inglewood, California, 1968. Abstracted in Research in Education, ERIC, Vol. 4, No. 2, 1969, p. 91.
- Riling, Mildred E. Oral and Written Language of Children in Grades 4 and 6 Compared with the Language of Their Textbooks. Report to the U. S. Office of Education, Cooperative Research Project 2410, Durant, Oklahoma, 1965.
- Robertson, Jean E. "Pupil Understanding of Connectives in Reading." J. Allen Figurel (Ed.), Forging Ahead in Reading, Newark, Delaware: International Reading Association, 1968, pp. 581-588.
- Ruddell, R. B. "An Investigation of the Effect of the Similarity of Oral and Written Patterns of Language Structure on Reading Comprehension." Unpublished doctoral dissertation, Indiana University, 1963.

- Russell, David H., and Henry R. Fea. "Research on Teaching Reading." In N. L. Gage (ed.), Handbook of Research on Teaching. Chicago: Rand McNally & Co., 1963.
- Saveland, Robert N., Robert M. Glendinning, John F. Kolars, Marion I. Wright, and Howard J. Critchfield. World Resources. Boston: Ginn and Company, 1968.
- Schlesinger, I. M. Sentence Structure and the Reading Process. The Hague: Mouton, 1968.
- Smith, William L. "The Effect of Transformed Syntactic Structures on Reading." In C. Braun (Ed.), Language, Reading, and the Communication Process. Newark, Delaware: International Reading Association, 1970, pp. 52-62.
- Spache, George D. Good Reading for Poor Readers. Champaign, Ill.: Garrard Publishing Company, 1974.
- Stoodt, Barbara D. "The Relationship Between Understanding Grammatical Conjunctions and Reading Comprehension," Elementary English, 49:502-504, April, 1972.
- Strang, Ruth. "Exploration on the Reading Process." In Theodore Clymer (Ed.), Reading Research Quarterly, International Reading Association, Vol. 2, No. 3, pp. 33-45, 1967.
- Strickland, Ruth. "The Language of Elementary School Children: Its Relationship to the Language of Reading Textbooks and the Quality of Reading of Selected Children," Bulletin of the School of Education, Indiana University, Vol. 38, No. 4, 1962.
- Tatham, Susan M. "Reading Comprehension of Materials Written with Select Oral Language Patterns: A Study at Grades Two and Four," Reading Research Quarterly, 5(3):402-426, Spring, 1970.
- Taylor, Stanford E., and Helen Frackenpohl. "A Core Vocabulary (Reading)." EDL Research and Information Bulletin No. 5. Huntington, N. Y.: Educational Development Laboratories, 1960.
- Wert, James E., Charles O. Neidt, and J. Stanley Ahmann. Statistical Methods. New York: Appleton, Century and Crofts, 1954.

Yngve, V. H. "A Model and an Hypothesis for Language Structure," Proceedings of the American Philosophy Society, 104:444-446, 1960.

Yngve, V. H. "Implications of Mechanical Translation Research," Proceedings of the American Philosophy Society, 108:275-281, 1964.