

AN INVESTIGATION INTO THE EFFECTS OF SYNTACTIC MANIPULATION
ON THE READING COMPREHENSION OF STUDENTS
AT TWO GRADE LEVELS

THESIS

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ABSTRACT

Since the early 1900's reading theorists have agreed that the understanding of various syntactic relationships does play a role in reading comprehension. This study attempted to investigate the effect of specific syntactic manipulation (verb) on the reading comprehension of intermediate and junior high school students. Each group was divided into good or poor readers based on results of the Stanford Achievement Test. Both good and poor readers were equal in vocabulary ability and differed only in their comprehension. A researcher-designed oral reading task consisting of specially constructed sentence trios was administered to each student. The trios consisted of a syntactically and semantically correct sentence, a sentence which was syntactically correct but semantically incorrect and a totally disruptive sentence. As each student read a total of 15 sentences, an error count (omissions, substitutions, insertions and repetitions) was tabulated. The results of the study demonstrated that the poor readers in grade four made significantly more errors than the good readers for the totally disruptive sentences. There was no significant difference found for individual sentence types between

the good and poor eighth grade readers. When comparing only the poor readers from both grades, the fourth grade students made significantly more errors for each sentence type than did the eighth grade students. Comparison of all students from both grades revealed the fourth grade students made significantly more errors than the eighth graders for two sentence types and total sentences read.

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CHAPTER I

Statement of the Problem

Purpose

What is reading? How does a child learn to read? What "happens" when a person reads? Why can a child "read" words, but not understand what is read? Is there a teacher of reading who has not pondered these questions over and over again?

Definitions of reading and theories about the reading process itself have abounded. Researchers have attempted in many ways to answer the preceding questions. Amid the often debated theories of reading, one thing remains clear: Reading is itself a complex process utilizing many separate processes to arrive at a single goal-comprehension or "meaning."

Psycholinguists state that the reading process involves a series of various "cue" systems which enable the reader to incorporate his experiences into and onto the printed page. The reader in a sense, brings along with him on the reading journey a number of past experiences and personal knowledge. These experiences are extracted one by one by the reader as needed. The reader's capacity to utilize these experiences are in fact what makes the reading

journey successful or not.

This researcher attempted to examine how one such "cue" system, syntax, affects the comprehension of fourth and eighth grade students through the administration of an oral reading task specifically designed for this purpose.

Need for the Study

Reading as a process, according to psycholinguists is a combination of three processes: semantics, graphophonemics and syntax. While each can be identified as a separate process, they simultaneously help a reader decipher that the "string of words" on the printed page is really a sentence which transmits meaning.

During the 1950's transformational grammarians prompted an increased interest in the study of syntactic structures and the function of syntax in relation to meaning. According to the research of Rosenbaum and Jacobs (1968), it is the syntactic element which actually generates the sentence itself. Most transformationists, Postal (cited in Rosenbaum and Jacobs, 1968), Rosenbaum and Jacobs (1968) among them, state that it is syntax which possesses the creative character of a sentence, with the semantic and graphophonemic processes operating

on the syntactic element.

Cromer's 1968 research (cited in Isakson and Miller 1976) suggested that readers could be divided into two groups based on the causes of their comprehension difficulty. One group had difficulty due to a deficiency in vocabulary and/or word recognition. Comprehension was adversely affected since individual word meanings could not be extracted. The second group possessed adequate word recognition skills, but still could not comprehend total sentences. The conceptualization of these groups sparked further study in the differentiation of comprehension difficulties.

Isakson and Miller (1976) used Cromer's basic conclusions as a basis for their study involving fourth grade students' reliance on syntax for comprehension. Manipulating syntactic restraints, they found that some students (whom they labeled as good readers) made more oral reading errors on a given manipulated sentence than did their classmates (labeled as poor readers) although both groups possessed the same word recognition ability. Their findings indicate that the good readers utilized more than just individual words and word meanings to comprehend sentences.

Bormuth, Manning, Carr and Pearson (1970) examined

in detail, the extent to which syntactic complexity influences comprehension. They found an unexpectedly low performance level by fourth grade students on varying sentence structures, many of which appeared to the researchers to be quite straight forward and obvious.

Weinstein and Rabinovitch (1971) further examined the importance of syntax in its particular relationship to memory. Good readers, it was found, could adequately use syntactic information as an aid to recall, whereas poor readers did not generalize the grammatical information inherent in every sentence.

Kachuk (1978), Richek (1976) and Ruddell (1965) concur that there is a positive correlation between the understanding of syntactic structures and reading comprehension.

Since increased emphasis is now being placed on syntax as a recognizable factor in the understanding of the written word, it seemed feasible to explore the relationship between the use of syntactic clues and reading comprehension.

Questions of this Study

The writer investigated the following questions:

1. Is there a significant difference between good and poor readers in the fourth grade for Sentence Type I?
2. Is there a significant difference between good and poor readers in the fourth grade for Sentence Type II?
3. Is there a significant difference between good and poor readers in the fourth grade for Sentence Type III?
4. Is there a significant difference between good and poor readers in the eighth grade for Sentence Type I?
5. Is there a significant difference between good and poor readers in the eighth grade for Sentence Type II?
6. Is there a significant difference between good and poor readers in the eighth grade for Sentence Type III?
7. Is there a significant difference between good readers in the fourth and eighth grades for Sentence Type I?
8. Is there a significant difference between good

readers in the fourth and eighth grades for
Sentence Type II?

9. Is there a significant difference between good readers in the fourth and eighth grades for Sentence Type III?
10. Is there a significant difference between poor readers in the fourth and eighth grades for Sentence Type I?
11. Is there a significant difference between poor readers in the fourth and eighth grades for Sentence Type II?
12. Is there a significant difference between poor readers in the fourth and eighth grades for Sentence Type III?
13. Is there a significant difference between fourth grade and eighth grade students for Sentence Type I?
14. Is there a significant difference between fourth grade and eighth grade students for Sentence Type II?
15. Is there a significant difference between fourth grade and eighth grade students for Sentence Type III?

Definition of Terms

Syntax - For this study, syntax will include the way a part of speech is used in a sentence: subject, verb, direct object et cetera.

Disruptive effect - The degree to which the probability of the occurrence of oral reading errors is increased by the inclusion of a confusing structured element or word in written context. This appears to be a viable dependent variable in measuring the degree to which syntactic and semantic relationships are utilized in sentence processing. (Isakson and Miller, 1976)

Good readers - For the purpose of this study, those students who read at least one grade level above their own as measured by the Comprehension subtest of the Stanford Achievement Test Form B.

Poor readers - For the purpose of this study, those students who read at or below grade level as measured by the Comprehension subtest of the Stanford Achievement Test Form B.

Sentence Type I - A researcher-constructed sentence which is syntactically and semantically correct.

Sentence Type II - A researcher-constructed sentence which is syntactically correct and semantically incorrect.

Sentence Type III - A totally disruptive sentence which is syntactically and semantically incorrect.

Limitations

There are certain limitations inherent in this study.

In dealing with two different grade levels, some aspects of score comparisons may be skewed. Some differences may be due to the instructional maturity of the older students.

The original sample used consisted of twenty-one fourth graders and thirty eighth graders. Due to the definition of good and poor readers previously given, the sample size was reduced to twelve fourth grade students and fourteen eighth graders.

Summary

Syntactic constraints have been shown to be a variable in students' comprehension of the written word. This study attempted to determine if there is a significant relationship between determined syntactic manipulation and comprehension.

CHAPTER II

Review of the Literature

Purpose

The primary purpose of this study was to examine the effect of syntactic manipulation on the reading comprehension of intermediate and junior high students based on an oral reading task.

In addition, the effect of semantic manipulation on reading comprehension was examined.

Development of the Study of Syntax

The interest in the study of syntax is not new. Transformational grammarians have influenced much syntactic research dating back to the 1950's. The theories of the transformationists have encouraged subsequent interest and although this interest has been steady, it appears that the 1970's spawned many studies examining the relationship of syntax to reading comprehension.

Syntax as "process"

As early as 1917, Thorndike (as cited in Athey, 1975) pointed out that reading is a process involving the correct synthesis of key sentence elements. Since that time, the

majority of research on syntax supports this view.

Some psycholinguists have theorized that reading as a process is really a combination of three systems which must be synthesized to acquire meaning. Graphophonemics, semantics and syntax all combine to lead the reader to the ultimate reading goal -- comprehension. It is through these systems that the reader discovers the "string of words" on the printed page is really a sentence carrying meaning.

Although each of the "cue systems" is important in its own right, it is "syntax" which has most captured the attention of teachers and researchers alike in recent years. According to Rosenbaum and Jacobs (1968) it is the syntactic element which actually generates the sentence itself. It is this generative effect which allows a constant series of new sentences to be formed. When one considers the alternative to sentence formation (that of memorizing previously learned ones for later repetition), the necessity of syntax becomes apparent.

Syntax and Comprehension

Much research has been conducted relating syntax to reading comprehension. As early as the 1940's, studies investigating this relationship were finding a definite

link between syntax and comprehension. Gibbons (1941, cited in Athey 1975) hypothesized that the ability to see relationships among sentence parts is essential to the understanding of the sentence itself. By use of a "disarranged phrase test," Gibbons tested his hypothesis using third grade students and found a correlation of .89 between the ability to discern the relationship among parts of a sentence and the capacity to understand the sentence. Kachuk (1978), Richek (1976) and Ruddell (1965) concur that there is a positive correlation between understanding syntactic structures and reading comprehension.

Subsequent studies have further investigated the nature and extent of the syntax - comprehension relationship. Cromer (1968, cited in Isakson and Miller, 1976) conceptualized two distinct groups of poor comprehenders. One group of poor readers appeared to have comprehension difficulties because of a deficiency in vocabulary and word recognition skills. Cromer proposed that this type of reader had difficulties because he/she could not extract individual word meanings. The second group of poor readers possessed adequate word recognition skills, but still had difficulty comprehending sentence meaning. It appeared therefore, that these readers could not integrate the separate lists of knowledge (words) into the larger

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scope (sentence) to achieve meaning. This conceptualization supports the view that poor readers do not utilize knowledge of syntax as an aid to comprehension, but rather, appear to process words singly and do not integrate word meanings. (Isakson and Miller, 1976).

Isakson and Miller (1976) proposed that Cromer (1968) failed in his conceptualization of comprehension difficulties to identify and subsequently group the students according to equivalent abilities in word identification (vocabulary). They studied fourth grade students' reliance on syntax for comprehension, but grouped the students in a unique way. Two groups of comprehenders were identified on the basis of the reading comprehension subtest of the Iowa Test of Basic Skills. Those labeled as good readers scored at least .5 of a year above grade level, while those scoring at least .5 of a year below grade level placement were labeled poor readers. Both groups scored within $\pm .5$ year of grade placement in word recognition ability as measured by the vocabulary subtest of the Iowa Test of Basic Skills at the time of testing. This distinction separated the Isakson and Miller (1976) study from its predecessors. Once grouped, the students were individually tested using a researcher designed oral reading task. Each student was required to read a selection

of sentences involving syntactic manipulation (specifically verb manipulation). Isakson and Miller (1976) found that those readers labeled as good comprehenders made more oral reading errors than the poor comprehenders as the sentences were manipulated. The good comprehenders, it was theorized, noted syntactic irregularity by their oral reading errors. Poor readers, on the other hand, read manipulated sentences without increased error. The findings indicate that good readers utilize more than just individual words and word meanings to comprehend sentences. The poor comprehenders did not possess the same capacity for utilizing the structure of language as an aid to comprehension.

One of the foremost studies in this area was conducted by Bormuth, Manning, Carr and Pearson (1970). Their purpose was to conceptualize and define three classes of the skills by which knowledge is presumably acquired from written language. Various syntactic structures were studied and used in the definition for each skill: sentence comprehension questions, anaphora comprehension questions, intersentence syntax questions. A comprehension skill as defined by the researchers, was the ability to respond correctly to a question beginning with a "wh" necessitating the deletion of one of the parts of a syntactic structure.

For example, in the sentence, "The tiny cat drank milk," the syntactic structure of adjective - noun (tiny cat) could be deleted in a comprehension question and replaced with a "wh" question such as "What cat drank milk?"

Anaphoric comprehension questions involved shortening an expression (usually with a pronoun). For example, in the sentences, "The tiny cat drank milk," "This cat is mine," the demonstrative pronoun "this" shortens the expression, "the tiny cat." The antecedent of the anaphora may be any length from a single word to a paragraph or longer.

Intersentence syntax involves the sequential position of expressions which in turn signal the relationships between the sentences. For example, causality could be shown in the sentences, "The boy fell off the horse." "He broke his arm." Reversing and combining the sentences changes the causality as well, "The boy's breaking of his arm caused his fall from the horse." Four question types -- rote, transform, semantic substitute and compound were developed for each of the three structured skill classes. Over 60 fourth grade students comprised the sample. Each student read specially constructed paragraphs and responded to questions derived from the four types. The results showed that many of the students were unable to demonstrate comprehension of the most basic syntactic structures. Rote

questions proved to be the easiest and compound questions were found to be the most difficult. There were many indications from the study that the major categories of structures (sentence comprehension, anaphora, intersentence syntax) were hierarchically related as well as the question types themselves. The researchers found the level of performance by the fourth grade students to be unexpectedly low, while in their view, the testing tasks appeared basic. It would appear therefore that many students do not comprehend written material as much as teachers might expect. This study has many implications for classroom use. Written language transmits much of the knowledge a student learns in school. It seemed logical therefore to ascertain certain syntactic structures which may hinder or impede the transmission of such knowledge.

The syntactic competence of problem readers was studied by Denner (1970). The study evaluated the theoretical proposition that syntactic competence is essential in learning how to read.

A four-task test (modeled after Farnham-Diggory, 1967), was administered to groups of problem readers:

1. first grade readers who were reading so poorly they were to be retained
2. first grade average readers (used as a control)

3. random sampling of third through fifth grade readers who were promoted on schedule despite reading difficulties
4. a group of Head Start students (mean age 6.2)

The subjects were asked to respond to four separate activities involving an enactive task (student obeys various commands to show mastery of basic words: jump, walk, clap, et cetera), a pictograph task (student identifies correctly a picture representing the same words used in the enactive task), a logograph task (student correctly identifies stimulus as with pictographs) and finally a synthesis task where the student read a sentence composed of the logographs, and was then asked to complete the action expressed.

Denner found that all groups performed perfectly on the enactive task and in fact there was no significant difference in either the pictograph or logograph tasks.

The average first grade readers performed as well on the synthesis task as they did on the other three tests. The third through fifth grade readers did significantly less well on the subsequent tasks while the poor first grade readers and the Head Start students were able to perform very few integrated acts, thus demonstrating little syntactic competence.

The same readers who grasped the concept of given logographs were unable in most cases to translate a series of symbols into an integrated or unified action. The students attempted to act out each individual logograph, rather than viewing the string of logographs as a meaningful sentence.

Denner (1970) contends that these students fail to utilize the rules which govern the relationship of words in a sentence (syntax).

Specific syntactic substitutions were studied by Beebe (1980) who investigated the effect of different miscues on reading. She tested forty-six fourth grade boys to determine to what extent substitution miscues affected their silent reading comprehension. After the students read a selected passage orally, their miscues were coded into one of three categories:

1. corrections made by student
2. syntactically and semantically acceptable
3. syntactically and semantically unacceptable

The students were then asked to re-tell the story to the examiner. The student received a re-telling score based on the Reading Miscue Inventory developed by Goodman and Burke (1972). The student's retelling score was correlated with the number and type of his miscues. As hypoth-

esized, Beebe (1980) found that students who corrected their miscues scored the highest on the re-telling task. Only the unacceptable miscues (syntactically and semantically incorrect) detracted from the understanding of the story. She concluded that syntactic miscues alter a student's comprehension adversely. The other types of miscues do not alter comprehension as significantly.

Specific Syntactic Structures

Healy and Miller (1970) studied the differential importance of individual words in a sentence as they relate to the whole. Their purpose was to discover if the main verb of a given sentence is more influential in determining sentence meaning than a noun (when used as an agent -- either subject or direct object). Sixteen young adults comprised the sample and were asked to sort a group of 25 sentences into piles on the basis of similarity of meaning. The sentences contained one of five pre-selected subjects matched with one of five pre-selected verbs (thus arriving at a possible total of 25 sentences). The results showed that the majority of subjects (13 of the 16) categorized the sentences according to verbs. Significance was noted at the .008 level by means of a sign test, thus rejecting the null hypothesis of no difference between nouns and

verbs as a basis for sentence sorting. Verbs therefore, appear to be more influential than agents in the judged meaning of a sentence.

Guthrie (1973) studied the extent to which syntactic cues are used by good and poor readers. The subjects ranged in age from seven to eleven, and were required to complete a maze task to produce a correct sentence. Three alternatives were given for each substitution, with one being a syntactic alternative, one being a lexical alternative and one correct response. The results of the study showed the number of occurrences of syntactic responses is lower for nouns and modifiers than for verbs or function words. As Guthrie states, one way of conceptualizing the results is that if a person is unable to respond correctly when faced with a noun or modifier, he is more likely to select a lexical response. When he is faced with a verb or function word, he will more likely select a syntactic alternative. Therefore the conservation of syntax is stronger for verbs than nouns.

Syntax and Semantics

Weinstein and Rabinovitch (1971) examined the role of syntax in the recall of information. These researchers attempted to discover whether the syntactic structure of a

sentence facilitates recall in groups of good and poor readers. Lists of sentences were constructed consisting of function words, nonsense syllable stems and bound morphemes. The students were required to learn four sentences, two of which were structured syntactically and two, which were unstructured. The sentences were tape recorded and played for the students individually. The students were required to repeat what they heard on the tape after a ten second time lapse. The student was given as much time as necessary to verbally reproduce what was heard. If an incorrect response was made, the material was repeated until three correct reproductions were made.

The results showed that good readers learned the structured lists in fewer trials than unstructured. There was not a significant difference in the number of trials for the poorer readers. In the case of the unstructured lists, both groups learned the lists with equal difficulty. The difference between the groups is found in their ability to utilize syntactic structures inherent in a sentence. The good reader is capable of synthesizing syntactic information in a way that the poor reader cannot. The locus of the facilitation for recall appears to lie in the cues inherent in syntax, which was implicit in the structured

lists.

Siler (1973-74) studied the oral reading errors made by second and fourth grade students on specially constructed passages. Students were instructed to read a variety of sentences individually typed on cards. The sentences were constructed to meet the following criteria: control sentences ("I like cold milk with my cake."), semantic violation ("We use milk to make dresses."), syntactic violation ("We use to silk make dresses.") and syntactic and semantic violation ("We use to milk make dresses."). Cards were placed face down on a table and the subject was required to turn the card over and read the sentence orally.

Four conclusions were drawn by Siler (1973-74) on the basis of his findings:

- a) Syntax appeared to have a greater effect than semantics on oral reading performance.
- b) Sentences violated syntactically were also violated semantically.
- c) Sentences violated semantically were not violated syntactically.
- d) Syntax and semantics appeared to be interrelated.

The conclusions drawn from the Siler study raise many implications for further research in this area.

Summary

It is generally accepted that children acquire a knowledge of syntactic use with maturity and experience. Studies have been conducted which demonstrate this sequential development suggesting that certain comprehension difficulties might be avoided by re-wording certain syntactic structures.

The vast extent to which syntax influences reading comprehension is still under investigation. Many assumptions have been made concerning what readers should be able to understand. The readers themselves however did not always live up to those assumptions as researchers are discovering.

Further study concerning syntax acquisition as well as syntax use is needed along with adequate methods of measurement.

CHAPTER III
The Research Design

Purpose

This research study was concerned with the extent to which syntactic manipulation alters oral reading comprehension in intermediate and junior high students, as well as whether good or poor readers differed significantly in their reliance on syntax.

The Hypotheses

The null hypotheses investigated were as follows:

1. There is no significant difference in the number of errors made between good and poor readers in the fourth grade for Sentence Type I.
2. There is no significant difference in the number of errors made between good and poor readers in the fourth grade for Sentence Type II.
3. There is no significant difference in the number of errors made between good and poor readers in the fourth grade for Sentence Type III.
4. There is no significant difference in the number of errors made between good and poor readers in the fourth grade across all sentence types.

5. There is no significant difference in the number of errors made between good and poor readers in the eighth grade for Sentence Type I.
6. There is no significant difference in the number of errors made between good and poor readers in the eighth grade for Sentence Type II.
7. There is no significant difference in the number of errors made between good and poor readers in the eighth grade for Sentence Type III.
8. There is no significant difference in the number of errors made between good and poor readers in the eighth grade across all sentence types.
9. There is no significant difference in the number of errors made between good readers in the fourth and eighth grades for Sentence Type I.
10. There is no significant difference in the number of errors made between good readers in the fourth and eighth grades for Sentence Type II.
11. There is no significant difference in the number of errors made between good readers in the fourth and eighth grades for Sentence Type III.
12. There is no significant difference in the number of errors made between good readers in the fourth and eighth grades across all sentence types.

13. There is no significant difference in the number of errors made between poor readers in the fourth and eighth grades for Sentence Type I.
14. There is no significant difference in the number of errors made between poor readers in the fourth and eighth grades for Sentence Type II.
15. There is no significant difference in the number of errors made between poor readers in the fourth and eighth grades for Sentence Type III.
16. There is no significant difference in the number of errors made between poor readers in the fourth and eighth grades across all sentence types.
17. There is no significant difference in the number of errors made between fourth grade and eighth grade students for Sentence Type I.
18. There is no significant difference in the number of errors made between fourth grade and eighth grade students for Sentence Type II.
19. There is no significant difference in the number of errors made between fourth grade and eighth grade students for Sentence Type III.
20. There is no significant difference in the number of errors made between fourth grade and eighth grade students across all sentence types.

Methodology

Subjects

The subjects involved in this study were intermediate (fourth grade) and junior high (eighth grade) students from a suburban parochial school in upstate New York.

A total of 25 fourth graders and 30 eighth graders were tested for this study. From this original number, the sample size was reduced based on the results of the Vocabulary subtest of the Stanford Achievement Test. This was to insure all students would have adequate vocabulary skills before being divided into good and poor readers on the basis of the comprehension subtest of the Stanford Achievement Test. A total of 26 students (12 fourth graders and 14 eighth graders) composed the sample.

Instruments and Procedure

The instruments for this study included the appropriate level of both the Reading Comprehension and Vocabulary subtests of the Stanford Achievement Test Form A which was administered to all fourth and eighth grade students. Based on the results of the Stanford Achievement Test, the students were divided into good and poor readers for each grade level.

The Reading Comprehension subtest was used to deter-

mine the groups labeled as good or poor readers, while the Vocabulary subtest was used to match the students according to vocabulary level.

A teacher-designed set of oral reading tasks was presented. These tasks were composed of sentence "trios" consisting of:

1. a syntactically and semantically correct sentence (Sentence Type I)
"The cat drank milk."
2. a syntactically correct, but semantically incorrect sentence (Sentence Type II)
"The cat sang milk."
3. a totally disruptive sentence which was syntactically and semantically incorrect (Sentence Type III)
"The cat went milk."

There were 15 sentence "trios" for each grade level providing a total "pool" of 45 sentences for each grade. Each sentence trio had the same word load and was constructed from the basal reading series used at each level. Single sentences were typed on index cards for use.

Each student was tested individually using the teacher-designed task. One sentence from each trio was randomly selected, with the only restriction that there

were five examples of each sentence type. Each student read only one sentence from each trio.

The student was asked to read the sentence typed on the index card. He was also instructed that no teacher assistance would be offered or given. Oral reading errors were recorded on a master sheet as well as tape recorded for future reference and verification. The student testing was completed after a total of 15 sentences (five from each type) was read.

The following types of errors were recorded: omissions, substitutions, insertions and repetitions and a total error count tabulated.

Statistical Design

Due to the small sample of the two independent groups (good and poor readers), a Student t-test was utilized.

Since it was necessary to establish levels of reading comprehension before dividing the samples, the Stanford Achievement Test scores (Vocabulary and Comprehension) and actual grade placement were used as a basis for the formation of the reading groups (fourth and eighth grade, good and poor). The following table shows the range of reading levels in each grouping based on the Comprehension subtest of the Stanford Achievement Test.

Table 1
 Comprehension Scores Based on the
 Stanford Achievement Test

	Poor Readers	Good Readers
4 th Grade Students	3.0 -- 4.5	5.3 -- 6.2
8 th Grade Students	6.5 -- 8.0	9.2 -- 12 +

A two-tailed t-test was used to test for significance at the .05 level.

Summary

This study was designed to examine the effect of selected syntactic manipulation on the comprehension of intermediate and junior high students based on an oral reading task.

Two testing instruments, the Stanford Achievement Test, and a researcher designed oral reading task were used in the study. Fourth and eighth grade students from a suburban parochial school comprised the sample.

Students were first grouped by the results of the vocabulary subtest of the Stanford Achievement Test (to partial out vocabulary as a causatory factor) and sub-

sequently divided into good and poor readers based on the comprehension subtest of the Stanford Achievement Test. After the students responded to an oral reading task constructed by the researcher, the results were tabulated by use of a two-tailed t-test.

CHAPTER IV

Findings and Interpretations

Purpose

The primary purpose of the current study was to examine the effect of specific syntactic manipulation on the reading comprehension of intermediate and junior high students as measured by a researcher-designed oral reading task. A secondary purpose was to examine the effect of semantic manipulation on the reading comprehension of intermediate and junior high students.

Analyzing the Findings and Interpreting the Data

The results of the two-tailed Student t-tests for the 20 null hypotheses tested in this study are presented in the following tables. All hypotheses were tested at the .05 level of significance.

The first null hypothesis stated that there is no significant difference between good and poor readers in the fourth grade for Sentence Type I. The pertinent data appear in Table 2.

Table 2

Student T-test Results of Good and Poor
Readers Tested for Sentence Type I

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	<u>p</u>
4 th Grade Good Readers	6	1.83	1.47	.56	NS *
4 th Grade Poor Readers	6	2.33	1.63		

* $p < .05$

\bar{t} crit = 2.23

On the basis of the data presented, the null hypothesis was accepted. There is, therefore, no significant difference in the amount of errors made by good or poor readers in the fourth grade for Sentence Type I.

The second null hypothesis stated that there is no significant difference in the number of errors made between good and poor readers in the fourth grade for Sentence Type II. The data for the hypothesis appear in Table 3.

Table 3

Student T -test Results of Good and Poor
Readers Tested for Sentence Type II

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	<u>p</u>
4 th Grade Good Readers	6	1.33	1.21	1.79	NS *
4 th Grade Poor Readers	6	2.50	1.05		

* $p < .05$

$t_{crit} = 2.23$

The null hypothesis was accepted on the basis of the data. The results indicate there is no significant difference in the number of errors made by good or poor fourth grade readers on Sentence Type II.

The third null hypothesis stated there is no significant difference in the number of errors between good and poor readers in the fourth grade for Sentence Type III. The results are shown in Table 4.

Table 4

Student T-test Results of Good and Poor Readers Tested for Sentence Type III

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	<u>p</u>
4 th Grade Good Readers	6	3.00	1.26	2.37	p < .05
4 th Grade Poor Readers	6	5.50	2.26		

t crit = 2.23

On the basis of the data, the null hypothesis was rejected. The results indicated that there was a significant difference in the number of errors made by good and poor fourth grade readers for Sentence Type III. The fourth grade poor readers made significantly more errors (2.50) than did the good readers.

The fourth null hypothesis stated that there is no significant difference in the number of errors made by good and poor readers across all sentence types (total number of sentences read). The data are shown in Table 5.

Table 5

Student T-test Results of Good and Poor
Readers Tested for All Sentence Types

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	<u>p</u>
4 th Grade Good Readers	6	6.17	2.23	2.80	p < .05
4 th Grade Poor Readers	6	10.33	2.88		

t crit = 2.23

Based on the data, the null hypothesis was rejected. The results demonstrated that there is a significant difference in the number of errors made by good and poor readers across sentence types. The poor readers made significantly more errors (4.16) across sentence types (total number of errors for all sentences read) than the good readers.

The fifth null hypothesis stated there is no significant difference in the number of errors made by good and poor readers in grade eight for Sentence Type I. Table 6 shows the testing results.

Table 6

Student T-test Results of Good and Poor
Readers Tested for Sentence Type I

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	p
8 th Grade Good Readers	7	0.57	0.98	.57	NS *
8 th Grade Poor Readers	7	0.00	0.00		

* $p < .05$

\bar{t} crit = 2.179

Based on the data, the null hypothesis was accepted. The results demonstrated that there is no significant difference in the number of errors made on Sentence Type I.

The sixth null hypothesis stated there is no significant difference in the number of errors made by good and poor eighth grade readers for Sentence Type II. The results are shown in Table 7.

Table 7

Student T-test Results of Good and Poor
Readers Tested for Sentence Type II

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	<u>p</u>
8 th Grade Good Readers	7	2.00	1.53	1.00	NS *
8 th Grade Poor Readers	7	1.00	1.00		

* p < .05

t crit = 2.179

Based on the results, the data failed to reject the null hypothesis. There is no significant difference in the number of errors made by good or poor eighth grade readers for Sentence Type II.

The seventh null hypothesis stated that there is no significant difference in the number of errors made by good and poor eighth grade readers for Sentence Type III. The results are shown in Table 8.

Table 8

Student T-test Results of Good and Poor Readers Tested for Sentence Type III

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	p
8 th Grade Good Readers	7	2.43	0.79	1.65	NS *
8 th Grade Poor Readers	7	1.43	1.40		

* $p < .05$

\bar{t} crit = 2.179

The data as shown failed to reject the null hypothesis. There was no significant difference in the number of errors made by good or poor readers in grade eight for Sentence Type III.

The eighth null hypothesis stated there is no significant difference in the number of errors made by good or poor eighth grade readers across all sentence types (total errors for all sentences read). Table 9 shows the results.

Table 9

Student T-test Results of Good and Poor Readers Tested for All Sentence Types

Group	N	\bar{X}	<u>SD</u>	<u>t</u>	<u>p</u>
8 th Grade Good Readers	7	5.00	2.45	2.41	p < .05
8 th Grade Poor Readers	7	2.43	1.40		

t crit = 2.179

The data indicate there is a significant difference in the total number of errors made across sentence types. The good eighth grade readers made significantly more errors (2.57) than did the poor readers. Therefore, this null hypothesis was rejected.

The null hypotheses 9-12 dealt with good readers in grades four and eight. These were stated as follows:

9. There is no significant difference in the number of errors made by good fourth and eighth grade readers for Sentence Type I.
10. There is no significant difference in the number of errors made by good fourth and eighth grade

readers for Sentence Type II.

11. There is no significant difference in the number of errors made by good fourth and eighth grade readers for Sentence Type III.
12. There is no significant difference in the number of errors made by good fourth and eighth grade readers across all sentence types (total errors for sentences read).

The results of the testing for the above hypotheses were compiled in Table 10.

Table 10

Compilation of Results from Student
T-tests for Good Fourth and Eighth
 Grade Readers

Sent.type	<u>Grade 8</u>			<u>Grade 4</u>			<u>t</u>	<u>p</u>
	N	\bar{X}	<u>SD</u>	N	\bar{X}	<u>SD</u>		
1	7	0.57	0.98	6	1.83	1.47	1.84	NS *
2	7	2.00	1.53	6	1.33	1.21	0.86	NS *
3	7	2.43	0.79	6	3.00	1.26	0.99	NS *
total	7	5.00	2.45	6	6.17	2.23	0.89	NS *

* $p < .05$

$t_{crit} = 2.20$

The data as shown have failed to reject the null hypotheses. There is no significant difference in the number of errors made between good readers in the fourth and eighth grades for any sentence type as well as across sentence types.

The null hypotheses 13-16 dealt with the poor readers in grades four and eight and were stated as follows:

13. There is no significant difference in the number of errors made by poor readers in grades four and eight for Sentence Type I.
14. There is no significant difference in the number of errors made by poor readers in grades four and eight for Sentence Type II.
15. There is no significant difference in the number of errors made by poor readers in grades four and eight for Sentence Type III.
16. There is no significant difference in the number of errors made by poor readers in grades four and eight across sentence types (total errors made for all sentences).

The results of the testing of these hypotheses is shown in Table 11.

Table 11

Compilation of Results from Student T-tests
for Poor Fourth and Eighth Grade Readers

Sent.type	<u>Grade 8</u>			<u>Grade 4</u>			<u>t</u>	<u>p</u>
	N	\bar{X}	<u>SD</u>	N	\bar{X}	<u>SD</u>		
1	7	0.00	0.00	6	2.33	1.63	3.81	p < .05
2	7	1.00	1.00	6	2.50	1.05	2.64	p < .05
3	7	1.43	1.40	6	5.50	2.26	3.97	p < .05
total	7	2.43	1.40	6	10.33	2.88	6.45	p < .05

t crit = 2.20

The null hypotheses 13-16 were rejected based on the data presented. There is a significant difference in the number of errors made by poor fourth grade readers for all sentence types as well as across sentence types (2.33, 1.50, 4.07, 7.90 respectively). In each case, the fourth grade readers made significantly more errors than did the eighth grade readers.

Hypotheses 17-20 dealt with the combined good and poor readers from grades four and eight, and were stated as follows:

17. There is no significant difference in the number

of errors made by fourth and eighth grade readers for Sentence Type I.

- 18. There is no significant difference in the number of errors made by fourth and eighth grade readers for Sentence Type II.
- 19. There is no significant difference in the number of errors made by fourth and eighth grade readers for Sentence Type III.
- 20. There is no significant difference in the number of errors made by fourth and eighth grade readers across sentence types (total errors for all sentences read).

The data are shown in Table 12.

Table 12

Compilation of Student T-test Results for Fourth and Eighth Grade Readers for All Sentence Types

Sent.type	<u>Grade 8</u>			<u>Grade 4</u>			<u>t</u>	<u>p</u>
	N	\bar{X}	<u>SD</u>	N	\bar{X}	<u>SD</u>		
1	14	0.29	0.73	12	2.08	1.51	3.94	p < .01
2	14	1.50	1.34	12	1.92	1.24	0.82	NS *
3	14	1.93	1.21	12	4.25	2.18	3.42	p < .01
total	14	3.71	2.33	12	8.25	3.28	4.11	p < .01

* p < .05

\bar{t} crit = 2.06

The table reveals that there is a significant difference in the number of errors made by fourth and eighth grade readers for Sentence Type I (1.79), Sentence Type III (3.42) and total sentences read (4.11). In each case, the fourth graders made significantly more errors than eighth grade students. Null hypotheses 17, 19, 20 were rejected on the basis of the data. However, there was no significant difference in the number of errors made by fourth and eighth grade readers for Sentence Type II and thus null hypothesis 18 was accepted.

Summary

The findings presented in this chapter reveal that comprehension as based on an oral reading task can be significantly affected by the manipulation of a specific syntactic structure. Age (as noted by grade placement) and present comprehension level (as noted by scores of a standardized achievement test) were two factors which were studied. The amount of oral reading errors differed with age and comprehension ability.

CHAPTER V

Conclusions and Implications

Purpose

The purpose of this study was to examine the effect of specific syntactic manipulation on the reading comprehension of intermediate and junior high students. A secondary purpose was to examine the effect of semantic manipulation on reading comprehension.

Conclusions

Since the early 1900's reading theorists have agreed that the understanding of syntactic relationships does play a role in reading comprehension. With varying intensity throughout the years, researchers have attempted to explain the nature and extent to which syntactic knowledge influences reading comprehension.

Using the basic premises of Cromer (1971) and Isakson and Miller (1976), this researcher attempted to examine the effect of verb manipulation of structured sentences on reading comprehension.

Two grade levels were investigated to test for the possibility that age may be a factor in reliance on syntax. Each grade level was subsequently divided into

good and poor readers based on the results of the reading comprehension subtest of the Stanford Achievement Test.

Vocabulary was partialled out as a contributing factor by insuring both good and poor readers had approximately the same vocabulary score (which was above grade level) based on results of the vocabulary subtest of the Stanford Achievement Test.

When comparing only the good readers from both grades, no significant differences were noted between sentence types (Sentence Type I: syntactically and semantically correct; Sentence Type II: syntactically correct but semantically incorrect; Sentence Type III: syntactically and semantically incorrect). Overall, the fourth grade readers made more errors, but the differences were not significant at the .05 level of significance.

Considering only the poor readers from both grades, significant differences were found between the fourth and eighth graders. The fourth grade readers made significantly more errors than the eighth grade readers for each sentence type tested, including the total number of errors. For both grades, the number of errors increased from Sentence Type I to Sentence Type III. Further research could investigate whether the increased amount of errors made by

the poor readers was significant across the sentence types.

Examining each grade individually, this researcher found there was no significant difference in the number of errors made by good and poor eighth grade readers for any sentence type. Even though not significant at the .05 level, the results indicate that good readers did make increasingly more errors for each sentence type. In total errors for all sentences, the good readers did make significantly more errors than the poor readers.

The reverse of the eighth grade results was found to be true in the case of the fourth graders. Poor students made more errors on each sentence type, as well as for the total number of errors for all sentences. The difference was significant for Sentence Type III (semantically and syntactically incorrect) and the total number of errors for all sentences read.

When total students from both grades were combined, the fourth grade readers made more errors on all three sentence types (as well as total errors for all sentence types) than did the eighth grade. The difference was significant at the .01 level for Sentence Type I, III and total errors.

Suggestions for Further Research

A small sample size was used for this study and although an appropriate statistical analysis was performed, a larger sampling of students might yield differing results, or in fact confirm the results of this researcher. The actual number of sentences read might be increased for future studies as well.

The students comprising the sample attended a suburban parochial school. A wider sampling of students from both public and private schools and urban as well as suburban areas might have produced different results.

The use of a different testing instrument to determine the samples might yield different groupings. The Stanford Achievement Test was administered to the total school population, but a test more specifically designed for reading competency could be employed in future research.

No attempt was made to record questions which were posed by the students during testing. It was observed that particularly, eighth grade students questioned or remarked about the disrupted sentences. Although the error count included omissions, substitutions, insertions and repetitions, perhaps a category for questions relating to the sentence should be included. Many students

read a disrupted sentence correctly, yet ended the declarative sentence with a questioning tone or made a direct comment such as, "This doesn't make sense." A re-telling task such as described by Beebe (1980) might be employed to test for comprehension of sentences read. In such a way, information about the nature or importance of the disruption could be examined.

Implications for Classroom Use

The results of this study concur with many previous studies (Bormuth et al, 1970, Isakson and Miller, 1976, among others) that syntax does play an important role in reading comprehension.

The responsibility of the classroom teacher becomes evident when faced with these results. First, it is necessary to be aware of the role syntax plays in the comprehension process. The assumption that if a student knows the appropriate vocabulary he or she will be able to read, is fallacious. Numerous studies have supported the fact that vocabulary knowledge is not sufficient to insure adequate comprehension (Cromer, 1971, Isakson and Miller, 1976).

Therefore, the classroom teacher can eliminate and in many cases prevent comprehension errors due to syntactic

difficulties. Practice in syntactic constructions by use of diagrams, clozure exercises or sentence patterns would aid in reducing confusion about syntax. Careful examination of miscues as suggested by Beebe (1980) would yield valuable information for the teacher. Frequent integration of syntax work into reading instruction would prove beneficial in alleviating possible syntax-related difficulties in reading comprehension.

Summary

The conclusions of this study concur at least in part with those of Isakson and Miller (1976). When examining individual grade levels, the poor readers made significantly more errors than the good in grade four for Sentence Type III and total number of sentences read. There was also a significant difference in the total number of errors for all sentences read by the eighth graders, with the good readers making more.

By examining the good students from grades four and eight combined, no significant difference in number of errors was found for any sentence type or total sentences read.

Conversely, there was a significant difference for each sentence type and total sentences when comparing

the poor readers from both grades. The fourth graders in all cases made significantly more errors.

Comparing all students from both grades revealed that the fourth graders made significantly more errors than the eighth graders for Sentence Types I, III and total sentences read.

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