



This is to certify that the

dissertation entitled

The Relationship of Text Structure Manipulations,
Discourse Type and Language Ability on Question
Answers and Free Recall Responses in Learning
Disabled Children

presented by

Marjorie Jean Penning

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Teacher Education


Major professor

Date January 16, 1986



RETURNING MATERIALS:
Place in book drop to
remove this checkout from
your record. FINES will
be charged if book is
returned after the date
stamped below.

--	--	--

THE RELATIONSHIP OF TEXT STRUCTURE
MANIPULATIONS DISCOURSE TYPE AND
LANGUAGE ABILITY TO QUESTION ANSWERS
AND FREE RECALL RESPONSES IN
LEARNING DISABLED CHILDREN

By

Marjorie Jean Penning

AN ABSTRACT OF A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Teacher Education

1986

ABSTRACT

THE RELATIONSHIP OF TEXT STRUCTURE MANIPULATIONS DISCOURSE TYPE AND LANGUAGE ABILITY ON QUESTION ANSWERS AND FREE RECALL RESPONSES IN LEARNING DISABLED CHILDREN

By

Marjorie Jean Penning

In recent years there has been a growing interest in the role of reader-related and text related variables in reading comprehension. This study was designed to compare a homogenous group of Learning Disabled students to regular education age matched peers. The purpose of this study was to assess the relationship of text structure manipulations for simple and complex sentence structure, discourse type for narrative and expository text (expository types of cause effect, problem solution, descriptive, list like and compare contrast) and language ability to free and probed recall responses.

Data for this study was collected by establishing subject control criteria for age, education, intelligence and decoding skills. Individual assessments were completed for 1) measures of language ability and 2) free recall and probed student responses to a series of passages. The passages were constructed to allow for a grammatically simple and a grammatically complex version of each of the discourse types.

A 2 x 6 x 2 multivariate analysis was completed on the data, with the between subject factors of group, and the

within subject factors of discourse type and grammatical complexity for both of the dependent measures of comprehension. A second analysis was completed to consider the added factor of type of question. The two groups were compared on language tests. An analysis of covariance was completed using the language measures each as a covariate to predict group differences.

There were significant group interactions with all of the other factors. Significant effects were found for discourse type and type of question for both probed and free recall responses. An analysis of covariance indicated that group differences could be predicted by the PICAC Overall scores and the percentage of complex sentences used. Significant effects were not found for the grammatical form manipulation.

Results of the study are discussed as supporting the facilitating influence of structured text on recall, and the role of syntactic skills in expository text comprehension. Findings failed to support expectations for comprehension based on sentence structure complexity in text for either group. Implications are for further research to differentiate levels of language skills necessary for comprehension of types of expository text.

To My Parents
MATTHEW AND ANN SCHOLTEN

ACKNOWLEDGMENTS

This dissertation is the result of the contributions and support of a number of people. First of all, I am indebted to my committee members: Dr. Thomas Carr, Dr. Shelia Fitzgerald, Dr. Taffy Raphael, Dr. George Sherman, and Dr. Ron Wolthuis for their assistance in revising the materials and editing the text chapters. I am grateful for the ongoing help of Dr. Shelia Fitzgerald, who chaired my committee, and of Dr. Taffy Raphael, who helped focus the topic and direction of the study. I would like to thank Dr. Bruce Porch for his review of the testing procedures. I would like to thank Mr. C. Kelly Kidder, Ms. Sharon Crampton, Mr. Frank Ritowski, and Mr. George Portfleet for their help in locating and scheduling the students for the study. I am indebted to Mr. Bob Korte, Dr. Mike Henry, and Dr. Grey Lairson for their review of the data analysis, and I am thankful for the assistance of Ms. Chris Kraak and Dr. Grey Lairson, who scored the data to measure reliability. I would like to thank the sixth grade students who participated in the study. Finally, this study would not have been possible without the support and encouragement of my husband, Dr. James Penning, who assisted me throughout the entire project.

TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
I. Introduction	1 - 4
II. Review of the Literature	5 - 29
Reader Related Variables	
Text Related Variables	
Systems for Analysis of Grammatical Form	
Systems for Analysis of Discourse Type	
Chapter Summary	
III Methodology	31 - 55
Experimental Design	
Subjects	
Materials	
Design	
Procedures	
Students	
Passages	
Dependent Measures	
Chapter Summary	
IV Results and Discussion	56 - 86
Results	
Discussion	

Chapter Summary	
V. Summary and Conclusions	87-107
Summary	
Conclusions	
Chapter Summary	
Appendices	108-186
A. Letters and Reports	108-114
Permission Letters	
Example Reports	
B. Passages	115-180
Cause Effect	
The War with Spain	
Complex	
Simple	
The Start of the French and Indian War	
Complex	
Simple	
Narrative	
Lentil	
Complex	
Simple	
Moony B. Finch	
Complex	
Simple	
Problem Solution	
Super Cities Tangled Transport	
Complex	
Simple	
Problems of a Growing Region	
Complex	
Simple	
Descriptive	
San Francisco	
Complex	
Simple	
Los Angeles	
Complex	
Simple	

- List Like
 - Seashells
 - Complex
 - Simple
 - Nine Important Elements
 - Complex
 - Simple
- Compare Contrast
 - Some Differences in Africa
 - Complex
 - Simple
 - Sparta and Athens: Cities in Greece
 - Complex
 - Simple

C. Summary Tables	181-185
Bibliography	186-200

LIST OF TABLES

Table	Page
1 Passage Titles by Discourse Type	37
2 Number of Words and Propositions in Passages	38
3 Relations Among Propositions in Text	41
4 Categorization of Passage Sentences According to Degrees Established by the van Dijk and Kintsch 1983 System	42
5 PICAC Scoring System for Categories of Decoding	50
6 Scoring System for Recall Responses	52
7 Scoring System for Question Answers	53
8 Mean Scores for Group Responses to the Pretests	58
9 ANCOVA Responses for Total Comprehension Scores for Group Differences with the Pretests as the Covariates	60
10 ANCOVA Results with Recall Scores for Group Differences Using Pretests as Covariates	60
11 ANCOVA Results for Question Answers Using Pretests as Covariates	61
12 Means for Recall Scores for Multivariate Analysis of Group by Grammatical Form by Discourse Type	63
13 Means for Responses to Questions for Group by Grammatical Form	64
14 ANOVA Mean Scores for Recall Responses for Group by Discourse Type	66
15 Mean Scores for Question Answers for Group by Discourse Type	66

Tables (cont.)	Pages (cont.)
16 Post Hoc Comparisons of Discourse Types Using Scheffe's Procedure of Analysis	67
17 Results of Multivariate Analysis for Group by Discourse Type by Type of Question	70
18 Mean Scores and Standard Deviations for the Interaction of Discourse Type by Question Type	71
19 Mean Scores for Learning Disabled and Regular Education Students' Responses to Types of Questions	72
APPENDIX C TABLES	
1 ANOVA for Mean Scores on Pretests for Group Comparisons	181
2 MANOVA Table for Recall Responses, Grammatical Form by Discourse Type Interaction	181
3 MANOVA Summary Table for Question Answer Responses for Group by Discourse Type by Grammatical Form Interaction	182
4 ANOVA Table for Recall Scores Group by Discourse Type Interaction	182
5 ANOVA Table for Question Answer Scores on the Interaction of Group by Discourse Type	183
6 Recall Scores for the Interaction of Group by Grammatical Form	183
7 ANOVA Table for Comparison of Question Answers for the Interaction of Group by Grammatical Form	183
8 MANOVA Table for Discourse Type by Type of Question Interaction	184
9 ANOVA Table for Group by Type of Question Interaction	185
10 Results of Scheffe's Procedure for Comparison of Question Types	185

CHAPTER 1

INTRODUCTION

Purpose of Study

This study was designed to assess the relationships among discourse type, grammatical form, and language ability as they affect the ability of Learning Disabled students to answer questions and recall text read. In this study a homogenous group of Learning Disabled children was compared to a group of Regular Education, age matched peers.

Rationale for the Study

Reading comprehension is influenced by a variety of text-related and reader-related variables. Measures of comprehension must account for or control for a number of parameters, generally beyond the scope of a single research project. In the area of reader-related variables, age, interest, decoding skill, background knowledge, strategies for drawing inferences, schemata, perspectives, levels of agreement with content, purpose for reading, monitoring of comprehension levels and reader processing styles will all influence reading comprehension (Meyer, 1981).

In the area of text-related variables, readers vary depending on text content, structure and emphasis (or the author's format to convey purpose and mood through word

choices and ordering of content). Text-related variables occur at all levels within and across sentences, as well as in longer units of discourse (Meyer, 1981).

It is important to consider both reader-related and text-related variables when studying the probable sources of comprehension breakdowns in Learning Disabled students. We know that Learning Disabled students are largely students who have trouble comprehending, yet the reasons for their difficulties have not been clearly delineated. Because the literature from studies of skilled readers indicates that there are potential problems with either reader-based or text-based variables, it is necessary to systematically examine the reader-related variables (such as background knowledge, linguistic competence, and intelligence) known to affect readers in general, and the text-variables (such as discourse type and grammatical structure) which seem to be likely causes of reading comprehension problems in the Learning Disabled students (Cromer, 1970; Bock & Brewer, 1985; Omanson, 1985).

In this study, reader-related variables such as age, interest, decoding skills, background knowledge, and purpose were held constant, as were the text-related variables for content and emphasis. Text-related variables for structure for both grammatical form and discourse type differences in content presentation were manipulated. Comprehension was assessed according to how it varied as a function of discourse type and grammatical complexity. This variation

was examined under the two differing conditions of free recall and probed recall.

This study was focused on sixth grade students, ages eleven to twelve, because these students are required to read content material in school, and thus, have had more experiences with expository text than students in lower grades. Interest and difficulty level were controlled by the use of material initially taken from fifth grade texts. Because of the strong influence of decoding skill on reading comprehension, this study controlled for decoding by selecting only Learning Disabled students who were good decoders but poor comprehenders.

Much of the decoding ability differences were minimized by measuring for and requiring a 90% accuracy level for decoding fluency and efficiency in the children involved in the study to provide a better measure of comprehension in children who were, in general, able to decode the text. Children who were able to decode the text were studied to delineate aspects of comprehension based on differences in organization of content in materials and skill in language areas.

Background knowledge and reading strategies are strongly influenced by intelligence. To control for intelligence, psychological test score requirements were used for part of the subject selection criteria. Because children with different profiles on psychological testing (in verbal as opposed to performance areas) may be

processing linguistic information differently, neither group were excluded from this study.

By studying the comprehension and language skills of poor comprehenders, we can increase our knowledge of the reading comprehension process and of the factors which influence breakdowns in reading comprehension.

Questions Addressed:

The research questions to be answered in this study were the following:

1) How do Learning Disabled students differ from normally-achieving peers in their comprehension of text varying in (a) discourse type? (b) grammatical complexity?

2) How do Learning Disabled students differ from normally-achieving peers in their use of forms of linguistic complexity?

Chapter 2

Review of the Literature

Reading comprehension is a complex, interactive process involving the text, the author, and the reader in communicative situation (Rumelhart, 1977; Stanovich, 1980; Tierney, Bridge & Cera, 1978-79). Readers vary their focus along a continuum from primarily text based processing to primarily reader based processing (Pearson, 1982). Many interrelated factors influence reader comprehension, such as the reader's purpose, familiarity with the topic, interest, motivation, and linguistic abilities, as well as types and complexity of discourse. The magnitude of the influence of various skills affecting reading comprehension can be viewed from the perspectives of reader-related variables and text-related variables.

Since both reader and text-related variables contribute to an interactive framework in the comprehension of skilled readers, it is necessary to also consider how they may contribute to reading comprehension failures in unskilled readers. This chapter presents a review of the literature for reader-related and text-related variables in skilled and in unskilled readers. First consideration is given to reader-related variables in skilled, then in unskilled

readers. This section is followed by text-related variables in skilled, then in unskilled readers.

READER RELATED VARIABLES

Skilled Readers:

Much information is available regarding the influences of text and reader variables on normal readers. Reader-related variables encompass the background knowledge and reading strategies that readers bring to the reading comprehension task. These include their ability to draw inferences, their schemata, (or knowledge of the world), their perspectives and preconceptions of the content, their purpose for reading, their monitoring of comprehension, and their processing styles (Meyer, 1981). Successful readers are able to understand text by their use of background knowledge (Marr & Gormely, 1982). They apply this knowledge to text information to build ongoing mental representations or schemata (Spiro, 1980; Goetz, 1979; Meyer, 1981; Kintsch, 1974), and they engage in repair strategies when reading breakdowns occur (Brown, 1980; Paris & Lindauer, 1976).

The literature on comprehension monitoring suggests that comprehension failures occur in the skilled readers as well as the unskilled readers (Brown, 1980; Flavell, 1981; Markman, 1981). Baker and Brown (1984) reported three main types of comprehension failures: when the appropriate schemata are not available because the reader lacks sufficient knowledge about the subject to interpret the text; when the schemata are available but the author has not

provided enough clues to suggest them; and when the reader finds a consistent interpretation of the text, but not the one the author intended. These readers would not take remedial action when comprehension fails, since they do not realize that comprehension has in fact failed. Thorndike (1917) reported that many sixth graders did not spontaneously test their understanding. This would be poor comprehension monitoring in otherwise skilled readers.

As much of the literature relevant for unskilled readers concerns difficulties with background knowledge and vocabulary, it is useful to review the skilled readers' use of schemata, and the influence it has on their text comprehension. Current research on reading comprehension has considered the interaction between reader-based and text-based variables as reflecting top-down and bottom-up processing of information. Flexibility in the degree of top-down or bottom-up focus is dependent on the reader's perceived needs in constructing an ongoing representation of the text (Spiro, 1980; Goetz, 1979). Readers form representations of text material in memory, with continual search for an appropriate schema. Those concepts which are well understood become readily available to the reader on an automatic basis. When written information conflicts with the reader's hypotheses and predictions, lower level inputs are required (Bruce & Rubin, 1981). Thus, as a reader moves through text, background knowledge is activated, relevant schemata are related, text input is used to instantiate

524

(R)

a f

on

(S)

wh

up

co

Re

fa

al

pr

un

st

Me

US

co

19

re

al

co

re

co

19

slots, and inferences are drawn when slots are empty (Rumelhart, 1980). Readers construct and apply schemata in a flexible manner, with schemata being suspended, elaborated on, or replaced, as the meaning of a text is constructed (Spiro, 1980). Schemata fill slots in a top down process, while words in text trigger potential inferences in a bottom up process. Selection of a particular schema depends on a conjunction of these two processes (Adams & Collins, 1979; Rumelhart, 1980; Rumelhart & Ortony, 1977).

In addition to use of background knowledge to facilitate comprehension of the text, skilled readers are also reported to engage in strategies to control ongoing processing, monitor comprehension and facilitate the understanding of difficult aspects of the text. These strategies are referred to as metacognitive (Brown, 1980). Metacognitive awareness and text monitoring strategies are used by the reader to recognize, evaluate and repair comprehension breakdowns (Paris & Lindauer, 1976; Trabasso, 1981). Comprehension monitoring consists of not only realizing that one has failed to understand the text, but also of knowing what to do when comprehension failures occur, (i.e. when and if to use strategic options to re-read, question, scan forward or backwards in the text, or consult another source). (Whimbey, 1975; Baker & Brown, 1984). The next section deals with unskilled readers.

While good studies of unskilled comprehenders do exist, (e.g. Brown & Palincsar, 1982, Palincsar & Brown, 1984), many suffer from two problems: not controlling for the range of differences between unskilled readers within a given category, and failing to distinguish between types of unskilled readers. By far the most prominent source of difficulty for unskilled readers, is their inability to read the text (Vellutino & Scanlon, 1982). Studies not controlling for decoding skills are unfortunately confounding comprehension difficulties with inability to decode the words.

In addition to decoding difficulties, unskilled readers may not have the available schemata, or lack knowledge and vocabulary to interpret the text (Spiro, Bruce & Brewer, 1980; Adams, 1980). There is a need for studies addressing these problems in the unskilled readers that define their population according to language levels and levels of intelligence or learning difficulties. This section will focus on the available studies in the area of background knowledge for the unskilled reader.

Unskilled readers differ in their ability to apply schemata to the text. With some readers, schemata may be overly restricted and tied too closely to personal experiences. Other readers do not realize that their own information is not only useful, but essential to enrich text interpretation (Raphael, 1982). Readers who rely too heavily on bottom-up processing and text material may fail to

activate background knowledge. Problems may occur with schemata selection, when readers apply too early a schema that does not fit, or locate schemata too late to recall salient concepts (Johnston, 1981). Other readers may fail to maintain a schema across longer sections of the text.

Reader familiarity with the text topic is needed to use knowledge structures in semantic memory to understand and integrate a particular text (Anderson, Reynolds, Shallert, & Goetz, 1977; Pearson, Hansen, & Gordon, 1979; Raphael et al, 1981; Prichart & Anderson, 1977). Poor readers have been shown to be influenced in their comprehension by unfamiliar text. Studies in listening comprehension have predicted the fund of general information of readers by their responses to comprehension questions (Humphreys & Davey, 1983). Taylor (1969) reported that negative effects on comprehension occur with good and poor readers because unfamiliar text requires more text based processing and a greater need for the reader to create new knowledge structures to assimilate information.

In addition to vocabulary and background knowledge limitations that influence unskilled readers' comprehension, unskilled readers have also been reported to be limited in their use of metacognitive strategies. Raphael et al, (1981) reported that poor readers had greater difficulty, when compared to skilled readers, judging passage difficulty and predicting performance level on a comprehension test. Language impaired children have also shown delays in both

the development of metamemory skills for the amount of information recalled, and in strategy type, use and maintenance (Menyuk, 1982). Poor readers have been found to use correct monitoring less frequently, to use fewer strategies for monitoring, and to be less aware of negative influences of lack of strategies on their reading comprehension (Paris & Myers, 1981). Poor comprehenders have been reported to show less awareness of the meaningful aspects of text (Canney & Winograd, 1979). Reading comprehension problems may, therefore, be reflecting a failure to monitor with resultant attempts to repair by attending to triggering events or alerts to comprehension failures. Such children may be failing to increase effortful attempts at information processing. They may not recognize problems or use planning strategies when it is clear that text is not understood (Marshall, 1981; Spiro, 1980; Brown, 1980; Collins & Smith, 1982).

In summary, unskilled readers differ from skilled readers in the area of decoding. They also differ in their degree of difficulty on other reader-related variables. They have been reported to have deficiencies in both the amount and use of available background knowledge and schema building processes. Like younger children, however, greater differences are noted by their failure to use comprehension monitoring strategies.

Information on reading comprehension in the less skilled reader is not, however, confined to reader input in

text processing. There are additionally aspects of the text that aid the reader in predicting and processing content. Information from the limited studies completed suggests that text variables may be a crucial area of exploration for comprehension breakdowns in unskilled readers, in addition to their obvious decoding deficits. In the next section, studies on text aspects will be reviewed.

TEXT RELATED VARIABLES

Skilled Readers:

Text related variables include the text content, structure, and emphasis (that is, the author's format to convey purpose and mood through word choices and ordering of content). Text related variables occur at all levels within and across sentences, as well as in longer units of discourse (Meyer, 1981). Text related variables have been studied in depth with normal readers. Linguistically based text analysis systems (Halliday & Hasan, 1976; Kintsch, 1974) have been used to measure the effect of grammatical cues in the text on comprehension. Such studies were, however, focused on sentence level processing, as opposed to longer units of discourse. Findings for normal readers, though, suggest little affect on comprehension when the grammatical format is altered. Text cohesive devices appear to be too general and too frequent in texts (Freebody & Anderson, 1983; Tierney & Mosenthal, 1981), and are not, therefore, related to text coherence.

Much of the research on affects on reading comprehension when texts are manipulated has involved narratives. Story grammar systems were devised to describe linguistically the rules for narrative construction. Freebody & Anderson, (1981), reported that normal reader comprehension cannot be predicted by story grammar structures, as the focus is on the relational structure created by the story statements rather than on the content. Green, et.al, (1980), stated that critical influences on comprehension such as age, inferences on character's goals, plans and attempts to attain the goal, and the representation of specific semantic concepts of a story are not considered in the story grammar models.

Although text changes have not influenced comprehension in normal readers for grammatical manipulations or story grammar rules, normal reader comprehension has been altered by changes in discourse type. Text organization for higher level units has been shown to facilitate comprehension in normal readers (Wilhite, 1982). Subjects recall more high level than low level information, however, when passage content is familiar (Graesser, 1978; Waters, 1978). Some researchers have reported that a high proportion of unfamiliar words in sentences with top level ideas is required before a decrease in performance results with the normal reader (Anderson & Freebody, 1982). Omanson (1985), however, reported that variation in word knowledge

will effect comprehension, not only for processing of individual words, but also for processsing of clauses.

In summary, normal reader comprehension does not change as a result of text manipulations for syntactic structure changes at the sentence level, or for overall grammatical organization of narratives. Top level structural organization for expository text does influence comprehension, particularly when topics are unfamiliar. The research focus for normal readers, therefore, is appropriately placed on reader-related variables, because text manipulations have been shown to be less effective in influencing comprehension. In the next section, evidence will be presented to show why text-related variables may be the desired area of focus, however, when studying comprehension breakdowns in the Learning Disabled reader.

Unskilled Readers:

Fewer studies have addressed comprehension skills for text related areas in unskilled readers. Bock and Brewer (1985) reported that discourse comprehension may depend on coreference among the sentences of the text resulting in a single integrated mental model. Construction of such mental models would be more difficult for expository text than for narratives, because expository text structures use more abstract ideas (Brewer, 1980). Bock and Brewer, along with Garnham (1982), Vipond (1980), and Oaken, Wiener & Cromer (1971), have reported that less-skilled comprehenders have difficulty integrating ideas across sentences to construct

text representations. The available studies suggest a need to further study comprehension skills in unskilled readers, by defining characteristics of the children studied, and by systematically measuring their ability to construct representations of varied text structure.

Unlike normal readers, unskilled readers have been found to vary in their comprehension of texts with grammatical manipulations (Cromer & Wiener, 1966; Guthrie, 1973). Specific grammatical structures have been shown to be difficult for poor readers, such as anaphoric references, or the use of pronouns referring back to the previously stated noun phrase (Frederiksen, 1982). Language impaired children are likely to be predisposed as a group to difficulties understanding complex grammatical form. When compared to normal children, language impaired eleven and twelve year old children on written recall tasks used fewer words, recalled fewer propositions (Sleight & Prinz 1982), and used fewer linguistic ties (Liles, 1982).

Because of the primacy of syntactic deficits in the language impaired population, and the difficulty these children have linking complex grammatical form to ideas, the linguistic skills of unskilled readers and the influences of syntactic structure on comprehension need to be explored. At the text level, causal relationships are expressed through linguistic connectives. Use of linguistic structures marking logical relations among propositions or sentences increases with language development (Beilin &

Lust, 1975; and Paris, 1978). It is likely, therefore, that children who are delayed in the acquisition of syntactic skills may not be able to understand sentences in texts that express causal relationships through linguistic connectives. This is an area that has not, as yet, been explored by researchers, although it is crucial to the understanding of the comprehension difficulties of the language impaired population. Although few studies have focused on the relationship between syntactic skills and poor comprehension, many studies report syntactic deficiencies in poor decoders (Vellutino et al, 1980; Vogel, 1974; deHirsch et al, 1966; Goldsmith, 1977; Flood; and Menyuk, 1979). Poor readers have been reported to have difficulty at the sentence level on comprehension tasks (Cromer & Wiener, 1966; Guthrie, 1973), which may be due to both decoding and syntactic difficulties.

An exploration of the syntactic skills for children who do decode text, but who fail to comprehend it, is suggested because the syntactic ties reported to link idea units together in text are developed late in the course of language acquisition. Fodor et al (1974), discussed the role of the clause boundary in sentence processing. They reported that as adult listeners hear a sentence, they integrate phonetic and lexical information about the input with syntactic and semantic hypotheses about sentence structure and meaning. Much of the work in the 1960's focused on the role of the clause boundary. Final decisions

about syntactic and semantic information are said to be delayed in processing until a clause boundary is reached. Information processed at the clause boundary then incorporates complete major syntactic and semantic units (Marslen-Wilson, Tyler & Seidenberg, 1976). Subordinate conjunctions are the cue that mark a subordinate clause organizing recall around the main clause, rather than processing sentences as a string of words without assigning an overall syntactic or semantic structure to them. Five year old normal children do not do as well on clausal segmentation tasks as seven and eleven year old children do (Fodor et al, 1974). Younger children have not mastered use of inter-sentence linguistic cues which guide the mapping of an utterance on to its discourse content. On recall tasks for sentences in story contexts, five year olds were more restricted in types of textual linkages they used. Anaphoric pronouns, for example, were not used below the age of six (Karmiloff-Smith, 1979), but they were used with eight year olds. Bock & Brewer (1985) reported that lack of skill in processing anaphora can affect text integration.

Few studies have considered language skills in poor readers beyond the sentence level. Such studies available do suggest, however, that language skills for text comprehension should be explored with this population. Spiro (1980) found that poor readers were significantly slower than good readers in responding to between sentence conditions when required to utilize text information outside

of the immediate text vicinity. His findings suggest a possible sentence linkage problem. In another study applicable to grammatical knowledge for surface level text comprehension, Liles (1982), reported that when compared to normal children on written recall tasks, language impaired eleven and twelve year old children used fewer linguistic ties. Carr and Evans (1985), reported that competence at spoken language cannot exert its full positive influence on reading until after the point when print specific skills are acquired, implicating the role of higher level syntactic skills in text comprehension. In summary, evidence to date suggests that although changes in syntactic structures at the sentence level, and in linkage across sentences for text cohesion, have not markedly decreased or facilitated normal reader recall responses, similar conclusions cannot necessarily be drawn for unskilled readers due to their verbal difficulties.

Since breakdowns in comprehension have been reported with skilled readers for varied discourse types, this may be the most promising area of study for comprehension breakdowns with unskilled readers. Although with skilled readers, story grammars for the structure of the narratives, did not account for differences in comprehension, a developmental trend was found in the comprehension of narrative structure when compared to expository text. Studies in child language development report a developmental trend with narratives preceeding

expository text for comprehension. Freedle and Hale (1979) found that story grammars could be used with elementary school children to transfer comprehension schema for narratives to expository prose, by rewriting the stories from one text type to the other.

On studies of expository text comprehension, Meyer, Brandt and Bluth (1980) found unskilled readers unable to identify with the author's organizational structure to facilitate recall of text. They additionally reported that unskilled readers were unable to benefit from signaling and text organization markers. Anderson (1980), provided additional evidence that poor comprehenders are unable to perceive and to use text organization. Marshall and Glock (1978-79) found that poor readers, unlike skilled readers, lack a well established schemata, and depend on information explicitly coded at the surface level of text. Other studies reported that structural changes to simplify organization provided little benefit for poor comprehenders. They apparently were not able to take advantage of text structure (Meyer, 1981; Marshall, 1981; Flood, 1981; Freebody & Anderson, 1981).

In summary, in the studies available, unskilled readers were considered as a group, and controls were not established for language skills, decoding skills, and intelligence. Studies are needed to determine how language skill deficits influence comprehension when one controls for intelligence and decoding skills. The present study was

designed to measure changes in reading comprehension across texts with varied grammatical form and discourse type. Measures of language, decoding skills and intelligence were used to clearly delineate the population of unskilled readers. Many different types of text analysis systems were reviewed for possible use in the study. The following section will review the available systems for text analysis. This review will provide a background for the selections of the van Dijk and Kintsch (1983) system for an analysis of grammatical form, and the Meyer (1975) system of rhetorical predicates which was used as the basis for delineating discourse types.

SYSTEMS FOR THE ANALYSIS OF GRAMMATICAL FORM:

Much of the research on text variables has focused on structural aspects. Many of these studies have used the sentence as the unit of analysis. Although historically there has been an interest in text analyses as a means for measuring comprehension, much of the focus was on readability formulas. In the 1950's the psychological research reflected such an interest (Kintsch & Vipond, 1979). Readability formulas such as the Flesch Reading Ease Scale (1948), the Dale and Chall Formula (1948), the Fog Readability Index (Gunning, 1952), and the Forcast Formula (Stricht, 1972), are still widely used as a means of determining the difficulty levels of basal readers, paragraphs for reading comprehension tests, insurance forms, and military and legal documents. Readability formulas,

however, typically fail to measure text comprehension. An important cause of low correlation between readability formulas and text comprehension is the fact that the formulas are not sensitive to such factors as word order, sentence complexity, and misused words (Redish, 1981), or to coherence and to schematic or generic organization. They also fail to consider reader variables (Klare, 1984). The analyses are limited to word and sentence length variables with some use of word frequency considerations.

With an increased interest in reading from both cognitive psychologists and psycholinguists, an extensive amount of literature has addressed other previously mentioned reader and text related variables that contribute to text comprehension. Current systems for both narrative and expository text have progressively attempted to incorporate some of these variables. Because readability formulas do not address syntactic complexity beyond sentence length, other systems were considered. Halliday and Hasan (1976) described a system of linguistic cohesion. Their system, however does not allow for ties in discourse beyond a pervasive and sentence confined level, as the surface forms measured are found extensively throughout all text. The study to be described incorporated passages written according to the van Dijk and Kintsch (1983) system that describes surface structure signals to relations among propositions. This system allows for a measure of grammatical complexity at the text level, and provides a

means of analyzing linkage of ideas across longer units of sentences. Although the system describes surface structure forms of linkage, underlying structure is accounted for as their system breaks down surface forms in to their underlying deep structure representation at the level of propositions. The levels used in the van Dijk and Kinsch (1983) system are described completely in the next chapter.

SYSTEMS FOR THE ANALYSIS OF DISCOURSE TYPES:

Text structure systems have been described for prose analysis. This section will review the systems considered as a means of text analysis for discourse types. Brewer (1980) divided discourse in to three underlying structural types, each with three to four forms of discourse force, taken from Searle's (1969) theory of speech acts. The types of structures represent material of differing types of linguistic form. Descriptive discourse conveys a stationary perceptual scene, narrative discourse conveys a series of events in temporal, causal or thematic chains, and expository text conveys underlying abstract and logical concepts such as those resulting from mental processes of induction, classification and comparison. The discourse forces refer to the author's communicative intent (i.e. to inform, entertain, persuade or to provide a literary aesthetic experience for the reader). Text structure content and emphasis also depends on the length of the discourse unit. Much of the research on discourse types has focused on the narrative, and most studies of structure used

the sentence as the unit of analysis. Several systems for analyzing text, therefore, have been limited by the type of prose assessed, their focus on linguistic structure with the exclusion of content and their use of sentence level connections as opposed to overall text organization patterns.

Recent attempts to analyze text appear to have been influenced by four developments in the linguistic literature: the work of Grimes (1975), Fillmore's Case Grammar (1968), the development of Speech Act Theory (Searle, 1969) , and the Story Grammar systems (Mandler & Johnson, 1977; Rumelhart, 1975; and Thorndyke, 1977). The work of Grimes, in his 1975 text The Thread of Discourse has been extensively incorporated into several of the expository text analysis systems, as a means of assessing syntactic structures across text levels. Grimes proposed a number of principles of text structure that included types of information, partitioning of information, and three levels of organization of information. Halliday (1967), referred to the three levels as: content, cohesion, and staging. The work of Fillmore in his 1968 article "A Case for Case" has been incorporated in text systems to measure semantic roles. Fillmore described case relationships as those semantically relevant syntactic relationships involving nouns and structures that contain them. These relationships are largely covert, and form a definite set. Only noun phrases

representing the same case can be cojoined. For example, in Fillmore's (1968) four sentences:

John broke the window.

A hammer broke the window.

John broke the window with a hammer.

John and a hammer broke the window.

In the first sentence, the subject is an Agent relation to the verb; in the second sentence, the subject is an Instrument; and in the third both Agent and Instrument appear in the same sentence. Because the subjects in the last sentence are grammatically different, they cannot be cojoined, so the fourth sentence is unacceptable, except as a humorous connotation, or an unusual expression.

The speech act influence on text analysis systems occurs only for the later systems (Goetz & Armbruster, 1980; deBeaugrande, 1980). Interest in listener knowledge and perspectives, and differences between the intent of the speaker and the impact on the listener as a form of a communicative interaction of language have been studied recently. Although Searle (1969) specified speech acts as the basic unit of communication, rather than the grammatically structured sentence, development of pragmatic theory has largely occurred within the last decade.

The final area of influence from the linguistic literature on text analyses systems has been the story grammar systems (e.g. Mandler & Johnson, 1979; Rumelhart, 1975; and Thorndyke, 1977). The story grammars used to

analyze narratives initiated interest in overall structure for expository text. Narrative analysis still consists of story grammars, although writers have been changing story grammars to include attention to content as well as structure. For example, Thorndyke (1977), investigated the structural similarities that reflected social cultural variables rather than linguistic universals. Black and Bower (1980) added attention to character goals and plans. Johnson and Mandler (1980) revised their system to incorporate character goals and multiple episodes. Changes in approaches to text structure analysis have followed, therefore, a similar path of investigation from the linguistic literature, beginning with an interest in language at the level of grammatical form, and expanding to incorporate information from the components of semantics, pragmatics, and finally the changes that occur with longer units of discourse.

Eight primary systems have been devised for expository text analysis. They differ in their emphasis on syntactic, semantic and cognitive content factors. The systems are (in order of development): Kintsch (1974), Meyer, 1975), Fredericksen (1975), Halliday and Hasan (1976), van Dijk (1977), Warren, Nicholas and Trabasso (1979), deBeaugrande (1980), Goetz and Armbruster, (1980); and Armbruster and Anderson, (1982). These systems were reviewed as possible approaches to describe text structure for varied discourse types.

The three systems of Kintsch (1974 Propositional Text Base System), Fredericksen (1975 Semantic and Logical Networks System) and Halliday and Hasan (1976 Linguistic Cohesion) were all systems confined to basically sentence level analyses. van Dijk's (1977 Macro-Structures) would allow for text analysis for longer units of discourse, were it formulated sufficiently for prose analysis, but that currently is not the case. Warren, Nicholas and Trabasso (1979 Event Chains) is primarily for narrative analysis, and has potential application, but has insufficient structure to apply to expository text. The Textuality Standards System (deBeaugrande, 1980), is also proposed at a theoretical level as a model of a possible system yet to be developed. Armbruster's (1984), and Armbruster and Anderson's (1982) system for text mapping represents an ideal framework for the organization of ideas, but it is a system that few texts follow in their idea organization. It is also a system for a graphic display of outlines of text content as opposed to analyzing the idea linkage in the prose format. Armbruster has, however, applied some of Meyer's system (1975 System of Rhetorical Predicates) to her work on text mapping.

Because Meyer's (1975) system of Rhetorical Predicates allows for levels of propositions to assess recall for lower and higher order ideas, and because her five types of rhetorical predicates describe content in passages applicable to expository text, her system was chosen as a means of describing and measuring comprehension of

expository text. A brief description of Meyer's system follows.

Meyer based her system on the work of Grimes (1975) and Fillmore (1968). Meyer's system is an attempt to describe relations among propositions in a text, referred to as rhetorical predicates. Rhetorical predicates involve lexical propositions (which specify case relations between words in clauses and simple sentences), and predicate propositions, (which specify case relations between sentences, paragraphs and longer units of text). Predicate is used to refer to relation (its use in logic) rather than verb. Lexical predicates or propositions and rhetorical predicates were taken from Grimes' semantic grammar of propositions. By using rhetorical relations, Meyer is able to order text ideas into hierarchical relationships, with important ideas at the top of the resulting outline formed from the text analysis.

Meyer has delineated five types of rhetorical predicates for content in passages: the adversative (contrastive pattern), covariance (cause effect pattern), response (problem solution pattern), attributive (list like pattern) and descriptive (examples pattern). Meyer's research shows that adversative and covariance structures facilitate recall from text. (Tierney and Mosenthal, 1982). This portion of Meyer's text analysis is relevant for the purpose of the following study. Her five types of rhetorical predicates for content in passages were used as

examples to find and construct passages representing each of the types (adversative, covariance, response, attributive, and descriptive) in addition to narratives. The remainder of Meyer's system allows for a means of representing ideas in a tree diagram form, with the most important ideas in the top position, and a further delineation of the relations between content words. The method of using a tree diagram to establish hierarchical relationships between text ideas was used to score free recall responses for top level and subordinate ideas. The other aspect of Meyer's system was not used in this study.

Summary of Chapter:

Reading comprehension is a complex, interactive process involving the text, the author and the reader in a communicative situation (Rumelhart, 1977; Stanovich, 1980; Tierney, Bridge & Cera, 1978-79). The reader varies his or her focus along a continuum from primarily text based processing to primarily reader based processing (Pearson, 1982). Many intertwined factors in both reader and text-related variables influence reader comprehension. Both reader and text-related variables, however, contribute to an interactive framework for skilled reader comprehension. They also both contribute to reading comprehension failures in unskilled readers.

A study to measure comprehension for expository text and narrative material must consider the primary reader and text-related variables. Reader-related variables include

the background knowledge and the reading strategies that readers bring to the reading comprehension tasks, in addition to their skills in decoding the text, their overall intelligence their level of language skills, and their purposes for reading. Much information is available on reader-related variables in the normal reader. The few studies available on unskilled readers, however, have not defined their populations sufficiently to determine prior levels of intelligence, language and decoding skills.

Text-related variables include the text content, structure and emphasis. Text variables occur at all levels within and across sentences, as well as in longer units of discourse (Meyer, 1981). In studies with normal readers, the text analyses have basically been limited to linguistic analysis at a sentence level, and have been found to be of limited value in predicting comprehension. Of most value have been studies on top level idea organization for longer units of discourse such as with Meyer's (1975) system of Rhetorical Predicates. Few studies have been completed on the unskilled readers to address either their comprehension of narrative materials or their understanding of varied discourse types. Studies available have not controlled for differences in decoding and language skills beyond a general level. There is a need to establish measures of reading comprehension in unskilled readers to improve our understanding of the reading comprehension process, and to enable us to focus instruction attempts on the comprehension

of text materials that will facilitate understanding. In order to do this studies are needed that carefully control the population of children with learning difficulties included, and closely analyze their grammatical skills for the structures felt to be related to text structures. Such a study requires designing controls for primary text and reader related variables not directly manipulated in the experiment. The study described in the following chapter was designed to meet those requirements.

CHAPTER 3

METHODOLOGY

The purpose of this chapter is to describe the subjects, materials, and procedures used in conducting a study on reading comprehension with a group of Learning Disabled students.

Experimental Design

Subjects:

Sixty students participated in the study; thirty sixth grade students in regular education classrooms, and thirty age matched language impaired students.

Language Impaired Students:

Because it was necessary to control for differences in language, intelligence, and decoding to establish a homogenous group of language impaired students, a strict admission criteria was established for those students. Students included in the study demonstrated normal intelligence, adequate decoding skills, and reading comprehension problems. All students, who met these criteria (in the Grand Rapids Public school system) were included as possible candidates for the language impaired group used in this study. Because the language impaired students selected overlapped with the clinically diagnosed group of Learning Disabled, that label will be used to refer

to this subgroup of children with learning problems. All such students met the following criteria:

Age: All students had a 1973 birthdate, and corresponding sixth grade membership, to control for age differences. The sixth grade age level was chosen because of the comprehension requirements needed for content reading at that grade level. Not all fifth grade students have experience with expository text, and children below the fifth grade vary additionally in decoding skills.

Intelligence: Scores on Psychological testing with the Revised version of the Weschler Intelligence Scale for Children (WISC-R) for Verbal and/or Performance scales were within the normal range (as defined by total subtest scaled scores above 85) to control for intelligence. This is the standard score equivalent to the fifteenth percentile. This test was administered by School Psychologists within two years prior to the study, and test scores were taken from the school records.

Decoding: Test scores for reading decoding on the Wide Range Achievement Test, also administered by School Psychologists were used. Every student reaching the fourth grade level in decoding was a possible candidate for the study. The cut off point was set at the fourth grade level because decoding skills were likely to have changed since the test was administered. Students were further tested in decoding skill by 1) the administration of the fifth grade paragraph of the Analytical Reading Inventory, for a measure

of paragraph reading, and 2) with the text words presented in random order, to assess any differences in decoding without the text context cues. Students who did not score at or above the independent reading level established on both tests, and additionally achieve a mean score of 13.00 according to PICAC scoring, which corresponds to a 90% accuracy and efficiency level, were excluded from the study. The 90% accuracy level was established as the level at which students are considered to be able to decode text freely and independently (Ekwall, 1976). Although that was established as a minimum criteria, the subjects in this study actually decoded at or above the 92nd percentile.

Reading Comprehension: Initially subjects were selected for consideration in the study by school placement, as their learning problems were reflected in their placement in either a resource room, self contained Learning Disability Classroom, or placement on a teacher consultant caseload. Once identified, comprehension problems were further tested by the administration of the comprehension questions accompanying the fifth grade paragraph on the Analytical Reading Inventory. Students who were able to score above the frustration level established on this test were excluded from the study.

Regular Education Students:

The Learning Disabled children were matched by age, sex, race, and general socioeconomic status (determined by home addresses and neighborhood schools) to normal sixth

grade students, who were further tested to ensure that they were scoring within the normal range (above the fifteenth percentile) across all modalities on the Porch Index of Communicative Ability In Children (PICAC), that they were able to decode the Analytical Reading Inventory paragraph and the passage words in random order at or above the Independent level, achieve a mean score at or above 13.00, or the 90% level, and that they could answer the correct number of comprehension questions from the paragraph to score at the independent level established for the test.

The final sixty students were comprised of thirty six boys and twenty four girls. Forty two students were Caucasian and eighteen were Black . The percentage of students according to race was consistent with data compiled by the school district for the percent of minority students in the district and in the Learning Disabled programs during the school year in which the study was completed.

Materials:

Materials used in the study included four pretests, and two sets of twelve passages, or a total of twenty-four, with accompanying comprehension questions.

Description of Pretests:

A variety of test measures were used to delineate student levels of functioning in the areas of language and grammatical proficiency. The test measures were as follows: Porch Index of Communicative Ability in Children (PICAC), with overall, auditory and verbal modality scores used, and

the Story Reformulation Test, for the number and percentage of complex sentence structures used. The tests were chosen to measure a variety of language skills in addition to use of complex sentences, and decoding proficiency. A description of individual tests is as follows:

The Porch Index of Communicative Ability in Children (PICAC), is a battery of twenty subtests of speech and language functions. The test additionally assesses some aspects of reading for simple script and writing at the word, sentence, and copying levels. This test was chosen because it is a psychometrically sound instrument with reliability coefficients above .98 (Porch, 1974). It was also selected to provide information on group characteristics, to ensure that Regular Education students were functioning at a normal level when compared to test norms, and to measure language skills for communication, retention, and processing of auditory information.

The Story Reformulation Test (Chappell, 1980), was given to assess student grammatical skills for both comprehension and expression. This test was chosen as the only valid test that can provide normative data on sixth grade students' use of grammatical form in longer units of discourse. This test was used in lieu of spontaneous speech analyses because it provided the added benefit of controlling content and measuring reception of ideas presented in complex sentence structure form.

Description of Passages:

Twenty four passages were developed for use in this study, selected according to the following format: All passages were initially taken from fifth grade science, social studies and English literature textbooks, from several different series, to establish consistency in experience with topics, similarity of content, and use of topics considered to be of uniform interest and difficulty levels for fifth graders. The passages were chosen to represent either a narrative or one of Meyer's (1975) five types of expository text structure (adversative, covariance, response, attributive, and descriptive). Two passages on similar content were selected for each discourse type. Table 1 lists the passages according to discourse types. Passages were rewritten until uniformity was established for approximate length, number of propositions, clarity of writing style and consistency in representing the different discourse types.

Table 1, PASSAGE TITLES BY DISCOURSE TYPE

Discourse Type	Example	Passage Title	Parallel Version
Covariance	Cause Effect	The War with Spain	Start of the French and Indian War
Story Grammar	Narrative	Lentil	Moony B. Finch
Response	Problem Solution	Super Cities Tangled Transport	Problems of a Growing Region
Examples	Descriptive	Los Angeles	San Francisco
Attributive	List Like	Seashells	Nine Important Elements
Adversative	Compare Contrast	Some Differences in Africa	Sparta and Athens Cities in Greece

Table 2 lists the 400 to 500 word length ranges, and the list of propositions, with the median score of 47.5 propositions for passage types, with a range from 39 to 56 propositions.

Table 2. NUMBER OF WORDS AND PROPOSITIONS IN PASSAGES

Passage Title	Number of Words (Simple)	Number of Words (Complex)	Number of Propositions

The War with Spain	514	482	49
The Start of the French Ind.War	526	408	53
Lentil	511	504	48
Moony B. Finch	469	486	45
Super Cities Tangled Transport	526	524	56
Problems of a Growing Region	501	536	47
Los Angeles	402	423	50
San Francisco	466	445	38
Seashells	500	476	55
Nine Important Elements	429	387	46
Some Differences in Africa	468	452	38
Sparta and Athens Cities in Greece	505	422	40

Following the selection and preliminary construction of the passages, each passage was rewritten to provide for a grammatically simple and a grammatically complex version for each of the twelve passages. This allowed for every child to read a simple and a complex passage of each discourse type. The syntax changes were written according to the guidelines describing levels of grammatical complexity for discourse in the van Dijk and Kintsch (1983) system. Table 3 provides the criteria used to measure relationships among propositions. In writing the passages, changes were limited to surface structure signals that denoted relations among propositions. The two text types did not vary in the order of presentation of content or in vocabulary. The two passage types varied in their use of clausal structure to link ideas grammatically. One set of twelve passages was written so that all sentences conveyed either no relation (a list of incoherent discourse), indirect coherence expressed by noncontiguous sentences, or direct coherence where facts temporarily and or conditionally related were denoted by separate sentences, linearly ordered. The relationship was expressed only one way (i.e. by sentence adverbials such as "therefore", "then", "so", etc.). The second set of passages were written so that all sentences reflected a coordinated connection (presented as a unit by compound sentences in addition to explicit coordinating connectives), a subordinate connection (to give facts in hierarchical

ordering where complex sentences and embedded clauses were used to show conditional relationships), an integration (where one fact determined some aspect of the other fact such as a manner of action or property by use of relative clauses) or a reduction (where one fact was presented as a modifier through adjectivization). Passages were rewritten so that sentences in each type contained as many sentences as possible from levels 0-2 in the simple versions and 3-6 in the complex, according to van Dijk and Kintsch's (1983) system (see Table 4).

Table 3 RELATIONS AMONG PROPOSITIONS IN TEXT (van Dijk and Kintsch, 1983, pp 122-23)

Degree	Title	Description
0	No Relation	This zero case, in which there is no relation between the facts, would characterize forms of listing or incoherent discourse.
1	Indirect Coherence	The facts are part of the same possible world episode. Thus they may share the same time, place or argument, and will be part of the same macrofact, as denoted by a macroproposition and expressed by noncontiguous sentences.
2	Direct Coherence	As in Degree 1 but in addition the facts are temporally and/or conditionally related, denoted by separate clauses or sentences which are linearly ordered. This relation is expressed only one way, for example by sentence adverbials such as "therefore, then, so as a result" etc.
3	Coordinated Connection	As in Degree 2 but now the facts are mutually consequence, and form one (ordered) pair, triple, n-tuple of facts, hence together one composite fact, presented as a unit, mostly by a compound sentence and explicit coordinating connectives.
4	Subordinate Connection	As in Degree 3 but now the facts are no longer sequentially, but hierarchically ordered: One fact is taken only as a specification (e.g. a condition) of the other, as is typically signaled by a complex sentence with full embedded clause in adverb position.
5	Integration	As in Degree 4, but now it is no longer the case that one fact is (re-)presented as conditioning or determining a whole other fact, but rather as determining only one aspect of the other fact, for example, as a specification of the manner of action or the property of a participant. Typically expressed by (restrictive) relative clauses.
6	Reduction	As in Degree 5 but now the fact no longer has the function of a modifier, but is reduced, as expressed by adjectivization.

Table 4. CATEGORIZATION OF PASSAGE SENTENCES
 ACCORDING TO DEGREES ESTABLISHED BY THE
 VAN DIJK AND KINTSCH (1983) SYSTEM.

Passage	Grammatical	# Sent.	# Sent.
	Version	Degrees 0-2	Degrees 3-6
War with Spain	Simple	73	1
	Complex	1	25
French Ind. War	Simple	60	1
	Complex	2	19
Lentil	Simple	72	4
	Complex	7	25
Moony B. Finch	Simple	67	4
	Complex	3	26
Prob. Growing R.	Simple	80	2
	Complex	3	30
Super Cities	Simple	77	2
	Complex	2	28
Los Angeles	Simple	52	3
	Complex	1	22
San Francisco	Simple	52	5
	Complex	0	22
Seashells	Simple	70	1
	Complex	1	27
Nine Elements	Simple	62	8
	Complex	4	25
Differences Af.	Simple	56	2
	Complex	5	21
Sparta and Ath.	Simple	75	1
	Complex	5	29

A final analysis was completed on the passages to establish that all passages met guidelines for the Sixth grade level according to the Fry (1968) Readability Formula, which was used to ensure a final measure of parallel passage complexity at the word length and sentence length level. Although these were initially fifth grade passages, they actually crossed six grade levels (from the third to the ninth), so uniformity was established by re-writing them to meet the criteria at the sixth grade level. Since the readability formulas are based on the numbers of words and /or syllables in sentences, differences in sentence length caused the simple passages to be rated at lower grade levels than the complex, although content was parallel. The passages in each group of grammatical form were at the same level. For example, because systems such as the Flesch Reading Ease Scale (1948), Recalibrated Flesch Reading Ease Formula (Kincaid et al, 1975), Dale and Chall (1948), McLaughlin Smog Index (1969), Farr Jenkins and Peterson Formula,(1951) and the Raygor system (1979) depend on sentence length, the simple and complex passages could not be placed at the same grade level. Because systems such as the Fog Readability Index (Guming 1952, 1954), the Spache (1953), the Dolch (1948), Sticht (1972, 1975) Forecast and the Ride Scale of Carver (1973, 1974) measure word length, the grade levels were the same for the two passage versions of each discourse type.

Validation of Passages

A group of three university faculty members in the field of reading and reading comprehension reviewed all of the passages, and unaimously agreed that all passages were of parallel content, familiarity and difficulty levels and that they reflected clear examples of the discourse types according to Meyer's (1975) descriptions.

A group of three university faculty members in the field of reading, a classroom teacher, and a speech and language pathologist evaluated the sentence structures in each of the passages, and unanimously agreed that grammatical changes were made according to the van Dijk and Kintsch (1983) system.

Development of Questions

A pool of twelve questions were constructed for each of the twelve passage types, according to Pearson and Johnson's (1978) criteria for textually explicit, textually implicit, and scriptually implicit question types. For each of the twelve passages the twelve questions constructed followed the following guidelines :

Textually Explicit

Answers were reproductions or synonyms of the target statements in the narrative. They were stated directly and within one to three consecutive sentences.

Textually Implicit

Responses derived from the text required the student to make at least one step of logical or pragmatic inferencing

The student needed also to combine information across 2-3 consecutive sentences.

Scriptally Implicit

Based on information in the narrative (either inferrible or explicitly stated) these questions required information from the student's prior knowledge to answer. To formulate an answer, the reader must first have read and remembered the text, and second, brought to bear pertinent information from the script. The answer, therefore, showed an integration of text and script knowledge.

In addition to question types, questions were constructed to use information considered to be related to higher level ideas in each passage structure. Three faculty members in the area of reading were used to review the questions for agreement on question types. Following their agreement that the questions were requesting information from the Pearson and Johnson (1978) categories, two of the four possible questions in each category were selected by the author for each passage, to represent questions that varied the most in overall content. This allowed for two explicit, two implicit and two scriptially implicit questions (or a total of six questions) for each of the twelve passage types.

Analyses:

The first measure involved a series of one-way Analyses of Variance, with each of the pretests used as an independent variable, to measure group differences. This

was followed by an Analysis of Covariance, using each pretest as a covariate to measure the extent of change in group responses when the covariate was controlled for. Measures two and three were multifactorial mixed designs, with a multivariate analysis completed with the between subject factor of group, and the within subject factors of the two levels of grammatical form, and the six levels of discourse type, for recall and question responses. Measure four used the between subject factor of group, the within subject factor of discourse type and also measured the three levels of question type.

Procedures:

Students

Formal approval of the research project was obtained from the Michigan State University Committee on Research Involving Human Subjects (UCRIHS), to ensure that the rights of the subjects used in the study were not violated. Letters of permission (See Appendix A), were then sent to parents of children meeting the age and classification criteria for placement in a Learning Disabilities classroom or resource room program. Following receipt of permission, the file was checked to establish that the student met the psychological criteria and was able to decode at the fourth grade level. Arrangements were then made with the principals and teachers to schedule the students for testing.

Students were tested for one to three consecutive sessions, depending on school testing times (i.e. times when students were breaking normally for recess and lunch) and the researcher's subjective judgment of the student's continued interest in responding to the test materials. All students responded with interest and appeared to enjoy the test situation.

Students were asked to read and answer questions after the reading paragraph to determine candidacy for the testing, based on their levels of decoding and comprehension skills. All students were tested in a quiet location and in an isolated room. Most of the students were tested in their school building. A few were tested in their homes or in a private agency office. Most students were able to complete the testing in two to two and one-half hours. A few students completed the testing in an hour and one half or required as long as three and one-half hours to complete the testing. Rapport was established with each student prior to the testing by conversing on a subject of interest. Students were rewarded for completing the testing both with stickers and with free time when returning to the classroom.

Passages

The passages for the study were grouped into two sets, A and B, by grammatical form. Each set had a simple and a complex paragraph from each of the six discourse types. Half of the students were given set A and half were given set B, with the passages presented in one of four random

orders across the two different sets. Paragraph orders were coded to ensure that the regular education students received the same paragraph set and order as their matched learning disabled student. Students were asked to read the paragraphs, give them to the examiner, and complete three long addition problems. After completing the math problems the students were asked to tell everything they remembered from the passage. The long addition problems were intersperced as a buffer between the reading of the target passage and its recall to avoid interference from memory of short term surface features, so that propositional memory for the meaning of the text would be assessed (Kintsch, 1974). Following their recall they were asked to answer orally the six comprehension questions that were presented in random order across the passages. The questions were presented in the same order for each student, but the order of the six questions was random for each of the twelve paragraph types. Each student was asked to read a total of twelve passages. Students were asked, following all the testing, to read random segments of two percent of the sentences from the passages to be sure that they were able to decode the text. In all cases, students read the text sufficiently (i.e. with no more than one decoding error) to assume that inability to decode the text was not a major hinderance to their comprehension.

Dependent Measures:

The scoring schemes are given for the pretests and the two dependent measures of Free Recall and Question Responses.

Scoring Scheme for Pretests

Pretests were scored according to task-specific criteria. The Porch Index of Communicative Ability in Children was administered and scored according to the sixteen point scoring system outlined in the test manual. The examiner was certified in the administration and scoring of this test instrument, and in the instruction of the test scoring system.

The Story Reformulation Test was scored in two ways. A score was first established for the number of propositions recalled correctly, and a second score was established for a percentage of complex sentences used when compared to the total number of sentences.

The Analytical Reading Inventory paragraph was used for both decoding and comprehension, for subject selection purposes. For decoding, a mean score was computed using Porch's (1967, 1974) scoring system adapted by the author and this examiner to measure decoding fluency. Table 5 outlines the scoring system as applied to the decoding paragraph. The same scoring system was also used to establish a mean test score for decoding words presented without the benefit of sentence contexts. The questions accompanying the Analytical Reading Inventory paragraph were used to measure comprehension according to the author's criteria for Independent, Instructional and Frustration levels of reading comprehension.

Table 5 PICAC SCORING SYSTEM CATEGORIES FOR DECODING

Score	Category	Dimensional Characteristics	Decoding
16	Complex	Accurate, responsive, complex, prompt, efficient	Not used
15	Complete	Accurate, responsive, complete, prompt efficient	Correct
14	Distorted	Accurate, responsive, complete or complex prompt, distorted	Syllable Stress
13	Complete Delayed	Accurate, responsive, complete or complex delayed	Delayed or Repeated
12	Incomplete	Accurate, responsive, incomplete, prompt	Change in a function word, verb tense or suffix
11	Incomplete Delayed	Accurate, responsive, incomplete delayed	Same as above but delayed
10	Corrected	Accurate, self corrected	Self corrected
9	Repeated	Accurate after instructions are repeated	Not used
8	Cued	Accurate after a cue is given	Not used
7	Related	Inaccurate, almost accurate	Semantic or Phonetic Miscue
6	Error	Inaccurate attempt at the task	Error word
5	Intelligible	Comprehensible but not an attempt at task	Rejection
4	Unintelligible	Incomprehensible but differentiated	Unintelligible
3	Minimal	Incomprehensible and undifferentiated	Not Used
2	Attention	No response but subject attends to task	Omissions
1	No Response	No response, no awareness of the task	Not Used

Scoring Scheme for Free Recall

Free recall responses were scored using Gordon and Pearson's (1983) weighted scoring system. This allowed for no, partial, and full credit. An additional category of credit was added to differentiate between ideas high and low in the passage structure. The top level ideas were given more weight in the revised scoring system. The scoring system for the passages is given in Table 6.

Table 6. Scoring System for Recall ResponsesThree Points

Three points were given for each statement that related to passage organization or statements of summary characteristics of the material in the passage. This would include the use of key words and phrases to tie together the presentation of ideas. (This category was passage specific, and therefore guidelines were established for unique aspects of each discourse type. For example, if for Sparta and Athens, the student stated the names of the two cities and said that they were being compared, he or she would receive three points).

Two Points

Two points were given for each statement of information specific to a main fact given in the text sufficient to capture the gist of the superordinate statement or fact.

One Point

One point was given for each fact stated that gave information, but without the referent either within the sentence or in the previous sentences. This was also given for information low in the structure such as unrelated details.

No Points

No points were given for irrelevant statements or inaccurate statements reflecting clear confusion.

Scoring Scheme for Question Answers

Questions answers were scored according to Gray's (1959) criteria for full credit, one-half credit or no credit. Table 7 summarizes the scoring used for question answers.

Table 7. Scoring Scheme for Question Answers.

Full Credit

Two points were given to any answer which was:

- a. an approximate reproduction of the words of the text
- b. an acceptable paraphrase of the text
- c. an abbreviated answer which retained the essential idea(s).
- d. a modified statement of the relevant ideas without incorrect ideas

Half Credit

One point was given for any answer which:

- a. contained either one of two ideas called for by the question, even if the other idea was incorrect.
- b. was essentially correct but involved an inaccurate or irrelevant item.
- c. Was partially correct in that it contained key items of a complete and accurate answer but omitted some essential element.
- d. included some or all of the items involved in a correct answer, but was so stated that the examiner had some doubt about the reader's interpretation.

No Credit

No points were given to answers which:

- a. Were not in direct response to the question, or were given in answer to another question.
- b. Were obviously unrelated to the question.
- c. Included facts or ideas included in the passage but were irrelevant to the particular question.
- d. Were so tangential to the answer that they bore no clear relation to it.

Interrater Reliability:

Interrater agreement was established for consistency in scoring both the free recall and the question answer responses. Two raters were used in addition to the researcher, a speech-language pathologist and a clinical psychologist. The two raters reviewed the criteria for scoring the recall and question answer responses and independently scored ten percent of the data, which was selected on a random basis. Combined scores for the questions and recall responses were computed for each rater, for each passage. Resultant correlation coefficients were ρ .97, .98 and .94, indicating a high agreement for interrater reliability.

Chapter Summary

Sixty subjects were included in the study. Thirty were learning disabled students who met criteria for age, decoding ability and intelligence. These students were matched to thirty regular education, sixth grade students. A series of pretests were given to the students to establish levels of language skills. Following the administration of the pretests, students were asked to read a series of twelve passages of varied discourse type and grammatical complexity. Passages were parallel in topic and complexity. Following each passage, students were asked to complete three long addition problems as a buffer for short term memory, and then to recall the information in the passage

and to answer six questions of varied type on the passage content.

Student test scores were compared for language skill, recall, and question responses. A multifactorial analysis was completed on the data to compare the between subject factors of group and the within subject factors of discourse type, grammatical form, and question type. Additional series of one-way and two way analyses of variance were used to further explore significant effects for the factors of discourse type, question type and subject group. An analysis of covariance was completed to measure the effect of the group differences when each pretest was used as a covariate. Finally, post hoc comparisons were made for specific discourse types with group differences, in addition to the interactions of grammatical form and question type factors. Results of the findings will be given in chapter four.

CHAPTER 4

Results and Discussion

The purpose of this study was to investigate the effects of grammatical form manipulation and discourse type on Learning Disabled and age matched regular education students' abilities to respond to free recall tasks and varied types of comprehension questions. For this reason, four analyses were conducted with both groups. The first data set measured and defined the language, decoding and syntactic skills in both populations. The second data set repeated the group comparisons on comprehension scores, but used the pretests each as a covariate, to measure its effect on group differences. The third analysis examined the effects of discourse type and grammatical form on free recall and probed recall responses. Factors included the between subject differences of group (Learning Disabled or Regular Education students), and the within subject variables of discourse type (narrative, problem solution, cause effect, descriptive, list like, and compare contrast), and grammatical form (simple or complex). Finally, a fourth analysis used the factors of group, discourse type, and the added factor of question type. The results of the four analyses will be reported in the following sections of this

chapter, followed by a summary of the results in response to the initial research questions, which were the following:

1. How do Learning Disabled students differ from their normally-achieving peers in their comprehension of text varying in a) discourse type? b) grammatical complexity?

2. How do Learning Disabled students differ from their peers in their use of linguistic complexity?

To measure the language, decoding and syntactical skills in the Learning Disabled and Regular Education students, and to describe the characteristics of the Learning Disabled students, the following information sources were used: (1) test scores on the Porch Index of Communicative Ability in Children (PICAC), for Overall, Verbal and Auditory Modality scores, (2) the Story Reformulation Test for the number of complex sentences, and (3) the Story Reformulation Test for the percentage of complex sentences. These scores were analyzed to compare group differences. Table 8 presents group means for each of these measures. To compare the two groups on the pretests also see Appendix C, Table 1. Significant differences were found ($p < .001$), between the two groups on all of the pretest measures. Students in the Regular Education group preformed at a higher level than did those in the Learning Disabled group.

TABLE 8. MEAN SCORES FOR GROUP RESPONSES ON THE PRETEST

Factor	Comparison of Ability	
	Learning Disabled	Regular Education
Pretest		
PICAC Overall	12.79	14.00***
PICAC Verbal	12.92	13.92***
PICAC Auditory	13.77	14.69***
Story Ref. % Complex Sent.	14.27	53.37***
Story Ref. # Complex Sent.	2.70	6.57***
***p < .001.		

To examine the relative importance of each of these factors for predicting success in comprehension, a second set of analyses were performed comparing comprehension performance levels using these scores as covariates. This second analysis was conducted to explore further the extent to which differences on the pretest measures would influence results on comprehension testing. If group differences were no longer present, such findings would indicate a possible relationship between the skill measured by the pretest(s) involved and the performance on the comprehension measures.

The analysis of covariance was conducted on the total comprehension score. This score was calculated from combining the recall and question response data. The significant factors from the first analysis served as the covariates, entered individually to avoid overlap since performance on each was related. In this experiment the group scores were used for the PICAC Overall, PICAC

Auditory, PICAC Verbal, the Story Reformulation percentage of complex sentences, and the Story Reformulation number of complex sentences. The individual covariates were entered first, followed by the evaluation of the effect for group differences after the covariate was accounted for. The results of the Analysis of Covariance are given in Table 9. Findings suggest that the differences between the groups on total comprehension scores could not be predicted by the PICAC Auditory, PICAC Verbal, or number of complex sentences used. Group differences were predicted, however, by the PICAC Overall scores and the Story Reformulation percentage of complex sentences used. To determine if these differences were also present in results for recall and question measures, the Analysis of Covariance was repeated for both. Results were consistent with the previous analysis, with differences in performance attributable to the PICAC Overall scores, and the percentage of complex sentences for the recall measure only (see Table 10 and 11).

TABLE 9. ANCOVA RESPONSES FOR TOTAL COMPREHENSION SCORES FOR GROUP DIFFERENCES WITH THE PRETESTS AS COVARIATES.

Source of Variation	Sum of Squares	df	Mean Square	F Value	Sig. F
PICAC Overall Cov.	1323022.22	1	1323022.22	18.89	.000
Main Effect Group	26211.77	1	26211.77	2.36	.13
PICAC Auditory Cov.	957542.84	1	957542.84	66.77	.000
Main Effect Group	208548.52	1	208548.52	14.54	.000
PICAC Verbal Cov.	685494.91	1	685494.91	42.89	.00
Main Effects Group	386944.48	1	386944.48	24.21	.000
Story Ref.% C.Sen.	1376409.48	1	1376409.48	137.54	.00
Main Effects Group	36674.98	1	36674.98	3.66	.06
Story Ref.# C.Sen.	724656.68	1	724656.68	52.62	.00
Main Effect Group	473963.55	1	473963.55	34.42	.00

TABLE 10. ANCOVA RESULTS WITH RECALL SCORES FOR GROUP DIFFERENCES USING PRETESTS AS COVARIATES.

Source of Variation	Sum of Squares	df	Mean Square	f Value	Sig F
PICAC Overall Cov.	681350.34	1	681350.34	65.27	.00
Main Effect Group	11572.30	1	11572.30	1.11	.30
PICAC Auditory Cov.	538357.44	1	538357.44	46.04	.000
Main Effect Group	83252.99	1	83252.99	7.12	.01
PICAC Verbal Cov.	341044.53	1	341044.53	26.07	.00
Main Effect Group	201268.95	1	201268.95	15.38	.00
Story Ref.% C.Sent.	714173.95	1	714173.95	72.94	.00
Main Effect Group	15815.51	1	15815.51	1.61	.21
Story Ref.# C.Sent.	372886.16	1	372886.16	31.41	.00
Main Effect Group	238402.97	1	238402.97	20.08	.00

TABLE 11. ANCOVA RESULTS FOR QUESTION ANSWERS USING
GROUP PRETESTS AS COVARIATES. .

Source of Variation	Sum of Squares	df	Mean Square	F Value	sig. F
PICAC O Cov.	62551.27	1	62551.27	122.37	.000
Effect Group	5284.40	1	5284.40	10.34	.002
PICAC A Cov.	55220.37	1	55220.37	105.26	.000
Effect Group	11851.51	1	11851.51	22.59	.000
PICAC V Cov.	38656.41	1	38656.41	61.84	.00
Effect Group	22687.42	1	22687.42	36.29	.00
Story Ref.%	69734.51	1	69734.51	173.33	.00
Effect Group	4332.67	1	4332.67	10.78	.00
Story Ref.#	33704.43	1	33704.43	59.73	.00
Effect Group	31103.46	1	31103.46	55.12	.00

To further examine apparent differences in students performance on the free recall and question response measures, comprehension scores were analyzed in a 6 (discourse type) x 2 (grammatical form) x 2 (ability group) multivariate Analysis of Variance. Scores were calculated for both free recall and question responses; these scores were entered as the dependent measures. Between subjects factors were discourse type (cause effect, narrative, problem solution, descriptive, list like and compare contrast), grammatical form (simple or complex), and group (Learning Disabled or Regular Education). The statistical procedure involved two steps. The first stage consisted of an examination of the multivariate F's with free recall responses and question responses, each considered separately. If the multivariate F was significant, univariate tests were examined. A summary of these results is presented in Tables 2 and 3 (Appendix C). Tables 12 and 13 give the mean scores from the analyses.

The analyses from measure three will be reported by factor effects. The results will be given first for discourse type, followed by grammatical form with group differences reported in each. An alpha level of .05 was used, however F values of .01 and .001 are reported as such.

The MANOVA and ANOVA tables for all cell means are provided in Appendix C.

Table 12. Means for Recall Scores (Multivariate Analysis of Group by Grammatical Form, by Discourse Type).

Factor/Level of Factor	Ability Comparison	
	LD	RE
Discourse Type: Cause Effect		
Simple	5.80	23.30***
Complex	4.67	25.03**
Discourse Type: Narrative		
Simple	16.07	48.67***
Complex	16.80	43.40***
Discourse Type: Problem Solution		
Simple	4.80	18.10***
Complex	4.17	17.73***
Discourse Type: Descriptive		
Simple	4.87	19.07
Complex	4.63	17.20
Discourse Type: List Like		
Simple	4.87	15.53
Complex	3.93	14.90
Discourse Type: Compare Contrast		
Simple	3.97	16.80
Complex	3.47	17.50

*** = Significance at the .001 level

** = Significance at the .01 level

* = Significance at the .05 level

Table 13. Means for Responses to Questions for
Group by Discourse Type by Grammatical Form

Factor/Level of Factor	Ability Comparison	
	LD	RE
Cause Effect		
Simple	2.67	8.57***
Complex	2.20	8.30*
Narrative		
Simple	5.13	11.10
Complex	5.03	10.83
Problem Solution		
Simple	3.83	8.70**
Complex	3.57	8.90
Descriptive		
Simple	2.63	6.67
Complex	2.70	7.27
List Like		
Simple	2.83	8.43
Complex	2.83	8.67
Compare Contrast		
Simple	3.40	8.00
Complex	2.53	7.50

***= Significance at .001 Level

** = Significance at .01 Level

* = Significance at .05 Level

Discourse Type

In the multivariate analysis a significant three-factor interaction was found involving discourse type, grammatical complexity and group. I broke that interaction down by testing the main effect of group in each cell of the factorial combination of discourse type and grammatical complexity. Significant effects were found for the cause effect simple, $F(1,58) = 88.58$ $p < .01$, cause effect complex, $F(1,58) = 21.89$ $p < .001$, narrative simple $F(1,58) = 92.61$ $p < .01$, narrative complex $F(1,58) = 54.23$ $p < .01$, problem solution simple $F(1,58) = 39.96$ $p < .001$, problem solution complex $F(1,58) = 40.41$ $p < .001$ passages. Differences for the recall scores for the descriptive simple $F(1,58) = 1.14$ $p < .29$, descriptive complex, $F(1,58) = .01$ $p < .90$, list like simple $F(1,58) = 1.78$ $p < .19$, list like complex, $F(1,58) = .01$ $p < .93$, compare contrast simple $F(1,58) = .16$ $p < .69$ and the compare contrast complex, $F(1,58) = .01$ $p < .94$ passages did not reach significance. These differences for the interaction effect were compared to probed recall results. Similar findings were present as significant effects were found for cause effect simple, $F(1,58) = 93.15$ $p < .001$, cause effect complex $F(1,58) = 4.40$ $p < .04$, and problem solution simple $F(1,58) = 8.14$ $p < .01$ passages. As with recall scores, significant effects were not found for descriptive simple, $F(1,58) = .66$ $p < .42$, descriptive complex, $F(1,58) = .02$ $p < .88$, list like simple $F(1,58) = .31$ $p < .58$, list like complex $F(1,58) = .43$ $p < .72$, compare contrast simple $F(1,58) = .26$ $p < .61$, and compare

contrast complex $F(1,58)=.00$ $p>.96$ passages. With the probed responses, however, significant effects were also not found for narrative simple $F(1,58)=.80$ $p<.37$, narrative complex $F(1,58)=1.39$ $p<.242$ and problem solution complex $F(1,58)=2.72$ $p<.10$ passages. Because these differences concerned the three-way interaction of group with discourse type by grammatical form, differences were further explored for the two way interaction of group by discourse type. Significant effects were found for all discourse types ($p<.001$) (see Table 14, and Appendix C, Table 4). Similar findings were found for probed recall responses, (see Table 15, and Appendix C, Table 5).

Table 14. ANOVA Mean Scores for Recall Responses, Group by Discourse Type.

Factor/Level of Factor	Ability Comparison	
	LD	RE
Cause Effect	10.47	48.33***
Narrative	32.87	92.07***
Problem Solution	8.97	35.83***
Descriptive	9.50	36.27***
List Like	8.80	30.43***
Compare Contrast	7.43	34.30***

Table 15. Mean Scores for Question Answers Group by Discourse Type

Factor/Level of Factor	Ability Comparison	
	LD	RE
Cause Effect	4.87	16.87***
Narrative	10.17	21.93***
Problem Solution	7.40	17.60***
Descriptive	5.33	13.93***
List Like	5.67	17.10***
Compare Contrast	5.93	15.50***

*** = Level of Significance at .00

These findings were further explored by a series of post hoc comparisons to compare the discourse types of cause effect, narrative, and problem solution to descriptive, list like and compare contrast consecutively. Table 16 lists the results of the Scheffe procedure. An analysis of the results indicates that the three discourse types of cause effect, narrative, and problem solution, were significantly different from the types of descriptive, list like and compare contrast at the .001 level.

Table 16. Post Hoc Comparisons of Discourse Types Using Scheffe's Procedure of Analysis.					
Source	DF	Sums of Squares	Mean Square	F Level	Sig. of F

Descriptive					
Cause Effect	37	53948.18	1458.06	21.27	.001
Narrative	37	121139.32	3274.03	7.28	.001
Problem Sol.	37	21365.03	577.43	31.81	.001
List Like					
Cause Effect	35	52433.89	1498.11	11.90	.001
Narrative	35	116785.04	3336.71	5.62	.001
Problem Sol.	35	20862.69	596.08	15.86	.001
Compare Contrast					
Cause Effect	35	53924.86	1540.71	24.14	.001
Narrative	35	119219.60	3406.27	6.92	.001
Problem Sol.	35	20951.90	598.63	17.68	.001

Grammatical Form

Because a significant effect was found for grammatical form in the interaction of group by grammatical form by discourse type ($F_{5,54}=6.78$ $p < .001$), reported earlier, these results were further explored by a series of two way interactions. Appendix C, Tables 6 and 7, list the results of a comparison of group by grammatical form for recall and question responses. Although there were significant differences between the Learning Disabled and the Regular Education groups, $F_{(1,58)}=17.51$, $p < .001$, grammatical form $F_{(1,58)}=.47$ $p < .49$ and the interaction of group by grammatical form $F_{(1,58)}=1.11$ $p < .30$, did not reach a level of significance. An analysis of the mean scores on free recall and probed recall responses showed that both groups of students scored better on the simple as opposed to the complex passage versions.

In the final measure type of question (textually explicit, textually implicit and scriptially implicit) was used as an independent variable in a multivariate analysis with the factors of group and discourse type. Because the sample size of 60 was not sufficient to measure a four way interaction with the added levels of grammatical form, (Kirk, 1983), and because significant results were not found for grammatical form outside of group differences, the factor of grammatical form to measure the effect of simple or complex passages was deleted from this analysis.

Because results of the group by discourse type by type of question analysis were significant, $F(5,54) = 3.39, p < .01$, these findings were further explored by independent analyses of the factor of question type. Table 17 lists the results for this interaction, with all discourse types reaching significance with some of the questions types with the exception of the problem solution passages.

Table 17, Results of Multivariate Analysis for Group by Discourse Type, by Type of Question.

Source of Variation	Sum of Squares	df	Mean Square	F Level	Sig. of F
Cause Effect					
T.E.	3367.27	1	3367.27	93.15	.01
T.I.	14.80	1	14.80	4.40	.04
S.I.	3.22	1	3.22	.80	.37
Narrative					
T.E.	3.11	1	3.11	1.39	.24
T.I.	20.85	1	20.85	8.14	.01
S.I.	4.22	1	4.22	2.72	.10
Problem Solution					
T.E.	.07	1	.07	.02	.83
T.I.	.01	1	.01	.01	.93
S.I.	1.84	1	1.84	1.43	.24
Descriptive					
T.E.	.73	1	.73	.37	.55
T.I.	.01	1	.01	.01	.93
S.I.	7.47	1	7.47	4.23	.04
List Like					
T.E.	.22	1	.22	.16	.69
T.I.	7.33	1	7.33	5.40	.02
S.I.	.88	1	.88	.54	.46
Compare Contrast					
T.E.	24.27	1	24.27	12.95	.001
T.I.	.27	1	.27	.18	.67
S.I.	1.49	1	1.49	1.22	.27

Similar findings were present when group differences were removed, with the exception of the descriptive passage. Table 18 lists the mean scores and the standard deviations for the group by question type interaction (see Appendix C, Table 8 for the analysis summary).

Table 18. Mean Scores and Standard Deviations for the Interaction of Discourse Type by Question Type.

Factor	Type of Question					
	Textually Explicit		Textually Implicit		Scriptally Implicit	
	M	SD	M	SD	M	SD
Cause-Effect	3.90	3.11**	3.00	2.64	3.97	3.06**
Narrative	5.82	2.78	4.82	2.94**	5.42	2.73*
Problem Sol.	4.68	2.53**	4.58	2.41**	3.23	2.37
Descriptive	3.68	2.09	3.65	2.80	2.30	2.08
List Like	4.40	2.83**	3.12	2.63**	3.87	2.54**
Compare Cont.	3.97	2.68**	2.93	2.46	3.82	2.91**

** = Significance at the .001 level

* = Significance at the .05 level

Findings for the factor of the type of question were further explored for group differences and then by post hoc comparisons using Scheffe's procedure. Significant differences at the .001 level were found for group responses to all three types of questions at the .001 level, (ANOVA summary Table 9, Appendix C). The mean scores from the

comparison of the Learning Disabled and Regular Education groups of students are given in Table 19.

Table 19. Mean Scores for the Learning Disabled and Regular Education Students' Responses to Types of Questions

Factor/Level of Factor	Ability Comparison	
	LD	RE
Textually Explicit	15.83	37.03***
Textually Implicit	11.60	32.63***
Scriptally Implicit	11.93	33.03***

*** = Significant at the .001 Level

A comparison of the mean scores of the two groups indicates that although both groups of students achieved higher scores on textually explicit questions, the Learning Disabled group was able to score higher on the textually explicit questions when compared to their responses on the other question types. The Regular Education students scores, however, were more uniform across the three question types. When group comparisons were removed, a post hoc comparison using Scheffe's procedure indicated that responses to the types of questions differed at the .001 level of significance (see Appendix C Table 10).

DISCUSSION

The results of the findings will now be discussed in reference to both the initial questions, and the literature addressing similar concerns. Theoretical considerations, practical considerations, limitations of the study, and

suggestions for further research will be presented in Chapter five.

The first research question involved the influence of discourse type on reading comprehension in the Learning Disabled subjects and Regular Education students. The results clearly support the influence of discourse type on passage comprehension. Significant differences were found between the discourse types of cause effect, narrative and problem solution when compared to descriptive, list like and compare contrast passages. These differences were maintained when the factor of group was taken out of the analysis. Differences were present for both free and probed recall responses.

In analyzing the six passages, although they each represent a distinct form of discourse type, the nature of the first three passage types result in a stronger structure for both syntactic form and content organization. Consider, for example the temporal order of reasons-results, episode sequence (Mandler & Johnson, 1977; Thorndyke, 1977), and question-answer frames available to the reader in interpreting the first three passage types. In all three passage structures the information introduced basically follows an order of mention sequence. The reader is able to use the passage order to organize the information in the order in which it is introduced in each sentence.

In contrast, structures such as descriptive (with an elaboration of ideas central to a specific topic) list like

(with an equal weighting for a series of items) and compare contrast (in which the reader must recategorize concepts in his or her mind to place the information with the appropriate referent) do not lend themselves to the same level of idea organization. These passages rather require retention of descriptive terms, discrete facts of a episodic nature, or retention of the categories to place the concepts in to for comparison. None of these types allow for sequential order in encoding the information.

When analyzing the mean score responses for the Learning Disabled group for both recall and question answer responses, the passages for narrative, problem solution and cause effect received the highest scores, when considering the first two in each group. These findings support the researchers who have stressed the importance of text structure in facilitating learning (Armbruster, 1982; Meyer, 1979; Shimmerlik, 1978). In particular, results support Frederiksen's (1979) conclusions that readers may alter the manner in which they process discourse, with the most use of conventional text based structures for highly conventionalized texts, and the least use for freely varying texts. In such a case, the more conventionalized, controlled text base structure of certain discourse types would facilitate reader processing. Further support for the superior results of the Learning Disabled population on these discourse types, when compared to the others, comes from the work of Marshall and Glock (1978-79), who reported

that explicit statements of logical relationships facilitates comprehension in poorer readers. Findings from this study did not concur with the conclusions of McGee (1982) who reported that fifth grade poor readers appeared to be unaware of text structure. Although the students in this study scored significantly lower than their age matched peers, they did use text structure to some degree. Important procedural differences, however, include McGee's use of poor readers, matched on comprehension levels, as opposed to poor comprehenders with controls for decoding, and her use of descriptive passages only for text structure. Because students in this study were not able to benefit from descriptive discourse, a similar finding to McGee's, it is important to consider that her conclusions were drawn from a less structured discourse type. With the subjects in this study, strong passage structure for discourse type did influence comprehension, and recall was negatively influenced by less structured passage types. The first conclusion of the study is that recall for both free and probed responses is facilitated by structured discourse types.

The second portion of the first research question concerned the role of grammatical form in influencing text comprehension. Results indicated that, although group differences were found, there was no support for the premise that altering grammatical form would influence comprehension for text in this population. The failure to find differences

based on grammatical form concurs with the results of Tierney and Mosenthal (1981), and Freebody and Anderson (1981) for skilled readers.

Because the subjects in this study had syntactic deficits, (documented on pretest responses, group characteristics for selection, and results of the analysis of covariance) and previous researchers stated the importance of processing linguistic connectives to understand causal relationships (Katz & Brent, 1968; Pearson, 1974-75), an analysis of their response to changes in sentence structure was important in further delineating both the role of syntactic skills in text comprehension and the possible implications for remediation. Because the Meyer, Brandt and Bluth study (1980) included grammatical form changes as a part of their signaling manipulation at the macropropositional level of text structure, these findings concur with theirs that comprehension underachievers fail to benefit from signaling changes on delayed recall.

The first research question also concerned the differences between the Learning Disabled students' and the Regular Education students' responses to both types of text manipulations. Findings on the two groups for discourse type manipulations concur with Taylor (1980), Meyer, Brandt and Bluth (1980), and Brown and Smiley, (1977,78), who reported that good and poor readers differ in their ability to recall and distinguish important ideas from text. The poorer

responses of the Learning Disabled students, when compared to their age matched peers, concurs with the findings of Bransford, Stein, Nye, Franks, Able, Merynski & Perfetto (1982) that poor readers do not routinely and spontaneously form a coherent representation by drawing concise, integrated inferences. When the groups were compared although more ideas were recalled from structured discourse types, the Learning Disabled readers still scored significantly lower than the Regular Education students in their ability to recall important ideas and to draw inferences from all types of text material. This weakness in the Learning Disabled group is the second conclusion of the study.

In the current study, when the two groups were compared for responses by discourse type for both free recall and probed recall, in addition to differences in performance ability, a similar pattern was found, with the narrative, cause effect and problem solution passages ranking first in the amount of information recalled. Similar facilitating effects of passages were reported by Vande Kopple (1982). Meyer and Freedle (1979) found that graduate students recalled more information from compare contrast and cause effect than from list like passages, also supporting the role of organized text in recall. Both the Learning Disabled and the Regular Education students, therefore, were aided in recall by highly organized text, supporting the role of organized text in facilitating recall for the

skilled reader, and suggesting a similar pattern of response for the Learning Disabled. The third conclusion of the study is that the Learning Disabled students follow a similar pattern to the Regular Education students for recall of text material.

Findings did not support the role of grammatical form for simple and complex sentence structures in facilitating recall in either group. When comparing the two measures of comprehension, for both question answer and recall responses, both groups were responding slightly better to the simple as opposed to the complex passages, although differences were not significant. Several researchers (Belin & Lust, 1975; Neimark & Slotnick, 1970; Paris, 1973; Pearson & Camperell, 1981) reported a developmental trend in the understanding of linguistic connectives and relations between the propositions they link. Previous research would suggest, however, that the sixth graders used in this study would have been able to understand the forms of complex sentence structure used (Robertson, 1968; Katz & Brent, 1968). The superior responses of the Regular Education group and the presence of syntactic deficits coupled with inferior scores on both recall and question measures are interpreted to concur with Pearson and Camperell (1981), who reported that connectives have a strong effect on the salience of causal relationships expressed in sentences, and may serve to facilitate the integration of ideas in memory. The failure to find significant results for the surface level changes in

grammatical form suggests that syntactic skills necessary to link ideas together across a series of sentences (felt to be involved in integration of text material) may be at a higher level and therefore not activated, not available or not facilitated by changes in surface structure form at the isolated sentence level. This would suggest that a certain level of syntactic knowledge is needed for text integration and that changes in surface structure form do not influence the sentence integration process. They will influence the comprehension across individual sentences but not the comprehension across sentences once these sentences have been comprehended.

The findings for the Learning Disabled subjects support greater difficulty responding on free recall tasks than on question answer tasks. Although this was an expected finding for both groups, the specific difficulty with the Learning Disabled group confirms literature citing poor reader difficulties stating top level ideas (Meyer, 1975; Anderson & Pearson, 1984). Because the scoring system was weighted to give additional points for ideas high in the content structure, and because only partial credit was given for incomplete propositional statements, the Learning Disabled children may have been penalized in that they frequently appeared to be reporting information low in the passage structure or failing to recall complete propositions. Further analysis of the data in Tables 12 and 13 was not completed to consider the importance level by comparing

specifically the weighted and unweighted scores. Therefore it cannot be determined if results give support to the findings of Tierney, Bridge and Cera (1978-79), or if findings concur with the recall pattern described by Meyer, Brandt and Bluth (1980) who described the "default" strategy of listing ideas remembered from the text without focus or an attempt to interrelate them.

A number of reasons may be present for the difficulty both groups of children experienced on the free recall task when compared to somewhat higher scores on the comprehension for question answers. These would include difficulty organizing their responses, an inability to perceive and/or to use the author's structure to guide their responses, difficulty accessing and organizing grammatical forms to convey the ideas completely, and difficulty understanding the social-communicative aspects of completeness in responses to open-ended questions. An additional explanation is raised by Royer, Hambleton and Cadorette (1975) who suggested that recall differences may be due to retrieval problems rather than comprehension problems. There is support for this perspective, in that retrieval is facilitated by cues provided within the questions to not only trigger retention of the material, but to structure the response.

Similar findings for both groups were present for the role of cues in facilitating responses to varied types of comprehension questions. An analysis of the means indicates

that the question types were responded to differently, also at a significant level, with both groups achieving higher scores for textually explicit questions. Such findings support the need to link sentences together across text at a syntactic level to draw the inferences needed to respond to textually implicit questions. Findings also support deficiencies in the fund of background information, suggested by low verbal scores in the Learning Disabled group, necessary to answer scriptally implicit questions. Textually explicit questions may be easier because they require retention of facts stated completely within one sentence context. The fourth conclusion is that textually explicit questions were more often answered correctly than were textually implicit or scriptally implicit questions in both groups of students.

The second, and related research question concerned the relationship of language skills to reading comprehension in children who are good decoders and poor comprehenders. The findings from the pretest group comparisons support the presence of language learning problems in the Learning Disabled group of children. Results of the analysis of covariance completed in the second analysis suggest that their particular weaknesses are due to syntactic deficits, (because the PICAC Overall test scores and the percent of complex sentence structures used in connected speech for the retelling of the narrative passage on the Story

Reformulation Test were the only two measures that accounted for group differences).

Although it does not necessarily follow that the syntactic deficits produced the comprehension problems, the importance of syntactic skill in reading comprehension has been documented. For example, Bock and Brewer (1985), reported that readers use syntax more heavily than listeners do for discourse cues in making given-new distinctions, and in the use of deep as opposed to surface anaphora (Hankamer & Sag, 1976; Webber, 1980). The findings of difficulty in syntactic areas for the Learning Disabled students' with low comprehension are in agreement with Oakhill (1982) who reported superficial representations of meanings from sentences in fifth graders who were poor comprehenders. Similar deficits for syntactic skills were noted by Westby (1982)

Frederiksen (1975), discussed two conceptions of the language processing system used in the reading comprehension process; the dominant conception of a more or less automatic parsing of each sentence, resulting in a semantic interpretation of the text (Anderson & Brower, 1973), and the constructivist conception that the comprehension memory system selectively processes the input using information and stored knowledge about the world to generate a semantic interpretation (Bartlett, 1932, Bransford & Franks, 1971; Frederiksen, 1972, 1975). The results of this study fit the Frederiksen interpretation. It is suggested that there is a

critical level of language function necessary to engage in the process of selectively processing and using information to construct the meaning of the text. It appears that the Learning Disabled subjects used in the study lacked the necessary syntactic skills to engage in a higher level of text interpretation. Bock and Brewer (1985) drew similar conclusions when they reported that the ability to integrate information across several sentences in written discourse appears to be correlated with reading success.

CHAPTER SUMMARY

In the results portion of this chapter, the findings were reviewed from measures designed to answer the two research questions reviewed in the discussion section. The first analysis involved a one-way analysis of variance on a series of five pretests measuring overall language, auditory processing, verbal, and syntactic skills. Results indicated significant group differences at the .001 level on all test measures. The second analysis was an analysis of covariance, using each of the pretests as a covariate to predict group differences which remained for all of the test measures except the overall language scores on the PICAC, and the percentage of complex sentence structures used on a narrative recall task.

A multivariate analysis was conducted to determine the effects of manipulations of discourse type and grammatical form on recall and probed recall scores in the Learning

Disabled and in the Regular Education groups. Significant effects were present for the group, by grammatical form by discourse type interaction. Further analyses indicated that significant group differences were found for both discourse type and grammatical form. Significant differences were found for the responses to the discourse types of cause effect, narrative and problem solution for both simple and complex passages tested with free recall, and for both cause effect and the simple problem solution passage using probed recall. There was not an effect for grammatical form or for the other discourse types on either the recall or the probed recall response measures.

The final measure consisted of a second multivariate analysis to consider the factors of group by discourse type by question type (for question types of textually explicit, textually implicit and scriptally implicit responses). Results indicated significant group effects, again for discourse type, as well as for the three question types. Additional findings from post hoc comparisons indicated that, while there were no clear patterns of interaction for discourse type by question type, significant differences were found between the question types, with superior responses on the textually explicit questions for both groups.

Results of these findings, when considering the initial research questions indicate the following:

1) The Learning Disabled and the Regular Education students were able to respond significantly better to text passages containing clear author structure, as indicated by their higher mean scores on the discourse types of cause effect, narrative and problem solution.

2) Although the Learning Disabled students consistently scored at a lower level on all discourse types, their patterns of response were similar to those of the Regular Education students.

3) The grammatical form manipulation did not facilitate responses in either group of students. Although the mean scores of both groups suggested a tendency to score better on the simple text versions, this difference did not reach significance.

4) Both the Regular Education and the Learning Disabled students responded better on the question answer than on the free recall response tasks. The Learning Disabled group appeared to decrease their discrepancy from the Regular Education students in their responses when allowed the additional cues of information and structure provided in the questions, and when not penalized for their failure to recall top-level ideas, or to state propositions completely.

This relationship was not explored, however, statistically.

5) Both groups of students scored higher on the textually explicit questions than on the other types.

6) Findings of the analysis of covariance indicated that the reading comprehension problems on the free recall,

but not the question type responses, could be predicted by group deficiencies in the percentage of complex sentence structures used and in the overall language score as measured by the Porch Index of Communicative Ability in Children (PICAC). Because comprehension of written discourse depends to some extent on the readers' skill in linking thoughts and ideas across text, the deficits found in this population for oral language skills should not be overlooked.

7) Although the Learning Disabled students had difficulties in their syntactic skills, they did not benefit from changes in the complexity of grammatical form in the passages. It is suggested that there is a necessary level of syntactic skill needed to allow one to understand longer units of discourse, and that the deficiencies in this group were below a critical threshold so that changes at the sentence level did not enable them to organize, select and integrate text beyond a sentence by sentence basis.

CHAPTER 5

SUMMARY AND CONCLUSIONS

This study was conducted to assess the relationship of discourse type manipulations for narrative and expository text (expository types of cause effect, problem solution, descriptive, list like and compare contrast), and syntactic structure manipulations for simple and complex sentence structure types to language ability, free recall responses and probed recall responses in a subgroup of Learning Disabled children. Test score responses of the Learning Disabled children were compared to results of age matched Regular Education sixth graders.

The purpose of this study was to manipulate the reader-related variable of language and the text-related variables of grammatical form and discourse type while holding constant other reader-related and text-related variables known to influence comprehension. Reader-related variables held constant were: age, interest, an established level of text decoding ability, an established level of intelligence, background knowledge, and purpose. The text-related variables controlled for were content and emphasis. This study examined the text related variables of discourse type and grammatical form to measure the results in both the regular education students and in readers with limited language and reading comprehension ability, who are often described as good decoders and poor comprehenders. The summary of the method is given in the following section.

Subjects: Sixty sixth grade students participated in the study. Thirty of the subjects were regular education sixth grade students. The other thirty were selected from the Learning Disabled population, because they met specific minimum criteria established for IQ scores within the normal range, as defined by 85 on either the Verbal or the Performance Scale of the Weschler Intelligence Scale for Children-Revised version and decoding skills of 90% efficiency and accuracy for word list and paragraph reading both scored using a modified version of the multidimensional scoring system established by Porch (1967). Students were matched by age, race, sex, and general socioeconomic status.

Materials: Materials in the study consisted of four pretests for language skills, and two sets of twelve passages representing varied discourse type and grammatical form. Each passage was accompanied by six comprehension questions. The pretests used were the Porch Index of Communicative Ability in Children (PICAC), scored for the Overall Auditory and Verbal Modalities, and the Story Reformulation Test, scored by both number and percentages of complex sentences used.

The twenty-four passages were initially taken from fifth grade Science, Social Studies and English Literature textbooks to establish consistency in experience with the topics, similarity of content and use of topics considered to be of uniform interest and difficulty levels. The passages were chosen to represent examples of narratives and

of Meyer's (1976) five types of expository text structure (adversative, covariance, response, attributive, and descriptive). Two passages on similar content were selected for each discourse type. Passages were then rewritten until uniformity was established for length, number of propositions, clarity of writing style, and consistency in representation of the discourse type. The twelve passages were each rewritten into both a simple and a complex sentence structure version according to the van Dijk and Kintsch (1983) system. Following the grammatical changes, passages were readjusted to reach uniform readability levels.

Six questions were written for each passage. Two questions were in each of the categories of textually explicit, textually implicit, and scriptally implicit.

Experimental Design: There were five analyses completed in this study. The first analysis involved a series of one-way Analyses of Variance to compare the Learning Disabled and the Regular Education groups on each of the pretest measures. The second measure was an Analysis of Covariance, using each of the pretests as a covariate to predict group differences, when the pretests were each accounted for. The third analysis was a multifactorial mixed design, using the between subject factor of group, and the within subject factors of discourse type and grammatical form. A three way multivariate analysis was completed on the data, using a 2(group) x 6(discourse type) x

2(grammaral form) design. The two ability levels of group were the Learning Disabled and the Regular Education students; the six levels of discourse type were cause effect, narrative, problem solution, descriptive, list like and compare contrast, and the two levels of grammatical form were simple and complex sentence structures. Free recall scores and probed recall scores were used as the dependent measures in this analysis. Finally, a third multivariate analysis with the repeated factors of group and discourse type, but with the added factor of type of question (textually explicit, textually implicit and scriptally implicit) was completed. The dependent measure used was the question answer scores divided according to the three question types.

Procedures: The passages for the study were grouped in to two sets, according to grammatical form, so each set had a simple and a complex paragraph of parallel verisons, representing each of the six discourse types. Half of the students read set A and half read set B, with the passages pressented in one of four random orders. The comprehension questions, initially placed in random order, were presented in uniform order to the students. The students were tested individually and all testing, scoring and analyses were completed by the author. Following administration of the pretests, using standard tester format, the students were asked to read the twelve passages. Following each passage reading, they were asked to complete three long addition

math problems, to tell everything they remembered from the passage, and to answer orally the six comprehension questions.

Dependent Measures: The pretests were scored according to standard criteria for the Porch Index of Communicative Ability in Children (PICAC). The number and the percent of complex sentences used were the scores for the Story Reformulation Test. The two decoding paragraphs used in determining eligibility for the study were scored according to a modified scoring procedure taken from the Porch Index of Communicative Ability.

Free recall responses were scored according to Gordon and Pearsons' (1983) criteria for credit, partial credit and no credit. An additional category of credit was added to differentiate between ideas high and low in the passage structure, with top level ideas receiving an additional point.

Question answers were scored according to Gray's (1959) criteria for full credit, one-half credit or no credit.

SUMMARY OF RESULTS

Findings from the first analysis comparing groups on the pretest measures indicated that there were group differences (significant at the .001 level) for all of the pretest measures used.

On the Analysis of Covariance using each of the pretests as a covariate, results for free recall scores used as the dependent measure indicated that group differences

could be predicted by the Overall test scores on the Porch Index of Communicative Ability in Children (PICAC), and the percent of complex sentences used in connected speech in response to the Story Reformulation Test. Group differences remained on all pretests when the question answer scores were used as dependent measures in the ANCOVA.

Results of the multifactorial analysis using the between subject factors of group and the within subject factors of discourse type and grammatical form were similar for both of the dependent measures of free and probed recall. Significant effects for both group and discourse type were found in the multivariate analysis. Therefore, follow-up analyses and post hoc comparisons were completed on the data. Significant effects remained for the two groups on all of the discourse types. Simple effects were found for the discourse types of cause effect, narrative and problem solution passages for free recall responses and cause effect and problem solution for probed recall responses. Although group differences were present in response to the grammatical form manipulation, significant main effects were not found for either grammatical form or the group by grammatical form interaction.

Results of the mutivariate analysis with the factors of group, discourse type, and question type revealed a significant main effect for group differences and an interaction effect for discourse type by type of question. This interaction suggests that while students consistently

performed higher on the Textually Explicit questions regardless of discourse type, they performed differently on the Textually Implicit or Scriptally Implicit questions across passages. For these two question types no clear pattern was established.

CONCLUSIONS

This study has relevance for both theory and practice. Conclusions from the study will be drawn first according to the study's relevance for theoretical implications and practical implications, followed by a discussion of the limitations and suggestions for further research.

Theoretical Implications

The theoretical implications of the study will first be presented according to the areas addressed in the specific research questions reviewed in Chapter 4, followed by a placement of the general findings of the study within the context of current models of reading comprehension.

The first implication of the study involves its contribution to the literature focused on exploring individual differences in reading comprehension. There are two conclusions to be drawn from the study regarding this area of research. The first concerns the delineation of characteristics to define the population of children who are good decoders and poor comprehenders. By setting prerequisites for involvement in the study according to key criteria assumed to differentiate this group, thereby establishing a homogeneous group of subjects, and by further

delineating the language and reading comprehension levels with this group, we can increase our knowledge of the comprehension process for these children.

The second conclusion of this study relative to the individual differences literature is its more global approach to the reading comprehension process. Spiro and Myers (1984) stressed the need to advance beyond good and bad reader comparisons on a single aspect of reading hypothesized to be related to proficiency. By setting controls and defining areas manipulated across a wide dimension of text and reader-variables in both Regular Education and Learning Disabled students, this study avoided some of those pitfalls.

The third theoretical implication of the study concerns an addition to the research regarding the role of language competence in the reading comprehension process. Perfetti and Goldman (1976) reported that reading comprehension is best understood as dependent on language comprehension skills. Comparative studies of the relationship between reading and listening skills argue against the view that reading comprehension consists simply of transferring oral comprehension skills to text. The wider range of knowledge required to understand written discourse, its differences in structure, its lack of contextual support, and its reliance on higher level syntactic skills (Bock & Brewer, 1985) all contribute to a need for increased knowledge and flexibility in the language and memory processes when attempting to

understand expository text. The difficulty experienced by the Learning Disabled children, who presented deficits in higher level syntactic areas, suggest that language processing skills must be considered both in formulating hypotheses concerning the nature of the reading comprehension process and in addressing comprehension breakdowns in children with language-learning problems.

Although a causal connection cannot be drawn between the language deficiencies and the text comprehension problems, this is an area in need of further research. This is not to say, that the study supports or refutes the need to improve oral language skills to facilitate reading comprehension in the normal population. The regular education controls used in the study did not experience deficits in either their complex sentence structure use or in their comprehension of the text material. Rather support is given for the position, that oral language skills for syntactic constructions develop to a high level prior to the development of written language skills (Sticht & James, 1984), and that linguistic ability needed for text comprehension is at a higher level of competence than the verbal metalinguistic skills involved in early reading instruction. Oral language training for sentence structure with a normal population not experiencing problems in higher level syntactic skills, particularly at the expense of work on developing print specific skills may, in fact, be counter-productive (Evans & Carr, 1985).

A fourth theoretical implication from the study concerns the findings relative to discourse types. Gibson and Levin (1975) reported that good and poor readers do not necessarily differ in their ability to transform a written word to speech (i.e. in the mechanics of reading) although they can. Gibson and Levin stressed the importance of the ability to use larger units and to make inferences from text. They reported that skilled decoders who have not learned to organize the text into higher order groupings may still be poor readers, so far as comprehension is concerned.

Much of this study concerned the role of text type in facilitating organization. Findings relative to discourse type support other research conclusions that narrative is easier to understand than descriptive text (Freedle & Hall, 1979). A possible factor in addition to complexity of content may be simply more exposure to narrative material. Of greater interest, however, is the implication from the results that poor reader comprehension as well as skilled reader understanding appears to be facilitated by structured text. These results contribute to the evidence for Frederiksen's (1975) constructivist model of discourse processing because this study shows that to some extent information in recall can be controlled by contextual conditions. These findings have relevance for the role of text structure models in further research in both reading comprehension and in models of the organization of knowledge in memory. Parallel findings for the Learning Disabled and

the Regular Education students suggests that both groups were using similar strategies for processing, organizing, and retaining the material, but that the Learning Disabled students were less skilled and therefore less successful in their attempts.

The fifth theoretical implication from the study involves the failure to find significance beyond the group differences for grammatical form. This implies that, although limitations in syntactic skills were present with this group, these students did not benefit from changes to facilitate processing of the text on a sentence by sentence basis. Although they may have been unable to understand at the sentence level, it is more likely that sentence level processing is necessary but not sufficient to engage in processing strategies to select, organize and interpret longer units of discourse. Findings support Bruce (1980) who reported that poor readers who were slower in between sentence conditions were not maintaining the schemata as they read through the text. Findings lend more support to critics (Morgan & Sellner, 1980) of the linguistic systems based on the concepts of cohesion and the role of grammatical form at sentence levels in text comprehension. Additional questions are raised regarding the use of readability formulas (beyond their lack of attention to content and inconsistencies in measuring grade levels) as a measure of text complexity, even in the area they are felt to explicitly measure, that of grammatical form.

Because the Learning Disabled students scored in a similar manner to the Regular Education students, but with less recall and more inaccurate responses, it appears that certain levels of competency are necessary in linguistic areas to enable one to engage in text interpretations across longer units of discourse. Sentence level skills, and/or a text containing sentences to be linked in consecutive order do not appear to be sufficient to allow for integration and interpretation of the text.

The sixth implication of the study concerns the findings relative to free recall and question answer responses. Because results were different, with higher scores in both groups, but particularly in the Learning Disabled group on the question answer responses, it is clear that the two common approaches for measuring comprehension are not equivalent. The recall task does not provide cues for text content and retrieval of information, and places upon the student the added burden of organizing the information, presenting concepts in a logical, sequential manner, drawing relationships between ideas, recalling top level content as well as factual information, and relying on language skills to formulate sentences to clearly convey ideas. This may be why the Learning Disabled students had greater difficulty on free recall tasks, which are more central to the comprehension process (Johnston, 1984). Findings argue for use of recall measures of assessment when viewing the reading comprehension process. This is not a new

finding; Rusch and Stoddard (1927) pointed out that reading a paragraph and finding the right answer to questions when the text is present is to some extent a matching exercise that disregards the mechanics of the process. It is a finding, however, that is often overlooked by educators and designers of reading comprehension measures.

The seventh theoretical implication concerns the findings relative to the type of question used in responses. Here a case can be made for tests using question answers to measure comprehension because they do provide examiners with information needed to determine if some degree of understanding has taken place when minimal results are found with free recall measures. Findings support Johnston (1984), that questions are not comparable, and the comprehension effects are different for different types of questions. Both groups responded better on the textually explicit questions; however, where the Regular Education students had fairly uniform success across all question types, the Learning Disabled students were generally limited in accurate responses to the textually explicit type of questions. Therefore in measuring reading comprehension, it would appear that inflated scores would be obtained on test measures focused at this level of recall, whereas the deficits in linking ideas together across text material, tapped by textually implicit questions, and deficits in the fund of background knowledge from probable language limitations assessed by scriptally implicit questions would

be missed. Research suggests that comprehension of implicit aspects of text, especially, are fundamental to the comprehension process. Paris and Lindauer (1977) wrote that the abilities to comprehend inferred relationships and to blend implicit and explicit information together in memory are fundamental aspects of semantic integration and understanding of stories.

The eighth, and final theoretical concern, but perhaps the most important, is the attempt to place these findings within the context of current models of reading comprehension. Although there is not clear agreement on the interactive model of reading (Stanovich, 1980), there is a tendency for researchers to support the view of reading as a dynamic activity based on an interaction of bottom-up and top-down processing, both operating under a capacity limitation (Spiro & Meyers, 1984). Carr (1985) described the reading process as an information processing system established around the "old" parts of the integrative cognitive processes by which the information content of spoken language and its functions are added to the "new" part consisting of perceptual processes for word recognition, and integrative processes needed to process syntactic constructions, rhetorical devices, and discourse-organizing techniques found in written language. This study was designed to consider certain dimensions of this highly complex, interactive system. Controls were established for some portions of reader and text based

variables, while other dimensions were manipulated. Although complete accounting for all the necessary variables involved in the reading comprehension process is beyond the scope of any single study, this particular study does offer a combination of results specific to the dimensions of the interactive model. The criteria established for subject selection, and the pretests given were designed to look specifically at the "old" parts of the system, whereas the focus on syntactic constructions, and changes in rhetorical devices and discourse types was an attempt to look at the aspects involved from the "new" system relative to written discourse demands. The last but highly important aspect of the system is the role of the perceptually based processes to encode and decode print. This study did not overlook these skills because procedures were designed to carefully control for the decoding skill, to remove its' effect from the process as nearly as possible thus allowing for measurement of the other areas of the reading comprehension process. It was felt that decoding skill is such a critical element in reading that without proficiency at this level the other aspects in the reading process could not be adequately measured because they may not even be engaged.

Practical Considerations

Seven practical considerations can be drawn from the findings of the study including the role of student language skills, the role of instructional materials in facilitating reading comprehension, and the focus of reading

comprehension measures. A delineation of individual areas of consideration is as follows:

1. Because of the role of syntactic skill in text interpretation and the accompanying deficiency in the Learning Disabled population, findings are in support of the need to measure and determine levels of proficiency in syntactic areas for longer units of discourse. Treatment of deficiencies in higher level syntactic skills would be implied if it could be shown through research that such training resulted in improvements in both use of complex grammatical form in connected speech, and a subsequent improvement in text comprehension.

2. Support is given for the role of text structure in facilitating comprehension in both the Learning Disabled and the Regular Education students. This implies that some instructional materials designed to provide explicit structure should be provided to children with limited comprehension, with increases in complexity focused on providing content presentation in other, less structured formats. This would fit with the approaches advocated by Armbruster & Anderson, (1981), Kantor, Anderson & Armbruster, (1983), Armbruster, (1984), and Armbruster & Anderson, (1984).

3. The findings suggest that focus on educational materials continue to vary the extent and range in presentation of materials of varied content and structure, to allow exposure to a wide variety of discourse types.

4. The results provide more support to the increasing position of many researchers (Felker, 1980; Bruce & Rubin, 1981; Rubin, 1982) that readability formulas are inappropriately used as a measure of text complexity.

5. There is a need to construct test measures of reading comprehension based on free recall and open ended questions as opposed to relying on the use of cued comprehension questions, particularly when the types of questions are not clearly defined. In addition to the area of assessment, instructional programs should be used to facilitate question answering for varied types of information (Raphael, 1980, 1983), and avoid focus in recall and questioning on the details of the story, but rather stress higher order concepts (Meyer, Brandt and Bluth, 1980, Singer and Donlan, 1982, Black and Bower, 1980, Beck, Omanson and McKeown, 1982).

6. Findings support the need to focus on aiding children with comprehension deficits involving the skill in linking together ideas across successively longer sentence units. Gordon (1980) found gains from similar inference training, whereas Clark (1981) supported work on anaphoric pronouns and comprehension of complex sentence structures.

7. Support is given for further evaluation of vocabulary for word meanings and pragmatic, or communicative, skills in Learning Disabled children for the purpose of determining if building semantic concepts and background knowledge for material related to the text. This

was advocated by Langer and Nicholich (1981). Use of structurally similar stories with similar content as suggested by (Hayes & Tierney, 1982, Rumelhart, 1980) would aid them in responding to scriptally implicit questions. Their difficulty on these items suggests a deficit in the fund of information necessary to supplement text understanding. This hypothesis would fit with Wittrock's (1974) generative hypothesis which contends that comprehension is primarily a function of the availability of distinctive, relevant memories in the learner, it it relies on the activation of existing knowledge structures.

Limitations of the Study

As is the case in most research endeavors, this study is not without limitations. There are three specific areas of weakness, two relative to the subject sampling, and one relative to the comprehension areas assessed. Because few children met the stringent criteria outlined for subject selection, it was necessary to limit the study to those children available, as opposed to drawing the sample randomly from a larger group. Findings, therefore, for the Learning Disabled children cannot be generalized to other students who do not have characteristics similar to this subject group.

Secondly because of decoding interacts strongly with other aspects of the reading comprehension process, ideally other students with a wide range of carefully measured decoding levels would have been added to the to the subject

group to further establish the necessary and also the sufficient level of reading skill to allow for automaticity in processing the text material. Further measures on decoding inefficiencies could be added and subject groups could be matched at different levels for language and decoding skills. Finally, the factor of metacognitive processing, particularly for metacomprehension skills, would have been added to the study because the reader's use of comprehension monitoring strategies is involved in text comprehension (Winograd, 1983; Tierney, 1983; Raphael & Pearson, 1982). This factor was omitted deliberately due to the complexity of the existing study and indications from the currently existing research that it was a known source of difficulty in the Learning Disabled population.

Implications for Future Research

This study ends with a call for future research. The findings suggest that additional research should be accomplished to further delineate the nature of the language and processing skills of children with reading comprehension deficits, to explore the role of higher level syntactic skills in text understanding, to further clarify the role of decoding levels of proficiency and the use of metacomprehension strategies to aid in determining the crucial points at which reading comprehension breaks down, and to determine if methodological changes in the study for the factor of grammatical form would results in changes in the text comprehension results.

Chapter Summary

The purpose of this study was to measure the affect of discourse type and grammatical form manipulations on the free recall responses and the question answer responses for a subgroup of Learning Disabled students and their age matched peers. Subjects for the Learning Disabled group met a minimum criteria for Intelligence and decoding skills. All students were further tested in language and decoding areas. Subjects then were asked to read, recall and answer questions on a series of twelve passages, containing a simple and a complex version of six discourse types. Results indicated significant group differences on all pretest measures. An analysis of covariance for recall scores indicated that group differences were no longer present when either the Overall modality score of the PICAC or the percent of complex sentences were controlled for. The results of a series of three multivariate analyses and follow-up one way and post hoc comparisons indicated that group differences were found for the factors of discourse type, grammatical form and question type. Significant results were found for the discourse types of cause-effect, problem solution and narrative passages, on recall measures, and for problem solution and cause effect passages on the question answer responses. There was no support for the effect of grammatical form. Differences were found on the question types of textually explicit, textually implicit and scriptally implicit. The Learning Disabled group of

students responded similarly to the Regular Education sixth graders on all three factors. While both groups responded better to question answer than to free recall tasks, and to textually explicit types of questions than to textually implicit or scriptally implicit, the responses of the Learning Disabled children were greater on these measures in comparison to their other responses.

The findings were interpreted as delineating the characteristics of the good decoder poor comprehender population, providing support for the probable role of syntactic skills in reading comprehension for expository text, suggesting that the structure as defined by discourse type does influence reading comprehension, with a facilitating effect for highly structured passages, questioning the validity of text cohesive levels of analysis and structure in altering text comprehension, confirming parallel processing strategies in reading comprehension for Learning Disabled and Regular Education students, and differentiating the type of responses given to varied comprehension measures such as free recall, and types of comprehension questions. Finally, the results were placed within the context of the interactive model of reading, with particular emphasis in this particular study on measuring the pre-existing language skills the reader brings to the comprehension process, and viewing them in the light of his or her use of the integrative processing skills needed to understand written discourse.

APPENDIX A

APPENDIX A
Letters for Permission

(Learning Disabled Students)

Dear Parent:

I will be testing children in Learning Disabilities and Resource Room programs in the Grand Rapids Public schools as a part of a research project on the relationship between language skills and reading comprehension. The testing will be done at school, and will involve screening testing on oral reading skills, and may involve an additional hour of individual testing in language (to complete a language test instrument called the Porch Index of Communicative Ability in Children, which is a battery of twenty subtests of speech and language function, to read a paragraph, to read a series of words and to retell a complex story), and may involve an additional session of one to two hours on reading comprehension (to read, summarize and answer questions on paragraphs of varied structure and content). Students may only be given the first portion of the tests, as they may not meet the study requirements for additional testing. Findings will be correlated to some previous school test scores, which I will take from the school records, and to reading comprehension scores on children without school learning problems.

I worked as a speech and language consultant for the Grand Rapids School System for nine years, and am now completing requirements for a Ph.D. in reading at Michigan State University. The purpose of my study is to increase our understanding of how to help children with learning problems understand what they read. I would like your permission to test your child free of charge, and to examine his/her scores on tests in school records as a part of this study. You may deny this permission and your child will receive the same care and teaching and you may withdraw this permission at any time, or your child may choose to discontinue his/her participation in the study at any time without penalty or loss of privilege to which he or she would otherwise be entitled. Your child will not be coerced to respond or participate if he/she does not wish to. In return for your child's participation in the study, I am willing to provide you with a summary sheet outlining the testing that was completed, your child's test scores, a statement on the findings of the study and some recommended areas of treatment.

If you will allow your child to participate in this study, please sign the bottom of this form, and return it in the enclosed self-addressed stamped envelope to the Speech Pathology Department office (West Middle School). The results of the study will be treated in strict confidence,

and individual students will remain anonymous. Within these restrictions, upon parent request, a summary sheet will be sent to parents on their child's responses and general comments on the study results.

As the parent/guardian of _____ I consent to have him/her take part in the Reading Comprehension Study being conducted by Marge Penning, who is completing requirements for a Ph.D. at Michigan State University.

Please indicate interest in the results by circling the appropriate answer

yes no I would like to receive a summary sheet of the findings on my child

yes no I would like my child's teacher to receive a copy of the findings.

Name _____ Date _____

(Regular Education Students)

Dear Parent:

I will be testing children in both Learning Disabilities and Resource Room Programs and in regular sixth grade classrooms in the Grand Rapids Public Schools as a part of a research project on the relationship between language skills and reading comprehension. I am in need of students in regular education to compare the results on a test of language (Porch Index of Communicative Ability in Children), paragraph reading, story retelling and summarizations of paragraphs given by children with school learning problems matched for age, sex, race and socioeconomic status.

I worked as a speech and language consultant for the Grand Rapids School System for nine years, and am now completing requirements for a Ph. D. in reading at Michigan State University. The purpose of my study is to increase our understanding of how to help children with learning problems understand what they read. I would like your permission to test your child as part of a control group for this study. You may deny this permission and your child will receive the same care and teaching and you may withdraw this permission at any time, or your child may choose to discontinue his/her participation in the study at any time without penalty or loss of privilege to which he or she would otherwise be entitled. Your child will not be coerced to respond or participate if he/she does not wish to. In return for your child's participation in the study, I am willing to provide you with a summary sheet outlining the testing that was completed, your child's test scores, and a statement on the findings of the study.

If you will allow your child to participate in this study, please sign the bottom of this form, and return it in the enclosed self-addressed stamped envelope to the Speech Pathology Department office (West Middle School). The results of the study will be treated in strict confidence, and individual students will remain anonymous.

As the parent/guardian of _____ I consent to have him/her take part in the Reading Comprehension Study being conducted by Marge Penning, who is completing requirements for a Ph.D. at Michigan State University.

Name _____ Date _____

Example Report Summarizing Testing

LANGUAGE-READING COMPREHENSION TESTING

Name: Phillip xxx (Regular Education Student)

B.D.: 8/5/73

Age: 11-8

Date of Evaluation: 4/22/85

Background Information

Phillip was seen for testing as a part of a research project on the relationship between language skills and reading comprehension.

Tests Administered

Porch Index of Communicative Ability in Children (PICAC)

Story Reformulation

Analytical Reading Inventory (paragraph)

Informal Assessment of Decoding Fluency

Comprehension of Reading by Text Type and Sentence Structure

Summary of EvaluationLanguage:

Phillip responded to the testing at or above age level in most areas, with an Overall mean score of 14.29 on the Porch Index of Communicative Ability in Children (PICAC), which placed him at the 85th percentile for his age level. Some discrepancies were noted in his responses, however, with lower scores on auditory tasks. Phillip's vocabulary and use of complex sentence structure were age appropriate. He did not, however, use two dimensional terms to describe the shape of items. Phillip, at times, interpreted questions too literally, and was only able to give the correct answer when the question was repeated or rephrased. Phillips's speech was free from articulation errors. On auditory linguistic tasks Phillip had difficulty retaining directions, and he was delayed in his ability to tune in to the task and to process complex auditory material efficiently.

Reading:

Phillip had no difficulty decoding words adequately to read grade level text. He did have more delays and confusion with function words when required to read a list of words, a task that also required more vigilance. Although Phillip was able to understand the paragraphs used in testing across all text types, patterns of strengths and weaknesses were present. Phillip tended to readily apply background knowledge, and to include extraneous information not mentioned in the text. This resulted, at times, with use of statements contradicting text material. Differences were not noted when sentence structure was manipulated within the passages, suggesting that Phillip is able to understand complex sentence structure in text. Some differences were noted in his response across question

types, with superior answers for questions on explicit text material and weaker answers on background knowledge questions. Phillip recalled more ideas and answered more questions correctly for paragraphs with narrative, cause-effect, and compare contrast types of organization. He had greater difficulty perceiving the organization of ideas and retaining specific terms for paragraphs depicting problem-solution, descriptive and list-like structures. On easier paragraphs, the high and low ideas were balanced in his free recall, whereas with harder paragraphs Phillip recalled fewer top level ideas and used fewer descriptive terms. Responses to writing tasks were above age level.

Summary and Recommendations

Phillip's response in all areas appear to be well within normal limits. Until the study is completed, comparison of easier and harder text types, and the number of ideas Phillip recalled cannot be compared to his age level peers. Because of Phillip's weakness on auditory retention tasks, he may need further evaluation to rule out the possibility of an Attention Deficit Disorder. The following areas are suggested for additional work with Phillip, based on his weaker areas of response:

1. Terms for shapes, particularly those necessary for later work in geometry.
2. Greater reliance on the text material present to give supporting statements for reasons for events, as opposed to guessing from background knowledge.
3. Reading and organizing material presented in a problem solution format.
4. Reading and organizing material in descriptive passages, particularly for visual spatial material.
5. Recall of specific terms for list-like structures
6. Retention of a series of directions.
7. Use of his name or a carrier phrase preceeding the introduction of auditory material to allow him time to tune in to instructions.

-

Marge Penning, M.A. CCC
Speech-Language Pathologist

LANGUAGE-READING COMPREHENSION TESTING

Name: Michelle xxx (Learning Disabled Student)

B.D.: 2/1/73

Date of Evaluation: 11/5/84

Background Information

Michelle was seen for testing as a part of a research project on the relationship between language skills and reading comprehension.

Tests Administered

Porch Index of Communicative Ability in Children (PICAC)

Story Reformulation

Analytical Reading Inventory (paragraph)

Informal Assessment of Decoding Fluency

Comprehension of Reading by Text Type and Sentence Structure

Summary of EvaluationLanguage:

On speech and language testing, Michelle had difficulty producing correctly the /r/ and /l/ phonemes, and inconsistent substitutions were noted for the /th/ and /sh/ sounds. Vocabulary limitations were noted for her ability to state attributes of items, and to retain noun modifiers. Although Michelle was using some complex sentence structure forms, she did not maintain grammatical linkage across longer units of discourse or understand complex stories. Michelle had difficulty on auditory tasks retaining directions and processing the verbs in two noun two verb delayed auditory commands.

Reading: Because the study is not completed, to compare Michelle's responses to her age matched peers, only general patterns of response can be reported. Michelle was able to read the text material, but with some delays, and a few errors on function words and word endings. She was noted to have difficulty organizing and recalling textually implicit information, understanding complex sentence structure, and linking together information across a series of paragraphs. Michelle recalled more information from narratives, descriptive and list-like structures, than from cause effect, problem solution and compare contrast patterns. Her writing was below age level, with spelling errors, particularly for homographs.

Recommendations

It appears that Michelle could benefit from work focused on the following areas:

1. Describing attributes of items
2. Understanding noun modifiers
3. Understanding complex sentence structures
4. Understanding information in narrative formats with expansions from simple to complex sentence structures.

5. Understanding temporal and geographical terms in text
6. Retaining directions across a series of items
7. Producing glide sounds (r,l)
8. Organizing information at the paragraph level

Marge Penning, M.A. CCC
Speech-Language Pathologist

APPENDIX B

PASSAGE 1 CAUSE-EFFECT COMPLEX
THE WAR WITH SPAIN

Many years ago we went to war with Spain, over a small island near our country called Cuba. Cuba was in the West Indies which is close to us, but far from Spain.

In the 1800's, Spain's largest and most needed possession was Cuba, because it was the source of many rich minerals, such as gold, copper, and metal, and a large sugar crop was raised there. Many Americans had placed money in mines, farms and sugar mills on the island, and they wanted a firm government which would protect their interests.

People in Cuba wanted to be free, so they had fought many times against Spain. Many were jailed and a bitter revolt flared up. Stories in U.S. newspapers, like those published by William Randolph Hearst, told of the brutal treatment of Cubans by the Spaniards. Since most Americans believed what they read, they began to agree with the Cuban wish for freedom.

The President sent the warship "Maine" to Cuba to help keep safe the United States people who were living there. But the warship was blown up and sunk in the harbor. More than two hundred people lost their lives. Although the true cause of the explosion was never found, most people blamed Spain, and war fever swept the country. "Remember the Maine!" became a war slogan, and some people told the President to fight Spain, while others said not to fight.

He was told that other countries would be angry, as they expected the United States to help. An article was written in the newspaper saying that he should act soon, and help fight in Cuba.

President McKinley urged the Spanish government to stop fighting with Cubans, to let their prisoners go, and to allow the U. S. to work out a treaty between Cuba and Spain.

Although Spain agreed, people in the United States still argued with the President for freedom for Cuba. At last he agreed to solve the problem by war.

The Spanish-American War began in the late 1800's, when we attacked Cuba by land and by sea. We found the Spanish navy in Santiago Harbor, and kept it there. Two successful land attacks gave us control of the hills above the city. One of these attacks was led by Theodore Roosevelt, who led a cavalry group of about a thousand men called the Rough Riders up the hill. After much fighting and many losses, the Rough Riders took the hill. The Spanish fleet tried to leave the harbor a ship at a time, but one by one every ship in the Spanish navy was forced to surrender to the Americans.

The Spaniards knew that Spain lost the war. Spain and the United States agreed to discuss terms and in the treaty, Spain gave up Cuba and Puerto Rico. When the treaty was signed, Spain gave up all claim to Cuba and Cuba was free.

PASSAGE 2 CAUSE-EFFECT SIMPLE
THE WAR WITH SPAIN

Many years ago we went to war with Spain. The war was over a small island near our country. The island was called Cuba. It was in the West Indies. That is far from Spain. It is near our country.

Cuba was Spain's largest possession in the 1800's. It was needed by Spain. Spain used Cuba for rich minerals. Cuba had gold, copper, metal and a large sugar crop. Many Americans wanted a firm government in Cuba. They wanted to protect their interests. They had placed money in mines, farms and sugar mills on the island.

People in Cuba wanted to be free. They had fought many times against Spain. Many were jailed. Then a bitter revolt flared up. Stories were printed in U. S. newspapers. They told of the brutal treatment of Cubans by the Spaniards. William Randolph Hearst published American newspapers. He wrote against Spain. Most Americans believed the newspapers. They began to agree with the Cuban wish for freedom.

The President sent a warship to Cuba. The warship was named "Maine". Some United States people were living in Cuba. The ship was to keep them safe. But the warship was blown up. It sunk in the harbor. More than two hundred people lost their lives. Most people blamed Spain. The true cause of the explosion was never found. War fever swept the country. People used the war slogan "Remember the

Maine!" Some people told the President to fight Spain. Others said not to fight. He was told that other countries would be angry. They expected the United States to help. An article was written in the newspaper. It said he should act soon. He should help fight in Cuba.

President McKinley urged the Spanish government to stop fighting with Cubans. He asked them to let their prisoners go. He asked that the U. S. be allowed to work out a treaty. The treaty would be between Cuba and Spain. Spain agreed.

Still people in the United States argued with him. They wanted to have freedom for Cuba. At last he agreed to solve the problem. It was by war.

The Spanish American War began in the late 1800's. We attacked Cuba by land. We also attacked Cuba by sea. We found the Spanish navy in the Santiago Harbor. We kept it there. Two successful land attacks were made by the Americans. They gave us control of the hills above the city. Theodore Roosevelt led one attack on the hill. He had a cavalry group. It had about a thousand men. They were called the Rough Riders. They went up the hill. There was much fighting. They had many losses. The Rough Riders did take over the hill. The Spanish fleet tried to leave the harbor. They left a ship at a time. One by one Americans forced every Spanish navy ship to surrender.

Spain lost the war. The Spaniards knew that. Spain and the United States agreed to discuss terms. Spain agreed to

give up Cuba and Puerto Rico. The treaty was signed. Spain gave up all claim to Cuba. Cuba was free.

PASSAGE 3 CAUSE-EFFECT COMPLEX
THE START OF THE FRENCH AND INDIAN WAR

In the 1700's there was a war with the Americans and British on one side, and the French and Indians on the other side. What were the reasons for this war?

Both France and Britain had claimed the Ohio Valley. The French claims were based on their explorer's and trapper's reports, while the British claims were based on a grant of this land to Virginia in its charter. British people began to cross the mountains in search of new lands. What were new lands to them, of course, were homes to the Indians who lived there. The Indians joined forces with the French to save their lands, and fighting resulted. There were frequent raids on homes.

The governor became quite upset when the French built a chain of forts stretching from Lake Erie to the forks of the Ohio. He sent George Washington to the Ohio Valley to ask the French to leave the forts they had built in the area. Washington was chosen because he knew how to map the lands, and he had the ability to pinpoint the exact locations of the French forts.

In December, Washington arrived at Fort Le Boeuf, after a long and difficult journey. He was welcomed by the French and was treated kindly by their leader, but the French refused to leave their forts along the Ohio River, so Washington left Fort Le Boeuf to return home.

Because the Governor was very angry to hear about the French refusal to leave the Ohio Valley, he made George Washington a colonel in the army, and then ordered him to drive the French out of the Ohio Valley. The Americans built a fort about sixty miles from the French one, and prepared to fight for the area.

The new French fort was built at a vantage point on the Ohio River, with a drawbridge and high wooden walls. Behind it, the French and Indians prepared for Washington's army. The French and Indians attacked the few hundred men near the fort, leaving over half of them dead. When Washington moved south to renew the strength of his army, the French and Indians pursued him until he finally stopped fighting at the American fort.

After the French and Indians won at the fort, they began to attack the English homes along the edge of the western New York frontier. Whole towns were wiped out and the French and Indians left many burning homes behind them.

PASSAGE 4 CAUSE-EFFECT SIMPLE
THE START OF THE FRENCH AND INDIAN WAR

In the 1700's there was a war. The Americans and the British were on one side. The French and Indians were on the other side. What were the reasons for this war?

France claimed the Ohio Valley. So did Great Britain. The French claims were based on their explorer's reports. They were also based on trapper's reports. The British claims were based on a grant of this land to Virginia. It was in Virginia's charter. British people began to cross the mountains. They were in search of new lands. The new lands to them were homes to the Indians. They lived there. The Indians joined forces with the French. They wanted to save their lands. Fighting resulted. Raids on homes were frequent.

The governor became quite upset. The French had built a chain of forts. The forts stretched from Lake Erie to the forks of the Ohio. The governor sent George Washington to the forts. He was to ask the French to leave. Washington was chosen. That was because he could map the land. He could pinpoint the exact locations of the French forts.

In December, Washington arrived at Fort Le Beouf. He had come on a long and difficult journey. He was welcomed by the French. He was treated kindly by the French leader. But the French leader refused to leave the Ohio River forts. Washington left Fort Le Beouf. He returned home.

The governor was very angry. He wanted the French to leave the Ohio Valley. They had refused. He made George Washington a colonel. Washington commanded an army. The governor ordered him to drive the French out of the Ohio Valley. The Americans built a fort. It was about sixty miles from the French fort. They prepared to fight. They wanted the Ohio River area.

The French fort was built at a vantage point. It was on the Ohio River. It had a drawbridge. It had high wooden walls. The French and Indians were behind the walls. They prepared for Washington's army.

A few hundred men were near the fort. The French and Indians attacked them. This attack left over half of them dead. Washington moved south. He wanted to renew the strength of his army. The French and Indians pursued him. They finally stopped fighting at the American fort.

The French and Indians won at the fort. Then they began to attack the English homes. The homes were along the edge of the western New York frontier. Whole towns were wiped out. The French and Indians left many burning homes behind them.

PASSAGE 5 NARRATIVE COMPLEX

LENTIL

In the town of Alto, Ohio, there lived a boy named Lentil. He wanted to sing but he couldn't because when he opened his mouth to try, only strange sounds came out. He couldn't whistle because he couldn't pucker his lips.

But he did want to make music, so he saved up enough pennies to buy a harmonica. He decided to become an expert, so he played a lot. Everyone in Alto liked Lentil's music, that is, everybody but Old Sneep, who didn't like much of anything.

One day the news got around that the great Colonel Carter was coming home. People began to plan a grand welcome, but when Old Sneep heard the news he said: "Humph! We wuz boys together. He ain't a mite better'n you or m and he needs takin' down a peg or two." Colonel Carter was the town's most important citizen, so the people hung out flags and decorated the streets. The Mayor prepared a speech, and the Alto Brass Band put on their new uniforms.

The train pulled in. The musicians in the band were waiting for the leader to signal them to play, the leader was waiting for the Mayor to nod to him to start the band, and the Mayor was waiting for Colonel Carter to step from his private car. All the people held their breath and waited.

Then there was a wet sound from above. There sat Old Sneep, sucking on a lemon. Old Sneep knew that when the musicians looked at him their mouths would pucker up so they could not play their horns. The whole band looked up at Old Sneep. The Mayor gave the signal to play, but the cornetist couldn't play his cornet, the piccolo player couldn't play his piccolo, the trombone player couldn't play his trombone and the tuba player couldn't play his tuba, because their lips were all puckered up. They couldn't play a single note! The musicians just stood there holding their instruments and looking up at Sneep sucking on the lemon. The leader looked helpless, the people were too surprised to move or say a thing, and the Mayor wrung his hands.

As Colonel Carter stepped from his car, the only sound was the noise of Sneep's lemon. Clouds began to gather on the Colonel's brow and he said: "Humph" in an indignant sort of way.

Of course Lentil's lips were not puckered and he knew that something had to be done. So he took out his harmonica and started to play. When Lentil began to play, Colonel Carter smiled. Then everybody sang and they all marched down Main Street to the Colonel's house. the Mayor's committee served ice cream cones to all the citizens and Colonel Carter made a speech saying how happy he was about such a fine welcome. When he said that he was going to build a building for the town of Alto, any building they

wanted, everybody was happy--even Old Sneep, but Lentil was the happiest of all!

PASSAGE 6 NARRATIVE SIMPLE

LENTIL

Lentil lived in the town of Alto, Ohio. He wanted to sing. He couldn't. He opened his mouth to try. But only strange sounds came out. He couldn't whistle. He couldn't even pucker his lips.

But he did want to make music. Lentil saved up enough pennies to buy a harmonica. He decided to become an expert harmonica player. He played a lot. Everyone in Alto liked Lentil's music. Old Sneep didn't though. Old Sneep didn't like much of anything.

One day news got around. The great Colonel Carter was coming home. People began to plan a grand welcome. When Old Sneep heard the news he said: "Humph! We wuz boys together. He ain't a mit better'n you or me. He needs takin' down a peg or two." Colonel Carter was the town's most important citizen. The people hung out flags. They decorated the streets. The Mayor prepared a speech. The Alto Brass Band put on their new uniforms. The whole town went to the station to welcome Colonel Carter.

The train pulled in. The musicians in the band were waiting for the leader to signal them to play. The leader was waiting for the Mayor to nod to him to start the band. The Mayor was waiting for Colonel Carter to step from his private car. All the people held their breath. They waited.

Then there was a wet sound from above. There sat Old Sneep. He was sucking on a lemon. Old Sneep knew that when the musicians looked at him, their mouths would pucker up. When their mouths puckered up, they could not play their horns. The whole band looked up at Old Sneep. The Mayor gave the signal to play. The cornetist couldn't play his cornet. The Piccolo player couldn't play his piccolo. The trombone player couldn't play his trombone. The tuba player couldn't play his tuba. Their lips were all puckered up. They couldn't play a single note! The musicians just stood there holding their instruments. They were looking up at Sneep. Sneep was sucking on the lemon. The leader looked helpless. The people were too surprised to move. They could not say a thing. The Mayor wrung his hands.

Colonel Carter stepped from his car. The only sound was the noise of Sneep's lemon. Clouds began to gather on the Colonel's brow. He said "Huamph" in an indignant sort of way.

Of course Lentil's lips were not puckered. He knew that something had to be done. He took out his harmonica. He started to play. Colonel Carter smiled when Lentil began to play. He began to sing. Then everybody sang. They all marched down Main Street. They marched to the Colonel's house. The Mayor's committee served icecream cones to all the citizens. Colonel Carter made a speech. He said how happy he was. It was such a fine welcome. He said that he was going to build a building for the town of Alto. Any

building they wanted. Then everybody was happy. Even Old Sneep was happy. But Lentil was the happiest of all!

PASSAGE 7 NARRATIVE COMPLEX

THE MAGICAL DRAWINGS OF MOONY B. FINCH

Moony B. Finch loved to draw. Moony had an eraser that he called his just-in-case eraser. Although he never used it, he always carried it with him just in case he ever needed it.

One day at the park, while Moony was drawing a picture of a cloud, a lady asked "May I have it?" When she touched the drawing, the cloud lifted right off the paper.

"That was amazing!" said the man sitting next to Moony on the park bench. "How did you do it?"

"I don't know," replied Moony, "because nothing like this has ever happened before."

"Will you draw something just for me?" asked the man, who wanted a pirate's treasure chest filled with gold coins.

"That's easy!" said Moony, as he gave the man his drawing. When the man picked it up, the treasure chest slid off the paper and landed in his lap! Gold coins spilled out of the chest, rolled down the sidewalk, and attracted a large crowd.

A woman with a baby came pushing through the crowd and said to Moony "How about a picture of a diamond-studded silver rattle for my baby?" Then a bearded old man stepped forward who wanted a picture of a chauffeur--driven limousine to look at. Everyone in the crowd began pushing and shoving and yelling at Moony "Draw this for me! Draw that!"

Moony stood up on the bench and shouted as loudly as he could "Please be quiet!" When the crowd hushed, Moony continued. "Hold still," he said, "I want to draw a picture of everybody."

Ties were straightened, hair was combed, and make-up was freshened, as Moony tore three pieces of paper from his drawing pad. On the first piece, he drew a picture of the smiling crowd with the man with his treasure chest, the woman and her baby and the silver rattle, the old man and his limousine, and all the people who wanted Moony to draw them a picture.

When the drawing was finished, Moony took his just-in case eraser from his pocket, erased the treasure chest with all of its gold coins, the silver rattle, and the chauffeur driven limousine. And as Moony erased them from the drawing, they disappeared from the clutches of their greedy owners.

The crowd murmured, then buzzed, then charged angrily right at Moony. Moony took his second piece of paper, drew a fierce dragon, and tossed the drawing into the crowd. When someone touched the paper, the dragon sprang to life. The dragon roared and breathed fire, so all the people ran for their lives! With the crowd gone, the dragon turned on Moony-who had taken his third piece of paper and drawn the fierce dragon. Using his eraser once more, he calmly began to erase the terrible teeth...the razor-sharp claws...the

powerful tail. And when the drawing was entirely erased,
the dragon disappeared!

PASSAGE 8 NARRATIVE SIMPLE

THE MAGICAL DRAWINGS OF MOONY B. FINCH

Moony B. Finch loved to draw. He had an eraser. He called it his just-in-case eraser. He never used it. He always carried it with him. Someday he might need it.

One day Moony was at the park. He was drawing a picture of a cloud. A lady said "May I have it?". She touched the drawing. Then the cloud lifted right off the paper.

"That was amazing!" said the man sitting next to Moony on the park bench. "How did you do it?"

"I don't know," replied Moony. "Nothing like this ever happened before." The man asked Moony to draw a pirate's chest. He wanted gold coins in it. Moony said it would be easy. The man picked up the drawing. The treasure chest slid off the paper. It landed in his lap. Gold coins spilled out of the chest. They rolled down the sidewalk. A large crowd came.

A woman had a baby. She came pushing through the crowd. She asked for a diamond studded silver rattle for her baby. Then a bearded old man stepped forward. He wanted a picture of a chauffeur-driven limousine to look at.

Everyone in the crowd began pushing and shoving a yelling. They wanted Moony to draw things for them.

Moony stood up on the bench. He shouted as loudly as he could. He told the crowd to be quiet. He said to hold still. He wanted to draw a picture of everybody.

The people straightened their ties. They combed their hair. They freshened their make-up. Moony tore three pieces of paper from his drawing pad. He drew a picture of the smiling crowd on the first piece. He drew the man and treasure chest. He drew the woman and her baby and the silver rattle. He drew the old man and his limousine. He drew all the people.

Then the drawing was finished. Moony took his just-in-case eraser from his pocket. He neatly erased the treasure chest and all the gold coins. He erased the silver rattle and the chauffeur driven limousine. They disappeared from the clutches of their greedy owners.

The crowd murmured. They buzzed. They charged right at Moony. They were angry. Moony took his second piece of paper. He drew a fierce dragon. Moony tossed the drawing into the crowd. Everyone scrambled to get it! Someone touched the paper. The dragon sprang to life. It roared. It breathed fire! All the people ran for their lives.

The crowd left. The dragon turned on Moony. Moony had drawn the fierce dragon on his third piece of paper. He used his eraser once more. He calmly began to erase the terrible teeth. He erased the razor-sharp claws. He erased the powerful tail. The drawing was entirely erased. Then the dragon disappeared!

PASSAGE 9 PROBLEM SOLUTION

SUPER-CITIES--TANGLED TRANSPORT

A megalopolis is a super city made up of many cities. One megalopolis in the United States includes the giant cities of Boston, New York, Philadelphia, Baltimore, and Washington, along with smaller cities and nearby towns. In that megalopolis, 20% of the people live on 1.4% of the nation's land.

Another megalopolis seems to be building up south of the Great Lakes between Chicago, Pittsburgh, and Detroit. A third may be growing along the California coast as the suburbs of San Francisco and Los Angeles expand. Because there are so many people, transportation and air pollution are problems.

Traveling is a problem in the super cities, as the people who live in a megalopolis are often on the move. Trains, buses, subways, airplanes, but mostly cars, take them from one place to the other. Traveling within the super city is a big problem. So many people are moving about on the roads and in the air that quite often they all jam together. More and more cars are made and bought each year. About 8,000,000 new cars are made yearly and 5,000,000 cars are scrapped. As a result, there are 22 cars for every mile of road.

Another part of the traveling problem is air pollution. Fumes from cars are said to be the worst offenders in ai

pollution. For some people with lung problems, air pollution can cause sickness and even death. It has been proven that air that is loaded with pollutants threatens people's health.

Some cities test the air every day and issue warnings when the pollution is at a high level, whereas others outlaw the sale of some kinds of gas. Still other laws call for exhaust controls on car engines.

These measures are not enough, as few people can stay out of the city when pollution is high, because they have to go to work. Controls are not state-wide, and many people vote down any law that results in higher prices on cars or gas--even when their health would be better.

What else can be done? Some experts say that the answer is to make more and better trains, as they point out that it takes nine times as much space for one person to travel by car as by bus or train. Better public transport to take workers back and forth between their homes in the suburbs and their jobs in the city can help. Experts also want to build large jet-ports away from the city with small trains going to the train stations.

Japan, France and Germany have built many fast train systems, but we have not. Why are we behind the other countries in making fast trains? Some experts believe it is because we have fallen in love with cars. They say that the car is a symbol of success to us, and given a choice of private or public transport, the average American prefers to

go in the car rather than take a bus or train. These experts believe that the United States will not make headway on the pollution and traffic problems until we fall out of love with our cars.

PASSAGE 10 PROBLEM SOLUTION SIMPLE

SUPER CITIES--TANGLED TRANSPORT

A megalopolis is a super city. It is made up of many cities. The giant cities of Boston, New York, Philadelphia, Baltimore, and Washington are a megalopolis. It also includes smaller cities and nearby towns. Twenty percent of the people live in that megalopolis. They live on 1.4% of the nation's land.

Another megalopolis seems to be building up. It is south of the Great Lakes. It is between Chicago, Pittsburgh, and Detroit. A third may be growing. It is along the California coast. The suburbs of San Francisco and Los Angeles are expanding. Transportation and air pollution are problems in the super cities. That is because there are so many people.

Traveling is a problem in the megalopolis. The people are often on the move. There are trains, buses, subways, airplanes and cars. They take them from one place to the other. In a super city traveling is a big problem. Too many people are moving about. They are on the roads. They are in the air. Quite often they all jam together. More and more cars are made each year. More and more cars are bought each year. About 8,000,000 new cars are made yearly. About 5,000,000 cars are scrapped. As a result, each mile has 22 cars.

Air pollution comes from the traveling problem. The worst offenders are car fumes. Air pollution can cause

sickness. It can even cause death. Some people have lung problems. Air pollution is not dangerous for them. The air can be loaded with pollutants. Then people's health can be threatened. This has been proven. Everyday some cities test the air. They check for high pollution levels. Then they issue warnings. Some kinds of gas are not sold. Some cities outlaw it. There are laws on car engines. They need exhaust controls.

These measures are not enough. Few people can stay out of the city. They have to go to work. Even with air pollution. Controls are not state-wide. Many people vote down laws. They do not want higher prices on cars. They do not want higher prices for gas. Even if they can have better health.

What else can be done? Some experts offer answers. We should make more trains. We need better trains. Cars take nine times more space. More people can travel by buses and trains. Better public transport is needed. Workers need to go back and forth. They go between their homes and their jobs. They go from the suburbs to the city. Experts also want to build large jet-ports. These would be away from the city. They would have small trains. They would go to the train stations.

Japan, France and Germany have fast trains. We have not built many fast train systems. Why are we behind the other countries? We have fallen in love with cars. Our car is a symbol of success. The average American prefers to go

in cars. He does not choose buses and trains. We have to fall out of love with our cars. That's what experts say. Then we will make headway. That will help the traffic problem. That will also help the pollution problem.

PASSAGE 11 PROBLEM SOLUTION COMPLEX

PROBLEMS OF A GROWING REGION

There are two kinds of problems in growing regions, the need for services, and the problems of the people. What are the service problems? Streets and other things must be built for growing districts. As new towns and cities are built in the West and older cities become larger, there is a growing need for all kinds of public buildings and services.

For example, streets must be laid out and paved, water must be piped into people's homes, and sewers must be built. Other problems, though, are those of the people. All persons share certain basic needs which are for food, clothing and shelter. This passage is about the problems of the people.

Most of the workers have jobs that give them good incomes. With the money they earn, they can pay for food, clothing and shelter to meet their families' basic needs. There are some people, though, who do not have a chance to meet all their important needs. Sometimes, through no fault of their own, people cannot provide enough food, clothing, or shelter for themselves or their families.

Conditions that prevent large numbers of people from meeting their basic needs are called social problems. In some parts of our country there are some people who do not earn enough money to satisfy their physical needs. Government figures show that about one family out of eight in the West has an income of less than \$4,000 a year. Often

this is not enough money to provide needed food, clothing and shelter.

Many of the poor people in the West live in large cities such as Los Angeles and Seattle. Some of them work at jobs that pay very low wages. Others work only part of the time or cannot find jobs at all. In order to live, many people depend on money they receive from government aid. Because these people cannot afford better housing, they are often forced to live in old rundown houses or crowded apartments. Districts that have largely rundown houses and old apartment buildings are known as slums.

Not all of the poor people in the West live in cities, however. Some of them are Indians who live on reservations in remote parts of the West. Others are farm workers who move from place to place, helping farmers to plant and harvest their crops. These people, known as migrant workers, do not have an easy life. They must work long hours for very little pay, and live in small shacks without lights or modern plumbing.

There are many reasons why people cannot get jobs that will help them have a good living. Some people are too old for some kinds of work, or their health is too poor. Others cannot find jobs because of prejudice. However, the main reason why people cannot get good jobs is that they lack the training or special skills needed to do the jobs that are there.

It is important that these people be helped to meet their basic needs. They must be given more money to provide good living conditions. They need help to find jobs, and mostly they need more education so they will be able to apply for jobs requiring skills they will have.

PASSAGE 12 PROBLEM SOLUTION SIMPLE

PROBLEMS OF A GROWING REGION

Growing regions have two kinds of problems. One kind of problem is a need for services. The other kind of problem is needs of the people. What are the service problems? Growing cities need streets. They also need other things. New towns and cities need public services too. Streets must be laid out and paved. Water must be piped into people's homes. Sewers must be built. The people have other problems. All persons share basic needs. Everyone needs food, clothing and shelter. This passage is about the problems of the people.

Most workers have jobs. Their jobs give them good incomes. They earn money. That can pay for food, clothing and shelter. They can meet their families' basic needs. Some people do not have jobs. They do not have this chance. They cannot meet their important needs. Sometimes it is not their fault. People do not have enough food, clothing or shelter. They cannot meet their needs. They cannot provide for their families. Sometimes large numbers of people cannot meet basic needs. This condition is called a social problem. In the United States some people do not earn enough money. They cannot satisfy their basic needs. There are government figures. They show low incomes. Low incomes are less than \$4.000 a year. One eighth of the families have low incomes. They do not have enough money. They cannot provide enough food, clothing and shelter.

Many poor people live in large cities. They live in Los Angeles and Seattle. Some of them work at jobs. Their jobs pay very low wages. Others work only part of the time.

Some cannot find jobs at all. Some people depend on government aid. They are given money. They cannot afford better housing. They are often forced to live in old rundown houses. Some live in crowded apartments. Some districts are largely rundown houses and old apartment buildings. They are called slums.

In the West, not all poor people live in cities. Some of them are Indians. They live on reservations. The reservations are in remote areas. Others are farm workers. They move from place to place. They help farmers plant and harvest crops. These people are migrant workers. They do not have an easy life. They must work long hours. They receive very little pay. They live in small shacks. They do not have lights. They do not have modern plumbing.

Why can't some people get jobs? There are many reasons. Some people are too old. They cannot do some kinds of work. Their health can be too poor. Another reason is prejudice. There is one main reason. People need training and special skills. Some people don't have special skills. They don't have enough education. They cannot do the jobs.

These people need help. They cannot meet their basic needs. They do not have good living conditions. They must be given more money. They need help to find jobs. They

need more education. Then they can apply for jobs. Then they will have more skills.

PASSAGE 13 DESCRIPTIVE COMPLEX

SAN FRANCISCO

San Francisco, located along a bay, has thousands of people. The bay is a large inlet of the Pacific Ocean that extends eastward through the coastal mountains in the central part of California. It looks somewhat like a lake, because it is almost separate from the ocean by two arms of land. The southern arm is a Peninsula, with San Francisco, the second largest city in the West, found at the end of it.

Around San Francisco Bay are many other cities and towns, with Oakland and Berkeley the largest. Together, San Francisco and its neighbors make up an area with more than three million people.

The city of San Francisco is bordered on three sides by water, as the Pacific Ocean lies to the west, San Francisco Bay lies to the east and the Golden Gate passage is to the north. The Golden Gate, a narrow water way, connects the ocean and the bay. San Francisco has two great bridges that connect it with nearby cities and towns. The Golden Gate Bridge, which lies north and south across the Golden Gate, is one of the longest hanging bridges in the world. The San Francisco-Oakland Bay Bridge, which joins San Francisco with the city of Oakland, goes across the San Francisco Bay.

Where San Francisco is has helped to make it a key seaport, as the Bay is one of the world's best natural harbors. With the Golden gate, it forms the only natural pass through the mountains that extend through much of the

coast of California. From San Francisco, goods can be shipped to land or to foreign ports. Along San Francisco's wharfs are rows of piers, where ships from many parts of the world dock. More than 130 steamship owners have offices in San Francisco, and four main railroads carry goods to and from this port.

Many plants have been built in the San Francisco area, with most of them outside the city in nearby towns and cities where there is more room for growth. Among the products made in the San Francisco area are cars, tools, drugs, paper, clothing and frozen foods.

San Francisco began as a small Spanish fort and mission, but about seventy years later, gold was found in California. Many people came to San Francisco on their way to the gold- fields, and the city grew quickly. In 1906 an earthquake started a fire that destroyed most of San Francisco, but when the fire was over, the people worked jointly to rebuild their city and make it nicer than it had been before. Today San Francisco is thought to be one of the nicest cities in the United States.

PASSAGE 14 DESCRIPTIVE SIMPLE

SAN FRANCISCO

San Francisco has thousands of people. It is located along a large inlet in the Pacific Ocean that is called a bay. The bay extends eastward. It goes through the coastal mountains. The mountains are in the central part of California. San Francisco Bay looks somewhat like a lake. It is almost separate from the ocean. It has two arms of land. The southern arm is called the San Francisco Peninsula. The city is located at the end of that arm. San Francisco is the second largest city in the West.

Many other cities and towns are around San Francisco Bay. Oakland and Berkeley are the largest. San Francisco and its neighbors make up a large area. There are more than three million people living there.

The city of San Francisco is bordered on three sides by water. The Pacific Ocean lies to the west. San Francisco Bay lies to the east. The Golden Gate passage is to the north. The Golden Gate is a narrow water way. It joins the ocean and the bay. San Francisco has two great bridges. The bridges connect it with nearby cities and towns. The Golden Gate Bridge lies north and south. It crosses the Golden Gate. It is one of the longest hanging bridges in the world. The San Francisco-Oakland Bay Bridge joins San Francisco with the city of Oakland. It crosses the bay.

San Francisco's place has helped to make it a key seaport. San Francisco Bay is one of the world's best

natural harbors. San Francisco Bay and the Golden Gate form a natural pass. It is the only natural pass through the mountains. The mountains extend along much of California's coast. From San Francisco, goods can be shipped to land. They can be shipped to foreign ports. There are rows of piers along San Francisco's wharf. Ships from many parts of the world dock there. More than 130 steamship owners have offices in San Francisco. Four main railroads carry goods to and from this port.

Many plants have been built in the San Francisco area. Most of them are outside the city of San Francisco. They are in nearby towns and cities. There is more room there for growth. Cars, tools, drugs, paper, clothing and frozen foods are made in the San Francisco area.

San Francisco began as a small Spanish fort. It was a mission. About seventy years later, gold was found. The gold was found in California. Thousands of people came to San Francisco. They were on their way to the goldfields. The city grew quickly. In 1906 an earthquake started a fire. The fire destroyed most of San Francisco. The people worked jointly. They rebuilt their city. They made it nicer. Today San Francisco is one of the nicest United States cities.

PASSAGE 15 DESCRIPTIVE COMPLEX

LOS ANGELES

Los Angeles has over two million people. Located in California, it is the largest city in the West. Except for New York and Chicago, Los Angeles is larger than any other city in the United States. It is spread across a low land in the southern part of California. In the north and east of Los Angeles are ranges of rough mountains while the Pacific Ocean lies to the west and south.

Los Angeles and its nearby cities have grown so close to each other that it is hard to tell where one ends and the other starts. There are more than sixty cities in the Los Angeles area, with Long Beach, Torrance, and Glendale among the largest. All these cities make up an area with more than seven million people.

If you were to fly in an airplane over the Los Angeles area, you would see large groups of one story houses, with schools, and stores. Most of the buildings you would see are low, but in some places, there are clusters of tall office buildings and hotels. Many freeways pass through Los Angeles and its nearby cities, making it easier for people to travel from one place to another in the huge area.

There are thousands of plants in and near Los Angeles that make airplanes, computers, tools, car parts, and tires.

Many plants in the Los Angeles area make fruit juice or use garden products and other crops raised on the fertile

farmlands in southern California. Los Angeles is one of the top makers of sports items, women's clothing, and chairs, while movie and tv shows are also made there.

Los Angeles, the main seaport in the West, has the world's largest man-made harbor. Because there was no harbor along the Pacific coast near Los Angeles, a breakwater had to be built. Then channels were dug into the land, with piers so ships could dock. Today the port of Los Angeles is so large that about eighty-five ships can be loaded or emptied at one time.

Many years ago, Los Angeles was a little Mexican town, but after California became part of the United States, more and more people came to the Los Angeles area. They found a pleasant warm climate and fertile soil, with plenty of room for homes and buildings. In addition oil, a needed resource, was found under the ground. All these things drew more people, with others coming as railroads and highways were built. Today the Los Angeles area is still growing, with the rapid increase in people causing a number of major problems.

PASSAGE 16 DESCRIPTIVE SIMPLE

LOS ANGELES

Los Angeles has over two million people. Los Angeles is located in California. It is the largest city in the West. Only New York and Chicago are larger United States cities. Los Angeles spreads across a low land. It is in the southern part of California. There are ranges of rough mountains. They are to the north and east of Los Angeles. The Pacific Ocean lies to the west and south.

Los Angeles has grown close to its nearby cities. They are not separate. There are more than sixty cities in the Los Angeles area. Long Beach, Torrance, and Glendale are the largest. All the cities have over seven million people. They form a large area.

From an airplane you can see large groups of one story houses. You see stores and low buildings. In some places there are clusters of tall office buildings and hotels. There are many freeways. They pass through Los Angeles. They pass through its nearby cities. It is easy to travel. You can go from one place to another in the huge area.

There are thousands of plants in the Los Angeles area. They make airplanes, computers, tools, car parts and tires. Many plants make fruit juice. Some use garden products. They use crops raised in southern California. There are many fertile farmlands in California. Los Angeles is a top maker of some items. It makes sports items, women's clothing and chairs. It also makes movies and tv shows.

Los Angeles is the main seaport in the West. It has the world's largest man-made harbor. There was no harbor along the Pacific coast. A breakwater was built. Channels were dug into the land. Piers were made. Now ships can dock. Today the port of Los Angeles is large. It holds about eighty-five ships. They can be loaded and emptied at the same time.

Los Angeles was a little Mexican town. That was many years ago. Then California became part of the United States. More and more people came. They found a pleasant and warm climate. They found fertile soil. There was plenty of room for homes. There was room for buildings. Oil is a needed resource. It was found under the ground. All these things drew more people. Others came on railroads and highways. Today the Los Angeles area is still growing. There is a rapid increase in people. It is causing major problems.

PASSAGE 17 LIST-LIKE COMPLEX

SEASHELLS

Seashells Although most shells that people collect are empty, seashells are the coverings of soft-bodied sea animals. The animals that once owned them belong to the second largest group of animals known, the mollusks. Mollusks, among the oldest groups of living things, live mostly along the shores and in shallow waters. Some live at great depths in the ocean, while others live in fresh waters or may even live on land. Seashells can be placed into separate groups.

Chitons, the most simple of all mollusks, have a shell made up of eight plates. The plates are placed one after the other, with each plate resting on the one after it. Some chitons are less than one inch long, but Steller's chiton may grow to 11 inches.

Bivalves are two-shelled mollusks, with each shell joined to the other at a hinge. The most common bivalves are the oyster, scallop, mussel, clam, and giant clam. The color and design of scallop shells make them a delight to collectors.

Sea Snails, a very large group of mollusks, have a single spiral shell. As many pretty shells belong to this group, they are the most prized by collectors. Among the more common of these shells are the limpet, top shell, turban shell, cowry, conch, and whelk.

Tusk Shells, which look like little elephant tusks, are sometimes called tooth shells. They are hollow tubes that curve and are smaller at one end, with both ends open. Some shells in this group are the ivory tusk, comma tusk, and elephant's tusk.

Oyster The oyster is a shellfish that makes pearls when a small item gets inside the oyster's shell, and the animal places a pearly substance around it. As layer after layer of this pearly substance is made, after a rather long period of time a pearl is formed.

Soft-Shelled Clam The soft shelled clam has two useful tubes that it raises up above the surface when the tide comes in. One tube draws in oxygen and food, and the other tube lets out carbon dioxide and waste products.

Scallop The scallop is a great traveler, as it does not form beds or fasten itself to rocks, but keeps moving by clapping its two shells together. In old times, travelers sometimes wore a scallop shell to show that they had taken long trips.

Turban Shells The pretty turban shells, usually found in the Indian Ocean, are in great demand. The shells are heavy and are shaped very much like a turban. Shell collectors treasure the green turban, which is the giant of the turban family.

Abalone Shell The abalone shell is pretty and useful because both the inside and the outside take a high polish. Buttons and some kinds of jewelry are often made from this

popular shell, which makes the pearly shiny material known as mother-of-pearl.

PASSAGE 18 LIST-LIKE SIMPLE

SEASHELLS

Seashells are the coverings of soft-bodied sea animals.

People collect shells. Most shells are empty. Animal once owned them. These animals belong to the second largest group of animals known. This group is called the mollusks. Mollusks are among the oldest groups of living things. Most mollusks live along the shores. They live in shallow waters. Some live at great depths in the oceans. Others live in fresh waters. They may even live on land. Seashells can be placed into separate groups.

Chitons are the most simple of all mollusks. The shell is made up of eight plates. The plates are placed one after the other. Each plate rests on the one after it. Some chitons are less than one inch long. Steller's chiton may grow to 11 inches.

Bivalves are two-shelled mollusks. Each shell is joined to the other at a hinge. The most common bivalves are the oyster, scallop, mussel, clam and giant clam. The color is attractive. The design of scallop shells make them a delight to collectors.

Sea Snails are a very large group of mollusks. Most of these animals have a single spiral shell. Many pretty shells are sea snails. They are the most prized by collectors. The limpet, top shell, turban shell, cowry, conch and whelk are the more common sea snails.

Tusk Shells look like little elephant tusks. Sometimes they are called tooth shells. They are hollow tubes. They curve. They are smaller at one end. Both ends are open. The ivory tusk, comma tusk and elephant's tusk are in this group.

Oyster The oyster is a shellfish. It makes pearls. This happens when a small item gets inside the oyster's shell. The animal makes a pearly substance. The substance goes around the item. Layer after layer of this pearly substance is made. A pearl is formed. This is after a rather long period of time.

Soft-Shelled Clam The soft shelled clam has two useful tubes. The clam raises them up above the surface. This is when the tide comes in. One tube draws in oxygen and food. The other tube lets out carbon dioxide. It lets out waste products.

Scallop The scallop is a great traveler. It does not form beds. It does not fasten itself to rocks. It keeps moving. It moves by clapping its two shells together. In old times travelers sometimes wore a scallop shell. This showed that they had taken long trips.

Turban Shells Turban shells are pretty. They are in great demand. They are usually found in the Indian Ocean. They are heavy. They are shaped very much like a turban. Shell collectors treasure the green turban. This is the giant of the turban family.

Abalone Shell The abalone shell is pretty. It is useful. Both the inside and outside take a high polish. It provides a pearly shiny material. This material is known as mother-of-pearl. Buttons and some kinds of jewelry are often made from this shell. This shell is popular.

PASSAGE 19 LIST-LIKE COMPLEX

NINE IMPORTANT ELEMENTS

1. Aluminum is a silver colored metal that is very light, and like most metals is shiny and can be bent and worked. This metal is not found free in the ground, but must be made from its compound, metal and oxygen, or aluminum oxide.

2. Carbon, a gas, is present in all living things. Carbon is usually black. Coal and soot are mainly carbon and a diamond is pure carbon.

3. Chlorine is a green gas, that is poison, yet you eat a food with this in it every day since salt is sodium chloride, a compound made up of both sodium and chlorine. When atoms of these items combine, the result is often a useful substance. The sea is salty mainly because of sodium chloride.

4. Copper is a metal that has a red shine, and was one of the first metals that man learned to use. It can be worked into pots, pans and wire, among other things. Brass contains copper.

5. Helium is a gas with no color or odor, that is lighter than air. It does not burn. A quart of helium weighs four times as much as a quart of hydrogen. It is the changing of hydrogen into helium that makes energy in the Sun.

6. Hydrogen is a gas that has no color or odor. Hydrogen atoms are a needed part of all the fuels we use, and are a part, of course, of the compound, water.

7. Iron is the most often used metal. We get it from iron oxides, of which iron ore is an example. Iron blends with carbon to form steel, which then blends with other things to form metals such as stainless steel.

8. Nitrogen is a gas that has no color or odor. It makes up about 3% of the air that you are breathing. It is also a large part of the meat, cheese and fish that we eat. You and all other living things are made up mainly of the four elements: carbon, hydrogen, oxygen and nitrogen.

9. Oxygen is also a gas with no color or odor. It is found in every breath you take because you breathe in oxygen. It is perhaps the most needed gas for all living things, making up about 1/5 of the air. Without oxygen fuels like gas, oil and coal would not burn.

PASSAGE 20 LIST-LIKE SIMPLE

NINE IMPORTANT ELEMENTS

1. Aluminum is a silver colored metal. It is very light. It is shiny like most metals. It can be bent and worked. This metal is not found free in the ground. It must be made from its compound. It is made from metal and oxygen. That is called aluminum oxide.

2. Carbon is a gas. It is present in all living things. Carbon is usually black. Coal is mainly carbon. So is soot. A diamond is pure carbon.

3. Chlorine is a green gas. It is poison. Yet you eat a food with this in it every day. It is salt. Salt is sodium chloride. It is made up of both sodium and chlorine.

When atoms of these items combine, the result is often useful. The sea is salty. It is mainly because of sodium chloride.

4. Copper is a metal that has a red shine. It was one of the first metals. Man learned to use it early. As you know, it can be worked into pots and pans and wire. Also it can be made into other things. Brass contains copper.

5. Helium is a gas. It has no color. It has no odor. It is lighter than air. It does not burn. A quart of helium weighs four times as much as a quart of hydrogen does. Hydrogen changes into helium. That makes the energy in the Sun.

6. Hydrogen has no color. It has no odor. It is a gas. Hydrogen atoms are a needed part of all of the fuels

we use. Of course this gas is a part of water. Water is made of gas and air.

7. Iron is the most often used metal. We get it from iron oxides. Iron ore is an example of iron and oxygen. Iron blends with carbon. That makes steel.

8. Nitrogen is a gas. It has no color. It has no odor. It makes up about 3% of the air. We need it for the air we breathe. Nitrogen is a large part of foods. It is in meat, cheese and fish. You and all other living things are made up of elements. Carbon, hydrogen, oxygen and nitrogen are the main ones.

9. Oxygen is also a gas. It has no color. It has no odor. It is needed in every breath you take. You breathe in oxygen. It is perhaps the most important gas. It is needed for all living things. It makes up about 1/5 of the air. Without oxygen fuels would not burn. Gas is a fuel. Oil and coal are fuels.

PASSAGE 21 COMPARE CONTRAST COMPLEX

SOME DIFFERENCES IN AFRICA

It is possible to contrast the surface features of Africa. The Sahara Desert, in northern Africa, is the largest desert in the world, consisting of drifting sand dunes, rocky lands, and vast stretches of gravel. There are two smaller deserts in southern Africa, that also are sandy and barren, making about two-fifths of Africa dry, barren desert land.

Unlike the deserts are the grasslands and rain forests in central Africa, which reach out on both sides of the equator. As the hot sun causes the air to rise, moist air from the sea comes in, and heavy rains fall. Close to the equator, where it is both very hot and damp, dense rain forests grow, with fields of tall waving grass on both sides of the forests.

The homes are different in Africa. Let us take a look at the homes of the poor, which are often simple. Many Africans are farmers who live in mud huts, with roofs covered with straw or large leaves. Shepherds who travel from place to place live simply, usually in homes not much more than a tent-like covering, made of wood and animal skins. The workers who live in cities, often live in tar-paper shacks. The homes of many poor Africans are simple and offer little in the way of modern comforts.

In the larger cities there are beautiful, modern buildings, where many people live in apartment houses that

are up-to-date in every way. People who live in these apartment houses have all the comforts of life. Also other people, who have good-paying jobs, own modern and well built houses. Some farmers, who own hundreds of acres of land, have nice homes. It is clear, then, that many other people in Africa have comfortable, up-to-date homes.

The industry differs too. The U. S. and most European countries contrast greatly with Africa in the amount of products made. In the industrial countries of Europe and North America most people live in cities, where they work in factories, shops and offices. Of course, farmers are a part of the people, too, but the numbers of farmers are few, and many people work in some kind of factory.

In Africa the amount of farming is great compared to the amount of industry. Some Africans clear bushes and trees from a patch of ground, farm this patch as long as the ground is fertile, and then move on and clear another patch of ground. Others live in towns in which the people of the town own the land as a group. Some large modern farms in Africa are owned by Europeans. Industry in Africa is done in the few large cities.

PASSAGE 22 COMPARE CONTRAST SIMPLE

SOME DIFFERENCES IN AFRICA

It is possible to contrast the surface features of Africa. The Sahara Desert is in northern Africa. It is the largest desert in the world. It consists of drifting sand dunes, rocky lands, and vast stretches of gravel. There are two smaller deserts in southern Africa. They, too, are sandy and barren. About two-fifths of Africa is dry, barren desert land.

Unlike the desert are the grassland and rain forests. They are in central Africa. The grasslands and rain forests reach out on both sides of the equator. At the equator the hot sun causes the air to rise. Moist air from the sea comes in. Heavy rains fall. It is very hot and very damp close to the equator. Dense rain forests grow there. On both sides of the forests there are fields of tall, waving grass.

The homes are different in Africa. Let us take a look at the homes of the poor. The homes of the poor farmers are often simple. Many African farmers live in mud huts. The roofs are covered with straw. Some are covered with large leaves. Shepherds travel from place to place. They live simply. Usually their homes are not much more than a tent-like covering. It is made of wood and animal skins. In cities workers often live in tar-paper shacks. The homes of many poor Africans are simple. Their homes do not have modern comforts.

In the larger cities there are beautiful, modern buildings. Many people live in apartment houses. The apartment houses are up-to-date in every way. There people have all of the comforts of life. Other people have good paying jobs. They own modern and well-built houses. Some farmers own hundreds of acres of land. They, too, have nice homes. It is clear, then that many other people in Africa have comfortable, up-to-date homes.

The industry differs too. The U. S. contrasts greatly with Africa. So do most European countries. They are different from Africa in the amount of products made. These countries of Europe and North America are industrial countries. Most people live in cities. They work in factories. They also work in shops and offices. Of course, farmers are a part of the people, too. The numbers of farmers are few. Many people work in some kind of factory.

In Africa the amount of farming is great. The amount of industry is small. Some Africans clear bushes and trees from a patch of ground. They farm this patch of ground. Then it is not fertile. Then they move on. They clear another patch of ground. Others live in towns. The people of the town own the land as a group. In Africa some large modern farms are owned by Europeans. Industry is done in a few large cities.

PASSAGE 23 COMPARE CONTRAST COMPLEX

SPARTA AND ATHENS: CITIES IN GREECE

Sparta, a city in Greece, was governed by soldiers. In the Spartan government, there was a council of Elders and a group made up of the people. But, the council and the people had very little power, as the real power was held by a few rulers. Most of these rulers were the leaders of the army. Fewer than one-third of the people living in Sparta were citizens. Merchants, business people, women and slaves could not be citizens.

Athens, a second city in ancient Greece, was a democratic city. Therefore, the voters of Athens all had a role in planning most things their city did. All voters belonged to the Athens Assembly. This group voted for city leaders and could punish them if they acted against the law.

However, less than half of the people who lived in Athens could vote. As in Sparta, four groups of people could not vote. They were women, business people, merchants, and slaves.

Life in Sparta centered around the soldiers. A soldier had to spend most of his time serving the city of Sparta. One of his duties was to serve in the army. Although soldiers had high status, their lives were not easy. All soldiers belonged to army clubs where they ate their meals and spent most of their time. They could not even go to their homes to see their wives and children very often.

Athens voters did a number of things in life. They

studied and talked about law, ideas and art. Because Athens also needed an army in times of danger, sports and army skills were of interest to them too. But most Athenians did

not mind sports because they valued health. They also valued the mind as well as the body. Athens gave high value to poets and thinkers, too.

Spartan boys began to learn about Spartan values from stories and songs that they heard at home. At the age of seven, the boys left their homes to live at school. In school they played games, learned sports skills, and trained to be soldiers. They did not learn much about science or art. The purpose of school in Sparta was to prepare boys for a soldier's life.

In Athens school focused on teaching boys to take part in government when they were older. Because Athens was a democracy, Athens felt it was vital for all citizens to become involved and skilled in government. Therefore the boys were sent to school to study grammar, sports and the arts. As the boys grew older, they studied poems, government, science, speaking and law.

PASSAGE 24 COMPARE CONTRAST SIMPLE

SPARTA AND ATHENS: CITIES IN GREECE

Sparta was a city in Greece. It was governed by the soldiers. There was a council of Elders in the Spartan Government. There was also a group in the Spartan government. They were both made up of people. But the council had very little power. The group of people had very little power. The real power was held by a few rulers. Most of these rulers were the leaders of the army. Many people lived in Sparta. Fewer than one-third were citizens.

Merchants could not be citizens. Business people could not be citizens. Women could not be citizens. Slaves could not be citizens.

Athens was a second city in ancient Greece. It was a democratic city. The citizens of Athens had a role in the city. They could plan most things their city did. All voters belonged to the Athens Assembly. This group voted for government leaders. It could punish them if they acted against the law. Many people lived in Athens. Less than one-half were voters. Four groups of people could not be voters. This was just like in Sparta. Women could not be voters. Business people could not be voters. Merchants could not be voters. Slaves could not be voters.

Life in Sparta centered around the soldiers. A soldier had to serve the city of Sparta. He spent most of his time doing this. One of his duties was to serve in the army. Soldiers had a high status. Still their lives were not

easy. All soldiers belonged to army clubs. They ate their meals there. They spent most of their time at the clubs. They could not even go to their homes often. They did not see their wives very much. They did not spend alot of time with their children.

Athens citizens did a number of things in life. They studied law. They talked about law. They talked about ideas and art. Athens needed an army in times of danger. Sports were of interest to them. Army skills were also important. Most Athenians did not mind sports. They valued health. They valued the mind. They valued it as much as they valued the body. Athens gave high value to poets. They thought highly of thinkers.

Spartan boys heard stories and songs at home. That is how they learned Spartan values. The boys left their homes at the age of seven. They went to live at school. They played games in school. They learned sports skills. They trained to be soldiers. They did not learn much about science. They did not study art. School in Sparta had a different purpose. It was to prepare them for a soldier's life.

In Athens school was to teach boys to take part in government. Althens was a democracy. Therefore Athens felt that all citizens should be involved in government. The boys were sent to schoool to learn skills for government. They studied grammar. They studied sports. They studied

the arts. Older boys studied poems. They studied science.
They also studied speaking and law.

PASSAGE QUESTIONS

The War With Spain

Textually Explicit:

What did Cuba Want?

What was the "Maine"?

Textually Implicit:

How did the Americans know about the problems in Cuba?

What happened that made the Americans want war?

Scriptally Implicit:

What is a treaty?

Why did Spain give up Cuba to the United States?

The Start of the French and Indian War

Textually Explicit:

Who ordered Washington to fight the French?

What did the governor want the French to do?

Textually Implicit:

Why were the Indians involved the the war?

What was the difference between the American and the

French forts?

Scriptally Implicit:

Why did Washington loose the battle?

Why didn't the French want to leave the forts?

Lentil

Textually Explicit:

Why couldn't the people in the band play their instruments?

What did the people of Alto plan for Colonel Carter?

Textually Implicit:

Why did Colonel Carter decide to give the town a building?

Why did Lentil learn how to play the harmonica?

Scriptally Implicit:

Why do people's lips pucker when they see a lemon?

Why did the people of Alto want to please Colonel Carter?

The Magical Drawings of Moony B. Finch

Textually Explicit:

What happened when the lady touched the cloud?

Why did Moony call his eraser a "just in case" eraser?

Textually Implicit:

When did the drawings come to life?

Why did the people get upset?

Scriptally Implicit:

Why did Moony decide to erase the riches he had drawn for the people?

Why were the people pushing, shoving, and asking for the drawings?

Super Cities: Tangled Transport

Textually Explicit:

Why might people living in the cities become ill?

What is a megalopolis?

Textually Implicit?

How could the transportation problem be solved in the United States?

What are the two problems with the use of cars in the cities?

Scriptally Implicit:

What would convince people to use public transportation?

Why wouldn't it work to build trains in smaller trains?

Problems of a Growing Region

Textually Explicit:

One family in eight is below what income level?

What are the three basic needs?

Textually Implicit:

What is hard for the low income people?

How could people with low wage jobs be helped the most?

Scriptally Implicit:

Where are the slums?

Why don't children of migrant workers receive a better education?

San Francisco

Textually Explicit:

What is unusual about San Francisco's harbor?

How large is San Francisco, compared to the other cities in the West?

Textually Implicit:

What was the first reason so many people came there?

Why are new buildings and factories built outside of the city of San Francisco?

Scriptally Implicit:

What do you have to do to get from San Francisco to Oakland?

What makes the city of San Francisco so beautiful?

Los Angeles

Textually Explicit:

How does Los Angeles's size compare to other cities in the West?

What is unusual about Los Angeles's harbor?

Textually Implicit:

Why are the smaller cities included in the Los Angeles area?

Why did people first move to Los Angeles?

Scriptally Implicit:

Why are tv shows and movie theatres an industry?

Why is Los Angeles a beautiful city?

Seashells

Textually Explicit:

What do tusk shells look like?

What are seashells?

Textually Implicit:

How did the turban shell get it's name?

Why don't all oysters have pearls inside of them?

Scriptally Implicit?

When do you find seashells?

Why do people collect seashells?

Nine Important Elements

Textually Explicit:

Name four of the elements described.

What weighs four times as much as hydrogen?

Textually Implicit:

What is a compound?

How are coal and diamond alike?

Scriptally Implicit:

What is water made of?

Why are some metals easier to get than others?

Some Differences in Africa

Textually Explicit:

Where are the modern buildings in Africa?

What are the two types of land in Africa?

Textually Implicit:

How do American people differ from Africans in their work?

Tell how the people farm the land in Africa.

Scriptally Implicit:

Why do shepherds travel so much in Africa?

Why isn't there more farm land in Africa?

Sparta and Athens: Cities in Greece

Textually Explicit:

What group of people ruled in Sparta?

What groups of people could not vote in either city?

Textually Implicit:

Why would government leaders obey the law in Athens?

In which city did the parents know their children
parents better?

Scriptally Implicit:

Which city had a better army?

Which city would be likely to begin teaching math?

APPENDIX C

Table 1. ANOVA TABLE FOR MEAN SCORES ON PRETESTS
FOR GROUP COMPARISONS.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio	Prob. of F
PICACO	21.78	1	21.78	102.70	.001
PICACV	14.85	1	14.85	47.51	.001
PICACA	12.87	1	12.87	59.24	.001
COM.Sen.%22932.15		1	22932.15	79.67	.001
COM.Sen # 224.27		1	224.27	18.22	.001

Table 2 MANOVA TABLE FOR RECALL RESPONSES, GRAMMATICAL
FORM BY DISCOURSE TYPE INTERACTIONS

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio	Prob. of F
Cause Effect					
Simple	157768.00	1	157768.00	88.58	.00
Complex	1092.26	1	1092.26	21.89	.00
Narrative					
Simple	27875.55	1	27875.55	92.61	.00
Complex	5183.21	1	5183.21	54.23	.00
Problem Solution					
Simple	2851.44	1	2851.44	39.95	.00
Complex	3592.00	1	3592.00	40.41	.00
Descriptive					
Simple	88.20	1	88.20	1.14	.29
Complex	.60	1	.60	.01	.90
List Like					
Simple	121.69	1	121.69	1.78	.19
Complex	.34	1	.34	.01	.93
Compare Contrast					
Simple	5.04	1	5.04	.16	.69
Complex	.25	1	.25	.01	.94

Table 3. MANOVA SUMMARY TABLE FOR QUESTION ANSWER
RESPONSES FOR THE GROUP BY DISCOURSE TYPE BY
GRAMMATICAL FORM INTERACTION.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio	Prob. of F
Cause Effect					
Simple	5050.90	1	5050.90	93.15	.001
Complex	22.20	1	22.20	4.40	.04
Narrative					
Simple	4.83	1	4.83	.80	.37
Complex	4.67	1	4.67	1.40	.24
Problem Solution					
Simple	31.28	1	31.28	8.14	.01
Complex	6.33	1	6.33	2.72	.10
Descriptive					
Simple	3.33	1	3.33	.66	.42
Complex	.10	1	.10	.02	.88
List Like					
Simple	1.01	1	1.01	.31	.58
Complex	.62	1	.62	.13	.72
Compare Contrast					
Simple	.60	1	.60	.26	.61
Complex	.01	1	.01	.00	.96

Table 4 ANOVA TABLE FOR RECALL SCORES: GROUP BY DISCOURSE
TYPE INTERACTION

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	Variance Ratio	Prob. of F
Cause Effect	21508.27	1	21508.27	36.75	.00
Narrative	52569.60	1	52569.60	38.86	.00
Problem Sol.	10827.27	1	10827.27	57.42	.00
Descriptive	10746.82	1	10746.82	44.30	.00
List Like	7020.02	1	7020.02	29.15	.00
Compare Cont.	10827.27	1	10827.27	37.26	.00

Table 5. ANOVA TABLE FOR QUESTION ANSWER SCORES ON THE INTERACTION OF GROUP BY DISCOURSE TYPE.

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio	Prob. of F.
Cause Effect	2160.00	1	2160.00	69.95	.00
Narrative	2076.82	1	2076.82	73.81	.00
Problem Sol.	1560.60	1	1560.60	84.25	.00
Descriptive	1109.40	1	1109.40	59.66	.00
List Like	1960.82	1	1960.82	88.62	.00
Compare Cont.	1372.82	1	1372.82	43.76	.00

Table 6 RECALL SCORES FOR THE INTERACTION OF GROUP BY GRAMMATICAL FORM

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	Variance Ratio	Prob. of F.
Group	214630.21	1	214630.21	17.51	.00
Gram. Form	3488.41	1	3488.41	.47	.49
Interaction	8151.01	1	8151.01	1.11	.30

Table 7 ANOVA TABLE FOR COMPARISON OF QUESTION ANSWERS FOR THE INTERACTION OF GROUP BY GRAMMATICAL FORM

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio	Prob. of F.
Group	30115.01	1	30115.01	92.18	.00
Gram. Form	15.87	1	15.87	.56	.46
Interaction	29.01	1	29.01	.96	.33

Table 8 MANOVA TABLE FOR DISCOURSE TYPE BY TYPE OF QUESTION INTERACTION

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio	Prob. of F.
Cause Effect					
Explicit	16874.41	1	16874.41	182.21	.00
Implicit	.22	1	.22	.06	.80
Script	368.67	1	368.67	91.97	.00
Narrative					
Explicit	.03	1	.03	.01	.91
Implicit	134.56	1	134.56	46.88	.00
Script	5.41	1	5.41	3.39	.97
Problem Solution					
Explicit	74.11	1	74.11	24.82	.00
Implicit	39.20	1	39.20	26.29	.00
Script	.70	1	.70	.54	.46
Descriptive					
Explicit	.01	1	.01	.01	.94
Implicit	2.57	1	2.57	1.70	.20
Script	.57	1	.57	.30	.58
List Like					
Explicit	37.37	1	37.37	27.10	.00
Implicit	69.51	1	69.51	47.65	.00
Script	19.44	1	19.44	12.05	.00
Compare Contrast					
Explicit	44.18	1	44.18	19.60	.00
Implicit	.42	1	.42	.29	.59
Script	18.01	1	18.01	14.64	.00

Table 9 ANOVA TABLE FOR GROUP BY TYPE OF QUESTION INTERACTION

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	Variance Ratio	Prob. of F
T. Explicit	6741.60	1	6741.60	75.18	.00
T. Implicit	6636.02	1	6636.02	80.02	.00
S. Implicit	6678.15	1	6678.15	91.25	.00

Table 10 RESULTS OF SCHEFFE'S PROCEDURE FOR COMPARISON OF QUESTION TYPES

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	Variance Ratio	Prob. of F.
TE x SI	11287.57	34	331.99	12.67	.001
TI x SI	10716.27	34	315.18	10.79	.001

BIBLIOGRAPHY

BIBLIOGRAPHY

- Adams, M.J. (1980). Failures to comprehend and levels of processing in reading. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), Theoretical Issues in Reading Comprehension (pp. 11-32). Hillsdale, N.J.: Lawrence Erlbaum.
- Adams, M.J., & Collins, A. (1979). A schema-theoretic view in reading. In R.O. Freedle (Ed.), New Directions in Discourse Processing Multidisciplinary Perspectives. Norwood, N.J.: Ablex.
- Anderson, J.R. & Brower, G.H. (1973). Human Associative Memory. Washington D.C.: Winston.
- Anderson, R.C. & Freebody, P. (1982). Reading Comprehension and the Assessment and Acquisition of Word Knowledge. (Tech. Rep. No. 249). Urbana: University of Illinois, Center for the Study of Reading.
- Anderson, R.C., & Pearson, P.D. (1984). A schema-theoretic view of basic processes in reading comprehension. In P.D. Pearson (Ed.), Handbook of Reading Research. (pp.255-292). New York: Longman.
- Anderson, R.C., Reynolds, R.E., Schallert, D.L., & Goetz, E.T. (1977). Frameworks for comprehending discourse. American Educational Research Journal, 14, 367-382.
- Anderson, T.H. (1980). Study strategies and adjunct aids. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), Theoretical Issues in Reading Comprehension. Hillsdale, N.J.:Erlbaum.
- Armbruster, B. (1984). Learning from content area textbooks The problem of "inconsiderate text." In G. Duffy, L. Roehler & J. Mason (Eds.), Comprehension Instruction. New York: Longman.
- Armbruster, B.B., & Anderson, T.H. (1981) Content area Textbooks. (Reading Education Report No.23). Urbana: University of Illinois, Center for the Study of Reading.
- Armbruster, B.B., & Anderson, T.H. (1982). Idea mapping: the technique and its use in the classroom or simulating the "ups" and "downs" of reading comprehension. (Tech. Rep. No. 36). Urbana: University of Illinois, Center for the Study of Reading.
- Armbruster, B.B., & Anderson, T.H. (1984). Producing "Considerate" expository text: or easy reading is damned hard writing. (Tech. Rep. No.46). Urbana:

University of Illinois, Center for the Study of Reading.

- Baker, L., & Brown, A.L. (1984). Metacognitive skills and reading. In P.D. Pearson (Ed.), Handbook of Reading Research, (pp.353-394). New York: Longman.
- Bartlett, F.C. (1932). Remembering. Cambridge, England: Cambridge University Press.
- deBeaugrande, R. (1980). Text, Discourse and Process: Toward a Multidisciplinary Science of Text. Discourse Processes IV, Norwood, N.J.: Ablex.
- Beck, I.L., Omanson, R.C., & McKeown, M.G. (1982). An instructional redesign of reading lessons. Effects on comprehension. Reading Research Quarterly, 17, 462-481.
- Beilin, H., & Lust, B., et.al. (1975). Studies in the Cognitive Basis of Language Development. New York: Academic Press.
- Black, J.B. & Bower, G.H. (1980). Story understanding as problem solving. Poetics, 9, 223-250.
- Bock, J.K., & Brewer, W.F. (1985). Discourse structure and mental models. In T.H. Carr (Ed.). The Development of Reading Skills. New Directions for Child Development No.27. (pp.55-76). San Francisco: Jossey-Bass.
- Bransford, J.D., & Franks, J.J. (1971). The abstraction of linguistic ideas. Cognitive Psychology, 2, 331-350.
- Bransford, J.D., Stein, B.S., Nye, N.J., Franks, J.F., Auble, P.M., Merynski, K.J., & Perfetto, G.A. (1982). Differences in approaches to learning: An overview. Journal of Experimental Psychology: General, 3, 390-398.
- Brewer, W.F. (1980). Literatry theory, rhetoric and Stylistics: Implications for psychology. In R.J. Spiro, B.C. Bruce & W.F. Brewer (Eds.). Theoretical Issues in Reading Comprehension (pp.221-239). Hillsdale, N.J.: Lawrence Erlbaum.
- Brown, A.L. (1980). Metacognitive development and reading. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.). Theoretical Issues in Reading Comprehension (pp. 453-481). Hillsdale, N.J: Lawrence Erlbaum.
- Brown, A.L. & Palincsar, A.S. (1982). Inducing strategic learning from texts by means of informed, self-control training. (Tech. Rep. No. 262). Urbana: University of

Illinois, Center for the Study of Reading.

Brown, A.L., & Smiley, S.S. (1977). Rating the importance of structural units of prose passages: A problem of metacognitive development. Child Development, 48, 1-8.

Brown, A.L., & Smiley, S.S. (1978). The development of strategies for studying texts. Child Development, 49, 1076-1088.

Bruce, B.C. (1980). Plans and social actions. In R.J. Spiro, B.C. Bruce & W.F. Brewer (Eds.). Theoretical Issues in Reading Comprehension (pp. 367-384). Hillsdale, N.J., Lawrence Erlbaum.

Bruce, B., & Rubin, A. (1981). Strategies for controlling hypothesis formation in reading. (Tech. Rep. No. 22). Urbana: University of Illinois Center for the Study of Reading.

Caney, G., & Winograd, P. (1979). Schemata for reading and reading comprehension performance. (Tech. Rep. No. 120). Urbana: University of Illinois, Center for the Study of Reading. (ERIC Document Reproduction Service No. ED 169 521).

Carr, T.H. (Ed.). (1985). The Development of Reading Skills. New Directions for Child Development. San Francisco: Jossey-Bass Inc..

Carver, R.P. (1973). Measuring prose difficulty. The RIDE Scale. Unpublished manuscript.

Carver, R.P. (1974). Improving reading comprehension measures of readability (AIR Final Report, Contract No N000 14-72-10240, Office for Naval Research) Silver Spring, Maryland: American Institutes for Research.

Chappell, G. E. (1980). Oral language performance of upper elementary school students obtained via story reformulations. Language, Speech and Hearing Services in the Schools, 11, 236-250.

Cioffi, G. (1982). Recognition of sentence structure in meaningful prose by good comprehenders and skilled decoders. Journal of Reading Behavior, XIV (1), 87-92.

Clark, C. H. (1981). Assessing comprehensibility and the PHAN system. The Reading Teacher, 670-675.

Collins, A. & Smith, E.E. (1981) Teaching the process of reading comprehension. (Tech. Rep. No. 182). Urbana: University of Illinois Center for the Study of Reading.

- Cromer, W. & Wiener, M. (1966). Idiosyncratic response patterns among good and poor readers. Journal of Consulting Psychology, 30, 1-10.
- Dale, E., & Chall, J.S. (1948). A formula for predicting readability. Educational Research Bulletin, 27, 37-54.
- van Dijk, T. A. (1977). Text and Context. London: Longman.
- van Dijk, T.A. & Kintsch, W. (1983). Strategies of Discourse Comprehension. New York: Academic Press.
- Dolch, E.W. (1948). Grading reading difficulty. In E.W. Dolch (Ed.), Problems in Reading (Chap.12). Champaign, Ill: Garrard Press.
- Ekwall, E.E. (1976). Diagnosis and Remediation of the Disabled Reader. Boston, Allyn & Bacon, Inc.
- Evans, M.A., & Carr, T. H. (1985). Cognitive abilities, conditions of learning, and the early development of reading skill. Reading Research Quarterly, XX (3), 327-350.
- Farr, J.N., Jenkins, J.J., & Peterson, D.G. (1951) Simplification of Flesch Reading Ease Formula. Journal of Applied Psychology, 35, 333-337.
- Felker, D.B. (1980). Document Design: A review of the relevant research. Wash. D.C.: American Institute for Research.
- Fillmore, C.J. (1968). The case for case. In E. Bach & R.T. Harms (Eds.), Universals of Linguistic Theory. New York: Holt, Rinehart & Winston.
- Flavell, J.H. (1981). Cognitive monitoring. In W.P. Dickson (Ed.), Children's Oral Communication Skills. New York: Academic Press.
- Fleisher, L.S., Jenkins, J.R. & Pany, D. (1979). Effects on poor readers' comprehension of training in rapid decoding. Reading Research Quarterly, 15 (1), 30-48.
- Flood, J. (1981). Prose comprehension, a selected review of the literature on inference generation as a requisite for understanding text. In D. F. Fisher & C.W. Peters (Eds.), Comprehension and the Competent Reader, (pp. 51-68). New York: Praeger.
- Flesch, R. (1948). The Art of Readable Writing. New York: Harper.
- Fodor, J.A., Bever, T.G. & Garret, M. F. (1974). The

Psychology of Language. New York: McGraw-Hill.

- Franks, J.J., Vye, N.J., Auble, P.N., Mezynski, K.J., Perfetto, G.A., Bransford, J.D., Stein, B.S., & Littlefield, J. (1982). Learning from explicit vs. implicit text. Journal of Experimental Psychology: General, 111 (4), 414-422.
- Frederiksen, C.H. (1972). Effects of task-induced cognitive operations on comprehension and memory processes. In R. Freedle and J.B. Carroll (Eds.), Language Comprehension and the Acquisition of Knowledge. Washington D.C.: V. H. Winston.
- Frederiksen, C. H. (1975). Representing logical and semantic structures of knowledge acquired from discourse. Cognitive Psychology, 7, 371-458.
- Frederiksen, C.H. (1979). Discourse comprehension and early reading. In L.B. Resnick and P.B. Weaver (Eds.), Theory and Practice of Early Reading (Vol.1). Hillsdale New Jersey: Erlbaum.
- Frederiksen, J. R. (1982). A Componential theory of reading skills and their interactions. (Tech. Rep. No. 227), Urbana: University of Illinois, Center for the Study of Reading.
- Freebody, P. & Anderson, R.C. (1981). Effects of vocabulary difficulty, text cohesion, and schema availability on reading comprehension. (Tech. Rep. No. 225). Urbana: University of Illinois, Center for the Study of Reading.
- Freedle, R. & Hale, G. (1979). Acquisition of new comprehension schemata for expository prose by transfer of a narrative schema. In R.O. Freedle (Ed.), New Directions in Discourse Processing (Vol.II), Advances in Discourse Processing, (pp. 121-136). Norwood, N.J.: Ablex.
- Fry, E.B. (1968). A readability formula that saves time. The Journal of Reading, II, 513-516, 575-578.
- Gibson, E.J., & Levin, H. (1975). The Psychology of Reading. Cambridge, Mass.: M.I.T. Pres
- Goetz, T. (1979). Infering from text: Some factors influencing which inferences will be made. Discourse Processes, 2, 179-195.
- Goetz, E. T. & Armbruster, B.B. (1980). Psychological correlates of text structure. In R. J. Spiro, B. C. Bruce & W. F. Brewer (Eds.). Theoretical Issues in Reading Comprehension. Hillsdale, N. J.: Erlbaum.

- Goldsmith, S. (1977). Reading disability: Some support for a psycholinguistic base. Paper presented at the Boston University Conference on Language Development. Boston.
- Gordon, R. M. (1980). The readability on an unreadable text. English Journal, 60-61.
- Gordon, C. J. & Pearson, P. D. (1983). The effects of instruction in metacomprehension and inferencing on children's comprehension abilities. (Tech. Rep. No. 277). Urbana: University of Illinois Center for the Study of Reading.
- Graesser, A. C. (1978). How to catch a fish. The representation and memory of common procedures. Discourse Processes, 1, 72-89.
- Gray, W. S. (1959). Gray Oral Reading Test. New York: Slosson Educational Publications, Inc.
- Green, K. D., Frehand, R., Beck, S. J. & Vosk, B. (1980). An assessment of the relationship among measures of children's social competence and children's academic achievement. Child Development, 51, 1149-1156.
- Grimes, J. E. (1975). The Thread of Discourse. The Hague: Mouton.
- Gunning, R. (1952). The Technique of Clear Writing. New York: McGraw Hill.
- Gunning, R. (1954). How to Take the Fog out of Writing. Chicago, Follett.
- Guthrie, J. T. (1973). Models of reading and reading disability. Journal of Educational Psychology, 65, 9-18.
- Halliday, M. A. K. (1961). Categories of the theory of grammar. Word, 17, 241-292.
- Halliday, M. A. K. & Hasan, R. (1976). Cohesion in English. London: Longman.
- Hankamer, J., & Sag, I. (1976). Deep and surface anaphora. Linguistic Inquiry, 7, 391-428.
- Hayes, D. & Tierney, R.J. (1982). Developing reader's knowledge through analogy. Reading Research Quarterly, 2, 256-280.
- Hess, A. M. (1982). Analysis of the cognitive processes underlying problems in reading comprehension. Journal of Reading Behavior, XIV (3), 314-333.

- deHirsch, K. (1966) Differential diagnosis between aphasic and schizophrenic language in children. Journal of Speech and Hearing Disorders, 32, 3-10.
- Humphreys, L. G., & Davey, T. C. (1983). Anticipation of gains in general information: A comparison of verbal aptitude, reading comprehension, and listening. (Tech. Rep. No. 282). Urbana: University of Illinois, Center for the Study of Reading.
- Johnson, N. & Mandler, J. (1980). A tale of two structures: underlying and surface forms in stories. Poetics, 9, 51-86.
- Johnston, P. (1981). Implications of basic research for the assessment of reading comprehension. (Tech. Rep. No. 206). Urbana: University of Illinois, Center for the Study of Reading.
- Johnston, P. (1984). Assessment in Reading. In P. D. Pearson, (Ed.), Handbook of Reading Research, (pp. 147-182). New York: Longman.
- Kantor, R. N., Anderson, T. H., & Armbruster, B.B. (1983). How are children's textbooks inconsiderate? Or, of flyswatters and alfa. Journal of Curriculum Studies, 15(1), 61-72.
- Karmiloff-Smith, A. (1981). The grammatical marking of thematic structure in the development of language production. In W. Deutsch (Ed.). The Child's Construction of Language. London: Academic Press.
- Katz, E. W. & Brent, S. B. (1968). Understanding connectives. Journal of Verbal Learning and Verbal Behavior, 7, 501-9.
- Kincaid, J. P., Fishburn, R. P., Roger, R. L. & Chissom, B. S. (1975). Derivation of new readability formulas. (Automated Readability Index, Fog Count and Flesch Reading Ease Formula) for Navy Listed Personnel Research Branch Report 8-751. Millington, Tenn: Naval Air Station, Memphis.
- Kintsch, W. (1974). The Representation of Meaning in Memory. Hillsdale, N. J.: Erlbaum.
- Kintsch, W. & Vipond, D. (1977). Reading comprehension and readability in educational practice and psychological testing. Bolder Univ. of Colorado. Paper presentation at a conference on Memory. Univ. Uppsala.
- Kirk, R. E. (1983). Experimental Design: Procedures for

the Behavioral Sciences, Second Edition. Belmont, CA: Brook/Cole.

- Klare, G.R. (1984). Readability. In D. P. Pearson (Ed.), Handbook of Reading Research. New York: Longman.
- Langer, J. A., & Nicholich, M. (1981). Effect of altered prior knowledge on passage recall. Paper presented at National Reading Conference.
- Liles, B. (1982). Use of cohesion in verbal narratives by normal and language disordered children. Paper presented at American Speech-Language Hearing Assoc. National Conference.
- Mandler, J. M. & Johnson, N. S. (1977). Remembrance of things parsed. Story structure and recall. Cognitive Psychology, 9, 111-151.
- Markman, E. M. (1981). Comprehension monitoring. In W. P. Dickson (Ed.), Children's Oral Communication
- Marr, M. B., & Gormley, K. (1982). Children's recall of familiar and unfamiliar text. Reading Research Quarterly, 18(1), 89-104.
- Marshall, N. (1981). The application of basic research to reading instruction. In, D. F. Fisher & C. W. Peters (Eds.), Comprehension and the Competent Reader (pp. 36-50), New York: Praeger.
- Marshall, N., & Glock, M. D. (1978-79). Comprehension of connected discourse: A study into the relationship between the structure of text and information recalled. Reading Research Quarterly, 14, 10-56.
- Marslen-Wilson, W. D., Tyler, L. & Seidenberg, M. (1978). Sentence processing and the clause-boundary. In W. J. M. Levelt & G. Flores d'Aarrais (Eds.); Studies in the Perception of Language. London: Wiley.
- McGee, L. M. (1982). Awareness of text structure: effects on children's recall of expository text. Reading Research Quarterly, XVII (4), 581-590.
- McLaughlin, G. H. (1969). Smog grading-a new readability formula. Journal of Reading, 639-646.
- Menyuk, P. (1979). Language and Maturation. Cambridge, Mass.: M.I.T. Press.
- Menyuk, P. (1982). Memory and language impairment. Paper presented at the Annual Conference, American Speech-Language-Hearing Association.

- Meyer, B. J. F. (1975). The Organization of Prose and its effects on Memory. Amsterdam: North Holland.
- Meyer, B. J. F. (1977). What is remembered from prose: A function of passage structure. In R. D. Freedle (Ed.), Discourse Production and Comprehension: Advances in Research and Theory (Vol.1). Norwood, N. J.: Ablex.
- Meyer, B. J. F. (1981). Basic research on prose comprehension: a critical review. In D. F. Fisher and C. W. Peters (Eds.), Comprehension and the Competent Reader. (pp. 8-35). New York: Praeger.
- Meyer, B. J. F., Brandt, D. M. & Bluth, G. J. (1980). Use of top-level structure in text: Key for reading comprehension in ninth-grade students. Reading Research Quarterly, 16, 72-103.
- Morgan, J. L. & Sellner, M. B. (1980). Discourse and linguistic theory. In R. J. Spiro, B. C. Bruce & W. F. Brewer (Eds.), Theoretical Issues in Reading Comprehension. (pp. 165-200). Hillsdale, N. J.: Erlbaum.
- Oakhill, J. (1982). Constructive processes in skilled and less-skilled comprehenders' memory for sentences. British Journal of Psychology, 73, 13-20.
- Omanon, R. C. (1985). Knowing words and understanding texts. In T. H. Carr (Ed.), The Development of Reading Skills. New Directions for Child Development (No.27) San Francisco: Jossey-Bass, Inc.
- Palincsar, A., & Brown, A. (1984). Reciprocal teaching of comprehension monitoring activities. Urbana: University of Illinois, Center for the Study of Reading.
- Paris, S. G. (1978). Coordination of means and goals in the development of mnemonic skills. In P. A. Ornstein (Ed.), Memory Development in Children. (pp. 259-273). Hillsdale, N. J.: Erlbaum.
- Paris, S. C. & Lindauer, B. K. (1976). The role of inference in children's comprehension and memory. Cognitive Psychology, 8, 217-227.
- Paris, S. C. & Myers, M. (1981). Comprehension monitoring, memory, and study strategies of good and poor readers. Journal of Reading Behavior, 13, 5-22.
- Pearson, P. D. (1974-75). The effects of grammatical complexity on children's comprehension, recall, and conception of certain semantic relations. Reading Research Quarterly, 10, 155-192.

- Pearson, P. D. (1982). A context for instructional research on reading comprehension. (Tech. Rep. No. 230). Urbana: University of Illinois, Center for the Study of Reading.
- Pearson, P. D. & Camperell, K. (1981). Comprehension of text structures. In J. T. Guthrie (Ed.), Comprehension and Teaching: Research Reviews. Newark, Del: International Reading Association.
- Pearson, P. D., Hansen, J. & Gordon, C. (1979). The effect of background knowledge on young children's comprehension of explicit and implicit information. Journal of Reading Behavior, 11, 201-209.
- Pearson, P. D. & Johnson, D. D. (1978). Teaching Reading Comprehension. New York: Holt, Rinehart & Winston.
- Perfetti, C. A., & Goldman, S. R. (1976) Discourse memory and reading comprehension skill. Journal of Verbal Learning and Verbal Behavior, 15, 33-42.
- Perfetti, R. D. & Lesgold, A. M. (1977). Discourse comprehension and sources of individual differences. In M. Just & P. Carpenter (Eds.), Cognitive processes in Comprehension. Hillsdale, N.J.: Erlbaum.
- Perfetti, C. A., Goldman, S. R. & Hogaboam, T. W. (1979). Reading skill and the identification of words in discourse context. Memory and Cognition, 7, 273-282.
- Porch, B. E. (1967). Porch Index of Communicative Ability. Palo Alto, California: Consulting Psychologists Press.
- Porch, B. E. (1974). Porch Index of Communicative Ability in Children. Palo Alto, California: Consulting Psychologists Press.
- Prichart, J., & Anderson, R. C. (1977). Taking different perspectives on a story. Journal of Educational Psychology, 69, 309-315.
- Raphael, T. E. (1980). The effect of metacognitive training on children's question answering behavior. Unpublished doctoral dissertation, University of Illinois.
- Raphael, T. E. (1982). Improving question answering performance through instruction (Tech. Rep. No. 32). Urbana: University of Illinois, Center for the Study of Reading.
- Raphael, T. E. (1983). Increasing students' sensitivity to sources of information: An instructional study in question-answer relationships. (Tech. Rep. No. 284).

Urbana: University of Illinois, Center for the Study of Reading.

- Raphael, T. E. (1981). The effects of some known sources of reading difficulty on metacomprehension and comprehension. Journal of Reading Behavior, XIII(4), 325-334.
- Raphael, T. E. and Pearson, P. D. (1982). The effect of metacognitive training on children's question answering behavior. (Tech. Rep. No. 238). Urbana: University of Illinois, Center for the Study of Reading.
- Raphael, T. E., Winograd, P., & Pearson, P. D. (1980). Strategies children use when answering questions. In M. L. Kamil & A. J. Moe (Eds.), Perspectives on Reading Research and Instruction. Washington, D. C.: National Reading Conference, Inc.
- Raygor, A. L. (1979). Raygor Readability Estimator. Rehoboth, Ma: Twin Oaks Publishing Inc.
- Redish, J. C. (1981). Understanding the limitations of readability formulas. IEEE Trans. Professional Communication, PC-24(1), 46-48.
- Rubin, A. (1982). What Can Readability Formulas Tell Us About Text? Cambridge Mass: Bolt, Gerbeck & Newman, Inc.
- Rumelhart, D. E. (1975). Notes on a schema for stories. In D. G. Bobrow & A. M. Collins (Eds.), Representation and Understanding: Studies in Cognitive Science. New York: Academic Press.
- Rumelhart, D. E. (1977). Understanding and summarizing brief stories. In D. LaBerge & S. J. Samuels (Eds.), Basic Processes in Reading: Perception and Comprehension. Hillsdale, N. J.: Erlbaum.
- Rumelhart, E. E. (1980). Schemata: The building blocks of cognition. In R. J. Spiro, B. C. Bruce, & W. F. Brewer, (Eds.), Theoretical Issues in Reading Comprehension. Hillsdale, N. J.: Erlbaum.
- Rumelhart, D. E., & Ortony, A. (1977). The representation of knowledge in memory. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), Schooling and the Acquisition of Knowledge. Hillsdale, N. J.: Erlbaum.
- Rusch, G. M., & Stoddard, G. D. (1927). Tests and Measurements in High School Instruction. Yonkers, N.Y.: World Book.
- Searle, J. R. (1969). Speech Acts. London: Cambridge

University Press.

- Shimmerlik, S. M. (1978). Organization theory and memory for prose. A review of the literature. Review of Educational Research, 48, 103-120.
- Singer, H. & Donlan, D. (1982). Active comprehension: problem solving schema with question generation for comprehension of complex short stories. Reading Research Quarterly, XVII(2), 167-185.
- Sleight, C. C. & Prinz, P. (1982). Narrative styles of language disordered and nondisordered children. Paper presented at the American Speech Language and Hearing Association, National Conference.
- Spache, G. (1953). A new readability formula for primary grade reading materials. Elementary School Journal, 53, 410-413.
- Spiro, R. J. (1980)a. Prior knowledge and story processing integration, selection and variation. Poetics, 9, 313-327.
- Spiro, R. J. (1980),b. Constructive processes in prose comprehension and recall. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), Theoretical Issues in Reading Comprehension. Hillsdale, N.J.: Erlbaum.
- Spiro, R. J., Bruce, B. C. & Brewer, W. F. (Eds.), (1980). Theoretical Issues in Reading Comprehension, Perspectives From Psychology, Linguistics, Artificial Intelligence and Education. Hillsdale, N. J.: Erlbaum.
- Spiro, R. J., & Myers, A. (1984). Individual differences and underlying cognitive processes. In P. D. Pearson (Ed.) Handbook of Reading Research. New York: Longman.
- Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in reading fluency. Reading Research Quarterly, 16, 32-71.
- Stanovich, K. E., Cunningham, A., & Freeman, D., (1984). Intelligence, cognitive skills and early reading progress. Reading Research Quarterly, XIX (3), 278-303.
- Stanovich, K. E. & West, R. F. (1983). On priming by a sentence context. Journal of Experimental Psychology: General, 112(1), 1-40.
- Stein, B. S., Bransford, J. D., Franks, J. J., Owings, R. A., Vye, N. J., & McGraw, W. (1983). Differences in the precision of self-generated elaborations. Journal of Experimental Psychology: General, 111(4), 399-405.
- Stein, B. S., Bransford, J. D., Franks, J. J., Vye, N. J.,

- & Perfetto, G. A. (1983). Differences in judgments of learning difficulty. Journal of Experimental Psychology: General, 111(4), 406-414.
- Sticht, T. G. (1972). Project realistic: Determination of adult functional literacy skill levels. Reading Research Quarterly, 7, 424-265.
- Sticht, T. G. (Ed.), (1975). Reading For Working. Alexandria, Va.: Human Resources Research Organization.
- Sticht, T. G., and James, J. H. (1984). Listening and Reading. In P. D. Pearson (Ed.), Handbook of Reading Research, (pp. 293-318). New York: Longman.
- Taylor, I. (1969). Content and structure in sentence production. Journal of Verbal Learning and Verbal Behavior, 8, 170-175.
- Taylor, I. (1980). The Korean writing system: An alphabet? A syllabary? A logography? In P. A. Kolers, M. E. Wrolstad & H. Bouma (Eds.), Processing of Visible Language Volume 2. New York: Plenum.
- Thorndike, E. L. (1917). The understanding of sentences: A study of errors in reading. Elementary School Journal, 18, 98-114.
- Thorndyke, P. W. (1977). Cognitive structures in comprehension and memory of narrative discourse. Cognitive Psychology, 9, 77-110.
- Tierney, R. J. (1983). Learning from text. (Tech. Rep. No. 37). Urbana: University of Illinois, Center for the Study of Reading.
- Tierney, R. J., Bridge, C., & Cera, M. J. (1978-79). The discourse processing operations of children. Reading Research Quarterly, 14, 539-573.
- Tierney, R. J. & Mosenthal, J. H. (1981). The cohesion concept's relationship to the coherence of text. (Tech. Rep. No. 221). Urbana: University of Illinois, Center for the Study of Reading.
- Tierney, R. J. & Mosenthal, J. H. (1982). Discourse comprehension and production: analyzing text structure and cohesion. In J. A. Langer & M. T. Smith-Burke (Eds.), Reader Meets Author-Bridging the Gap. A Psycholinguistic and Sociolinguistic Perspective. Newark, Delaware: International reading Association.
- Trabasso, T. (1981). On the making and assessment of inferences during reading. In J. T. Guthrie (Ed.),

Reading Comprehension and Education. Newark, Del.:
International Reading Association.

- Vande Kopple, W. J. (1982). The given-new strategy of comprehension and some natural expository paragraphs. Journal of Psycholinguistic Research, 11(5), 501-520.
- Vellutino, F. R., Harding, C. J., & Tanzman, M. (1980). New York State Senate multidisciplinary intervention model, Title VI-G, final report. Submitted to the Bureau of Education for Handicapped. Washington D.C.
- Vellutino, F.R., & Scanlon, D. M. (1982). Verbal processing in poor and normal readers. In C. J. Brainerd & M. Pressley (Eds.). Verbal Processes in Children. Progress in Cognitive Developmental Research, (pp.189-264). New York: Springer-Verlag.
- Vogel, S.A. (1974). Syntactic abilities in normal and dyslexic children. Journal of Learning Disabilities, 7, 103-109.
- Wagoner, S. A. (1983). Comprehension monitoring: What it is and what we know about it. Reading Research Quarterly, XVIII(3), 328-346.
- Warren, W. H., Nicholas, D. W. & Trabasso, T. (1979). Event chains and inferences in understanding narratives. In R. O Freedle (Ed.), New Directions in Discourse Processing, II. Norwood, N. J.: Ablex.
- Waters, H. (1978). Superordinate-subordinate structure in semantic memory: The roles of comprehension and retrieval processes. Journal of Verbal Learning and Verbal Behavior, 17, 587-597.
- Webber, B. L. (1980). Syntax beyond sentence: Anaphora. In R. J. Spiro, B. C. Bruce & W. F. Brewer (Eds.), Theoretical Issues in Reading Comprehension. Hillsdale, N. J.: Erlbaum.
- Westby, C. E. (1982). Cognitive and Linguistic aspects of children's narrative development. Communicative Disorders, VII, 1-16.
- Wilhite, S. C. (1982). Pre-passage questions: The influence of structural importance. (Tech. Rep. No. 234). Urbana: University of Illinois, Center for the Study of Reading.
- Whimbey, A. (1975). Intelligence Can Be Taught. New York: Dutton.
- Winograd, P. N. (1983). Strategic difficulties in

summarizing texts. (Tech. Rep. No. 274). Urbana:
University of Illinois, Center for the Study of Reading.