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THE UNIVERSITY OF ALBERTA

AN INVESTIGATION INTO THE RELATIONSHIP OF ANAPHORIC REFERENCE AND READING COMPREHENSION OF GRADE TWO PUPILS

by

Larry Arnold Miller

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "An Investigation into the Relationship of Anaphoric Reference and Reading Comprehension of Grade Two Pupils" submitted by Larry Arnold Miller in partial fulfilment of the requirements for the degree of Ph.D. in Elementary Education.

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ABSTRACT

The major purpose of this study was to investigate the ability of High and Low Readers to comprehend the basically syntactic aspect of language known as the antecedent/anaphora relationship. Specific focus was on three possible variables that may contribute to the reader's inability to comprehend this relationship. These variables were: (1) the number of antecedents interacting in a discourse; (2) the distance between the antecedent and anaphora; (3) the anaphoric category (categories were devised on the basis of form and function).

An ancillary purpose of the study was to examine relationship between oral language production of anaphora and comprehension of the antecedent/anaphora relationship on written language.

The sample used in the study consisted of one hundred children enrolled in their second year of school in a large western, Canadian city. The use of children enrolled in grade two was important in that prior research had shown some children at this level lacked mastery of the grammatical phenomenon under study.

A selected subsample of forty-eight children was chosen to participate in an oral language production task. The oral language production of these children was compared with performance on the written language measures (TAR).

To examine the children's ability to comprehend the antecedent/anaphora relationship the investigator constructed the Tests of Anaphoric Reference (TAR). All the dependent variables were built into the passages used in the TAR and thus were reflected in the children's scores on these tests.

The statistical design of the study was basically a 2 X 2

factorial with the above mentioned dependent variables. Analyses of covariance, with grouping by reader level and sex, were the principal statistical procedures used in the investigation. The covariate in all analyses was the children's word recognition scores.

The results of the study indicated that the High Reader's scores were significantly superior to those of Low Readers on all dependent variables. This superiority was consistent even when the effects of word identification ability were partialled out.

It was concluded that the addition of antecedents to a discourse caused difficulty for readers at this level. An increase in distance between antecedent and anaphora is also an interfering factor especially for Low Readers. The effects of anaphoric category which reflected case relationships, were mixed. However, it was clear that some cases, particularly the genitive, are more difficult than others.

The relationship between oral language production of anaphora and the comprehension of the antecedent/anaphora relationship was such that the high producers of anaphora tended to score lower on the specially designed written language tests of anaphoric reference (TAR). This finding indicates that the relationship between oral language production and reading comprehension may not be as direct as some researchers have suggested.

The investigation indicated that further research is needed in relation to the factors that may interfere with comprehension of the antecedent/anaphora relationship. Also, the relationship between oral language production of anaphora and comprehension of antecedent and anaphora in written language requires further study.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION AND STATEMENT OF THE PROBLEM

Introduction

> While it is true that we are interested in the pedagogy of reading, we cannot be sure that it is being taught until we have found out what it is. To put it another way—we have to know how to recognize and identify reading behavior before we can productively study methods of producing reading behavior. (Raygor, 1971, p. 9)

Raygor's comment, part of his presidential address to the Nineteenth Annual Meeting of the National Reading Conference, elucidates the need for establishing priorities in reading research. It would appear that effective pedagogy should develop from a knowledge of the reading process.

In seeking this end, many researchers have focused their attention on the correlates of the reading act (e.g., perception, intelligence, etc.). While these correlates, and the disciplines under whose aegis they fall, are crucial to the understanding of reading behavior, one must not permit them to become 'ends unto themselves'. In recent years the discipline of linguistics has often been permitted to become this 'end unto itself'. Aukerman (1971) supports this contention by pointing out that, "...some basal readers now boldly claim to be linguistically oriented without so much as a revision in their text (pp. 141-142)." Since all written material is linguistic in nature it appears that some publishers are attempting to capitalize on consumer ignorance. Although some authors and publishers have permitted linguistics to become a dominant force in reading materials, others have thoughtfully applied certain linguistic tenets to increase

our knowledge of the reading process. Needless to say, the process of reading cannot be directly observed. Today, many researchers who are engaged in psycholinguistic analysis are concerned about the relative importance of syntax and semantics in language (Gibson, 1972; Hamilton and Deese, 1970; Mehler and Carey, 1968, 1967; Sachs, 1966; Miller, 1962). Schlesinger (1966) has thoughtfully pointed out that a complete separation of syntax and semantics is untenable. This relationship is of vital importance in understanding the process of reading.

The semantic element in the act of reading has been the focus of numerous investigations (Dale, Razik, and Petty, 1974). However, recent research has shown that certain syntactic relationships are not well understood by some children (Bormuth et al., 1974). Syntactic relationships are important in the act of reading because they signal information within and between sentences.

Anaphora, a word that substitutes for, or refers to, another word, group of words, or topic in a passage, would seemingly be classed as a purely syntactic phenomenon. However, using personal pronouns as an example, one is able to discern certain semantic information inherent in the word. For example, the word he, although obviously relying on some other word, its referent, for interpretation, does possess certain semantic information. One can identify the referent as a singular male by the form of the pronoun alone.

In reading, certain processes are involved in the comprehension of the antecedent/anaphora relationship. It appears that the anaphora, along with its limited semantic information such as gender and number is identified. Next, the word, group of words, or topic which the anaphora substitutes for, or refers to, must be recalled or located.

This remembering or locating process might be referred to as the "awareness of the antecedent/anaphora relationship". Although there has been some speculation, and research, indicating that awareness of the antecedent/anaphora relationship is not an equally difficult task for all readers, the conclusions cannot be considered definitive. Indeed, if one considers the two major studies that have examined the reader's understanding of the antecedent/anaphora relationship (Bormuth, Manning, Carr, and Pearson, 1970; Lesgold, 1974) there appear to be two distinct, and contradictory views as to the difficulty of certain anaphoric categories. This difference is especially evident in the category of personal pronouns.

The studies mentioned in the previous paragraph focused upon the difficulty children have in understanding the antecedent/anaphora when various anaphoric categories are considered (e.g., personal pronouns, numeric pronominal, proverb, etc.). Difficulty was calculated on the basis of the percentage of children who comprehended a grammatical structure which represented the anaphoric category being tested. No attempt was made in either investigation to examine the variables that may affect comprehension of the antecedent/anaphora relationship.

Purpose of the Study

The purpose of this study was to investigate the abilities of two groups of readers, those high in general reading ability and those low in general reading ability, to comprehend the grammatical phenomenon known as the antecedent/anaphora relationship. Specific focus was on the investigation of possible intervening factors that may contribute to the reader's inability to understand this relationship.

These factors which appeared to interact in a discourse were: (a) the number of antecedents, (b) the distance between antecedent and anaphora, and (c) the formal aspects of the anaphoric form (e.g., nominative, objective, and genitive case).

A secondary purpose of the study was to investigate the relationship between oral language production of anaphora and reading comprehension of the antecedent/anaphora relationship. The study of this relationship was accomplished on a group basis by comparing the oral language production of anaphora with understanding of the antecedent/anaphora relationship in written language.

Overview of the Design of the Study

The statistical design of the study was basically a 2X2 factorial with three dependent variables. Analyses of covariance, with grouping by reader level and sex, were the principal statistical procedures used for data evaluation.

The use of children in their second year of formal school instruction was chosen on criteria resulting from a literature search in language acquisition. Specifically, the literature indicated that some second grade children may not have full understanding of certain anaphoric forms. The main sample, 100 children, was randomly drawn from seven different grade two classes of the Edmonton Roman Catholic School System.

The specific choice of children who were in their second year of formal school instruction was relevant in that one of the aims of the study was to examine the relationship between oral language production of anaphora and written language comprehension of the antecedent/

anaphora relationship. A selected subsample of forty eight children, drawn from the main sample of 100, was chosen to participate in an elicited oral language production task. The selected subsample of children was divided into [illegible] and the oral language production of anaphora was compared with their reading performance on the written language tests especially designed for this study.

Definition of Terms

The following terms, important to this study, are defined as follows:

Anaphora

Anaphora are linguistic structures which refer to, or substitute for, other linguistic structures, commonly called referents or antecedents. In this study pronominal reference was the general anaphoric category investigated. Specifically, the study dealt with three anaphoric categories as they relate to antecedents. They are:

Category	Forms	Function
1	I, we you he, she, it, they	To replace or refer to an animate noun or nouns. These forms function as the subject of a sentence.

Example: John walked into the room. He had an apple in his hand.

2	me, us you him, her, it, them	To replace or refer to an animate noun or nouns. These forms function as direct objects, indirect objects, and objects of prepositions.

Example: John walked into the room. Susan gave an apple to him.

7	my, our your his, her, its, their	To replace or refer to an animate noun or nouns. These forms function to indicate possession.

Category Forms Function

Example: John walked into the room. He had an apple in his hand.

Notes: The above categories are limited to anaphoric relationships. For the purposes of this study exophora and cataphora were not [illegible] are beyond the [illegible] of these terms. For the [illegible] syntax functions were limited to subjects nouns. It is recognized that the entire NP is replaced or referred to by the anaphora. Also, it is recognized that inanimate objects can serve as antecedents for the forms in the categories (e.g., hurricanes, ships, etc.).

Antecedent

This term describes a word, group of words, or topic to which a word occurring later in the sentence or discourse refers to or substitutes for. The terms antecedent and referent were used synonymously in this study. For the purpose of the investigation, the antecedent(s) used consisted only of one or two words (e.g., Sam or Sam and Mary).

Awareness of the Antecedent/Anaphora Relationship

This term refers to the ability of the reader to either use a memory retrieval process or to visually locate (via a visual regression process) the antecedent for a particular anaphora. In this study, awareness of the antecedent/anaphora relationship was determined by the performance of the reader on the Tests of Anaphoric Reference-Close Format (TAR-C) and the Tests of Anaphoric Reference-Multiple Choice Format (TAR-MC).

Discourse

This term refers to a sequence of sentences such that the meaning of the discourse cannot be determined by interpreting each sentence independently. There is an implication in discourse that each string

of words must have some interpretation consonant with the model of the situation being built up by the reader. (Bobrow, 1968)

High Anaphora Producers

This term describes twenty-four children drawn from the main sample of 100. These children obtained a percentage score of 11.1 or higher in terms of number of anaphora spoken on the oral language production task in relation to the total number of words produced on the same task. This value (11.1 per cent) was chosen as an arbitrary cut off point in order to dichotomize the total subsample (N forty-eight) into two equal groups.

High Reader Group

This term describes fifty children in the main sample of 100 children who achieved a score of 3.6 or higher on the measure of general reading comprehension (Gates-MacGinitie Reading Tests (1965), Primary B). The score of 3.6 on the comprehension section of the Gates-MacGinitie Reading Tests was an arbitrary cut-off point used to dichotomise the main sample.

Low Anaphora Producers

This term describes twenty-four children drawn from the main sample of 100. These children obtained a percentage score of 11.0 or lower in terms of number of anaphora spoken on the oral language production task in relation to the total number of words produced on the same task. This value (11.0) was chosen as an arbitrary cut-off point in order to dichotomize the total subsample (N=forty-eight) into two

equal groups.

Low decile group

[illegible] children who achieved a score of [illegible] or lower on the measure of comprehension (Peabody Picture Vocabulary Test). [illegible] the score of [illegible] on the comprehension section of the Gates MacGinitie test was an arbitrary cut off point used to dichotomize the sixth sample.

Proposition

The term proposition refers to a structured sequence of words that expresses an idea. A proposition must contain a finite verb, gerund, participle, or infinitive, either implicitly or explicitly stated, along with a subject, either implicitly or explicitly stated. For the purpose of this study a proposition will be operationally defined following the guidelines of Hunt (1972). Certain modifications of the Hunt guidelines were made for this study (See Appendix I).

Sentence

This term refers to a sequence of selected syntactic items combined into a unit in accordance with certain patterns of arrangement, modification and intonation in any given language (Lehmann, 1972). For the purpose of this study a sentence consisted of one or more propositions, one of which contained a finite verb.

Test of Anaphoric Reference Cloze Format (TAR-C, Form 1)

This is a specially designed test that was used to assess the

subjects' ability to comprehend the antecedent, anaphora relationship. The test was constructed using two interacting antecedents (and two additional characters to serve as distractors), one male and one female. The basic format of the test was a multiple choice procedure.

Test of Anaphoric Reference-Multiple Choice Format (Male, Form 2)

This is a specially designed test that was used to assess the subjects' ability to comprehend the antecedent/anaphora relationship. It contained two interacting antecedents (and two additional characters to serve as distractors), one male and one female. The basic format of the test was a multiple choice procedure.

Test of Anaphoric Reference-Multiple Choice Format (Male, Form 2)

This is a specially designed test that was used to assess the subjects' ability to comprehend the antecedent anaphora relationship. It contained four interacting antecedents, two female and two male. The basic format of the test was a multiple choice procedure.

Derivation of the Hypotheses

The generation of the hypotheses for this study emanated from the following general questions.

1. What are the relative abilities of High and Low Readers in understanding the antecedent/anaphora relationship when the number of antecedents interacting in a discourse are considered?

2. What are the relative abilities of High and Low Readers in understanding the antecedent/anaphora relationship when the effects of distance between antecedent and anaphora are considered?

3. What are the relative abilities of High and Low Readers in understanding the antecedent/anaphora relationship when the effects of anaphoric category are considered?

4. Will the ability of all readers to comprehend the antecedent/anaphora relationship be affected by an increase in the number of antecedents interacting throughout a discourse?

5. Will the ability of all readers to comprehend the antecedent/anaphora relationship be affected by an increase in the distance between antecedent and anaphora?

6. Will the ability of all readers to comprehend the antecedent/anaphora relationship be affected by the anaphoric category?

7. What is the relationship between oral language production of anaphora and comprehension of the antecedent/anaphora relationship in written language?

8. What is the relationship between intelligence and the reader's ability to comprehend the antecedent/anaphora relationship?

9. What is the relationship between visual memory span and the reader's ability to comprehend the antecedent/anaphora relationship?

The following null hypotheses were formulated for each of the questions:

Question 1.

1.1. There will be no significant difference in the performance of High and Low Readers on the TAR-C and on the TAR-MC regardless of whether the number of antecedents is two rather than four.

Question 2.

2.1. There will be no significant difference in the performance of High and Low Readers on the TAR-C and TAR-MC when the distance between the antecedent and anaphora is 0-2 propositions or 3-5 propositions.

Question 3.

3.1. There will be no significant difference in the performance of High and Low Readers on the TAR-C and TAR-MC in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case).

Question 4.

4.1. There will be no significant difference in the subjects' scores when the means of TAR-C, Form 1 (2 antecedents) are compared with TAR-C, Form 2 (4 antecedents).

4.2. There will be no significant difference in the subjects' scores when the means of TAR-MC, Form 1 (2 antecedents) are compared with TAR-MC, Form 2 (4 antecedents).

Question 5.

5.1. There will be no significant difference in the subjects' scores when the means of the TAR-C, Form 1 (0-2 Propositions) are compared with TAR-C, Form 1 (3-5 Propositions).

5.2. There will be no significant difference in the subjects' scores when the means of the TAR-C, Form 2 (0-2 Propositions) are compared with TAR-C, Form 2 (3-5 Propositions).

5.3. There will be no significant difference in the subjects' scores when the means of the TAR-MC, Form 1 (0-2 Propositions) are compared with TAR-MC, Form 1 (3-5 Propositions).

5.4. There will be no significant difference in the subjects' scores when the means of the TAR-MC, Form 2 (0-2 Propositions) are compared with TAR-MC, Form 2 (3-5 Propositions).

Question 6.

6.1. There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-C, Form 1.

6.2. There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-C, Form 2.

6.3. There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-MC, Form 1.

6.4. There will be no significant difference in the subjects'

scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-MC, Form 2.

Question 7.

7.1. There will be no significant difference between High and Low Readers in their oral language production of anaphora.

7.2. There will be no significant difference between High and Low Readers in their oral language production of Category 1, Category 2, and Category 7.

7.3. There will be no significant difference between High and Low Readers in their ratio of anaphora to total number of words produced on the oral language task.

7.4. There will be no significant difference in the performance of the High and Low Anaphora Producers on the TAR-C and TAR-MC.

Question 8.

8.1. There will be no significant relationship between intelligence, as measured by the Lorge-Thorndike Intelligence Test, Level 2, Form A, and performance on the TAR-C and TAR-MC.

Question 9.

9.1. There will be no significant relationship between visual memory span, as measured by the Detroit Tests of Learning Aptitude, Subtest 16, and performance on the TAR-C and TAR-MC.

Significance of the Study

Syntactic structures in language, through which much information is signalled, are not equally understood by all readers. Many of these structures have been investigated only in a cursory manner. In addition, a great deal of recent psycholinguistic research has used the "sentence" as the stimulus to be read by the subjects. While the sentence offers certain advantages, both theoretical and practical, as the unit of investigation, many syntactic structures are inter-sentential in nature.

The reading act, as performed by the child in the acquisition process, typically uses connected discourse as the stimulus.

This study was intended to provide information concerning the beginning reader's ability to comprehend one, primarily syntactic phenomenon that can occur across sentence boundaries. The scope of the study included both theoretical and practical aspects.

A significant element of this study was the investigation of several factors that may interfere with the comprehension of the grammatical phenomenon in question, the antecedent/anaphora relationship. These factors were chosen for investigation because they appear to bear a unique relation to the understanding of antecedent and anaphora.

While it is accepted that oral language and the receptive act of reading are related, the exact nature of this relationship is still largely unexplored. This study is considered important in that it attempts to establish directly the relationship between oral language production of a given grammatical element and the understanding of that element in written language.

Delimitations and Limitations of the Study

The following delimitations were placed on the study:

1. In respect to the area under investigation which was substitution, only personal pronouns which were anaphoric in nature were selected for study.
2. In respect to possible factors that may interfere with comprehension of the antecedent/anaphora relationship, only the following were chosen for study:
   a. The effects of multiple antecedents in a discourse.

b. The effects of distance between antecedent and anaphora.

c. The effects of anaphoric category.

The following limitations are inherent in the study and should be taken into account when the generalization of the findings is considered:

1. The subjects who composed the sample were from one grade level (grade two). Also, these children were urban students drawn from one school system in a large, Western Canadian city.
2. The subjects were screened so that a score of at least 2.0 had to be obtained on a measure of general reading ability. Moreover, all subjects had to demonstrate a high degree of word identification ability on a test composed of all the words that occurred on the TAR.
3. The oral language protocols obtained may not be truly representative of the total language of the child. Situational variables are known to influence elicited oral language production.

Certain limitations, which became apparent during the study, are noted in Chapter 8.

CHAPTER 2

REVIEW OF RELATED LITERATURE: A THEORY OF READING

This chapter discusses certain theories and models of reading in order to provide a theoretical basis for the study. Particular focus will be on the influence of syntactic factors on the beginning reader's comprehension of written language and particularly on substitution with which this study is especially concerned. The focus is on a theory of beginning reading since the sample consisted of children in their second year of school and who may be considered to be in the acquisition stage of the reading process.

Theories and Models of Reading

Two recent books have contributed to the increase in knowledge about the processes of reading. Theoretical Models and Processes of Reading, Singer and Ruddell (eds.), and The Literature of Research in Reading with Emphasis on Models, F. B. Davis (ed.), present the theoretical positions of a number of researchers. Although many of the models are incomplete and focus on selected processes, the reading researcher is now better equipped to place his work in a given theoretical context.

The use of models is not without its critics. Kingston (1968, 1970, 1971) is quite critical of the current reading models. He states, "...few, if any, of the current reading models lend themselves to empirical verification or can be used to predict reading behavior (p. 8-61, 1971)."

Kingston is correct in pointing out that the models presented

often reflect the special interest or background of the researcher. He commented, "Language acquisition and utilization models, psycholinguistic models, information-theory models, perceptual models, learning models represent disjunctive categories (p. 8-62, 1971)." This writer contends there is a special need for specialists in reading to integrate the knowledge of related disciplines into a specialized model of reading.

Jenkinson (1972), in addition to describing various needed aspects of a viable model of reading, focuses upon an often neglected dimension--the developing reader. From her observations concerning the developing reader and the special characteristics he demonstrates, Jenkinson feels that better progress would be made "...if we do not attempt to account, at least in the same model, for both the developing and the mature reader (p. 105)."

Wiener and Cromer (1967), in viewing the reading process, make an important distinction between the beginning and mature reader. This distinction is articulated as follows:

> The failure to distinguish between acquisition and accomplished reading in definitions partially accounts for the confusion about the relationship between identification and comprehension. In the acquisition of reading skill, identification may be a necessary antecedent to comprehension... But identification, which is essential in the acquisition phase for comprehension, may be irrelevant for the skilled reader who already has meaning associated with the visual forms and who may go directly from the written forms to the meaning without identification: that is, without an intermediary "verbal-auditory" transformation. (p. 623)

Researchers differ in their description of the reading process. Based mainly on the works of Wiener and Cromer (1967), Neisser (1967), Goodman (1970, 1968, 1965), and F. Smith (1971), the following phases of direct interaction with visual input have been selected as representing major facets of the reading process. Psychological processes

such as memory, association, analysis, etc. are assumed to take place within these phases.

Discrimination

Although Wiener and Cromer correctly presuppose discrimination when they speak of identification this is not to imply that it is of small consequence, especially to the beginning reader. It would appear that the beginning reader is quite involved in discriminating the various letters in a word. That is, he must be able to immediately distinguish one letter from another and one sequence of letters from another sequence.

Neisser (1967) has examined two of the existing theories that explain identification, and specifically discrimination. Template matching, a theory that contends a letter would be recognized by comparing and noting compatibility with a stored model, is rejected by Neisser on both empirical and common sense grounds. The common sense view holds that letters are recognizable in a variety of positions, orientations, and styles. The theory is likewise refuted by a vast array of empirical evidence, much of it conducted by Neisser and his associates (Neisser, 1963(a)(b); Neisser and Weene, 1960; Selfridge and Neisser, 1960).

Feature analysis is offered as a viable alternative to the template matching theory. The basis of this notion is that each letter is distinguished by a set of distinctive features that would discriminate one particular letter from the other letters of the alphabet. Although Neisser recognized the potential of the feature analysis theory he did not attempt to specify the distinctive features of the letters.

Gibson and her associates at Cornell University have focused a great deal of attention on identifying both the existence of dis-

tinctive features and their nature (Gibson, 1965; Gibson, Pick, and Osser, 1962; Pick, 1966). While the findings do not indicate precisely the exact composition of the distinctive features for each letter, Gibson and her co-workers have laid a firm research base for their existence.

F. Smith, following Neisser (1967) and Gibson (1965), has adopted the position that distinctive features play a crucial role in letter identification. This assumption is carried a step further by applying many of the basic tenets of feature analysis to word identification (Smith and Holmes, 1971). Smith notes that the feature analytic system uses redundancy. Redundancy exists when information is available from more than one source (see Lott and Cronnell, 1968). By introducing this idea, Smith extended the basic work of Neisser and Gibson. The redundancy concept is compatible with another of Smith's notions concerning the reading process--the reduction of uncertainty. The main types of redundancy used in discrimination are featural and orthographic. The former refers to the distinctive characteristics of letters while the latter refers to the expected sequence of letters.

Word Identification

F. Smith (1971) has discussed three prevalent theories concerning word recognition which are whole-word identification, letter-by-letter identification, and identification by letter clusters. Recognizing that each of the theories appears to offer a plausible explanation for the process of word recognition, Smith exposed certain deficiencies in each. In summary, he commented as follows:

> Each approach...has inadequacies that are partly met by an opposing view, which would suggest that they are not mutually exclusive, and that no one of them has

> any real claim to be the closest representation of the truth (p. 127).

As an alternative to the three theories Smith forwarded an extension of the feature analytic theory in which the word distinguished was assigned to a category and identified or given a name. This identification or recognition could be immediate or mediated depending on the individual's previous familiarity with a word.

Comprehension: Semantic and Syntactic Cues

Comprehension is, perhaps, the most elusive part of the reading process since there are very few observable behaviors as to the degree and nature of the comprehension taking place. Today, many researchers agree that the reader's knowledge of the language (particularly his use of semantic and syntactic cues) plays an important part in his understanding of what is read (Goodman, 1970; Hochberg, 1970a,b,c; Levin and Kaplan, 1970).

Although the basic idea that the reader uses both semantic and syntactic cues is not entirely new (cf. Huey, 1908), recent research has focused extensively on this area. Results from research tend to indicate that both mature and beginning readers make use of such cues. Many questions remain to be answered as to how mature and beginning readers differ in their use of semantic and syntactic cues. An equally important question is how high and low reading achievers (at any level) differ in using these cues.

Those researchers who hold an information processing viewpoint of reading tend to emphasize the importance of using semantic and syntactic cues. For example, Goodman (1970) views reading as an active information processing activity with both semantic and syntactic cues

playing a vital role in the reading process. Goodman's (1970) statement as to the nature of the reading process is as follows:

> Reading is a selective process. It involves partial use of available minimal language cues selected from perceptual input on the basis of the reader's expectation. As this partial information is processed, tentative decisions are made to be confirmed, rejected, or refined as reading progresses. (p. 260)

This statement advocates the use of both semantic and syntactic cues. An earlier comment by Goodman (1965) was more direct in relating the importance of syntax. He wrote:

> Most words have lexical (or dictionary) meaning. However, it is the devices which signal the structural meaning that makes communication intelligible. (p. 291)

Although dealing basically with the mature reader, Neisser (1969, 1967) has contributed to the general theory that views the reader as an active hypothesizer (see also Levin and Kaplan, 1970). His analysis-by-synthesis proposal suggests that the reader is an active hypothesis tester who uses his linguistic knowledge to build a model of the print. This is an on-going process and the reader's hypotheses are continually being confirmed, denied, or revised.

Much of the work by Hochberg (1970a,b,c) supports the general theory of Neisser. Both researchers are vitally concerned with the role of pre-attentive processes. Hochberg cites evidence to the extent that, since the foves, the center of the eye, picks up only fine detail, the peripheral vision, along with the reader's expectations, guides the reading over the page (cf. Neisser, 1969). The fixations are guided by the reader's general linguistic knowledge. This is referred to as the "cognitive search guidance" (Hochberg and Brooks, 1970).

Smith (1971) distinguishes the importance of syntax to the beginning and fluent reader as follows:

> The more difficulty a reader has with reading, the more he relies on the visual information; this statement applies to both the fluent and the beginner. In each case, the cause of the difficulty is inability to make full use of syntactic and semantic redundancy, of nonvisual sources of information. (p. 221)

Later, Smith remarks:

> Syntax is a tool that the fluent reader uses to predict what the surface representation should be, and he needs only a minimum of cues to provide a confirmation of that prediction—provided he is able to make use of redundancy accurately. (p. 221)

In any investigation concerning language, it is useful to refer to Schlesinger's (1969, 1968) proposal that complete separation of semantics and syntax is practically impossible. This conclusion arose from his work, mainly with mature readers, concerning the relation of the eye-voice-span (EVS) to phrase units. His experiment required the subjects to report all the words they could remember once the text was removed. Results from the study showed that the readers typically pronounced words to both syntactic and semantic boundaries. Schlesinger contended that the distance the eyes are ahead of the voice (while reading aloud) represents a decoding unit.

Replicating part of the Schlesinger (1969) study, Levin and Kaplan (1970) found similar results with subjects from several age groups (grade two through adults). Their findings confirmed that the EVS tended to extend to a phrase boundary. It was also noted in that particular study the tendency was not related to the age of the reader except for the grade two pupils. Unfortunately, the special characteristics of the second grade children were not discussed.

Studies of Semantics

Reading educators have long recognized the importance of the

semantic element in comprehension. The dominance of word knowledge in comprehension is well documented in the literature (Dale, Razik, and Petty, 1971; Dale and Reichart, 1957). Contributing to our knowledge of the semantic element in comprehension are the factor analytic studies (Davis, 1968, 1944; Alaban, 1974; Langham, 1941) and the readability investigations (Yoakum, 1948; Gray and Leary, 1935; Dale and Tyler, 1934).

Substitution forms, the grammatical phenomena being examined in this study, do not convey a great deal of semantic information. Typically, one can only ascertain such basic features as number and gender in a substitution form. It was assumed in this study that the semantic information contained in a substitution form would not cause the reader difficulty. The topic under investigation was the relationship between substitution forms (anaphora) and their antecedents.

Studies of Syntax

The syntactic element in language has come into increasing importance in the past few years. Much of this interest arose with the emergence of the transformational-generative grammars. Some of the aspects investigated tend to show that the syntactic element is of vital importance in comprehension (see Hamilton and Deese, 1970).

In an early study of syntax, Gibbons (1941), though using a small sample of [illegible] examined there was a high relationship between understanding sentences and children's ability to see relationships between parts of a sentence (r = .89). Also, she noted a correlation of .72 between the ability to see relationships among parts of a sentence and total reading ability.

O'Donnell (1963), using a sample of high school students,

examined the relationship between grammatical knowledge and reading comprehension. After statistically deleting the effect of vocabulary, O'Donnell noted two trends. First he observed a low, positive relationship between reading comprehension and knowledge of English structure as measured by his instrument. Second, he noted a high, negative correlation between reading comprehension and knowledge of traditional English grammar. Since the statistical relationships were low, O'Donnell did not argue for teaching formal grammatical structure in order to aid reading comprehension. Although the general findings of the O'Donnell investigation are important, it must be remembered that he used mature readers in his sample and results may not be applicable to normal children in earlier grades.

An important study by Nurss (1967) attempted to determine whether syntactic structure contributed to comprehension difficulty in reading. The results of her investigation are relevant to this study since the sample consisted of 108 second grade pupils. Notable conclusions are as follows:

> Vocabulary contributes the largest amount to the variability in reading difficulty at the beginning reading level. Syntactic structure affected reading difficulty when measured by oral reading error; but did not have a measurable effect when comprehension was measured by a picture comprehension test. (p. 87)

Nurss realized that the nature of her comprehension task was not totally satisfactory. Her "stories" consisted of only one sentence each (there were thirty-six in all) and comprehension was measured by the children pointing to the picture (there were three choices) that correctly depicted the "story". As Nurss stated, "Syntactic structure, undoubtably, plays a larger role in determining comprehension difficulty of passages than it does in determining comprehension difficulty of sentences (p. 88)."

The preceding studies have focused basically on the general problem of syntax and its relation to reading comprehension. Other studies have examined more specific syntactical elements of language. Although most readability formulas emphasize word counts, many have used some form of syntactic measurement, namely, sentence length (Spache, 1953; Flesch, 1943; Gray and Leary, 1935). Recently, MacGinitie and Tretiak (1969) have demonstrated that mean sentence length is a factor in readability.

Robertson (1966) showed that connectives, considered by many researchers to be merely structure words, could cause comprehension problems for some children. Using a sample of fourth, fifth, and sixth graders, she obtained significant correlations between understanding of connectives, as measured by a specially designed test, and sex, mental age, and abilities in listening, reading, and written language. Support is found in her study for Ruddell's (1965) conclusion that high frequency oral language patterns are easier to read than oral language patterns of low frequency. Robertson commented, "The investigation indicated that the language features of the printed page which are rare in children's oral language may be those which often characterize the most difficult text for children to read (p. v)."

Various researchers have examined the role ambiguity plays in oral language comprehension (Carey, Mehler, and Bever, 1970; Mackay and Bever, 1967) but Little (1972) and Chai (1967) investigated the problem in a reading context. While the focus of the Little study, conducted with a sample of elementary school children, was to examine the concept of ambiguity as a whole, certain sentences contained substitute forms that contributed to this ambiguity. These sentences were assigned dif-

ficulty ratings by Little (as were all sentences). The results showed a wide range of difficulty attributed to these sentences suggesting that substitute forms alone do not appreciably affect the comprehension of a sentence.

A study devised by Chai (1967) used pronouns with ambiguous antecedents. The sample consisted of adults, eighth, seventh, and fifth grade students. The purpose of the investigation was to discover "...the parameters that allow the resolution of an ambiguous pronominal referent ... (p. 3)." Chai found that while the eighth graders (and above) could normally resolve the ambiguities by choosing the appropriate referent, the fifth graders were generally unable to accomplish this task.

As stated previously, transformational-generative grammar has contributed a new dimension to language studies. Early investigations typically used oral language as the communication vehicle and focused on showing that the number of transformations was a factor in speed of comprehension (Epstein, 1967; Gough, 1965; Miller, 1962). Recent research has largely contradicted this early contention (Watt, 1970; Wearing, 1970; Greenough and Semmel, 1969).

Fagan (1969) was the first researcher to examine extensively the role of transformations in reading comprehension at the elementary school level. By use of the "cloze" procedure and specially constructed passages that had been analyzed for the various transformations used in the sentences, Fagan obtained significant correlations between these transformations and sex, grade, reading achievement, mental ability, and socio-economic status. Certain types of transformations, mainly embeddings and deletions, were found to correlate more highly with a difficult sentence or passage than transformations of other types. In

relation to the controversy concerning derivational complexity, Fagan offered the following analysis from his study:

> Although this study was not designed to test the validity of the Derivational Theory of Complexity, findings showed that the number of transformations per sentence did not influence the difficulty of a sentence or passage. When the number of steps or subrules within a transformation was considered, however, the results were, al most controversial. (p. vi)

Fagan compiled a list of the fifteen easiest and fifteen most difficult transformations for the three grades (fourth, fifth, and sixth) studied. The simple pronoun transformation (he, she, they, etc.) was found to be the fourth easiest transformation, however, the genitive pronoun transformation (his, her, their, etc.) ranked eighth most difficult among the fifteen. This suggests that one cannot make generalized statements about the difficulty of substitution forms independently of their functions.

Three comprehension studies (Lesgold, 1974; Bormuth, Manning, Carr, and Pearson, 1970; Jenkinson, 1957) specifically explored the reader's comprehension of substitute forms. Jenkinson's (1957) study, which dealt with the types of clues high school students use in performing cloze tests, examined substitution in a peripheral manner. Jenkinson was interested in all types of clues, however, she indicated that accurate location of referents was one of the syntactic clues used by her subjects.

The Bormuth et al. (1970) investigation was specific in studying substitution forms. A major focus of this research was to investigate children's understanding of anaphoric relationships. Anaphoric relationships occur when a substitute form is used in place of, or refers to a word, group of words, sentence, or topic. The term 'antecedent' is

usually applied to the word, group of words, sentence, or topic that the anaphora replaces or refers to. Fourteen anaphoric structures were used in this investigation which included 240 fourth grade students. The structures were ranked according to the percentage of subjects correctly answering questions that tested each anaphoric relationship. Personal pronouns ranked as the least comprehended category with only 64.5 per cent of the students correctly responding.

The difficulty ordering of the Bormuth et al. (1970) study, especially personal pronouns, was recently challenged by Lesgold (1974). Lesgold's main contention focused on the lack of semantic control in the earlier investigation. Replicating part of the Bormuth et al. work, with a total sample of eighty children from the third and fourth grades, Lesgold used fourteen anaphoric structures, nine of which were identical to those used in the Bormuth et al. study. Of interest to this study was the finding of 91.7 per cent comprehension for the personal pronoun category. This high level of comprehension is greatly different from the finding of Bormuth et al.. Lesgold contends that the explanation for this difference lies in uncontrolled semantic factors (in the Bormuth et al. work).

In order to arrive at a valid interpretation of the investigations reviewed one must observe the unit of communication used in a given study. Many of the studies adopted the sentence as the unit to be read or orally comprehended by the subjects. In addition to the rise in popularity of transformational-generative grammars, which obviously has contributed to the use of the sentence, the sentence appears to offer other advantages. Latham (1973) reasoned that the sentence, "...seemed to exhibit a kind of closure which allows it to be investi-

gated in relative, if not complete independence (p. 43)."

Most reading material, however, is not presented in single, isolated sentences but in a text of at least several sentences structured around a topic. Thus, research which relies on the sentence as the main unit of language may be limited in its application to children's performance as they read material longer than the sentence--usually termed "discourse".

Carroll's (1971) insightful critique of studies of semantics and syntax also has implications for the use of the sentence as the unit of language for analysis. Carroll's criticisms of research on semantics and syntax are:

> a. Typically, the subjects are normal, reasonably well educated native speakers of English.
>
> b. Typically, the sentences presented to the subjects are quite ordinary sentences using high- and medium-frequency words; they are presented as self-contained, isolated sentences; if a number are presented, they are unrelated in content.
>
> c. Sentences are ordinarily presented in the absence of any context with which they might otherwise be accompanied.
>
> d. Sentences are presented for immediate understanding or immediate recall, only very rarely for recognition or recall after a considerable time period.
>
> e. Motivation of subjects is typically high, at the level one would expect in an experiment where subjects are paid volunteers who are alert and eager to please the experimenter. (pp. 47-48)

It is the writer's contention that the child's behavior in reading a sentence may differ from his behavior in reading a paragraph or longer unit (i.e., discourse). Transformational-generative grammar has used the sentence as its unit of analysis. No viable theory of discourse has yet been forwarded. However, available information

concerning discourse is given in the next section.

Characteristics of Discourse

Many of the skills-focused definitions of reading implied elements of discourse without ever formalizing them. For example, the skills of "organizing ideas" (Betts, 1956), "finding and understanding thought relationships" (Niles, 1963), and "drawing conclusions" (McKee, 1948) suggest elements of discourse. The parameters of discourse, however, were not defined.

Most of the recent work in discourse analysis has come from structural linguistics, mainly from the study of tagmemics (Becker, 1965; Pike, 1964). Additional analysis has been forwarded by Christensen (1965) and Hasan (1968). Koen, Becker, and Young (1969) have argued that the paragraph possesses a psychological reality. Following the work of Becker (1965), the investigators proposed that written discourse contains three operating systems which are composed of lexical, grammatical, and rhetorical elements. The lexical system is characterized by "lexical equivalence chains" which employ such devices as word repetition, synonomity, metaphor, paraphrasing, and relative and personal pronouns. The grammatical system is characterized by patterns of formal markers (e.g., the continuation of a plural subject or predicate). The rhetorical system "...consists of patterns or sequences of functional slots, each of which may be filled by one or more sentences (p. 491)." (see also, Christensen, 1965)

Hasan (1968) discussed the elements that contribute to cohesion in written discourse. She feels that cohesive ties may be grammatical, lexical, or phonological. Lexical cohesion is seen in the use of near-

synonyms while phonological cohesion is evidenced in poetry. Grammatical categories of cohesion include reference, substitution, ellipsis, and conjunction.

Wardhaugh (1969) feels that such elements as pronominal sequences, tense and aspect change, sequencing words (first, then, however), deictics (this, that), and determiners (a, the) all contribute to the cohesion of verbal discourse.

Topicality, the organization of a passage around a theme, has been proposed by Mosberg and Shima (1969) as a characteristic of discourse. They further define topicality as how tightly a passage is structured around the subject matter. Anaphora analysis is proposed by Mosberg and Shima as one method of measuring topicality. The authors speculated that as the distance between the anaphora and original concept increase, the structuring around the concept word would be more difficult. The notion of distance between anaphora and antecedent was tested in this study.

Although many schemes for analyzing language have used sentence-based units (e.g., the T-unit (Hunt, 1965)), a recent study by Hanf (1972) was based on a scheme for segmenting language into "cognitive units". This analytical scheme was devised to examine discourse units in language.

A Theory of Reading

The reading process consists of psychological, physiological, and linguistic variables. Although the total reading process must be described in an interdisciplinary manner, the focus of this study, awareness of the antecedent/anaphora relationship, relates primarily to psycholinguistic aspects. Although one attempts to study a certain aspect

of the reading process in some isolation, other variables are undoubtably interacting.

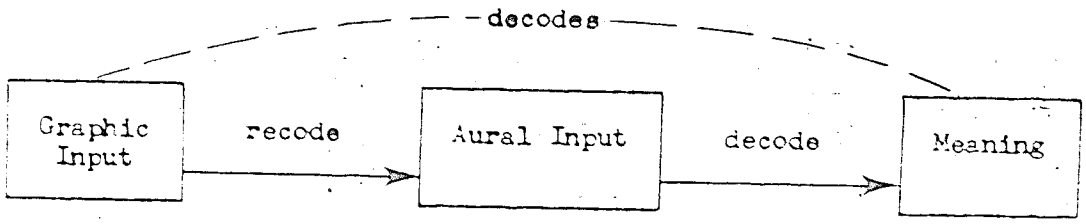
Those phases of the reading process against which it is necessary to understand substitution are those previously reviewed, that is, discrimination, identification, and comprehension (including both semantic and syntactic factors). Goodman's (1970, 1968) models of reading may be used to describe both the oral and silent reading performance of the beginning reader and provide a framework for this study.

Since the reading of the present study was silent in nature the focus will be on Goodman's model of silent reading. This model is reproduced in Figure 2.1.

FIGURE 2.1

AN ADAPTION OF GOODMAN'S 1970 MODEL

TO ILLUSTRATE EARLY SILENT READING



The model depicted in Figure 2.1 suggests that the reader must first recode the graphic input to aural input, and then decode the meaning as he would aural language input in listening. Goodman, however, does not adequately explain what happens in the recoding and decoding stages. The writer believes that in order for reading to result in meaning at the end of decoding, the reader must discriminate the graphic features, identify words, and use the semantic and syntactic cues of his language.

The writer is assuming that the subjects of this study possessed adequate discrimination skills and consequently these were not tested. Word identification ability was assessed by means of a specially designed test (see Chapter 5). The use of semantic and syntactic cues was the focus of the study. More specifically, the study investigated how the beginning reader understands the antecedent/anaphora relationship in written discourse. Since the antecedent/anaphora relationship represents a dualism, the investigator proposed to examine both facets. Thus, in one specially designed instrument, the subjects were required to supply the substitute form while the subjects had to identify the antecedent in the second instrument (see Chapter 5 for a description of these instruments).

There is a great deal of speculation, supported with some evidence, that certain aspects of oral language are related to similar aspects in written language. For example, Ruddell (1963) believes that oral language patterns which are most common in the child's language are the ones most easily comprehended in written language. The aspect of the oral/written language debate examined in this study is the relationship between oral language production of certain anaphora and the comprehension of the antecedent/anaphora relationship in written language.

The next two chapters will review the literature on (a) substitution forms as an aspect of language and as a possible factor relating to reading comprehension, and (b) oral language development as it relates to reading.

CHAPTER 3

RELATED LITERATURE: LINGUISTIC SUBSTITUTION AND PRONOMINAL REFERENCE

The previous chapter reviewed studies which have indicated a number of grammatical elements which influence reading comprehension. One of these elements is pronominal reference which is a form of substitution. Since it was the purpose of this study to investigate this facet in more detail as it relates to language and to reading comprehension, a review of the literature concerning substitution as an aspect of language is necessary.

Since reading is a language based activity it is reasonable to determine how linguists have treated the particular facet of language being investigated, in this instance, substitution. Specifically, one would wish to determine how substitution has been defined, what forms are attributed to it, and how it functions in the general schema of language as a whole.

There is no agreement among linguists as to the meaning of the term substitution. Early linguists did not normally use the term. Instead, they classified most substitute forms under the heading of pronouns. Later, more refined terminology was used, but in a manner that is often confusing to the reader. For example, Bloomfield (1933) treated substitution as a general phenomenon and included anaphora as a subcategory, while Hasan (1968) felt that substitution was merely one type of construction that contributes to grammatical cohesion.

Linguists have attempted to describe substitutes by form and function. This review will consider some of the major attempts in this

endeavor. H. B. Allen (1964) presented four major movements in the study of English grammar. These movements are identified as "traditional", "historical", "descriptive", and "generative". One must remember that although these movements are somewhat comparable to chronological periods, there is a great deal of overlapping. Also, certain linguists, who would normally be placed in one category, tend to espouse ideas that fit into other categories. An example of this is Z. Harris, who would be classified in the Allen outline as "descriptive", yet, many of his ideas concerning grammar writing greatly influenced the generative movement.

Allen's movement periods will be used as a framework for discussion. Although the system devised by Allen does have limitations, such as those noted above, it does present a method for grouping certain linguists whose ideas of grammar tend to have certain similarities. Major figures within each movement will be discussed and the focus will be on the individual's method of describing substitution with special emphasis on definition, form, and function. Certain works are more relevant to this review than others and no attempt will be made to treat all movements equally.

Traditional Grammar

Although this period extended from the earliest English grammars through the eighteenth century, there were certain characteristics which typified the era. Grammarians attempted to use the formulations of Latin grammars in describing English. Also, the grammars tended to be prescriptive in nature and assumed a static or ideal language. Typically, normal changes that languages tend to undergo were simply ignored.

In spite of the detractions in the methods of these early scholars, certain of their ideas are consistent with current linguistic thought. First, the grammarians did not hesitate to appeal to semantics in their formulations. Second, as Thomas (1963) notes, "the traditionalists intuitively perceive an organic relationship between certain kinds of constructions...(p. 7)."

Priestly, Ward, and Murray. Representative of the grammarians of the traditional era are Joseph Priestly, William Ward, and Lindley Murray. Joseph Priestly's work, Rudiments of English Grammar (1761), was one of the early comprehensive grammars. Hartung (1956) considers this grammar of importance because Priestly took into account general usage in his descriptions of language. This was in spite of the fact that prescriptive grammars were prevalent during this time.

A comprehensive survey of grammar entitled An Essay on Grammar (1765) by William Ward was considered by Nist (1966) to be the first complete handbook of grammar in English. Much of the book was devoted to the correct use of grammatical forms (e.g., the correct use of lie and lay was thoroughly discussed).

A third major work of the traditional period was Lindley Murray's book English Grammar (1795). This treatment of grammar showed little change from the work of previous scholars but the Grammar was the most popular and frequently printed during the nineteenth century so it is worth considering.

The traditionalists' definition of pronouns was narrow in that they typically described their substituting only for a noun or substantive. Priestly (1761) wrote, "Pronouns are words that are used as substitutes for nouns, to prevent the too frequent and tiresome repetition

of them...(p. 8)." The notion of 'avoiding repetition', which might be considered a philosophical "why" of pronouns, was typical of the linguists of this and earlier eras (Michael, 1970). Although somewhat more elaborate, the definitions of Ward and Murray did not differ greatly from that of Priestly.

In describing pronouns Murray used six classes while Ward noted five and Priestly only four. When possible, all the grammarians used a latin model for declining the pronouns. The adherence to the latin model, which used case structure, produced some unusual listings of English pronouns (e.g., Priestly's personal pronouns contains the vocative case with the form O me). The notion of case structure for personal pronouns, however, is used by modern structural linguists in their descriptions of English. Also, several recent psycholinguistic experiments have been conducted where the dependent variable was the subjects' ability to comprehend, imitate, or produce pronouns whose only distinguishing feature was case (e.g., Hatch, 1970: Chai, 1967).

Lindley Murray's description of English substitutes contained the largest number of classes. They were: personal, possessive, relative, interrogative, definite, and distributive. The latter two classes were considered by neither Priestly nor Ward. As with Priestly and Ward, Murray devised elaborate form classes although he did tend to describe the grammatical function of a form if it occurred in more than one class. For example, the form his was included in both personal and possessive pronoun classes. For the form his to qualify as a possessive, it had to be prefixed to a substantive (e.g., his book). If the form stood alone it was categorized as a personal pronoun--possessive case (e.g., The book is his.). This type of classification was typical of

an early effort to obtain functional distinctions of pronouns. Thus, as was typical of this era, similar forms were distinguished by function. In summary the definitions these grammarians formulated for pronouns were narrow in scope in that they focused only on the replacement of a noun or substantive. Generally they were concerned with elaborate form classes and devoted scant attention to the important problem of function. Notable insights into the functions of pronouns were often buried in footnotes (e.g., the observation that the referent could follow the pronoun). This was probably due to the fact that the phenomenon could not be explained in the existing framework and the grammarian did not wish to complicate his classification system with exceptions.

Historical Grammars

The historical grammarians based their analyses of language on the diachronic aspects of the target language and related foreign languages. By chronicling the historical changes that languages undergo they attempted to account for certain irregularities that occur, as well as discovering possible reasons for these irregularities. The idea of language families was developed during this period and many of the similarities that relate certain languages were described. The rigid prescriptive grammars were basically abandoned and more attention was given to the language as it was actually used by the speakers. Needless to say, there was no distinct break between the traditional and historical periods and many of the ideas of the former were evident in the grammars of the latter period.

Sweet. Henry Sweet's work, A New English Grammar, Logical and Historical (1891), was typical of the grammars of the period. Sweet's

analyses show that he was aware of the elusive nature of pronouns. A large number of divisions and sub-divisions were used in an attempt to refine his classification scheme of substitute forms.

Sweet posited three notions concerning the general characteristics of pronouns that are important. First, he noted that pronouns carried little or no independent information and relied mainly on their referent for meaning. Second, a pronoun could substitute for both single nouns or groups of nouns. The notion that pronouns could substitute for more than a single noun was an advancement over the ideas of the earlier grammarians. Finally, Sweet noted the grammatical phenomenon of postcedents and gave examples of how they functioned (cf., Ward, 1765, who alluded to the existence of postcedents but did not describe them).

Jespersen. Otto Jespersen, the Danish linguist, is considered a dominant figure in the historical era as described by Allen. His major work, A Modern English Grammar on Historical Principles (1914) and the more concise, Essentials of English Grammar (1933) contain valuable treatments of pronouns. Jespersen followed earlier definitions of substitutes by stating they replaced or referred to another word or words in a sentence.

The standard treatment of pronouns at that time was not completely satisfying to Jespersen. An alternative classification scheme was devised based on expanded form classes. Jespersen felt that the grammarian could better close the gap between form and function with these expanded classes. Sweet had noted earlier there was a great amount of cross-classification involved in pronouns. Jespersen, with his extended form classes, was better able to avoid this overlap and to discuss the function in terms of its form class members. These classes,

and an example of each, are as follows:

A. Pronouns of definite indications:

1. Pronouns of contextual indication. (Personal pronouns)
2. Pronouns of pointing. (This, that, yonder, thus, so)
3. The definite article. (The)
4. The pronoun of identity. (Same)
5. The pronoun of similarity. (Such)
6. The pronouns of complexity. (Relative pronouns)

B. Pronouns of indefinite indication:

1. The pronoun of indefinite unity. (One)
2. The indefinite article. (An, a)
3. The pronoun of difference. (Other)
4. The pronoun of discretion. (Certain)
5. The pronoun of unspecified quantity. (Some)
6. The pronouns of indifference. (Any, either)
7. Indefinite pronouns requesting a solution (Interrogative pronouns)

C. Pronouns of totality:

1. Positive. (All, both, every, each)
2. Negative. (No, none, neither)

As previously mentioned, Jespersen extended his observations beyond that of the pronoun serving only a referential or substitute function. He noted that in a construction with do so, a verb that was previously mentioned was replaced or referred to. Jespersen only made passing comment to this construction and did not develop the idea, however, this observation represented a step in enlarging the domain of substitute forms in general.

The grammarians of the historical period expanded the definition of substitutes that had been formulated by the scholars of the traditional era. This expansion focused on the fact that a substitute could refer to or substitute for units of language larger than the word. In addition, the traditional form classes were greatly expanded. This enabled these linguists to better account for the functions of the various form classes. In the descriptions of these grammarians greater stress was placed on a more functional account of language, especially in terms of substitutes.

Descriptive or Structural Grammars

Although this period is dominated by the work of Bloomfield (1933), it is necessary to mention the contributions of two other outstanding linguists to the era. These linguists, Sapir and Boaz, did not produce specific grammars of English that could be referred to for their descriptions of substitutes, although many of their general insights into language preceded the more famous work of Bloomfield. It appears that the general contributions of Sapir (1921), along with those of his mentor, Boaz, laid the groundwork for the period described here as the structural era.

Bloomfield. Leonard Bloomfield, whose major work Language (1933) is considered a classic, attempted to introduce more scientific rigor into the study of language. Bloomfield denied the mental processes as a valid part of linguistic inquiry and only attempted to study observable data. The goal of the structural linguist thus became completely involved with describing the language as it existed.

The general term "substitution" was used by Bloomfield to

describe what most linguists had previously defined as pronouns or pronominals. A substitute was defined as "...a linguistic form or grammatical feature which, under certain conventional circumstances, replaces any one of a class of linguistic items (p. 247)." Bloomfield felt that each substitute held to a grammatically definable domain.

Substitution was delineated by the introduction of the term "anaphora". Anaphora was defined as follows:

> To a large extent, some substitution-types are characterized further, by the circumstances that the form for which substitution is made, has occurred in recent speech. Thus, when we say "Ask the policeman, and he will tell you" that substantive "he" means, among other things, that the singular male substantive expression which is replaced by "he", has been recently uttered. A substitute which implies this, is an "anaphoric" or "dependent" substitute, and the recently-uttered replaced form is the antecedent. (p. 249)

Bloomfield, as with the earlier linguists Boaz and Sapir, did not emphasize large form classes. Substitution was considered to be a grammatical arrangement and thus, defined by function. He did note some of the usual form attributes of substitutes, e.g., their inflected nature, their being short words, etc.. Of greater interest are some of his insights into the nature of anaphora. For example, Bloomfield noted the existence of the so-called "zero-anaphora" where a noun is deleted (e.g., I like fresh milk better than sour).

The basic notion of verbal substitutes as first noted by Jespersen was expanded. In addition to the now accepted do form Bloomfield included have, will, shall, can, must, and may as verbal substitutes.

Other Structural Linguists. The work of Hockett (1958), Fries (1952), Hill (1958), and R. Allen (1961) further increased understanding of the function of substitute forms. Some notable insights by

these linguists into the function of substitutes are: (a) the notion that the referent of a substitute may be extralinguistic (Hockett, 1958), and (b) that pronouns may replace nominal constructions not merely nouns (Allen, 1961).

Harris. In Z. Harris one discovers a figure similar to Boaz and Sapir. The similarity lies not in their linguistic tenets but in the fact that all served as transcenders of two eras. Just as the insights of Boaz and Sapir laid the groundwork for the structuralists, Harris served as the forerunner of the transformationalists. Prideaux (1971) noted the lack of credit given to Harris by many transformationalists, in spite of the fact that many of his formulations and observations served as a foundation for later work (e.g., the idea of transformations and kernel sentences are but two of his conceptions).

Harris attempted to devise a more formal method of describing language. The prime vehicles used by Harris were "co-occurrence" and "transformations". The formal definition of co-occurrence was posited as follows:

> For classes K, L in a construction c, the K co-occurrence of a particular member L_i of L is the set of members of K which occur with L_i in c. (p. 392)

Harris posited the idea of the pro-form in his work, a term that has been adopted by the transformationalists. Included under the aegis of this term were: pronouns, wh-pro forms (who, which, what, etc.), pro-V forms (do, can, will, etc.), pro-A (his, that), pro-S (this, that, it, so), and pro-N-pair.

A formal description of co-occurrence relationships was forwarded by Harris. This formal description accounted for what Harris called 'bound' pro-forms and 'indeterminately bound' pro-forms. The

former referred to pro-forms for which an antecedent could be determined and the latter to pro-forms for which one could not definitely identify the antecedent. Although the formal description offered by Harris was complex it offered a powerful method of capturing functional relationships without resorting to the more rigid and less rewarding frame filling of Fries.

Crymes and Hasan. Two other linguists are mentioned at this point. Although both Crymes (1968) and Hasan (1968) have published recently, they are essentially structuralists. Their books are important in that both devoted their entire work to the problem of substitution.

Crymes' work is set in a tagmemic framework which was first proposed by Pike (1954, 1955, 1960). Basically, tagmemics is a slot-and-filler type of grammar.* Elson and Pickett (1962) define the tagmeme as "...the correlation of a grammatical function of slot and a class of mutually substitutable items occurring in that slot (p. 57)."

In defining a substitute, Crymes offered the following:

> a SUBSTITUTE is a closed-list item which designates not a real-world referent but a member of a positioned class or subclass of constructions or words which it can, under conventional circumstances, replace... (p. 31)

Substitutes were discussed from three aspects: predicate slot, nominals, and modifers. Within each of these areas Crymes attempted to set up a hierarchy. Copious examples of forms that fill given slots were offered and discussed in terms of the hierarchy. Since Crymes has probably done the most thorough review of literature to date in this area, she was able to present a large number of substitute form classes (with the possible exception of semantic substitution as posited

* It is beyond the scope of this review to pursue the intricacies of tagmemic analysis.

by Menzel (1970)).

Hasan (1968) also based her research on substitution in a structural framework which basically followed the proposals of Halliday. The total effort of the analysis centered on an attempt to describe the factors that contribute to grammatical cohesion. Cohesion was defined as "...the relation between, not within, sentences...(p. 18)." Hasan's work is especially valuable in the context of this study in that it attempted to describe cohesion factors in a textual situation. Hasan defined text as "...any piece of language, spoken or written, of whatever length, that does form an integrated whole (p. 1)."

In her attempt to describe certain cohesive factors Hasan makes use of the terms 'anaphora' and 'cataphora'. Anaphora indicates a referring back in the text and cataphora a referring forward in the text. Hasan also makes use of the term 'exophora', meaning, to refer to the situation in order to interpret the referent (cf. Hockett, 1958).

Cohesion is discussed under four main headings: reference, substitution, ellipsis, and conjunction. Subcategories of reference include pronominals, demonstratives, and comparatives. Items are considered to have the property of reference if they refer to other words in the text and depend on them for interpretation. In this category are many of the words traditionally referred to as personal and possessive pronouns. However, Hasan used categories only as a convenience. Her main concern was to describe the function of words and how they contribute to cohesiveness in a text.

A second major category, substitution, is differentiated from reference in the following manner:

The distinction between substitution and reference

> is that substitution is more a purely verbal relation, a relation between linguistic items such as words or phrases as such, whereas reference involves the semantic interpretation. (p. 82)

Substitution was further divided into nominal substitution (which contained such members as one, same, so, and not), and verbal substitution (which contained only the word do).

The work of Hasan offers a concise system for analyzing elements that contribute to cohesion. Because of its straightforward nature, it is readily adaptable to experimental studies (e.g., Hawkins, 1969, used Hasan's categories in his experiment).

Obviously, there were many different orientations and approaches in describing grammar during the structural or descriptive era. From the literature one can observe the ever-expanding realization of the complexity involved in describing various substitution processes. Notable insights included the establishment of the so-called "zero-anaphora" (Bloomfield, 1933) or ellipsis (Hasan, 1968), the expanded domain of substitutes (e.g., pro-V and pro-S forms (Harris, 1955)), the appeal to extra-linguistic knowledge in determining antecedents (Hockett, 1958; Hasan, 1968), and the formalization of terms to describe the process of forward and backward pronominalization (anaphora and cataphora (Hasan, 1968)).

Generative Grammar

It is appropriate to partition generative grammar into several subdivisions since the field has changed drastically since the initial publication of Chomsky's Syntactic Structures (1957). Even incorporating the refinements put forth in Chomsky's later work, namely, Aspects of the Theory of Syntax (1965), would not expose the diverse thinking in

the field today. Indeed, for the layman, keeping abreast of changes in generative theory is quite difficult. However, using Chomsky's Syntactic Structures as a useful beginning point, the contributions of generative grammarians in describing language will be examined.

In Chomsky's early writing, a tripartite grammar was adopted which contained a "phrase structure", "a transformational component", and "morphophonemics". All sentences of English or any other language were considered to be either "kernels" or developed from kernels. Thus, it was proposed by Chomsky, following the suggestion of Z. Harris (1955), that from a single sentence such as The boy is eating an apple, one could derive such sentences as:

a. Is the boy eating an apple?

b. An apple is being eaten by the boy.

c. The boy isn't eating an apple.

d. What is the boy eating?

e. Who is eating an apple?

Of course, this list of derived sentences could be further expanded.

Later refinements in generative grammar by Lees (1960), Katz and Fodor (1963), and Katz and Postal (1964) were followed by the publication of Chomsky's second major treatise, Aspects of the Theory of Syntax (1965), in which a rearrangement of relationships in the various components was postulated. The basic concept of kernel sentences was abandoned and the notion of deep structure was introduced. Also, transformations now were asserted, following Katz and Postal (1964), to be meaning preserving whereas in earlier works transformations had the power to change meaning. Although Chomsky originally proposed four major types of elementary operations, his new proposal contained only

three—adjunction, substitution, and deletion.

Pronominalization in a Generative Framework. Lees and Klima (1963) presented one of the early comprehensive discussions of pronominalization within a generative framework. Their attempt at handling pronominalization concentrated on the transformational component. However, the transformational rules they devised proved inadequate to handle several classes of sentences (e.g., backward pronominalization). Major attempts to revise the pronominalization transformation were conducted by Langacker (1969) and Ross (1967). Postal (1969; 1971; 1972) noted there was still a vast array of sentences which could not be accounted for by existing formulations (mainly transformations).

Postal decided the answer to the problem lay in devising constraints on the grammar (Postal's Cross-over Principle). Although his final attempt at formulating the principle is somewhat vague, one can basically state that Postal was concerned with stopping the movement of one NP over another with which it is coreferential during the transformational cycle. Lakoff (1968) also attempted to handle pronominalization through general constraints on the grammar. In addition, he proposed that certain pronouns (definite pronouns) would have to be introduced in the deep structure. Finally, Lakoff proposed integers, marking NPs at the deep structure level. This proposal differed from Ross (1967) in that Lakoff did not assume pronominalization to be cyclic.

All of the proposals forwarded failed to describe a class of sentences forwarded by Bach (1970), the so-called Bach-Peters Paradox. Bach noted a class of sentences (e.g., The man who shows he$_i$ deserves it$_j$ will get the prize he$_i$ deserves) that under transformational analysis of pronominalization would have to have an infinite deep structure. The

paradox is a paradox only if the NPs containing relative clauses (and not just the head NP) are relativized. Bach hinted that the solution to this problem was to allow pronouns to be introduced directly into the base.

The interpretive theory (Jackendoff, 1969; 1972), following Chomsky (1965) did allow for the direct insertion of pronouns into the base as lexical items. Jackendoff felt that coreference was purely a semantic concept which could not be accounted for in transformations.

This proposal, among others, has led to a stimulating debate within linguistic circles. There now appears to be two schools of thought, one generative and the other interpretive. First, there are those who advocate marking coreference in the base and stating pronoun-antecedent relationships in terms of constraints in the phrase marker (Postal, 1972, 1969; Harada, 1971; Lakoff, 1968). Next, there are those who advocate an interpretive theory of pronominalization (Bresan, 1971; Warburton and Prabhum, 1971; Jackendoff, 1969; Dougherty, 1968).

Within the transformational framework, linguists have forwarded proposals and counter-proposals to handle the problem of pronominalization. None of the proposals have been able to account for all the classes of sentences that contain pronominalized forms. Further, since the grammatical phenomenon of pronominalization is inter-sentential as well as intra-sentential, discourse pronominalization has remained largely unexplored by the transformationalist, since transformational grammar is typically viewed as a sentence grammar.

Transformationalists typically have not focused their attention on such pronoun features as case, number, and gender. Instead, these linguists have attempted to capture the total phenomenon of pronominaliza-

tion. While this is consistent with the proposals originally set out by Chomsky (1965), that is, capturing significant linguistic generalizations, this type of analysis does not lend itself to an experiment in written language discourse.

Summary

The problem of substitution has been dealt with by linguists from the traditional to the transformational eras, however, there does not appear to be a single, viable description of the phenomenon. Early attempts at describing substitution focused on elaborate form and function classes. Later, linguists demonstrated that substitution was a complex grammatical phenomenon that could encompass not only pronouns, but also pro-verb, pro-adjective, pro-adverb, and even pro-sentential forms.

Some general characteristics of the four major linguistic periods are summarized on the following page (see Figure 3.1). From the analysis of data on the linguistic treatment of substitution and pronominalization the following decisions relevant to this study were made.

1. The writer will adhere to the position that substitution is the general classification of the grammatical phenomenon under study and other terminology will fall within this framework. Thus, substitution included any construction that takes the place of, or refers to, either in speech or print, another grammatical construction. Subsumed under substitution are: anaphora, cataphora, exophora, proforms, etc. The classification scheme for this study was delimited

FIGURE 3.1

GENERAL CHARACTERISTICS OF PRONOUNS OVER FOUR LINGUISTIC PERIODS

PERIOD	FORM	FUNCTION	REPLACEMENT FORM
1. Traditional (grammatical prescription and assumption that language was static and inactive)	Elaborate form classes generally patterned on a Latin declension framework.	Little emphasis on function. In general a pronoun replaced a noun.	The form replaced was a noun or substantive.
2. Historical (a. focus on linguistic changes; b. attempt to avoid overlap of form and function)	A refining of classification scheme of forms.	Pronouns were considered as "mark words".	Nouns, substantives, subordinate clauses, entire principal clauses.
3. Descriptive (a. more scientific rigor in studying language b. substitution class expanded)	Less emphasis on forms.	a) Focus on function b) Form was assigned by function.	In addition to the replacement forms of the historical period, replacement forms could also be outside the written language situation.
4. Generative (a. formulation of a theory of language b. variation of opinion as to how pronouns were generated.	Little emphasis on form.	Focus on grammatical relationships.	Noun or substantive.

to pronominal, anaphoric constructions. Both forms and function were used in developing the anaphoric categories (see Appendix E for scheme).

2. Pronoun classes will be distinguished by form and function (see Appendix E).

3. The replacement form will be a noun or two conjoint nouns (Sam and Mary).

4. The replacement form will precede the substitution form (pronoun). That is, the replacement form will be an antecedent.

CHAPTER 4

PRONOMINAL SUBSTITUTION IN WRITTEN AND ORAL LANGUAGE AND ITS RELATIONSHIP TO READING COMPREHENSION

While only two studies (Bormuth et al., 1970; Lesgold, 1974) have looked directly at the problems caused by certain substitution forms in reading at the elementary school level, many researchers have included elements of substitution in their work. Elements of substitution have been found in readability investigations and comprehension studies (in both oral and written language). The following sections will review this work.

Readability Studies

Readability studies have some significance in relation to substitution and the comprehension of substitution forms. Some of the readability studies, and the formulas that were derived from these investigations, contain an element of substitution, namely, personal pronouns and personal reference.

Dale and Tyler (1934) were the first researchers to directly include a measure of substitution in their formula. The number of personal pronouns was one of twenty-five factors they correlated with the criterion measure. The criterion used was seventy-four selections from which the subjects were asked to choose the best and poorest conclusion from among five possibilities. This provided an ordering in terms of difficulty (Klare, 1963). However, in the final analysis this number of personal pronouns was not considered a sufficiently discriminating factor. Therefore, it was not included in the final formula.

Gray and Leary (1935) attempted a comprehensive study of the factors involved in making a book difficult or easy to read. From an analysis of all the various factors initially considered, the following five were eventually used in devising the actual readability formula:

a. Number of personal pronouns
b. Number of different hard words
c. Average sentence length, in words
d. Percentage of different words
e. Number of prepositional phrases

The number of personal pronouns was not evaluated as an extremely important element although it was one of significant factors chosen from a list of forty-four. Its weight in the equation of readability was .00912, the lowest value given of any of the five factors. Later formulas (e.g., Kesler, 1941), which were based on the original Gray and Leary investigation, tended to disregard the pronoun factor since it appeared to have little influence in the formula.

The average sentence length in words, the number of affixes, and the number of personal references were considered by Flesch (1943) to be important factors in determining readability. The weight given to the personal reference factor was .0659, the lowest of the three variables. According to Flesch, the material could be rated on an easy/difficult scale by the number of personal pronouns. It is important to note that pronouns in this study were equated with ease of reading. Nineteen or more personal references per 100 words meant "very easy" material while two or less indicated "very difficult". Flesch devised other categories between these extremes. His criteria for personal references was as follows:

> All first-, second-, and third-person pronouns except the neuter pronouns it, its, itself, and the pronouns they, them, their, theirs, themselves, if referring to

> things rather than people. However, count he, him, his and she, her, hers always, even where these words refer to animals or inanimate objects. (p. 57)

Flesch did not offer a rationale for his classification scheme. Later, Flesch (1948) divided his formula into two distinct units. His first, reading ease, only took into account the number of syllables per 100 words and average number of words per sentence. In the second, the human interest formula, Flesch retained the personal word count and added a factor entitled "personal sentences".

The introduction of the "cloze" technique (Taylor, 1953) led to many new studies in readability. Two of these studies investigated the systematic deletion of given parts of speech from the text. Normally, every nth word, usually the fifth, is deleted from the passage. Louthan (1965), using a sample of 236 seventh-grade pupils, investigated the effects of systematic deletion on comprehension. Comprehension was measured by asking questions immediately after the subject had read the passage. Louthan defined his classification scheme for pronouns as follows:

> Type seven was a deletion of substantive uses of pronouns, in which syntax indicate that the word is a complete marker for a nominal unit designated earlier in the passage. This class also includes expletive uses such as "<u>there</u> was a crooked man..." (p. 297)

His conclusion as to the effects of deleted pronouns was stated, "If... pronoun substantives (Type seven) are deleted, there is no appreciable difference between the performances on tests following the cloze materials and those following unmutilated passages (p. 297)."

Coleman (1971) used the cloze procedure to determine which word classes contributed most significantly to complexity in written language. Using a modified version of Fries' (1952) grammatical classification

system to test a large number of word classes, Coleman found a correlation coefficient of .58 between comprehensibility and number of pronouns (cf., Gray and Leary (1935) who found a correlation of .476). Coleman concurred with Miller's (1951) explanation that pronouns refer to people, and "...people are better at reading about other people than about anything else (p. 35)." Flesch would obviously agree with this analysis. Coleman felt Miller's idea might be part of the answer but added that "it is also because pronouns are a form of repetition (p. 172)." Coleman, therefore, associated pronouns with ease of reading.

In summary, the evidence from the readability studies indicates that personal pronouns do not contribute to a lack of comprehension in written language. However, none of the investigations took into account possible factors that may interfere with understanding of the antecedent/anaphora relationship (e.g., distance between antecedent and anaphora). Also, these studies typically used a sample of mature readers and the results may not be generalizable to younger readers.

Studies that Directly Investigated the Problem of Substitution in Written Language

C. Harris (1948), in investigating the problem of literary comprehension, recognized several aspects of substitution that could prove troublesome. Among them were the problems of ellipsis, metaphor, idiom, and figurative language. In addition, Harris perceived the antecedent/anaphora relationship as an area of potential difficulty in comprehension.

The problem of finding antecedents was likened to that of a foreign language student coping with a new language. He related this

situation as follows:

> The foreign-language student, it would appear, is striving to develop from the unfamiliar context another context that he can read or comprehend; he is attempting to substitute a set of meaningful symbols for a set of meaningless ones. (p. 283)

Harris went on to point out that readers of English sometimes face this same problem. He commented, "They face it when they have to "dig out" just which person is meant by "he" or what thing is meant by "it" (p. 283)."

Harris felt that the further a referent was located from its pronoun the more difficult the thought of the passage would be to follow. A special set of passages was devised to test his hypothesis. The sample consisted of 100 men who had been recently discharged from military service. Seven items were used to test the subjects' knowledge of the antecedent/anaphora (pronoun) relationship. Intercorrelations showed these items to be heavily loaded with factors one and two (both measures of word knowledge). Later, Harris, on the basis of his first experiment and a second replication, decided the variance could be explained in terms of one factor--word knowledge (cf. Davis, 1944).

A major study by Bormuth, Carr, Manning, and Pearson (1970) directly investigated children's ability to understand substitute forms. The basis of this investigation was derived from Bormuth's book, On the Theory of Achievement Test Items (1970). Bormuth observed that a great deal of information is "...signaled by the relationships between sentences (p. 50)." One of the particular intersentence elements examined by Bormuth was anaphora. He defined anaphora as follows:

> Anaphora are pro structures called anaphoric expressions which refer back to (or substitute for) some structure called an antecedent or postcedent which appears in a different clause. (p. 50)

There are four major types of anaphora as described by Bormuth (see

Figure 4.1). Although Bormuth realized that anaphorization occurs in large discourse units, he narrowed his examples to consecutive sentences.

The Bormuth et al. (1970) experiment was designed so that, from a total sample of 240 fourth grade children, sixty students would respond to each question type for a given structure. This was necessary due to the large number of structures being tested. In addition to the fourteen structures used in testing anaphora, the experiment also investigated basic sentence comprehension and intersentence syntax comprehension.

The category of personal pronouns proved to be the most difficult for the sample. This is contrary to the finding regarding personal pronouns in the readability studies. Due to the predominance of personal pronouns in children's basal readers (as opposed to other anaphoric categories), thi result indicates an area of concern.

The Bormuth et al. study incorporated the sentences or sentence pairs in a paragraph of four or five sentences. While there was no direct control of the distance between the antecedent and anaphora one can infer they were in close proximity to each other. It would not be surprising if further study, using anaphora that was more widely separated from its antecedent, demonstrated an even greater problem in understanding. Even a cursory examination of basal readers shows that a great deal of anaphora is widely separated from the antecedents. The ability of children to understand substitute forms that are widely separated is unknown. However, Bormuth et al. (1970) have taken a first step past the type of test that merely incorporates the sentence. This first step toward discourse analysis has broken new ground in evaluating children's understanding of grammatical structures.

A partial replication of the Bormuth et al. (1970) experiment

FIGURE 4.1

BORMUTH'S CLASSIFICATION OF ANAPHORA

Pro Words

a. N Joe picked up the bat. (He) is a good hitter.
b. V Joe eats ice cream by the gallon. Jim (does) too.
c. Aj Muscular boys showed up. (This kind) plays well.
d Av Joe sat under a tree. The air was cool (there).
e. S Joe may be able to play. The team hopes (so).

Deleted Modifiers

a. N The boy with the hat will pitch. (This boy) is good.
b. V The boys practiced hard. (This) helped.
c. Aj Joe was extremely fast. (This fast) a player was needed.
d. Av Joe went somewhat reluctantly.* (This) was unusual.

*reluctance

Ellipsis

a. N The boys wanted to eat a quart of ice c... ...ere wasn't (that much...) left, so they had to be sa...ed with what they got.
b. V Although I don't see Bill much these days, she seems to (...).
c. Aj The stands were green. The fence was (...) too.
d. Av We all agreed to meet at nine o'clock. The boys were on time. The girls were not (...).

Semantic Substitute

a. N Jim gathered the bats and balls. He put (this equipment) away.
b. V The boys played very hard. (Their effort) won the game.
c. Aj The boys were able and eager. (These qualities) helped.
d. Av John sat on the roof. (This perch) helped him see better.
e. S Joe hurt his hand. (This accident) worried the team.

N = nominal V = verbal Aj = adjectival Av = adverbial
S = sentential

was performed by Lesgold (1974). Lesgold challenged the findings of the earlier study in relation to the order of difficulty assigned to the various anaphoric structures. Of paramount interest to the present investigation was the finding of 91.7 per cent comprehension in the category of personal pronouns. This compared with the Bormuth et al. finding of 64.5 per cent comprehension. As an explanation for this difference Lesgold contended that the Bormuth et al. study may not have controlled for semantic factors. Also, Lesgold felt that "...an anaphora cannot be comprehended unless both it and its antecedent are simultaneously in operating (short-term) memory (p. 334)." One can assume that Lesgold would associate distance between antecedent and anaphora as an interfering factor in understanding this relationship. The writer feels that Lesgold's contention concerning uncontrolled semantic factors is valid. However, one must challenge the hypothesis of the necessity for both the anaphora and antecedent operating in short-term memory for comprehension to occur. This explanation cannot account for anaphora that is widely separated from its antecedent.

Lesgold (1974) pointed out that differences existed between the Bormuth et al. (1970) investigation and his own study. They were:

> (a) the present study used oral, constructed responses while Bormuth et al. used written, multiple-choice responses; (b) the present study explicitly controlled the number of semantically plausible potential answers in each passage; (c) the location of the target structure in the passage was counterbalanced in the present study; and (d) Bormuth et al. used 420 fourth-grade subjects while the present study used 80 subjects from the third and fourth grades. (p. 334)

Two differences that Lesgold did not mention were (a) the Bormuth et al. study used the Dale-Chall formula to control readability while the Lesgold did not; and (b) neither study controlled for word recognition

ability of the students.

Summary

Substitute forms have been recognized as a factor in comprehension although the results of the studies are variable. The readability studies tend to associate substitute forms (at least personal pronouns) with ease of reading. Comprehension studies, which often investigated the phenomenon in a more direct manner, present differing views. The methodology used in the investigations may explain some of the differences reported. In addition to the conflict of whether substitutes represent an interfering factor in reading comprehension, two other aspects of substitution have been hinted at or directly raised. First, the effects of multiple antecedents is not known. Next, the effects of the distance between antecedent and anaphora has yet to be investigated. Both of these questions are addressed in this study.

Language Acquisition and Pronominal Substitution

Oral language ability appears to be related to success in reading (Athey, 1971; Waugh, 1971; Ruddell, 1970). The literature on language acquisition to be reviewed will focus on (a) the age(s) at which various substitution forms appear; (b) the possibility of a discernible developmental pattern connected with these substitution forms; and (c) evidence that children produce and comprehend substitute forms by the time they enter school.

Observational Studies

An early study by Davis (1937) described the language develop-

ment of twins compared with "other" children. The ages of the children observed were five and one-half, six and one-half, and nine and one half years. A definite developmental trend was found in the case of the second and third person pronouns. The results concerning the first person pronouns were inconclusive. In a further analysis of the data Davis noted the use of the third person masculine and feminine pronouns. A substantial difference in use was noted with masculine pronouns being dominant. This imbalance in usage was consistent for both male and female subjects. An explanation for these results can be found in the observational situation since Davis structured the situation around a 'cowboys and Indians' format. (See Kennedy (1970) for other considerations in child language study.)

Goodenough (1938), using a sample of 203 children enrolled in the nursery school and experimental kindergarten of the University of Minnesota, Institute of Child Welfare, attempted to observe self-awareness development of children through their use of personal pronouns. The language samples were obtained from two separate situations. The first observation took place with the child engaged in free play with his or her classmates while the second involved an adult observer who provided toys and picture books but avoided direct verbal contact. The children were observed within a month of the mid-point of their birthdays. A record of at least fifty consecutive responses was recorded.

Analysis focused on the appearance of a given pronoun group and the ratio of pronouns in relation to other pronoun groups and complete utterances. Since the study was exploring social development many of the linguistic groupings appear somewhat unusual in light of current linguistic descriptions (e.g., I, me, and myself represent one independent

group). This type of grouping was consistent with Goodenough's notion that first person pronouns are a sign of social activity and awareness.

The percentages of pronouns used by the subjects did not seem to be related to sex and age. Certain individuals and categories did exhibit change. Many of Goodenough's conclusions centered upon the techniques used in the study rather than on the actual effects of pronouns on social development. In relation to the situational variable she commented, "...the immediate situation exercises an important effect upon the form and content of speech...(p. 344)." The limitations of merely using numerical counts to judge language development was another key observation. She remarked, "Developmental changes are qualitative as well as quantitative...(p. 344)." Finally, in a crucial observation that is often credited to recent scholars, she wrote of the inadequacy of comparing the child's speech with an adult model. Goodenough stated, "...too much attention has been paid to the type of grammatical analysis used by adults and too little to the developmental changes in conceptual thinking and social drives that lie in back of verbal expression (p. 344)."

A study of language development by Young (1942) included a sample of seventy-four preschool children ranging in age from thirty to sixty-five months. The sample was subdivided by sex and socioeconomic status. Speech protocols were obtained while the children were engaged in normal activities such as indoor and outdoor play. Few details were given as to how the linguistic groups were devised other than a statement alluding to the use of Jespersen's Essentials of English Grammar.

The investigation revealed that pronouns accounted for approximately twenty-eight per cent of all comprehensible words spoken. In relation to development, personal pronoun proportions did not change

significantly between the ages of thirty and sixty five months. Possessive pronouns showed a marked decrease with age. No major sex differences were noted for the sexes or socioeconomic groups (cf. Hawkins who did find socioeconomic differences in reference to pronoun production).

A diary study was reported by Weir (1962) of her son Anthony who was twenty eight to thirty months old at the time of the investigation. This creative study is intriguing in that the recordings were made while the child was alone and engaged in pre-sleep monologues.

Weir found the use of some pronouns more pronounced than others. For example, it was the most frequently observed form, yet there appeared to be restrictions in the production of this form. Although an intricate analysis of contextual constraints was not undertaken by Weir, several were generally noted. Of prime importance was the fact that the child used "...the correct syntactic slots as compared to standard English, but the category of gender has not yet been learned....(p. 74)." Another observation was the absence of the reflexive pronoun (other than one instance of himself). Anthony typically used the form I told me instead of I told myself.

An analysis of why the child does not possess a firm grasp of pronominals was offered by Weir. She reasoned as follows:

> It is certainly not surprising to find pronominal substitution with the child's class of personalized pronouns so poorly learned in that it involves viewing the speech-event not only from the point of the addresser and addressee, but also from the point of view of the person or thing discussed. (p. 74)

In order to determine if a transformational grammar (based on N. Chomsky's Syntactic Structures) was capable of "...describing children's grammar as a self-contained system and indicating developmental trends (p. 408).", Menyuk (1963) undertook the task of analyzing the language

of forty-eight nursery and forty-eight first grade children. The sample was somewhat atypical in respect to I.Q. (mean I.Q. equalled 140.4 for the nursery school children and 134.0 for the first grade children). All children with physical disabilities and speech defects were eliminated from the study. The mean age equalled three years, eight months for the nursery school children and six years, five months for those in the first grade.

Speech was elicited in three separate situations. In addition, a classroom language sample was taken for cross-validation purposes. Two separate grammars were written by Menyuk. The first was a grammar of adult speech and the second a specially constructed child grammar which was used to describe the language of the children in her sample.

While all the children used the pronominalization transformation (e.g., Blacky saw Tippy and he was mad), only sixteen nursery and twenty-six first grade children demonstrated use of the pronominalization transformation (e.g., There isn't any more). In examining transformations that were used by significantly less than 100 per cent of the first grade children, Menyuk found only fifty-four per cent using the pronominalization transformation ($p = .05$). No differences between the sexes were noted.

The investigation completed by the Harvard group using the now famous duo of Adam and Eve has become the basis of several papers (Brown et al., 1968; Brown and Bellugi-Klima, 1964; Brown and Fraser, 1963; to mention a few). Though basically a longitudinal observation study, there were elements of elicited imitation, grammar writing, and controlled comprehension. The study was initiated in 1962 with two children, Adam (twenty-seven months) and Eve (eighteen months). A third

child, Sarah (twenty-seven months) was later added to the study. At the end of the observation period the children were forty-eight, twenty eight, and forty-eight months old respectively. The difference in ages is due to the fact that Eve was only observed for ten months while Adam and Sarah were studied for a period of twenty months (Brown, 1973). Transcripts of the children's speech were made every month during the investigation. A minimum of two hours was recorded although occasionally up to six hours of speech was taped.

In an analysis of this data Brown and Bellugi-Klima (1964) described the pronominal form appearing in conjunction with the noun phrase it replaced (e.g., I miss it cowboy boot). According to the authors, this process represents a logical sequence of development. They state:

> One can here see the equivalence in the process of establishment. First the substitute is produced and then, as if in explication, the form or forms that will eventually be replaced by the substitute. Adam spoke out his pronoun antecedents as chronological consequents. (p. 318)

A slightly similar situation was reported by Bloom (1970) in her observational study. The children in the Bloom study were younger than Adam and Eve (Kathryn and Eric were nineteen months, one week old and Gia was twenty-one months old at the commencement of the study). The exact instance of the pronominal form co-occuring with noun phrase was not recorded, however, age differences probably account for this. Bloom did note the demonstrative pronouns this and that's being used in a systematic, yet non-adult manner. The observation was recorded as follows:

> Kathryn's use of the demonstrative pronouns "this" and "that's" appears to indicate a particular instance of

> the referent she named and was not strictly deictic in the sense of pointing out the referent directly--for the sake of pointing it out. In every instance in which she used the construction, the referent named was manifest and Kathryn either looked at it or picked it up, or, in the case of events, carried out the particular action she named... (pp. 43-44)

Perhaps this action could be the non-linguistic counterpart or antecedent to the phenomenon described by Brown and Bellugi-Klima (1964).

In relation to the children's early use of proforms, Bloom observed the following:

> The names for 'things' and 'actions' are important, but he learns that he can get by without them and begins to use proforms such as "this", "this one", "do", "it", "here" quite early. (p. 168)

This statement may be accurate but one must bear in mind Bloom's earlier observation in relation to demonstrative pronouns. In analyzing the utterances of her subjects it appears that the appropriate non-linguistic environment was often affecting use of proforms. For example, in the utterance It won't fit, the child was attempting to place a block on a train.

Huxley (1970) reported an observational study that specifically examined the development of personal pronouns in two children (Katriona and Douglas) from the ages of two years, four months to three years, nine months. Using a classification system taken from the writings of several linguists (Fillmore, 1968; Postal, 1966; Householder, 1955; Lyons, 1968) Huxley attempted to chart the development of pronouns in the two children. Major categories explored were as follows:

> Egocentric pronouns in subject position (I, possessives)
> Egocentric pronoun in non subject position (me)
> Non egocentric pronoun, participating in discourse (you)
> Anaphoric, non demonstrative animate pronouns (he, she, her, it_{np})

Anaphoric inanimate pronoun (it$_{np}$)
Plural pronouns (we, you (pl.)
Anaphoric, non demonstrative plural (they)

Several observations are pertinent to this review. First, the developmental pattern of pronouns tends to be somewhat erratic. For example, a form may appear quite early and then not reappear for some time. Also, it was noted that Katriona's grasp of the pronominal system was more sophisticated than that demonstrated by Douglas although his general linguistic development was generally more advanced. This led Huxley to speculate that "...his greater difficulty over pronouns was due to the fact that his linguistic structure as a whole was more complex than Katriona's, whose structures are generally easier, with fewer variables to manipulate (p. 159)." A final observation was that certain categories appear to be more easily grasped by the children than others, that is, they are acquired early and tend to be used in a manner that resembles the adult model. For example, the egocentric pronoun in non subject position posed no problem for either child yet plural pronouns (e.g., we/us) tended to cause difficulty. Huxley felt that this may be due to the more complicated set of semantic features associated with the plural pronouns (cf., Waryas, 1973).

Imitation and Comprehension Studies

Using a sample of forty children from kindergarten to fourth grade, C. Chomsky (1969) investigated the acquisition of four syntactic constructions including pronominalization. She used three other grammatical constructions in her experiment and found errors more closely related to age (for pronominalization) than to the constructions being tested (ask/tell, promise, and easy/eager to see). The cut-off age for

pronominalization appeared to be five years, six months, that is, children seemed to fail the pronominalization tasks before this age. As an explanation for this regularity in acquisition Chomsky wrote:

> ...the principles of pronominalization appear to be acquired by the majority of children at about the same age. Our conjecture about the reasons underlying this difference is that the rules for pronominal reference are considerably more basic and more general than the rules underlying our other constructions. (p. 109)

Although Chomsky's study is valuable one might question the conclusions since only the pronominal form he was used in the test. There is an implication here that all pronominal forms that apply to this transformation would be acquired equally (cf. Berko (1960) who may also have generalized from inadequate data). In spite of the fact that only the pronominal form he was used, this study does present evidence that certain grammatical structures are not mastered until the primary grades (cf. Olds, 1968).

The pronoun case preference of young children was explored by Hatch (1970). The sample consisted of forty pre-kindergarten children (mean age: five years, one month) and twenty pre-second grade children (mean age: seven years). An oral language elicitation format, using a reversible S-V-O pattern into which pronouns (I, me, she, her, he, him, we, us, they, them) were randomly inserted, was employed to determine if pronoun case was a confusing element.

Statistically significant results prompted Hatch to make the following conclusion:

> Pronoun case, then, seems to be an area of some confusion for the child who is beginning a reading program as well as for the second-grade child who has already been exposed to preprimers and primers which contain only the grammatical pronoun case. (p. 42)

According to Lesgold (1972b), children's short term memory prevents them from processing anaphoric structures (pronouns) in the same manner as adults. From the results of an earlier study (1972a), using adult subjects and the medium of print, Lesgold argued that:

> ...pronoun reference, and perhaps anaphoric reference in general, between two propositions results in those propositions being processed into a form in which their element is represented only once--jointly--for the two propositions. Further, when a common element of two propositions is not "flagged" in the sentence's surface structure form (e.g., with a pronoun), this joint representation is less likely. (1972b, p. 2)

Proceeding from this argument, Lesgold (1972b) attempted to investigate whether children, who had demonstrated the ability to comprehend pronouns, process sentences (containing these forms) in a manner similar to adults. Using subjects from grades three and four, he first ascertained whether the subjects demonstrated ability to comprehend the referent/anaphora relationship using the Bormuth et al (1970) technique. Satisfying this requirement of comprehension, he then used the probe technique to determine whether the sentences were processed in an adult manner. An examination of the performance of the children indicated that the processing was not the same, specifically, "...the short term memory of limitations of the children reduced their ability to complete anaphora comprehension processing (1972b, p. 16)." It must be noted that this study used both the medium of print and oral language in that half of the subjects read the passages while the remainder both read and heard a tape recording of each passage. Lesgold (personal communication) reported no significant difference in the performance of the subjects in relation to presentation mode.

A study by Maratsos (1973) lends support to the evidence already compiled that the comprehension of pronouns is developmental

in nature. One hundred and six children aged three, four, and five years old were tested to evaluate the effect of stress on understanding pronominal co-reference. To demonstrate comprehension the children were asked to act out the sentence. A sample sentence that demonstrates the importance of stress in oral language (in given situations) is as follows:

John hit Harry, and then Sarah hit him.

The referent changed depending upon whether or not him is stressed. Although stress is not an important aspect of the receptive act of silent reading, it is important in oral language. The results of this investigation showed a definite developmental trend in terms of accurately portraying the sentences.

Oral Language and the Beginning Reader

Much of the research on the relationship of oral language and reading has attempted to show that children use the semantic and syntactic constraints in reading that are demonstrable in oral language production.

In observing the reading errors of 100 beginning readers, Clay (1968) found that seventy-two per cent of their oral reading errors occurred in equivalent morpheme class or morpheme-sequence class structure. This result and examination of the children's correction patterns led her to conclude that "...the young child's guesses at points of uncertainty in his reading tend to be dominated by his control over the syntax of his language (p. 437)."

Weber (1970) used a sample of first graders to investigate the use of grammatical context in oral reading. Two separate samples were

obtained for the study (N = twenty-one for group one; N = twenty-four for group two). From the results of this study Weber concluded the following:

> These analyses of oral reading errors have provided substantial evidence that beginning readers use their knowledge of grammar to narrow down the words that compete for a given sentence slot, just as they surely do in understanding speech. (p. 162)

An investigation of children's reading strategies by the use of sentence-matching and sentence-splitting tasks, by Francis (1972), indicated findings in agreement with Schlesinger (1968) that children tend to read for content. She also felt that errors tended to be corrected on the basis of semantic appropriateness as opposed to syntactic information (p. 119). The sample consisted of fifty children ranging in age from five years, nine months to seven years, three months (mean ages at the time of testing).

While the above noted studies tend to show that children do make use of syntactic and semantic constraints in both their oral language and oral reading, other studies have looked at the general relationship between oral language and reading (Dougere, 1970; Tatham, 1970; Ruddell, 1965).

Ruddell (1965) investigated the relationship between oral and written patterns of language structure and reading comprehension. A significant correlation was reported between reading achievement and performance on an investigator-constructed syntax test. Ruddell showed that a child had more success in reading when the language of the text corresponded to his own oral language patterns. This finding is somewhat controversial in that the patterns the child uses may merely reflect the generally simple patterns of the English language. As

Nurss (1967) has succinctly stated, "It is not clear whether these patterns are easier to read because the structures are more frequently used in children's language, or because they are less complex structures (p. 5)."

In extending Ruddell's research on oral language and reading comprehension Tatham (1970) found similar results. She concluded that children at both the grade two and grade four level were better able to comprehend passages that contained frequent oral language patterns, as opposed to infrequent patterns.

Bougere (1969), using a sample of sixty first grade pupils examined the predictive value of four different measures compared with reading achievement. She used the T-unit (Hunt, 1965), mean length of the T-units, the ratio of subordinate clauses to T-unit length, and the ratio of sentence-combining transformations to T-units as her measures of oral language. Oral language samples were gathered by an elicitation procedure. Bougere reported that the various measures of oral language competency were not highly related to reading achievement.

In addition to the studies previously mentioned, several often-quoted investigations tend to show a positive relationship between oral language ability and reading ability (O'Donnell, R., Griffin, W., and Norris, R., 1967; Loban, 1963; Strickland, 1962).

Summary

The evidence demonstrates that the acquisition of substitute forms is developmental in nature. This conclusion is, of course, subject to the caution that children will differ from each other in their individual development. Of special interest to this study is whether

or not children comprehend pronominal forms in oral language by school age. While the evidence is not overwhelming, the indications are that at least some aspects of pronominalization are not understood by some children (Hatch, 1970; C. Chomsky, 1969; Menyuk, 1969; Chall, 1967). Thus, a reasonable statement at this time would be that substitute forms are acquired over a period of time, the exact timetable for this acquisition is still to be determined, and the acquisition period probably extends (for some constructions) into the school years.

Several studies have been reviewed that indicate there is a relationship between oral language ability and reading comprehension ability. There have been no studies that directly examined the relationship between oral language production of pronouns and the complementing ability to comprehend such forms in silent reading.

CHAPTER 5

THE EXPERIMENTAL DESIGN

A design consisting of a 2X2 factorial was used in this study, the factors being reader level, and sex. The dependent variables were number of antecedents in a discourse, distance between antecedent and anaphora, and anaphoric category (category indicated the case of the anaphora--nominative, objective, and genitive).

This chapter will discuss the classification of the anaphora, selection of sample, standardized instruments, the analysis of the basal readers, construction of the test passages, a description of the investigator-designed instruments (a. Word Recognition Test; b. The Tests of Anaphoric Reference-Cloze Format (TAR-C); c. The Tests of Anaphoric Reference-Multiple Choice Format (TAR-MC)), oral language production, the procedures used in the administration and scoring of the instruments, and the treatment of the data.

Classification of the Anaphora

A decision was made to limit the study of substitution to pronouns and later, to anaphoric pronouns. In her discussion of grammatical co[illegible]on, [illegible]n (1968) described the anaphora/cataphora/exophora distinction (see Chapter 3 for a discussion of the terms). With the exception of a small experiment conducted by Schlesinger (1966), using adult subjects, cataphoric forms have not been investigated. The only study that specifically explored children's use of exophoric pronouns was that of Hawkins (1969) and this study was devised to examine SES differences in production rather than comprehension. While pronouns that are exophoric

and cataphoric in nature certainly deserve investigation, pronouns that are anaphoric in nature are more predominant.

The review of previous studies indicated that personal pronouns have been the object of two recent investigations with the results being contradictory (Bormuth et al., 1970; Lesgold, 1974). The initial decision to investigate personal pronouns that were anaphoric in nature was derived from the conflicting results of these studies. Although Bormuth et al. (1970) and Lesgold (1974) considered personal pronouns one anaphoric category there is evidence that certain personal pronoun types may be more difficult to understand (in terms of the antecedent/anaphora relationship) than others. The work of Fagan (1969) and Coleman (1971) indicate that the genitive case personal pronouns may represent a confusing factor in understanding the antecedent/anaphora relationship. Hatch (1970) presented evidence that some children at the grade two level confused case relationships in oral language. As a result of the findings of the above mentioned studies the category of anaphoric personal pronouns was subcategorized according to case relationships. In addition, other anaphoric categories taken from the investigations of Bormuth et al. (1970) and Lesgold (1974) were used in the anaphoric category classification scheme (see Appendix E).

Both Harris (1948) and Mosberg and Shima (1969) felt that distance between antecedent and anaphora would increase the difficulty in understanding this relationship. There have been no studies which have directly tested this variable. Thus, a decision was made to examine the effects of distance between antecedent and anaphora on the comprehension of this relationship.

Lesgold (1970b) has hinted that the addition of antecedents

would increase the difficulty in understanding the antecedent/anaphora relationship. While only Lesgold has offered any indication that this variable may be important in the comprehension of the antecedent/anaphora relationship, the investigator reasoned that this variable may be of importance due to the burden placed on memory, both in coding the antecedents and in recalling them.

This review of studies and the decisions that were made based on their results indicated direction for the investigation. However, a doubt could remain as to the importance of investigating only constructions that fit this rather narrow area, basically pronominals that are anaphoric in nature. Therefore it was decided to examine basal readers used in the teaching of reading. Two basal readers, which are currently used in Canadian schools, were examined in the screening (see this chapter for the analysis). The basal readers Magic and Make-believe (Thomas Nelson and Sons) and Stories Old and New (Copp-Clark Publishing Co.) were randomly selected from among those series currently being used in Canadian schools. The results of this analysis supported the focus indicated by the review of previous studies. The exact composition of the anaphoric categories will be discussed later in this chapter.

Selection of the Sample

The choice of students in their second year of school as the sample was determined from results of previous studies dealing directly or indirectly with anaphora, both in oral language and the media of print. There were indications that certain grammatical structures in general, and anaphoric structures in particular, are not understood properly by some school age children. Therefore, a decision was made to seek a

grade where the literature indicated a lack of oral language facility in the case of the selected oral language categories.

In a written language study, Chai (1967) found that sentences with ambiguous antecedents were comprehended by children in grade eight and above while children in grade five were generally unable to identify the correct antecedent in this type of sentence. Returning to the studies of Bormuth et al. (1970) and Loesgold (1974), conflicting evidence is presented as to the grade four child's ability to comprehend anaphoric structures. The results of these studies were particularly conflicting in terms of the anaphoric category entitled "personal pronouns". Fagan's (1969) investigation, using students drawn from grades four, five, and six indicated that the simple pronoun transformation is easily comprehended while the pronominalization transformation (genitive) represents a difficult aspect of language.

The results of studies in language acquisition indicate a developmental trend in relation to anaphora, however, the majority of studies have only considered the personal pronoun system. The research does indicate that certain oral language aspects of anaphora are not comprehended by some school age children (Hatch, 1970; C. Chomsky, 1969; Menyuk, 1969). Hatch (1970) presented the evidence that is most important to this study. She found that pronoun case is an area of confusion for some second grade children. Since the child at the grade two level is apparently still in the acquisition process, both in oral language and reading, this grade appeared to represent a viable area of focus. If the child is indeed still acquiring facility in manipulating anaphoric structures in oral language then this is an opportune moment to examine the relationship between oral language and reading ability. The choice

of students in their second year of schooling was also based on the fact that the study was conducted in the spring of the year and that a larger range of reading ability would be evident (as opposed to grade one).

The total population for this study consisted of students in their second year of school enrolled in the Edmonton Catholic School System during the months of April and May, 1973. The initial number selected was 180 children who were randomly selected from the total population made available. These children were enrolled in seven different schools. Seven children were eliminated from the group because a second language was spoken in the home. A decision had been made to select children from totally English-speaking environments. The children who were eliminated were identified by their homeroom teachers as being exposed to a language other than English. Typically, this exposure came from parents or grandparents living in the home, whose first language was a language other than English.

Two other measures were administered in order to eliminate other variables which may influence the results. It was decided that a child would have to score 2.0 or higher on the Gates-MacGinitie Reading Test (1965), Primary B which was administered by the classroom teachers in January of 1973 to all children in the second grade of the Edmonton Catholic School System. A decision was made to eliminate those children who did not score at least 2.0 or higher on the comprehension portion of the Gates-MacGinitie Reading Test. This resulted in the elimination of thirty children from the initial sample. Those children who scored 2.0 or higher on the comprehension section of the Gates-MacGinitie Reading Test were also given a word recognition test constructed especially for the study and described elsewhere in this chapter. Children who had

[illegible] pronouncing ten or more words were eliminated from the final [illegible] The word recognition test resulted in four more children being [illegible]. The goal of employing these two screening measures was t[illegible] that the children in the study would not be excessively low [illegible] art recognition which may interfere with their comprehension of the material read.

After the exclusion of the children who were exposed to two languages, the elimination of those who failed to achieve a score of 3.0 or higher on the comprehension section of the Gates-MacGinitie Reading Test (1965), Primary B, and the removal of those who missed more than ten words on the specially designed Word Recognition Test, 129 of the 180 children remained. These children were dichotomized on the basis of sex and reading achievement with 3.6 (in reading achievement) being the cut-off point. For the purpose of statistical analysis equal cells were [illegible]ed with fifty Low Readers and fifty High Readers in each cell. Further, each cell of Hi[illegible] Low Readers contained twenty-five girls and twenty-five boys. To b[illegible]ance the cells on the basis of sex a set of random numbers was used to eliminate twenty-nine of the final 129 children. The mean silent reading comprehension scores of the main sample are shown in Table 3.1.

In addition to the main sample a selected subsample was ran-domly selected for pa[illegible]ipation in an oral language production task. A total of forty-eight children were selected from the main sample of 100. Twelve children were selected from the boys who were High Readers, the girls who were High Readers, the boys who were Low Readers, and the girls who were Low Readers. The mean reading achievement scores of boys and girls differed by only one month. Since the sample was divided

TABLE 5.1

MEAN GRADE LEVEL SCORES, AND RANGE OF SCORES FOR THE TOTAL SAMPLE ON THE GATES-MACGINITIE READING TEST (1965), PRIMARY B, BY READER LEVEL AND SEX (N=100)

Gr.	Silent Reading Comprehension Group	Mean Grade Level Scores			Range of Scores
		Boys	Girls	Total	
2	High Readers	4.4	4.5	4.5	3.7 - 5.4
	Low Readers	2.8	2.9	2.9	2.1 - 3.6
	Total	3.6	3.7	3.7	2.1 - 5.4
	Range of Scores	2.3-5.4	2.1-5.4	2.1-5.4	

according to silent reading comprehension scores, a marked difference is evident between the means of the High and Low Readers. The difference of 1.6 years is the same for both the boys and girls.

The mean chronological ages of the sample are depicted in Table 5.2.

TABLE 5.2

MEAN CHRONOLOGICAL AGES IN MONTHS, BY READER LEVEL AND SEX (N=100)

Gr.	Silent Reading Comprehension Group	Age in Months		
		Boys	Girls	Total
2	High Readers	90.2	90.1	90.1
	Low Readers	90.4	89.7	90.1
	Total	90.3	89.9	

As shown in Table 5.2, the High and Low Reader groups are evenly matched

in mean chronological age. The mean age of the girls is four months younger than the mean age of the boys.

Standardized Instruments

Certain standardized tests were used in this study to screen the children and to establish independent variables. These measures are discussed in this section.

Gates-MacGinitie Reading Test

The Gates-MacGinitie Reading Test (1965), Primary B, Form 1 was used as a screening and classification instrument. Those children who scored below 2.0 on the comprehension section of this test were eliminated from the sample. The children who qualified for the final sample were assigned to High and Low Reader groups (the cut-off score was 3.6).

A reliability of .81 (Technical Manual, 1965) is reported for the test. Although Spache (In O. K. Buros (ed.), The Sixth Mental Measurement Yearbook (1965)) and Wantman (In O. K. Buros (ed.), The Sixth Mental Measurement Yearbook (1965)) have criticized certain aspects of the test, both concluded that it is useful for determining the level of competence for groups of pupils in reading.

Lorge-Thorndike Intelligence Test

The Lorge-Thorndike Intelligence Test (1957), Level 2 was administered to all subjects including those who were not included in the main sample. The inclusion of all subjects was to minimize the effects of being "left out" that might be experienced by children who

were not in the main sample. This test has received favorable reviews in the various Mental Measurement Yearbooks edited by O. K. Buros (e.g., Tittle, In Buros, 1972; Freeman, In Buros, 1959).

The odd-even reliability for this particular level of the Lorge-Thorndike Intelligence Test is low (.586), however, this can be accounted for since there was a systematic alternation of geometric and pictorial items in subtests 2 and 3. Reliability for this test (other levels) is typically high with correlations ranging from .882 to .940.

Table 5.3 presents the means and range of intelligence quotients obtained by the main sample on the Lorge-Thorndike Intelligence Test (1957), Level 2, Form 1, by reader level and sex.

TABLE 5.3

MEANS AND RANGE OF INTELLIGENCE QUOTIENTS,
BY READER LEVEL AND SEX (N=100)

Gr.	Silent Reading Comprehension Group	Intelligence Quotients			
		Boys	Girls	Total	Range
2	High Readers	113.88	116.12	115.02	097-132
	Low Readers	109.76	107.36	108.56	092-130
	Total	111.86	111.76	111.81	092-132
	Range	093-130	092-132	092-132	

While there is only a slight difference between the means of the boys and girls, a difference of 6.46 exists between the means of the High and Low Readers. As expected, the difference favors the High Reader group. It is interesting to note that while High Readers (girls) score higher than their male counterparts, the reverse is true in the

case of the Low Readers with boys' mean score being about two points higher than the girls.

The Detroit Tests of Learning Aptitude

The Detroit Tests of Learning Aptitude, Subtest 16 (1967) were used to test the children's visual memory span for letters.

It has been reported in various studies (e.g., Schlesinger, 1966) that the reader's eye voice span (EVS) roughly corresponds to a phrase unit. Because the distance factor in propositions is itself a form of memory measurement for semantic information, and since the readers must use visual cues to aid their prediction of meaning, the Detroit Test was chosen to investigate how children operate in this regard. In this test the child is shown a set of lower case letters on a card. Each set of letters is printed on a separate card and one second per letter is allotted for viewing. The child is then required to repeat, in exact order, the letters printed on the card. Scoring of the test was consistent with the directions in the Manual (1967), however, the raw scores were used instead of the mental age equivalents.

The mean scores and range of scores are given in Table 5.4. Table 5.4 reveals that High Readers score approximately two points higher on the visual memory test than the Low Readers. There is a nearly one point difference favoring the girls over the boys.

Analysis of the Basal Readers

The basal readers Magic and Make-believe (Thomas Nelson and Sons) and Stories Old and New (Copp-Clark Publishing Co.) were randomly selected from among those used in Canadian schools to determine the

TABLE 5.4

MEANS AND RANGE OF SCORES FOR VISUAL MEMORY FOR LETTERS ON THE DETROIT TESTS OF LEARNING APTITUDE, SUBTEST 16, BY READER LEVEL AND SEX (N=100)

Gr.	Silent Reading Comprehension Group	Mean Scores Boys	Girls	Total	Range
2	High Readers	14.72	15.89	15.30	10-24
	Low Readers	13.16	13.80	13.48	10-20
	Total	13.94	14.84	14.39	10-24
	Range	10-24	10-23	10-24	

incidence of the various anaphoric categories (see Appendix E for a description of the categories).

Although the classification system was already delimited due to considerations arising from the results of previous studies, several problems were encountered in analyzing the texts. The major concerns and the decisions that were made are as follows:

1. The analysis was delimited to include only anaphoric constructions. Certain sentences contained constructions that confused this apparent straightforward situation. An example of this problem is demonstrated by sentences (a) and (b).

    a. "I can't do it," said Mother Mouse.

    b. Mr. Rabbit looked into the pot. "I wish I had some carrots!" he said.

    In sentence (a), the word I is cataphoric in nature, that is, its referent follows rather than precedes. In sentence (b), the word I is again theoretically cataphoric in nature,

depending on the word he, which in turn depends on its antecedent Mr. Rabbit for interpretation. Yet, if the reader knew the general rules of writing, he would intuitively realize the relationship and that I had to be Mr. Rabbit since a new paragraph would be needed if someone else were speaking. If this situation was perceived, the word I and its antecedent (Mr. Rabbit) now represent an anaphoric relationship. The question is whether or not children in their second year of school would perceive this rather complex situation. While there is no direct evidence to indicate a decision, the investigator surmised that a great deal of written language sophistication would be needed on the part of the reader. Thus, such instances were considered cataphoric and not included in the incidence count. Other situations that were encountered were treated in a similar manner.

2. In children's literature in general, and in the basal readers in particular, it is not uncommon to note a typically inanimate object becoming animate. For example, one often discovers cars that talk etc.. Also, talking animals, although animate, are frequently encountered. In one story that was analyzed, a roller coaster car assumes the male singular pronoun (he) and converses with both children and certain (supposedly) inanimate objects (e.g., the ferris wheel) in an amusement park. Discussions with primary school teachers indicated that such adult anomalies pose few problems for children. Thus, a decision was made to

treat such normally inanimate objects as animate if they assumed such a role.

3. Expressions such as My, oh my were encountered in the texts. Since no referent exists for such forms they were not counted.

To insure consistency in the analysis of the basal readers, certain guidelines were established. Following Robertson (1966), the incidence count was taken from every twentieth page of the reader being analyzed. A decision was made to eliminate poetry and plays since special types of writing are involved in these genres. Also, a page had to contain at least fifty running words, not including titles, to be considered. If a page did not comply with the guidelines, the investigator proceeded until the necessary requirements were fulfilled. The analysis was continued from that page.

The results of the analysis are depicted in Table 5.5. Series A produced a total of 148 anaphora which fit the descriptive categories. This figure represented nine per cent of the total number of words on the pages analyzed. Category 1 (six per cent), Category 2 (one per cent), and Category 7 (one per cent) accounted for seven per cent while all other categories combined only totaled two per cent.

The thirteen categories analyzed in Series B produced a total of 217 anaphora. This total accounted for approximately eleven per cent of the words found on the pages analyzed. As in the case of Series A three categories accounted for a large proportion of this percentage (Category 1 - six per cent; Category 2 - one per cent; Category 7 - two per cent). The forms and functions of the three categories of highest incidence are as follows:

TABLE 5.5

DISTRIBUTION OF THE ANAPHORIC CATEGORIES

IN GRADE TWO BASAL READERS

Series	Category	Total Tokens
A*	1	81
	2	20
	3	6
	4	4
	5	0
	6	0
	7	24
	8	0
	9	3
	10	1
	11	4
	12	3
	13	4
	(Total)	146
B*	1	123
	2	30
	3	7
	4	8
	5	0
	6	0
	7	40
	8	0
	9	2
	10	2
	11	1
	12	1
	13	3
	(Total)	217

* Series A is Magic and Make-believe (Thomas Nelson and Sons)

* Series B is Stories Old and New (Copp-Clark Publishing Co.)

Category 1. This category contained the forms I, we, you, he, she, it, and they. These forms refer to or replace an animate noun or nouns. The forms function as the subject of a sentence.

Category 2. This category contained the forms me, us, you, her, it, and them. The forms refer to or replace an animate noun or nouns. The forms

function as direct objects, indirect objects, and objects of prepositions.

Category C. This category contained the forms my, mine, your, his, her, its, and their. The forms refer to or replace an animate noun or nouns. They form a function to indicate possession.

The author classified the words to be found in Appendix B

Word Recognition Test

The Dolch Basic Sight Word Test (1942) format was adapted for this test. In place of the words used in the Dolch Basic Sight Word Test (1942), the investigator substituted all the words that were used in the stories. A decision was made to exclude any subject who missed more than ten words on the test. Although Betts (1954) has suggested ninety-nine per cent accuracy in word recognition as the criterion for independent reading some reading specialists (Spache and Spache, 1973) feel this figure is arbitrarily high.

The criterion used in this study was quite high. To qualify for the final sample the children had to obtain a score of 370 or higher out of a total of 380 words. This means that a percentage score of ninety-seven or higher had to be achieved.

The test (Appendix B) was administered to all students in the original sample (N=180). Although this procedure added time to the data gathering procedure, the investigator felt it important that certain children did not experience a "left out feeling". The Dolch Basic Sight Word Test (1942) format presents the student with four separate words on a line. The administrator calls a word from each line and the subjects must circle, or in some manner indicate, the correct answer. This procedure is repeated until all the words are called.

TABLE [illegible]

MEANS AND RANGE OF SCORES ON THE WORD RECOGNITION TEST,
BY READER LEVEL AND SEX OF [illegible]

[illegible]	Reader Level (Comprehension Test)	Boys	Girls	Total	Range
[illegible]	High Readers	[illegible]	[illegible]	[illegible]	[illegible]
	Low Readers	[illegible]	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]	[illegible]
	Range	[illegible]	[illegible]	[illegible]	

The High Readers mean score on this test was approximately two points higher than that of the Low Readers. Sex superiority was nearly one point with the difference favoring the girls.

Construction of the Passages Used in the Study

Four stories were drawn from basal readers (Magic and Make-believe (Nelson and Sons), Friends Old and New (W. J. Gage), More Friends Old and New (W. J. Gage), and Stories Old and New (Copp-Clark)) and modified to reflect the variables under study. The stories were randomly chosen from those that contained either two or four characters. This was necessary since both the TAR-2 and TAR-MC, the tests that used the passages as the reading stimulus, used forms that contained either two or four characters. In addition to the 'number of characters' variable, which were reflected in the TAR as antecedents, the stories were modified to take into account the variables of anaphoric category and the distance factor. These variables and their inclusion in the passages will be discussed in this section.

In conjunction with the modification of the paragraphs several practical considerations had to be taken into account. These focused primarily on the age of the subjects in the sample (Mean age = 11 years 9.1 months). Such factors as attention span of the children, the [illegible] were readily noticed and were taken into account during the administration. The prime method of guiding instruction in this area was to talk to [illegible] grade teachers who had been noted as successful in this area by their principals and had at least three years of teaching experience. Decisions that resulted from the conversations were evaluated in the light of the study described elsewhere in this chapter.

Incidence of Anaphora

As seen in Table 4.1, the anaphoric interpretations were not evenly spread in actual numbers. In the Doyle-Clark series (Starting Out Now), Category 1 represented sixty-three per cent, Category 2 sixteen per cent, and Category 3 twenty-one per cent of the total of those selected for study. The percentages found in the Thomas Nelson series (Walk Tall Sidewalking) were: Category 1--sixty-five per cent; Category 2--sixteen per cent; Category 3--nineteen per cent.

Since it was virtually impossible to have the selected passages reflect the exact percentages encountered in the basal readers, a slightly arbitrary ratio of sixty (Category 1), twenty (Category 2), and twenty (Category 3) was utilized. These ratios permitted the investigation of the selected anaphoric categories in a format that was reasonably similar to that encountered in the basal readers. The use of the arbitrary ratio was necessary since one that reflected the categories in the passages

[illegible]

and Shima stated, "As the number of words between the anaphoric term and original concept increases, it would be expected that structuring around the original concept word would be more difficult (pp. 18-19)."

The use of "number of words" as the distance measure is attractive in that computation is quite simple. However, problems arise in using this measure. Weber (1970b) raised the question of how one should treat sequences such as call up--one word or two? Also, all of the classic problems encountered in readability research such as defining or classifying 'hard', 'easy', and 'common' words would be present if one attempted to use the "number of words" as the distance measure (see Klare, 1963; Chall, 1958).

Some of the difficulties inherent in using "number of words" might be solved by substituting the notion of morphemes, however, this appears only to create problems of a different nature. For example, difficulties could arise with irregular past tense forms. This problem can be demonstrated with the past tense of go and walk. While it may be obvious to count walked as two morphemes, the dilemma remains as to how one should treat went (see also, Cazden, 1972; Dale, 1972; Weber, 1970b; Slobin, 1967).

Since it was assumed that children process meaning as they read, a decision was made to use a semantic rather than a syntactic measure of distance. Hanf (1972) has recently developed a promising classification scheme for segmenting discourse into cognitive topics called propositions. She explicates this system as follows:

> Dividing the discourse into cognitive topics is segmenting the language into words or groups of words expressing a proposition (author's underlining), assertion or thought and containing a finite verb, implicitly or explicitly stated. (p. 175)

C. Chomsky (1973), in reviewing this study, felt the classification scheme was valid for the sample used in Hanf's investigation (ages of the children ranged from five to nine years), but cautioned against its use with older subjects. She felt it "...is unreliable whenever the speaker advances into more sophisticated transformations (p. 27)."

It was decided to adapt this classification scheme for determining the distance between antecedent and anaphora. Some modification was made to the Hanf guideline (see Appendix D). Basically, these modifications were made to eliminate certain inconsistencies that were perceived. For example, in the Hanf scheme, catenation (a string of verbs) is included as part of the verb phrase. Yet, in reference to conjunction, a predicate is implied, thus designating a proposition. Consider sentences (a) and (b).

a. The children ran and skipped and played.

b. The children saw a clown, and a tiger, and an acrobat.

Referring to the Hanf guideline, sentence (a) would contain only one proposition while sentence (b) would have three. It is contended that a more reasonable classification would be to imply a subject before the verbs in sentence (a).

The actual number of propositions between antecedent and anaphora (in the passages) ranged from zero to five. An arbitrary decision was made to create a dichotomy with zero to two propositions representing one category and three to five propositions representing the second. The distance factor was built into the passages in such a way that equal numbers of the zero to two proposition category and the three to five proposition category could be encountered in random fashion by the readers.

Other Modifications of the Passages

Since the passages originally were drawn from the appropriate basal reader levels for the grade two sample, it was not deemed necessary to apply other vocabulary controls.

A small modification of the passages was accomplished in the case of cataphora. As previously stated, this study was delimited to include only anaphoric structures. Thus, front shifting was necessary for some quotations. For example, in the sentence, "I think a storm is coming," said John., the speaker was front-shifted. The sentence then read, John said, "I think a storm is coming.".

Tests of Anaphoric Reference-Multiple Choice Format (TAR-MC)

The Tests of Anaphoric Reference-Multiple Choice Format (TAR-MC) were constructed using two of the specially designed passages (see Appendix A for the passages in combination with the multiple choice format). One of the passages (Hereafter known as Form 1) contained two antecedents and the other (Hereafter known as Form 2) contained four antecedents. As previously mentioned two characters were present in Form 1 so that both forms had four plausible answers for the tests.

The multiple choice format was constructed so that the subjects would be given the anaphora and their task was then to identify the antecedent for that particular anaphora. Each multiple choice question contained four possible responses. In the case of Form 1, the four choices included the two interacting characters who actually served as antecedents and two additional characters. These dummy elements provided plausible answers (previously mentioned) for this format.

On Form 2 of the TAR-MC, it was not necessary to introduce any additional story characters since there were already four antecedents.

In formulating the test directions it was decided to focus the children's attention directly on the anaphora. This decision was based on the age of the children used in the sample. Also, using this method, it was possible to eliminate any confusion on the part of the children as to which anaphora was focused upon in a given question.

To discourage "set" for the task, distractor questions were interspersed throughout the tests. These questions used the same format but focused upon some aspect of the discourse other than the antecedent/anaphora relationship.

Validity

While it is difficult to offer any type of statistical validity for the TAR-MC, Form 1 and 2, it is possible to argue for content validity. Since the test comprised the stories and the multiple choice questions, the content of both must be considered. The construction of the stories has already been discussed. The fact that the stories were taken from the appropriate basal readers, and the precautions of including only anaphoric categories, of representing proportionately the three main categories of anaphora found in the basal readers, of balancing the number and gender of characters involved, of arranging the distance between anaphora and antecedent in objective and systematic fashion, and of eliminating possible sources of confusion such as sex role stereotyping, would appear to indicate that the stories were valid for the intended purpose.

Each question constructed on the story contained the names of

characters represented in the story--only one of which was the correct answer within the test directions. The child's attention was focused on the anaphora in the text (through numbered lines) and directions were standard. In order that the child would not develop a set for pronouns, distractor questions on forms of language other than anaphora were included. Furthermore, the choice of the correct answer in all questions was randomized. Stories and questions were subjected to university faculty members for evaluation and comments and were tested in a pilot study before being administered to the study sample.

Reliability

Split-half reliabilities were computed for both Form 1 and Form 2 of the TAR-MC. The distractor questions were not included in the computation. The reliability coefficient for Form 1 was .67. Form 2 reliability was calculated to be .63. When corrected for length by the Spearman-Brown Prophecy Formula, these coefficients were respectively .80 and .77. These reliabilities appear satisfactory for the purposes of this study (Kelly, cited by Thorndike, 1951).

Administration

As previously mentioned, the subjects' attention was directly focused on the anaphora for a given question. On the recommendation of the second grade teachers who advised the investigator in the construction of the TAR, all the lines in the stories were numbered. This facilitated the location of the anaphora. Although this added an element of unnaturalness to the reading task it was felt that the children would have a very difficult time locating the anaphora if this was not done.

The numbering of the lines enabled the administrator of the test to direct the children to a particular anaphora on a given line. The entire sequence for testing is as follows:

a. The children were directed to read the entire story silently to themselves.

b. Upon completion of the story the children's attention was focused upon a particular anaphora in a given line.

c. The children would then choose the proper antecedent (from a list of four) for that particular anaphora.

d. This procedure would be repeated until all questions were completed.

Tests of Anaphoric Reference-Cloze Format (TAR-C)

While the TAR-MC required the subjects to identify the antecedent when their attention was directed to the anaphora, the Tests of Anaphoric Reference-Cloze Format (TAR-C) (see Appendix A) supplied the antecedent and the subject had to furnish the anaphora. In both instances an assumption is made that the subjects had to understand the entire relationship in order to complete the task successfully.

The cloze procedure in general has been used primarily in readability and comprehension studies (Bickley, Ellington, and Bickley, 1970; Hafner, 1966). Various deletion patterns are possible when using the cloze technique but the every nth word method is most common. The validity and reliability of this method has been the subject of a good deal of research (Bormuth, 1969, 1967, 1966, 1963; Greene, 1964; Ruddel, 1963; Weaver and Kingston, 1963; and numerous others). The particular pattern used in this study was that of selected deletion. Such a pattern has been used previously (Bradley, 1971; Coleman, 1971; Louthan, 1965).

Gallant (1965) used a sample of 273 pupils in grades one, two,

and three to determine if the cloze procedure was appropriate in terms of reliability and validity. Using the split-half technique, Gallant obtained correlations of between .90 and .97. The cloze scores were compared to standardized reading measures and tested for significance. The correlations ranged from .65 to .81 ($p = .01$). The conclusion of Gallant's investigation was that the cloze procedure is appropriate for the primary grades.

While the standard cloze technique dictates that every nth word of a discourse be removed the selected cloze procedure allows one to remove only selected items (e.g., mass count nouns, adverbs, prepositions, etc.). Typically, the items to be deleted are predetermined by the researcher. In this study the selected cloze procedure was not used as a general comprehension measure, rather, it was assumed that the subjects would have to understand the antecedent/anaphora relationship in order to supply the deleted words. The deleted elements in the cloze format were the anaphora built into the passages (e.g., he, I, you, etc.).

To discourage "set" for the task, additional words (not anaphora) were deleted from the passages. "Set" for the task occurs when the subjects' responses to a given question is unduly influenced by the answers to previous questions. In this instance, if only anaphora were deleted the subjects might make an educated guess as to the correct answer without actually knowing it. Thus, the deletion of other words (e.g., nouns, verbs, adjectives, etc.) would tend to negate the effects of "set" for the task. In addition to not deleting any other anaphora as distractors, care was taken not to eliminate any of the antecedents. The use of distractor items in combination with the selected anaphoric deletions provided a total of fifty blanks. This is consistent with

Bormuth's (1967) contention that fifty items are needed to insure validity. The instructions used in the administration were compatible with those suggested by Bormuth (1964).

Reliability

Although Gallant (1965) has established the suitability of the cloze procedure in general, no research has been reported indicating the appropriateness of the selected deletion pattern with a grade two sample. Thus, a decision was made to determine the instrument's reliability prior to its administration to the entire sample. Table 5.7 reports the test-retest reliabilities. The interval between the test and retest was a one week period. The decision to use this interval was made in consultation with a statistical advisor from the Department of Educational Research, University of Alberta.

TABLE 5.7

TAR-C TEST-RETEST RELIABILITY (N=30)

Test	Reliability
TAR-C (Form 1)	.936
TAR-C (Form 2)	.841

The reliability coefficients obtained for the TAR-C indicate that the tests are quite reliable.

Oral Language Production

A subsample of forty-eight children was randomly selected from the main sample of 100 to participate in a language production task.

Twelve students were selected from each group within the main sample, that is, male High and Low Readers and female High and Low Readers. Oral language production was chosen (over imitation or comprehension) on the basis of findings by Fraser, Bellugi, and Brown (1963). Replications of this classic study have supported the main findings that production implies the ability of imitation, and perhaps more important, comprehension (Nurss and Day, 1971; Lovell and Dixon, 1967; Turner and Rommetveit, 1967). Reading is a receptive language activity, however, since oral language production implies receptivity it was felt that more variability would be obtained using this type of task.

The children were asked to make up a story about four pictures or sets of pictures. The pictures were chosen to reflect the written language test variable of number of antecedents. This was accomplished by choosing two pictures that contained two antecedents (one male and one female). Two different pictures were selected that contained four antecedents (two females and two males). The format of the pictures was constructed so that two of the pictures depicted a sequence of action while the other two showed still scenes (see Appendix C for the pictures and directions used in the oral language task). The format is depicted in Table 3.3.

Written language "name tags" were placed on each of the characters in the pictures and these names were pronounced for the subjects. The reasons for this are as follows:

1. Naming the pictures and providing a written stimulus of the names eased the memory burden of the children who otherwise would have to remember the names they gave the characters. It was felt that if the children had to remember all the names, they could tend only to involve one or two characters in their stories.

2. In one picture, a dog appears. Since this dog could be identified as a male or female, the assigning of a name (Sam) gave a firm identity. Also, in this situation, it balanced the picture in reference to male and female characters.

3. It was felt that assigning names to the characters would decrease the use of [illegible] (Gillham and Hesseltine, 1969).

TABLE 3.3

CONSTRUCTION OF THE PICTURES USED IN THE ORAL LANGUAGE PRODUCTION TASK

Picture Number	Format	No. of Antecedents
1	Still	Two
2	Sequence of Action	Two
3	Still	Four
4	Sequence of Action	Four

The directions for the oral language production task were designed to minimize probing and talk from the investigator (see Cowan et al., 1968). If probing was necessary, open-ended questions were asked (e.g., Can you tell me any more?). All stories related by the children were taped for later analysis.

The Pilot Study

The Pilot Study was conducted approximately three weeks prior to the beginning of the main collection of data. In addition to The Pilot Study, a small pre-pilot session was carried out. This session was not conducted formally but was designed to elicit responses from the children concerning "set" for the various tasks, especially in regard

to the TAR-C and TAR-MC. Also, three second grade teachers were asked to comment on such physical factors as size of the print and line spacing.

The [illegible] of [illegible] the [illegible] of dummy elements to the TAR-C and TAR-MC. The purpose of these dummy elements (described previously) was to limit guessing. A second decision was to make, as nearly as possible, the print and spacing used in the TAR-C and TAR-MC consistent with that encountered by the children in their basal readers.

The formal Pilot Study involved the administration of all the instruments used in the investigation. Thirty children enrolled in their second year of school in the Edmonton Catholic School System (and assigned to the investigator by this system) constituted the sample. The main purposes of the Pilot Study are as follows:

1. To determine the time required to administer the instruments used in the study.
2. To determine the reliability of the TAR-C.
3. To determine the optimum number of students to be tested in a sitting.
4. To determine the amount of time the students could sufficiently attend to the tasks without becoming unduly distracted.

Results of the Pilot Study revealed the TAR-C reliabilities to be quite high (see Table 5.7). The test-retest reliabilities were .936 for Form 1 and .841 for Form 2 (N=30).

The decisions reached concerning the number of students to be tested in a sitting, the time necessary for administering the various instruments, and the proper amount of time to allot for each instrument are discussed in the following section.

Collection of the Data

The data were collected during the last three weeks of April, 1973 and the first three weeks of May, 1973. In addition to the [illegible] were administered by [illegible] were briefed by the investigator on the procedures for the study. All [illegible] were gathered during the investigation.

Collection of the data was divided into two parts. The Slosson Oral Reading Test and Attendance Information were administered during the last three weeks of April, 1973. Oral language samples were obtained during the first three weeks of May, 1973.

On the basis of the pilot study it was decided to administer the TAB-S and TAB-WE in small groups of approximately six students. The use of small groups was especially important in reference to the TAB-S since the administrator had to be available to spell words for the children. This was done by providing each child with a blank piece of paper. If the child wished to make a response where the spelling was unknown, he told the word to the administrator and the proper spelling was recorded on the paper. Although the small group criterion was not so crucial in giving the TAB-WE, it was decided to follow the same testing procedure to insure consistency. A decision was made to systematically alternate the administration of the TAB-S and TAB-WE. This was done to minimize practice effect. For example if there were twenty-four children in a school that qualified for the final testing, four groups would be created for the TAB-S and TAB-WE. Arbitrarily naming these groups A, B, C, and D they would be given in the following manner:

Group (approximately [illegible] children in a group)

A - TAN-3, Form A; TAT-3, Form A; TAT-3, Form B; TAN-3, Form B

B - TAN-3, Form B; TAT-3, Form A; TAT-3, Form B; TAN-3, Form A

C - [illegible]

D - TAN-3, Form A; TAT-3, Form B; TAT-3, Form A; TAN-3, Form B

Upon completion of TAN-3, Form A, every second subject in each group received TAT-3, Form A, while the remaining subjects received TAT-3, Form B. This procedure was continued until all groups had been administered Form A and TAN-3. In no time was a group given more than one TAT-3 form in a single sitting. Testing sittings were approximately thirty minutes in duration although this varied for individual groups. No time limits were placed on the tests. Also, care was taken not to disrupt any special activities going on in the school at the time of testing.

The above described procedure for administering the tests was used in the Pilot study and found to be satisfactory.

The protocols from the oral language production tasks were obtained in individual sessions with only the investigator and the child present. The investigator attempted to engage the child in conversation before initiating the elicited production task. This was done to put the child at ease and remove some of the formality that exists in such a situation. The tape recorder was in view of the students and they were told the session would be taped. The tape recorder did not appear to intimidate any of the children as many asked to hear their stories. The investigator attempted to allow the children to hear at least one of their stories played back on the tape recorder.

All of the standardized measures were administered in the

instances since both answers indicate a knowledge of the antecedent and are grammatically correct.

Analysis of Covariance

A two-way analysis of covariance was used to analyze the dependent variables. Twenty-four separate analyses were carried out in examining the three major dependent variables under study. Grouping on the analysis of covariance was by reader level and sex. Although there was extensive screening of the children in relation to word recognition, it was possible to miss up to ten words and still be included in the final sample. Thus, a decision was made to include word recognition as the covariate.

Analysis of Variance

Both a two-way and one-way classification were used in analyzing the data generated by the subsample who were drawn from the main sample. First, a two-way analysis of variance, with grouping by reader level and sex, was conducted to analyze five different oral language variables.

Also, a one-way analysis of variance was used to determine the relationship between oral language production of anaphora and the understanding of such on the written language measures. Test sample grouping on this analysis was by reader level and sex.

Computations of Correlations

Correlations were calculated for both the total sample and the selected subsample. Twenty-nine variables were analyzed for the entire sample and twenty-four for the subsample.

Analysis of Variance with Repeated Measures

To determine whether there was a significant difference in the difficulty of the three major anaphoric categories (Category 1, Category 2, and Category 7), an analysis of variance with repeated measures was carried out. If the analysis indicated a significant difference the Scheffé procedure was applied to test the difference between the means. This test is conservative in respect to Type 1 errors and the significance level was set at .05 (as was the level for the other analyses in the study).

t-Tests

A major research question of this investigation was to determine whether or not the number of antecedents interacting throughout a discourse is a significant variable in the understanding of the antecedent/anaphora relationship. This variable was built into the passages and reflected in the TAR-C and TAR-MC.

The t tests were carried out to determine the effects of additional antecedents, that is, whether the entire sample scored significantly lower on the tests that contained four antecedents (as opposed to the tests that contained two antecedents).

The effects of increased distance between antecedent and anaphora on the entire sample were also tested by means of t tests. The t tests were applied to the data to determine whether the entire sample scored significantly lower on the TAR-C and TAR-MC when the distance was 3-5 propositions rather than 0-2 propositions.

Finally, t-tests were used to analyze data produced by the subsample on the oral language production task. The scores of the High

and Low Anaphora Producers were compared to determine whether either group performed significantly higher on the TAR-C and TAR-MC.

Summary

The TAR-C and TAR-MC were used as treatments in this study. The construction of the passages used in the TAR-C and TAR-MC included all relevant variables under investigation. These variables were the number of antecedents interacting in a discourse, the distance between antecedent and anaphora, and the three anaphoric categories chosen for the study.

In addition to the written language tests, elicited oral language protocols were obtained from a selected subsample of children who were drawn from the main sample to examine the relationship between oral language production of anaphora in performance on the TAR-C and TAR-MC.

The main sample consisted of 100 students, who were in their second year of schooling, from the Edmonton Catholic School System. Grouping was by reader level (High and Low Readers) and sex. Equal cells were created with twenty-five children in each cell. In addition to the main sample, a subsample of forty-eight children was selected on a stratified random basis. The subsample participated in the oral language tasks.

A two-way analysis of variance and covariance was used to determine if High and Low Readers differed significantly in their performance on the selected dependent variables which were reflected by the TAR-C and TAR-MC. Analysis of variance with repeated measures was the statistical procedure used to determine whether the anaphoric categories were comprehended equally by the groups in the main sample. To

discover the effects of number of antecedents and distance between antecedent and anaphora on the total sample, t tests were carried out. Finally, computations of correlations were used to examine the relationship between twenty-nine variables including intelligence and visual memory and performance on the TAR.

Two different methods of data analysis were used to examine the relationship between oral language production of anaphora and performance on the TAR-C and TAR-MC. A two-way analysis of variance, with subsample grouping by reader level and sex, was used to compare the production levels of High and Low Readers. Also, t-tests were used to determine if High and Low Anaphora Producers differed significantly in their oral language production of anaphora.

CHAPTER 6

FINDINGS: COMPREHENSION OF THE ANTECEDENT/ANAPHORA RELATIONSHIP

The main purpose of this study was to investigate the beginning reader's ability to comprehend connected discourse which had been written to include the antecedent/anaphora relationship. This chapter will examine the results of the various analyses in relation to the High and Low Reader's performance on the TAR-C (cloze format) and TAR-MC (multiple choice format). The three dependent variables analyzed were: (a) number of antecedents interacting in a discourse, (b) the distance between antecedent and anaphora, and, (c) the case of the anaphora as represented by the categories investigated.

Differences Between High and Low Reader's Ability to Comprehend the Antecedent/Anaphora Relationship When the Effects of the Number of Antecedents Are Considered

The first major question focused on the abilities of High and Low Readers to comprehend the antecedent/anaphora relationship when the number of antecedents in a discourse is considered. Hypothesis 6.1 was formulated to examine this question.

Hypothesis 6.1

> There will be no significant difference in the performance of High and Low Readers on the TAR-C and on the TAR-MC regardless of whether the number of antecedents is two rather than four.

Hypothesis 6.1 was tested using a two-way analysis of covariance with grouping by reader level and sex. The covariate was word recognition.

The TAR-C, Form 1 contained two interacting antecedents while TAR-C, Form 2 was written with four antecedents.

TAR-C

Table 6.1 depicts the mean scores and standard deviations for the sample by reader level and sex.

TABLE 6.1

MEAN SCORES AND STANDARD DEVIATIONS OF THE TAR-C, FORM 1 (2 ANTECEDENTS) AND TAR-C, FORM 2 (4 ANTECEDENTS) BY READER LEVEL AND SEX (N=100)

	TAR-C, Form 1		TAR-C, Form 2	
Group	Mean	S.D.	Mean	S.D.
High Readers	32.56	4.49	31.20	3.89
Low Readers	25.12	6.84	23.42	6.50
Boys	28.30	6.28	26.28	6.39
Girls	29.38	7.42	28.34	6.73

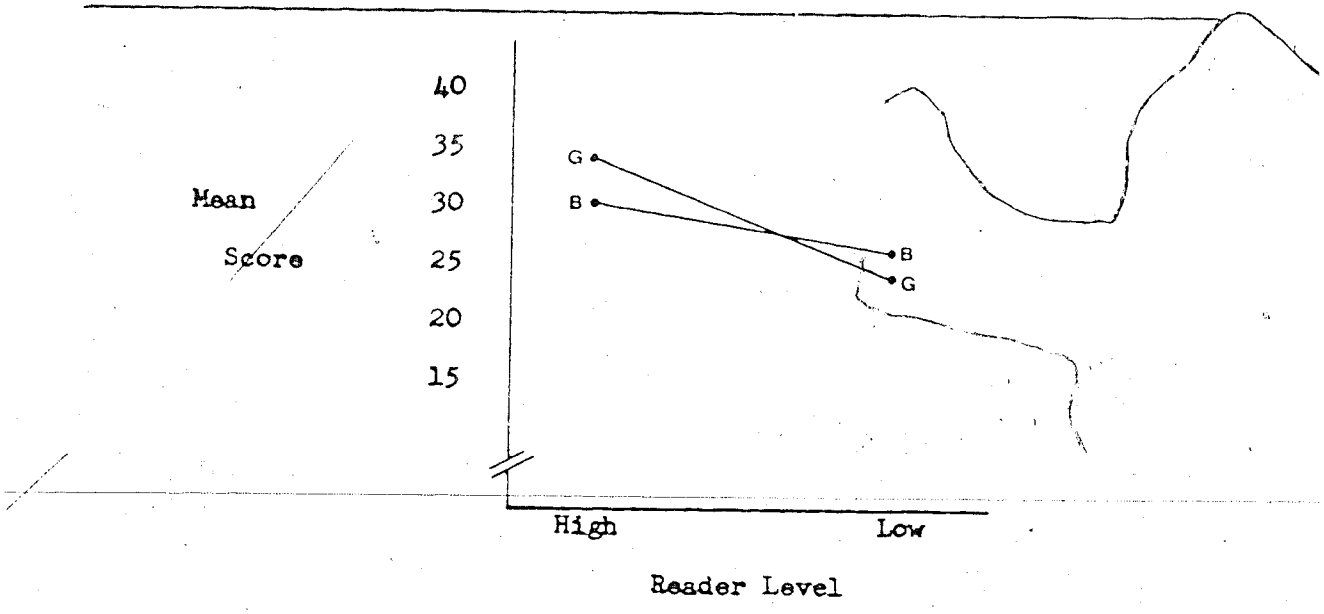
The highest possible score on the TAR-C was forty. The total sample was 100 children in their second year of schooling with fifty members in each grouping, that is, fifty High Readers and fifty Low Readers. The sex groupings also contained fifty members.

TAR-C, Form 1. The two analysis of covariance indicate that High Readers performed significantly higher on the TAR-C, Form 1 than Low Readers ($F. = 22.07$, $df. = 1/95$, $p < .001$). No significant difference was noted in relation to the mean scores of boys and girls ($F. = .45$, $df. = 1/95$, n.s.). Interaction between reading level and sex was

significant ($F. = 4.46$, df. = 1/95, $p < .05$). Figure 6.1 depicts the interaction between reader level and sex.

FIGURE 6.1

INTERACTION BETWEEN READER LEVEL AND SEX ON TAR-C, FORM 1 (N=100)



The reading level/sex interaction indicates that girls in the High Reading group scored higher on the TAR-C, Form 1 than boys who were High Readers, however, the opposite was true in the case of Low Readers. It is interesting to note that the covariate affected the significance of the interaction. Without the covariate the interaction would not have reached the .05 level of confidence. This perhaps indicates that Low Readers who are boys have more difficulty with word recognition and this difficulty interfered with comprehension.

TAR-C, Form 2. Form 2 differed from Form 1 in that the former

held four antecedents interacting throughout the discourse while the latter only two. Table 6.1 shows the means and standard deviations for TAR-C, Form 2, by reader level and sex.

The two-way analysis of covariance revealed only one significant main effect. High Readers performed significantly higher than Low Readers on the TAR-C, Form 2 ($F. = 31.51$, $df. = 1/95$, $p < .001$). No sex difference was indicated by the data ($F. = 1.34$, $df. = 1/95$, n.s.), nor was any interaction present ($F. = 1.01$, $df. = 1/95$, n.s.).

TAR-MC

The multiple choice format of the TAR contained twenty items. As in the case of the TAR-C, Form 1 of the TAR-MC contained two antecedents that interacted throughout the discourse while Form 2 was comprised of four antecedents. The means and standard deviations for the sample are reported in Table 6.2. Table 6.2 shows that the mean score

TABLE 6.2

MEAN SCORES AND STANDARD DEVIATIONS OF THE TAR-MC, FORM 1 (2 ANTECEDENTS) AND TAR-MC, FORM 2 (4 ANTECEDENTS) BY READER LEVEL AND SEX (N=100)

	TAR-MC, Form 1		TAR-MC, Form 2	
Group	Mean	S.D.	Mean	S.D.
High Readers	17.92	2.27	16.64	3.30
Low Readers	13.46	4.50	12.46	3.79
Boys	15.20	4.42	14.70	2.74
Girls	16.18	3.94	14.40	3.36

of the High Reader group was approximately four and one-half points higher than the Low Readers on Form 1 and slightly more than four points higher on Form 2. The girls outperformed the boys on Form 1 by about one point but the scores were nearly equal on Form 2.

TAR-MC, Form 1. A significant difference was demonstrated by the analysis in relation to reader level with the High Readers surpassing the Low Readers ($F. = 19.20$, $df. = 1/95$, $p < .001$). There were no significant differences noted for sex ($F. = .34$, $df. = 1/95$, n.s.) or interaction between reader level and sex ($F. = .86$, $df. = 1/95$, n.s.).

TAR-MC, Form 2. The results indicate that High Readers again significantly exceeded the Low Reader's mean score on Form 2 ($F. = 16.04$, $df. = 1/95$, $p < .001$). Also, sex difference did not prove to be significant ($F. = 1.87$, $df. = 1/95$, n.s.). The analysis did not indicate any significant interaction ($F. = .00$, $df. = 1/95$, n.s.).

Summary

The findings indicate that High Readers consistently scored higher than Low Readers on the TAR-C and TAR-MC regardless of whether the number of antecedents in the discourse is two or four. It appears that neither number of antecedents nor the testing format (cloze and multiple choice) affects this superiority of high achieving readers.

The results showed that sex was not a significant factor in relation to performance on the TAR-C and TAR-MC. Interaction effects were only noted in one instance (TAR-C, Form 1). Here, the girls from the High Reader group outperformed the boys from the High Reader group but the opposite was true in the case of Low Readers.

Therefore, Hypothesis 6.1 must be rejected on the basis of the

statistical analyses carried out on the data.

Differences between High and Low Reader's Ability to Comprehend the Antecedent/Anaphora Relationship when the Effects of Distance between Antecedent and Anaphora Are Considered

Following the review of literature, the second question focused on the effects of distance between the antecedent and anaphora. The literature indicated that distance may be a factor affecting the comprehension of this relationship. Hypothesis 6.2 was used to examine the ability of High and Low Readers when the distance factor was considered.

Hypothesis 6.2

> There will be no significant difference in the performance of High and Low Readers on the TAR-C and TAR-MC when the distance between the antecedent is 0-2 propositions or 3-5 propositions.

As in the case of Hypothesis 6.1, a two-way analysis of covariance was used to test Hypothesis 6.2. The covariate was word recognition.

On the TAR-C, twenty items reflected the 0-2 proposition distance and an equal number of items represented the 3-5 proposition length factor. The TAR-MC contained ten items for each of the distance categories.

TAR-C, Form 1

The mean scores and standard deviations for the TAR-C, Form 1 (0-2 Propositions) and TAR-C, Form 1 (3-5 Propositions) are reported in Table 6.3.

TAR-C, Form 1 (0-2 Propositions). The mean score of the High Readers proved to be significantly higher than that of the Low Readers

TABLE 6.3

MEAN SCORES AND STANDARD DEVIATIONS OF DISTANCE FACTOR BETWEEN ANTECEDENT AND ANAPHORA FOR THE TAR-C, FORM 1, BY READER LEVEL AND SEX (N=100)

	TAR-C, Form 1 (0-2 Propositions)		TAR-C, Form 1 (3-5 Propositions)	
Group	Mean	S.D.	Mean	S.D.
High Readers	16.74	2.18	15.70	2.81
Low Readers	13.40	3.42	11.72	3.93
Boys	14.94	3.14	13.36	3.67
Girls	15.20	3.51	14.06	4.21

(F. = 14.61, df. = 1/95, p < .001). No difference was noted between the sexes (F. = 1.35, df. = 1/95, n.s.). Significant interaction effects were found between reader level and sex (F. = 4.28, df. = 1/95, p. < .05). The interaction is shown in Figure 6.2.

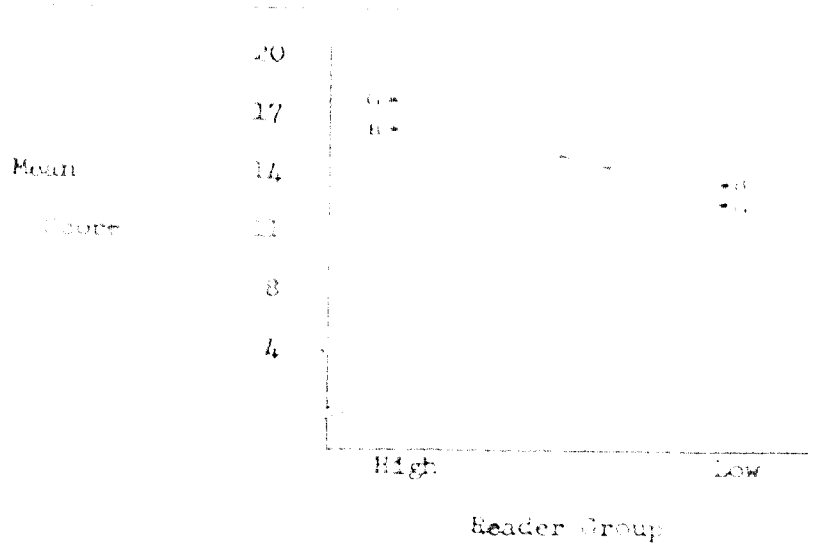
Figure 6.2 portrays High Readers who are girls as superior to High Readers who are boys, however, Low Readers who were boys outscored Low Readers who were girls. This pattern of interaction is similar to that encountered on the TAR-C, Form 1 when the number of antecedents was being considered.

TAR-C, Form 1 (3-5 Propositions). While the scores of all the groups dropped when the number of propositions intervening between the antecedent and anaphora increased, the superiority of the High Readers over the Low Readers continued (F. = 14.21, df. = 1/95, p < .001). There was no significant difference in the performance of boys and girls (F. = .07, df. = 1/95, n.s.). Interaction did not reach significance (F. =

FIGURE 6..

INTERACTION BETWEEN READER LEVEL AND SEX

ON TAR-C, FORM 1 (0-2 PROPOSITIONS) (N 100)



1.46, df. = 1/95, n.s.).

TAR-C, Form 2

The distance factor was again tested using the TAR-C, Form 2. Distance factor mean scores and standard deviations are presented in Table 6.4.

TAR-C, Form 2 (0-2 Propositions). The two-way analysis of covariance indicated that Low Readers scored lower than High Readers on the TAR-C, Form 2 (0-2 Propositions) (F. = 13.08, df. = 1/95, $p < .001$). There was no significant difference between the means of the sexes (F. = 1.91, df. = 1/95, n.s.). The analysis did not reveal any interaction effects (F. = 1.44, df. = 1/95, n.s.).

TABLE 6.4

MEAN SCORES AND STANDARD DEVIATIONS OF DISTANCE FACTOR BETWEEN ANTECEDENT AND ANAPHORA FOR THE TAR-C, FORM 2, BY READER LEVEL AND SEX (N=100)

	TAR-C, Form 2 (0-2 Propositions)		TAR-C, Form 1 (0-2 Propositions)	
Group	Mean	S.D.	Mean	S.D.
High Readers	15.66	2.76	15.74	2.71
Low Readers	12.10	3.54	11.54	3.47
Boys	13.24	3.44	13.12	3.50
Girls	14.38	3.43	14.34	3.44

TAR-C, Form 2 (0-2 Propositions). The mean scores of the High Readers surpassed those of the Low Readers by a significant margin ($F. = 35.98$, df. = 1/95, $p < .001$). The finding of no significant difference in relation to sex was consistent with the TAR-C, Form 2 (0-2 Propositions) ($F. = 0.44$, df. = 1/95, n.s.). Interaction effects were not recorded ($F. = 0.11$, df. = 1.95, n.s.).

Summary

The findings in relation to the distance factor on the TAR-C indicate a significant superiority favoring High Readers over Low Readers. Thus, in reference to the TAR-C, Forms 1 and 2, Hypothesis 6.2 must be rejected. No sex differences were evident in the analysis although one case of significant interaction was reported. This occurred on the TAR-C, Form 1 (0-2 Propositions). The interaction indicated that girl High Readers scored higher than boy High Readers.

An opposite effect was recorded in the case of the low readers with the boys scoring significantly higher than the girls.

TAR-MC, Form 1

The distance factor scores for Form 1 were computed and the means and standard deviations are found in Table 6.1. The highest score obtainable on this measure was ten.

TABLE 6.1

MEAN SCORES AND STANDARD DEVIATIONS OF DISTANCE FACTOR BETWEEN ANTECEDENT AND ANAPHORA FOR THE TAR-MC, FORM 1, BY READER LEVEL AND SEX (Grade 6)

Group	TAR-MC, Form 1 (0-2 Propositions) Mean	S.D.	TAR-MC, Form 1 (3-5 Propositions) Mean	S.D.
High Readers	8.86	1.33	9.04	1.11
Low Readers	6.64	2.45	6.80	2.38
Boys	7.54	2.36	7.64	2.31
Girls	7.96	2.25	8.20	1.95

TAR-MC, Form 1 (0-2 Propositions). The two-way analysis of covariance showed a significant main effect with the High Readers scoring higher than the Low Readers ($F. = 13.90$, $df. = 1/95$, $p < .001$). No significant sex difference was evident in the analysis ($F. = 0.07$, $df. = 1/95$, n.s.). Also, interaction effects were not present ($F. = 0.44$, $df. = 1.95$, n.s.).

TAR-MC, Form 1 (3-5 Propositions). The difference between the

mean scores obtained by the reader groups was significant with the High Readers continuing to outscore the Low Readers ($F. = 18.76$, $df. = 1/95$, $p < .001$). The analysis did not indicate any sex difference ($F. = 0.71$, $df. = 1/95$, n.s.). Interaction effects were not in evidence ($F. = 0.85$, $df. = 1/95$, n.s.).

TAR-MC, Form 2

The multiple choice format was analyzed for the distance factor in a manner similar to the other TAR. The highest possible score on this measure was ten. Table 6.6 presents the mean scores and standard deviations for the TAR-MC, Form 2.

TABLE 6.6

MEAN SCORES AND STANDARD DEVIATIONS OF DISTANCE FACTOR BETWEEN ANTECEDENT AND ANAPHORA FOR THE TAR-MC, FORM 2, BY READER LEVEL AND SEX (N=100)

	TAR-MC, Form 2 (0-2 Propositions)		TAR-MC, Form 2 (3-5 Propositions)	
Group	Mean	S.D.	Mean	S.D.
High Readers	8.46	1.72	8.18	1.82
Low Readers	6.52	2.08	5.92	2.01
Boys	7.62	3.98	7.06	2.22
Girls	7.36	2.06	7.04	2.37

The mean scores indicated that Low Readers scored lower than High Readers on the instrument while boys slightly outscored girls. The statistical device used to examine the differences in the means was a two-way analysis of covariance. The covariate was word recognition.

TAR-MC, Form 2 (0-2 Propositions). Main effects were found for reader level with High Readers producing higher scores than the Low Readers ($F. = 9.13$, $df. = 1/95$, $p < .001$). Although the boys scored slightly higher than the girls, the difference did not prove to be significant ($F. = 3.48$, $df. = 1/95$, n.s.).

TAR-MC, Form 2 (3-5 Propositions). The High Readers continued to score significantly higher than the Low Readers ($F. = 18.30$, $df. = 1/95$, $p < .001$). No significant findings were obtained for sex ($F. = 0.46$, $df. = 1/95$, n.s.), nor were there any significant interaction effects present ($F. = 0.00$, $df. = 1/95$, n.s.).

Summary

Hypothesis 6.2 was rejected on the basis of the analysis. The scores of the High Readers significantly exceeded those of the Low Readers on both forms of the TAR. This superiority was maintained whether the distance was 0-2 or 3-5 propositions intervening between antecedent and anaphora.

The two-way analyses of covariance did not disclose any sex differences in the mean scores of the boys and girls nor was any significant interaction noted.

Differences between High and Low Reader's Ability to Comprehend the Antecedent/Anaphora Relationship when the Effects of Anaphoric Category Are Considered

The literature has indicated that the case of personal pronouns may be an interfering factor for some children in comprehending the antecedent/anaphora relationship. In this study the TAR-C and TAR-MC

contained three anaphoric categories which have been typically referred to as the nominative, objective, and genitive case. Since these categories were built into the passages used for the TAR, individual scores could be recorded in relation to each of the categories. Previous work has indicated that certain cases may be more difficult than others for beginning readers.

Hypothesis 6.3 was formulated to examine the abilities of High and Low Readers when the effects of anaphoric category are considered.

Hypothesis 6.3

There will be no significant difference in the performance of High and Low Readers on the TAR-C and on the TAR-MC in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case).

TAR-C, Form 1

The cloze form of the TAR contained a total of forty items. Of this total twenty-four items reflected Category 1, eight items Category 2, and eight items Category 7. As in the case of the previous analyses, the two-way analysis of covariance was employed to determine if the difference between the means were significant. The mean scores and standard deviations for Categories 1, 2, and 7 on TAR-C, Form 1 are depicted in Table 6.7. Table 6.7 indicates that the High Readers achieved higher mean scores than the Low Readers in all categories. The scores of the girls are slightly higher than those of the boys in the three categories.

TAR-C, Form 1 (Category 1). The difference between the means of the High Readers and the Low Readers proved to be significant ($F. = 9.64$, $df. = 1/95$, $p < .001$). Although no significant sex difference was

TABLE 6.7

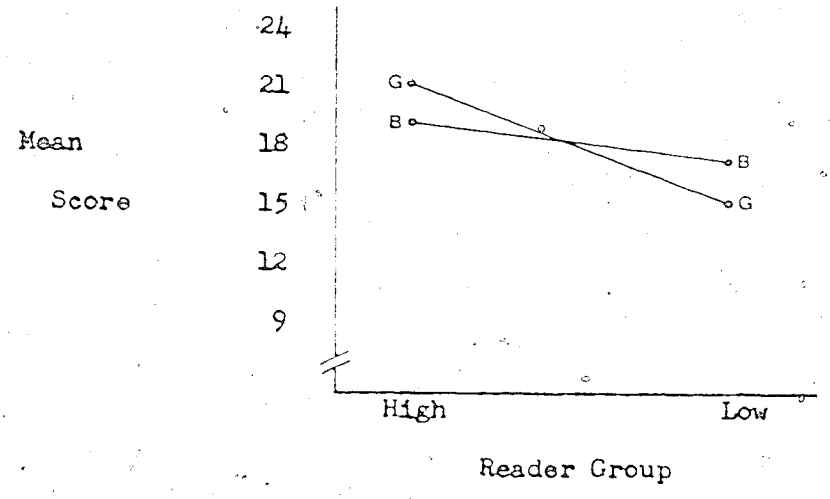
MEAN SCORES AND STANDARD DEVIATIONS OF ANAPHORIC CATEGORIES ON THE TAR-C, FORM 1, BY READER LEVEL AND SEX (N=100)

	TAR-C, Form 1 (Category 1)		TAR-C, Form 1 (Category 2)		TAR-C, Form 1 (Category 7)	
Group	Mean	S.D.	Mean	S.D.	Mean	S.D.
High Readers	20.06	2.81	6.02	1.44	6.30	1.39
Low Readers	16.22	4.40	4.32	1.94	4.56	1.78
Boys	18.12	3.89	5.04	1.85	5.16	1.75
Girls	18.16	4.33	5.30	1.96	5.70	1.84

noted (F. = 3.02, df. = 1/95, n.s.), interaction effects were found to be present (F. = 4.97, df. = 1/95, $p < .05$). The interaction between reading group and sex is illustrated in Figure 6.3. This Figure shows

FIGURE 6.3

INTERACTION BETWEEN READER LEVEL AND SEX ON TAR-C, FORM 1 (CATEGORY 1) (N=100)



that High Readers who were girls scored higher than boys. In the case of Low Readers, the boys scored significantly higher than the girls. The interaction pattern depicted in Figure 6.3 is the same as that found on the other TAR that demonstrated interaction effects.

TAR-C, Form 1 (Category 2). The findings in relation to this variable continued to show the significantly higher performance of the High Reader group over the Low Readers ($F. = 8.76$, $df. = 1/95$, $p < .01$). As in the case of Category 1, no sex difference was indicated by the analysis ($F. = 0.03$, $df. = 1/95$, n.s.). However, unlike Category 1, interaction effects were not observed ($F. = .84$, $df. = 1/95$, n.s.).

TAR-C, Form 1 (Category 7). The pattern of findings was not changed by the genitive case variable. The difference between the means of the High and Low Reader groups was highly significant with the superiority favoring the High Readers ($F. = 11.47$, $df. = 1/95$, $p < .001$). Evidence of sex difference was not found ($F. = .69$, $df. = 1/95$, n.s.), nor was any significant interaction indicated ($F. = 0.01$, $df. = 1/95$, n.s.).

Summary

The cloze form TAR yielded results that were similar to established patterns of performance. Significant main effects were observed with High Readers consistently scoring higher than Low Readers on all anaphoric categories. No sex differences were found and only one instance of significant interaction. The interaction indicated that High Readers who were girls scored higher than boys who were High Readers while the Low Readers who were boys produced scores that were significantly higher than those of the girls in the Low Reader group.

TAR-C, Form 2

Hypothesis 6.3 was also tested on the TAR-C, Form 2 by means of a two-way analysis of covariance. As in Form 1, Form 2 reflected all of the anaphoric categories under study. The proportions of the categories were the same in both forms. The highest score attainable on Category 1 (Nominative) was twenty-four, while a score of eight was possible on Category 2 (Objective) and Category 7 (Genitive). Table 6.8 reveals the mean scores and standard deviations for the sample in relation to the anaphoric categories.

TABLE 6.8

MEAN SCORES AND STANDARD DEVIATIONS OF ANAPHORIC CATEGORIES ON THE TAR-C, FORM 2, BY READER LEVEL AND SEX (N=100)

	TAR-C, Form 2 (Category 1)		TAR-C, Form 2 (Category 2)		TAR-C, Form 2 (Category 7)	
Group	Mean	S.D.	Mean	S.D.	Mean	S.D.
High Readers	20.00	2.89	6.32	1.22	4.90	1.39
Low Readers	14.68	4.31	5.16	1.77	3.58	1.46
Boys	16.76	4.46	5.54	1.59	4.00	1.41
Girls	17.92	4.56	5.96	1.63	4.48	1.68

The data show that High Readers scores exceeded those of Low Readers. Slight differences are noted for the means of the sexes with girls maintaining a superiority over the boys.

TAR-C, Form 2 (Category 1). As would be expected by the means shown in Table 6.8, the two-way analysis of covariance revealed a significant difference in the case of the reader group ($F. = 30.10$, $df. = 1/95$,

$p < .001$). There was no significant difference between the mean scores of the sexes ($F. = .66$, $df. = 1/95$, n.s.). No finding of interaction was disclosed by the analysis ($F. = 0.10$, $df. = 1/95$, n.s.).

TAR-C, Form 2 (Category 2). The objective case mean scores did not differ significantly in respect to reader level ($F. = 3.15$, $df. = 1/95$, n.s.). Although this was the first incidence of High Readers not performing significantly higher than Low Readers, the findings approached the .05 level of confidence. Sex difference was not evident in the analysis ($F. = 0.27$, $df. = 1/95$, n.s.). No interaction between reader group and sex was noted ($F. = 0.17$, $df. = 1/95$, n.s.).

TAR-C, Form 2 (Category 7). Reader level scores differed significantly on this measure with High Readers surpassing the Low Readers ($F. = 10.39$, $df. = 1/95$, $p < .01$). Although no sex difference was observed ($F. = 1.42$, $df. = 1/95$, n.s.), significant interaction effect occurred ($F. = 5.37$, $df. = 1.95$, $p < .05$). The interaction effects are shown in Figure 6.4. As in the case of the other variables that demonstrated interaction effects, the High Readers (girls) scored higher than the boys who were High Readers but Low Readers (boys) were superior to girls who were Low Readers.

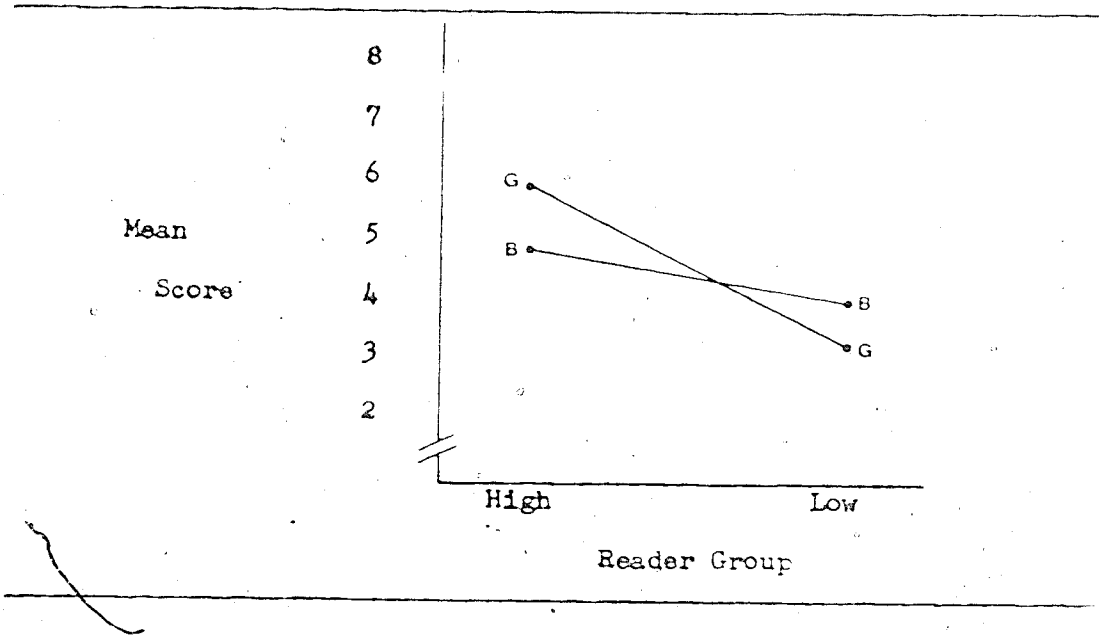
Summary

Differences between scores on Category 2 (Objective case), as tested by the cloze format, produced the first incidence of no significant main effects for reader level. There is no obvious explanation why this result differed from previous findings. It must be remembered, however, that the level of significance did approach acceptability. The analysis did not reveal any change in pattern in reference to the other

FIGURE 6.4

INTERACTION BETWEEN READER LEVEL AND SEX

ON TAR-C, FORM 2 (CATEGORY 7) (N=100)



categories, that is, High Readers scored higher than Low Readers.

Main effects for sex were not found in any of the analyses. One case of significant interaction (Category 7) was noted. The product of this interaction was the same as earlier observed in other analyses. The data showed that girls who are High Readers scored higher than boys who are High Readers. In the case of Low Readers the superiority was reversed.

Thus, Hypothesis 3A is accepted in the case of Category 2 but rejected for Categories 1 and 7.

TAR-MC, Form 1

The multiple choice format of the TAR reflected the three

anaphoric categories in the same proportions as the TAR-C. The highest possible score on Category 1 was twelve while a maximum score of four was attainable on Categories 2 and 7. Table 6.9 reports the mean scores and standard deviations on TAR-MC, Form 1 for the three anaphoric categories under study. Table 6.9 indicates that High Readers scored nearly

TABLE 6.9

MEAN SCORES AND STANDARD DEVIATIONS OF ANAPHORIC CATEGORIES ON THE TAR-MC, FORM 1, BY READER LEVEL AND SEX (N=100)

	TAR-MC, Form 1 (Category 1)		TAR-MC, Form 1 (Category 2)		TAR-MC, Form 1 (Category 7)	
Group	Mean	S.D.	Mean	S.D.	Mean	S.D.
High Readers	10.94	1.33	3.60	0.70	3.38	0.83
Low Readers	8.26	2.81	2.78	1.28	2.46	1.22
Boys	9.40	2.73	3.08	1.21	2.76	1.15
Girls	9.80	2.40	3.30	1.00	3.08	1.10

two points higher than Low Readers in Category 1 and approximately one point higher in Categories 2 and 7. The difference in mean scores (on all three anaphoric categories) between boys and girls did not appear to be great. A two-way analysis of covariance was conducted to determine the significance of the difference between the means.

TAR-MC, Form 1 (Category 1). Main effects were found for reader level on this measure ($F. = 17.71$, $df. = 1/95$, $p < .001$). The analysis did not reveal any sex difference ($F. = 0.01$, $df. = 1/95$, n.s.), nor was any significant interaction present ($F. = 0.14$, $df. = 1/95$, n.s.).

TAR-MC, Form 1 (Category 2). Highly significant findings were

evident in the analysis for Category 2 with the High Reader group once again maintaining its superiority in performance ($F. = 17.61$, $df. = 1/95$, $p < .001$). Sex grouping produced no significant main effects ($F. = 1.32$, $df. = 1/95$, n.s.). In addition, interaction between reader level and sex was not present ($F. = 0.18$, $df. = 1/95$, n.s.).

TAR-MC, Form 1 (Category 7). Established patterns of performance were continued on this measure of the genitive case variable. Although the level of significance was not as high as that on Categories 1 and 2, High Reader's scores exceeded those of the Low Reader group by a significant margin ($F. = 8.12$, $df. = 1/95$, $p < .01$). The mean scores of the boys and girls did not differ in any significant degree ($F. = 0.96$, $df. = 1/95$, n.s.). Interaction effects were not in evidence ($F. = 0.89$, $df. = 1/95$, n.s.).

Summary

The results of the two-way analysis indicated that Hypothesis 6.3 must be rejected in the case of reader level. On all three categories, the High Readers scored significantly higher than the Low Readers. Thus, the non-rejection of Hypothesis 6.3 is proven untenable.

No significant main effects were recorded for the sex grouping and interaction effects were absent for all variables tested.

TAR-MC, Form 2

In Form 2 of the TAR-MC, anaphoric categories were represented in the same ratio as the other TAR. As in the case of Form 1 the highest possible scores attainable were twelve (Category 1) and four (Category 2 and 7). The mean scores and standard deviations of each group on the

TAR-MC, Form 2 are given in Table 6.10. The High Reader group scored higher on all three anaphoric categories. Although the boys outscored the girls on two of the categories the difference was not significant. The level of significance was determined by the two-way analysis of covariance. As with all the other analyses, the covariate was the children's word recognition scores.

TABLE 6.10

MEAN SCORES AND STANDARD DEVIATIONS OF ANAPHORIC CATEGORIES ON THE TAR-MC, FORM 2, BY READER LEVEL AND SEX (N=100)

	TAR-MC, Form 2 (Category 1		TAR-MC, Form 2 (Category 2)		TAR-MC, Form 2 (Category 7)	
Group	Mean	S.D.	Mean	S.D.	Mean	S.D.
High Readers	10.38	2.13	3.16	0.89	3.00	0.97
Low Readers	7.84	2.49	2.16	1.08	2.46	1.13
Boys	9.28	2.64	2.56	1.13	2.76	1.02
Girls	8.94	2.66	2.76	1.08	2.70	1.15

TAR-MC, Form 2 (Category 1). The difference between the means of the nominative case variable was significant at a high level of confidence. The High Reader group was once again dominant ($F. = 12.06$, $df. = 1/95$, $p < .001$). In comparing the sexes, the level of significance approached, but did not reach acceptability ($F. = 3.61$, $df. = 1/95$, n.s.). No interaction effects were observed ($F. = 0.03$, $df. = 1/95$, n.s.).

TAR-MC, Form 2 (Category 2). The objective case category produced no change from established patterns of performance. The High Readers outperformed the Low Readers by a considerable margin ($F. =$

14.17, df. = 1/95, $p < .001$). Sex difference did not approach an acceptable level of confidence (F. = 0.34, df. = 1/95, n.s.) and interaction effects were not indicated by the analysis (F. = 0.00, df. = 1/95, n.s.).

TAR-MC, Form 2 (Category 7). Category 7 produced the only situation where the difference between the means of the reader groups was not significant (F. = 2.75, df. = 1/95, n.s.). Neither sex (F. = 0.35, df. = 1/95, n.s.), nor interaction effects (F. = 0.27, df. = 1/95, n.s.) proved to be significant.

Summary

On two categories (Categories 1 and 2) the High Readers scored significantly higher than Low Readers. However, on Category 7 there was no significant difference between the means of the reader levels. It must be pointed out that the level of significance did approach the acceptable .05 level.

As with the other multiple choice format TAR, no sex differences were noted, nor was any significant interaction between reader level and sex observed.

According to the results of the analyses, Hypothesis 6.3 cannot be rejected in the case of the TAR-MC, Form 2 (Category 7), but is rejected for the other two anaphoric categories.

The Effects of Number of Antecedents on Subjects' Ability to Comprehend the Antecedent/Anaphora Relations

In the previous analysis the focus has been on the reader and sex groups and score differences within these groups over a number of

variables. In this, and the following sections, all subjects are taken as a single group and the effects of the dependent variables are examined. The distinctions of reader level and sex are used in the analyses but not in direct comparison with each other.

The first basic question to be studied is the increased number of antecedents in a discourse and the effects of this increase on the subjects' performance in comprehending the antecedent/anaphora relationship.

The review of literature has indicated that an increase in the number of antecedents would cause readers more difficulty in comprehending the antecedent/anaphora relationship. While the previous analyses indicated that High Readers typically score higher than Low Readers, regardless of whether the number of antecedents was two or four, the question next explored was whether all groups of readers produce lower scores on the TAR when the number of antecedents is increased.

Hypothesis 6.4 was formulated to test this question.

Hypothesis 6.4

> There will be no significant difference in the subject's scores when the means of TAR-C, Form 1 (2 antecedents) are compared with TAR-C, Form 2 (4 antecedents).

To test Hypothesis 6.4, which compared the means of tests (not reader groups or sexes) t-tests were used. The means and standard deviations of the TAR-C, Forms 1 and 2 can be found in Table 6.1. The results of the t-tests are shown in Table 6.11.

The findings of this table indicate that the increase in number of antecedents does affect the performance of the subjects. The performance of the High Reader group was the most significantly changed by the increase in antecedents ($p = .0004$) followed closely by the boys ($p =$

.0004). The approximately two point decline in the performance of the Low Reader group could not be attributed to chance ($p = .0092$) nor could the nearly one point difference of the girls ($p = .0470$).

TABLE 5.11

t-TEST VALUES FOR TAR-C, FORM 1 (2 ANTECEDENTS) VERSUS FORM 2 (1 ANTECEDENTS) FOR THE TOTAL SAMPLE (N 100)

TAR-C, Form 1 with TAR-C, Form 2

Group	T	df	Probability
High Readers	3.80	49	.0004
Low Readers	2.71	49	.0092
Boys	3.66	49	.0006
Girls	2.28	49	.0470

The results of the t-tests conclusively show that an increase in the number of antecedents interacting throughout a discourse significantly affects the performance of the grade two readers. Therefore, Hypothesis 5.4 must be rejected.

Referring back to the question in focus, a second hypothesis was constructed, using the TAR-MC, Forms 1 and 2 as the testing vehicle.

Hypothesis 5.5

> There will be no significant difference in the subjects' scores when the means of the TAR-MC, Form 1 (2 antecedents) are compared with TAR-MC, Form 2 (1 antecedents).

Again, t-tests were applied to the data. The means and standard deviations of the TAR-MC, Forms 1 and 2 may be viewed in Table 5.2. The results of the t-tests are depicted in Table 5.12.

The addition of two antecedents to the TAR-MC, as in the case

TABLE 6.12

t-TEST VALUES FOR TAR-MC, FORM 1 (2 ANTECEDENTS) VERSUS FORM 2 (4 ANTECEDENTS) FOR THE TOTAL SAMPLE (N=100)

TAR-MC, Form 1 with TAR-MC, Form 2

Group	T	df	Probability
High Readers	3.52	49	.0009
Low Readers	2.01	49	.0495
Boys	1.50	49	.1402
Girls	3.55	49	.0009

of Form 2, made the test significantly more difficult for the High Readers. The level of significance was nearly as high as that for the TAR-C comparison ($p = .0009$). This finding indicates that High Reader's scores are depressed by the addition of antecedents on both the cloze and multiple choice formats.

While the level of significance was not as great as that found on the TAR-C comparison, Low Readers did score significantly lower on the TAR-MC, Form 2 ($p = .0495$). Therefore, the results indicate that number of antecedents lowers the mean scores of the Low Reader group regardless of format.

In relation to the sexes, the difference between the mean scores of the girls proved to be highly significant ($p = .0009$). The confidence level was higher than that noted on the TAR-C comparison for the readers who were girls.

In the case of the readers who were boys, the level of confidence did not reach an adequate level ($p = .1402$). No apparent explana-

tion is available for this finding since the number of antecedents did prove to affect comprehension scores on the TAR-C for the boys.

Summary

The analysis of the data indicates that Hypothesis 6.5 must be rejected in all but one instance. The scores of the readers who were boys did not differ significantly on the Form 1 versus Form 2 comparison of the TAR-MC and thus, Hypothesis 6.5 cannot be rejected in this instance. On the whole, the evidence indicates that increasing the number of antecedents in a discourse does interfere with the reader's comprehension of the antecedent/anaphora relationship.

The Effects of Distance on Subjects' Ability to Comprehend the Antecedent/Anaphora Relationship

Previous research has indicated that increasing the distance between antecedent and anaphora would correspondingly decrease comprehension of the relationship that exists between the two elements. Because of the planned construction of the passages and TAR, four separate analyses were possible--one for each form of the TAR-C and TAR-MC in which scores for 0-2 propositions are compared with scores for 3-5 propositions as the distance factor between antecedent and anaphora.

The comparisons made in these analyses focused on the effects the variable in question (distance) had on the scores of all the subjects. The hypothesis that was devised to examine the distance variable was composed as follows:

Hypothesis 6.6

There will be no significant difference in the subjects'

scores when the means of the TAR-C, Form 1 (0-2 Propositions) are compared with TAR-C, Form 1 (3-5 Propositions).

Analysis was performed by applying t-tests to the data to determine whether or not the difference between the mean scores was significant. Table 6.3 shows the mean scores and standard deviations for the TAR-C, Form 1 (0-2 Propositions and 3-5 Propositions). The results of the t-tests are reported in Table 6.13.

TABLE 6.13

t-TEST VALUES FOR TAR-C, FORM 1 (0-2 PROPOSITIONS) VERSUS (3-5 PROPOSITIONS) FOR THE TOTAL SAMPLE (N=100)

	TAR-C, Form 1 (0-2 Propositions versus 3-5 Propositions)		
Group	T	df	Probability
High Readers	3.80	49	.0024
Low Readers	4.30	49	.0001
Boys	4.16	49	.0001
Girls	3.35	49	.0016

The distance increase, in terms of number of propositions, proved to be a highly significant variable in the understanding of the antecedent/anaphora relationship for all groups included in the sample. The approximately one point decrease in the scores of the High Readers was significant at the .0024 level of confidence while the lower mean score on Form 2 for the Low Readers was even more significant ($p = .0001$). The loss in comprehension for the readers who were girls was significant ($p = .0016$) as was the situation for the boys ($p = .0001$).

There was no support found for Hypothesis 6.6 since all groups

scored at a significantly lower level when the distance between antecedent and anaphora was increased on the TAR-C, Form 1. Thus, Hypothesis 6.6 is rejected.

Hypothesis 6.7 was formulated to test the distance factor on TAR-C, Form 2.

Hypothesis 6.7

There will be no significant difference in [illegible] subjects' scores when the means of the TAR-C, Form 2 ([illegible] Propositions) are compared with TAR-C, Form 2 (3-5 Propositions).

As with Hypothesis 6.6, t-tests were used to ascertain the level of significant difference between the means of the two scores for each group of readers. Means and standard deviations for each group can be found in Table 6.4. The results of the t-tests are given in Table 6.14.

TABLE 6.14

t-TEST VALUES FOR TAR-C, FORM 2 (0-2 PROPOSITIONS) VERSUS (3-5 PROPOSITIONS) FOR THE TOTAL SAMPLE (N=100)

	TAR-C, Form 2 (0-2 Propositions versus 3-5 Propositions)		
Group	T	df	Probability
High Readers	-0.93	49	.3585
Low Readers	2.18	49	.0339
Boys	0.05	49	.9626
Girls	1.18	49	.2434

The results on the TAR-C, Form 2 were quite surprising, especially in the case of the High Readers. The mean score of this group was actually higher when the distance between antecedent and anaphora was increased. However, the difference was not significant. The

increased distance did significantly affect the performance of Low Readers in terms of decreased scores ($p = .0339$).

The difference between the means for the boy and girl readers did not approach the acceptable level of confidence. This finding is different from the results noted on the TAR-C, Form 1.

The results of the analysis indicate that Hypothesis 6.7 cannot be rejected for High Readers, boys, and girls. The Hypothesis is rejected in the case of the Low Readers since the difference between the means reached the level of .05.

To test the distance factor on the TAR-MC, Form 1, Hypothesis 6.8 was used.

Hypothesis 6.8

> There will be no significant difference in the subjects' scores when the means of the TAR-MC, Form 1 (0-2 Propositions) are compared with TAR-MC, Form 1 (3-5 Propositions).

Using the multiple choice format of the TAR, the distance factor was again tested by means of t-tests. The means for the sample are reported in Table 6.5 while the results of the t-tests are shown in Table 6.15.

On the TAR-MC, Form 1 the increased distance did not prove to be a significant factor in the comprehension of the antecedent/anaphora relationship. All groups had negative T values since the mean scores favored the 3-5 proposition distance. This finding is unexpected in light of the speculations of previous writers (Mosberg and Shima, 1969; Harris, 1948). Possible explanations for the findings on the TAR-MC, Form 1 will be discussed in Chapter 8.

On the basis of the t-tests, which were used to evaluate the difference between the means in relation to the distance factor, Hypothesis 6.8 cannot be rejected.

TABLE 6.15

t-TEST VALUES FOR TAR-MC, FORM 1 (0-2 PROPOSITIONS) VERSUS (3-5 PROPOSITIONS) FOR THE TOTAL SAMPLE (N=100)

TAR-MC, Form 1
(0-2 Propositions versus 3-5 Propositions)

Group	T	df	Probability
High Readers	-1.35	49	.1824
Low Readers	-0.67	49	.5075
Boys	-0.46	49	.6513
Girls	-1.47	49	.1474

To test Form 2 of the TAR-MC, Hypothesis 6.9 was devised.

Hypothesis 6.9

There will be no significant difference in the subjects' scores when the means of the TAR-MC, Form 2 (0-2 Propositions) are compared with TAR-MC, Form 2 (3-5 Propositions).

The final hypothesis testing the distance factor used the TAR-MC, Form 2. This form contained four antecedents and used the multiple choice format. Table 6.6 displays the means and standard deviations for the sample and the t-test comparisons are shown in Table 6.16.

TAR-MC, Form 2 produced mixed findings in relation to the effects of the distance factor on comprehension of the antecedent/anaphora relationship. The comprehension of the Low Reader group was significantly affected by the increased distance as was the group of readers who were boys. The actual levels of confidence were .0058 (Low Readers) and .0118 (boys) respectively. Although the scores of the High Readers and girls were lower when the intervening number of propositions was increased the level of confidence did not reach a sufficient

TABLE 6.16

t-TEST VALUES FOR TAR-MC, FORM 2 (0-2 PROPOSITIONS) VERSUS (3-5 PROPOSITIONS) FOR THE TOTAL SAMPLE (N=100)

TAR-MC, Form 2
(0-2 Propositions versus 3-5 Propositions)

Group	T	df	Probability
High Readers	1.55	49	.1279
Low Readers	2.89	49	.0058
Boys	2.62	49	.0118
Girls	1.83	49	.0733

level to reject Hypothesis 6.9. In both cases the significance level approached the .05 level of acceptability.

Hypothesis 6.9 was rejected for both Low Readers and boys, the Hypothesis cannot be rejected for High Readers and girls.

Summary

The effects of distance on the comprehension of the antecedent/anaphora relationship were examined by means of t-tests on the mean scores of the subjects. The results of these analyses were mixed. Hypotheses 6.6, 6.7, 6.8, and 6.9 were devised to test the subjects' ability to comprehend the antecedent/anaphora relationship when the effects of distance were considered. The analyses of the data indicated that Hypothesis 6.6 was rejected, 6.7 was rejected only in the case of the Low Readers (but could not be rejected for the other readers), 6.8 was not rejected, and Hypothesis 6.9 was rejected for both Low Readers and boys but could not be rejected for High Readers and girls.

The Low Readers were the group most affected by the increase

in distance between antecedent and anaphora. Only on the TAR-MC, Form 1 did the difference between the mean scores not significantly decrease due to the effects of increased distance between antecedent and anaphora.

The distance factor, typically, did not seem to be an interfering element in comprehending the antecedent/anaphora relationship for the High Readers. Only on the TAR-C, Form 1 did the decrease in scores reach significance.

The performance of the readers who were boys was decidedly mixed. A significant decrease in scores was noted on the TAR-C, Form 1 and the TAR-MC, Form 2. On the other two TAR, the difference between the means did not reach an acceptable level of confidence.

As in the case of the High Readers, the scores of the girls were only slightly affected by the increase in distance. The mean scores of this group only differed significantly on the TAR-C, Form 1. It is interesting to note that TAR-C, Form 1 was the only TAR to affect the scores of all groups.

The tentative conclusion that can be reached at this time is that Low Readers do indeed appear to suffer a decrease in comprehension because of the increased distance between anaphora and antecedent. However, the effects of distance on the comprehension of other groups of readers is not clear. The findings concerning this factor will be discussed in Chapter 8.

The Effects of Anaphoric Category on Subjects' Ability to Comprehend the Antecedent/Anaphora Relationship

It was indicated by the review of relevant literature that for some readers the understanding of the antecedent/anaphora relationship

may be related to the surface structure case of the anaphora. This variable was reflected (in this study) as the anaphoric category.

The effects of anaphoric category on performance of the entire sample was examined via a one-way analysis of variance with repeated measures. If the analysis indicated a significant difference between the means of the categories, the Scheffe procedure was used to test the difference. This test is quite conservative and minimizes the effect of Type One errors.

Hypothesis 6.10 was formulated to test the subjects' ability to comprehend the antecedent/anaphora relationship when the effects of anaphoric category are considered.

Hypothesis 6.10

> There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-C, Form 1.

The means and standard deviations for the anaphoric categories are shown in Table 6.7. Since the categories did not occur in equal proportions, it was necessary to take this into account when analyzing the data.

Table 6.17 portrays the significant findings on TAR-C, Form 1 in relation to the anaphoric categories.

For all groups of readers Category 2 (Objective case) proved more difficult than Category 1 (Nominative case). In the comparison of Category 1 with 7, the results were not as clear. Low Readers and boys scored significantly lower on the comparison, however, High Readers and girls did not find the genitive case category more difficult. The comparison of anaphoric Category 2 with 7 did not produce any significant findings.

Hypothesis 6.11 was formulated to test the comparisons on the

TABLE 6.17

COMPARISONS OF ANAPHORIC CATEGORIES THAT DIFFER SIGNIFICANTLY, ON TAR-C, FORM 1, FOR THE TOTAL SAMPLE (N=100)

TAR-C, Form 1

Group	Category 1 with 2	Category 1 with 7	Category 2 with 7
High Readers	*	n.s.	n.s.
Low Readers	*	*	n.s.
Boys	*	*	n.s.
Girls	*	n.s.	n.s.

* significant at the .05 level

TAR-C, Form 2.

Hypothesis 6.11

There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-C, Form 2.

Table 6.8 illustrates the mean scores and standard deviations for the anaphoric categories on the TAR-C, Form 2. Significant findings that were obtained in relation to the difference in performance between anaphoric categories are reported in Table 6.18.

The results of all anaphoric category comparisons were quite clear. They were not, however, consistent with comparisons on the TAR-C, Form 1. There was no significant difference in the mean scores of the reader groups when Category 1 and 2 were compared. This was contrary to the findings on TAR-C, Form 1, where Category 2 proved to be more difficult for all readers. The genitive case category (Category 7) continued to be more difficult for the Low Readers and boys.

TABLE 6.18

COMPARISONS OF ANAPHORIC CATEGORIES THAT DIFFER SIGNIFICANTLY, ON TAR-C, FORM 2, FOR THE TOTAL SAMPLE (N=100)

	TAR-C, Form 2		
Group	Category 1 with 2	Category 1 with 7	Category 2 with 7
High Readers	n.s.	*	*
Low Readers	n.s.	*	*
Boys	n.s.	*	*
Girls	n.s.	*	*

* significant at the .05 level

In addition, High Readers and girls scored significantly lower on the genitive case anaphoric category. The comparison between Categories 2 and 7 was in contrast to the findings on TAR-C, Form 1. All groups found the genitive case more difficult than the objective case category on the TAR-C, Form 2 while no significant difference was noted between the means on TAR-C, Form 1.

To test the effect of the anaphoric category variable on the TAR-MC, Form 1, Hypothesis 6.12 was constructed.

Hypothesis 6.12

> There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-MC, Form 1.

As with the data generated from the TAR-C, the multiple choice format data were analyzed by a one-way analysis of variance with repeated measures. The analyses took into account the unequal proportions of incidence for the anaphoric categories. If a significant difference

was indicated, the statistical procedure attributed to Scheffe, which allows for comparisons of means, was applied. The .05 level of confidence was considered significant for this analysis.

Means and standard deviations for the anaphoric categories are given in Table 6.9. Significant findings, in relation to the difference between the mean scores of the anaphoric categories, are shown in Table 6.19.

TABLE 6.19

COMPARISONS OF ANAPHORIC CATEGORIES THAT DIFFER SIGNIFICANTLY, ON TAR-MC, FORM 1, FOR THE TOTAL SAMPLE (N=100)

	TAR-MC, Form 1		
Group	Category 1 with 2	Category 1 with 7	Category 2 with 7
High Readers	n.s.	*	n.s.
Low Readers	n.s.	n.s.	n.s.
Boys	n.s.	*	n.s.
Girls	n.s.	n.s.	n.s.

* significant at the .05 level

Only two significant findings were reported on the TAR-MC, Form 1. For both the High Readers and boys, the genitive case anaphoric category proved more difficult than the nominative. The comparison of category 1 with 2 showed no significant differences. This finding is consistent with that on both Form 1 and 2 of the TAR-C. The comparison of category 2 with 7 corresponded with the TAR-C, Form 1, but was in opposition to the findings on the TAR-C, Form 2.

Hypothesis 6.13 was formulated to test the effects of the

anaphoric category variable on the TAR-MC, Form 2.

Hypothesis 6.13

There will be no significant difference in the subjects' scores in relation to Category 1 (Nominative case), Category 2 (Objective case), and Category 7 (Genitive case) on the TAR-MC, Form 2.

The mean scores and standard deviations for the anaphoric categories can be viewed on Table 6.10. Comparisons of anaphoric categories that differ significantly are reported in Table 6.20.

TABLE 6.20

COMPARISONS OF ANAPHORIC CATEGORIES THAT DIFFER SIGNIFICANTLY, ON TAR-MC, FORM 2, FOR THE TOTAL SAMPLE (N=100)

TAR-MC, Form 2

Group	Category 1 with 2	Category 1 with 7	Category 2 with 7
High Readers	*	*	n.s.
Low Readers	*	n.s.	n.s.
Boys	*	n.s.	n.s.
Girls	n.s.	n.s.	n.s.

* significant at the .05 level.

Mixed findings were again evident on the TAR-MC, Form 2. The comparisons of the objective case category with the nominative (Category 1 with 2) proved significant for three of the reader groups (only the comparison for the girls did not prove significant) with the objective case proving more difficult. Also, the genitive case category significantly lowered the scores of the High Readers in comparison with the nominative case. No other significant findings were noted in the

analysis.

Summary

Comparisons between the anaphoric categories were made to determine if some categories interfered (more than others) with comprehension of the antecedent/anaphora relationship. The findings indicated that the category representing the genitive case variable was the most difficult for the readers. Out of a possible sixteen comparisons with Category 1, Category 7 proved to be significantly more difficult in nine instances. Comparing Category 7 with 2, the findings indicated that Category 7 scores (for various groups of readers) were significantly lower four times. Comparisons between the other anaphoric categories were inconclusive.

The Low Readers were the group most affected by the anaphoric categories especially the effects of category 7. These findings will be discussed fully in Chapter 5.

CHAPTER 7

FINDINGS: ORAL LANGUAGE PRODUCTION OF PRONOUNS AND WRITTEN LANGUAGE COMPREHENSION OF THE ANTECEDENT/ANAPHORA RELATIONSHIP. THE RELATIONSHIP OF INTELLIGENCE AND VISUAL MEMORY SPAN TO COMPREHENSION OF ANTECEDENT AND ANAPHORA

This chapter will discuss the findings concerning oral language production of anaphora and written language comprehension of the antecedent/anaphora relationship as measured by performance on the TAR-C and TAR-MC. In addition, the results of the computations of correlations will be reported for intelligence and visual memory span in relation to comprehension of the antecedent/anaphora relationship.

Two separate analyses were used to examine the relationship between elicited oral language production and comprehension of antecedent and anaphora in written language. First, using the subsample of forty-eight students selected from the total sample of 100, a two-way analysis of variance was carried out to determine if High and Low Readers differed in their production of anaphora. Next, t-tests were used to see if High and Low Anaphora Producers differed significantly in their understanding of the antecedent/anaphora relationship.

Reader Level and the Oral Production of Anaphora

In Chapter 6 it was established that High Readers scored significantly higher on the TAR-C and TAR-MC when the variables of number of antecedents, distance between antecedent and anaphora, and anaphoric category were considered. To examine the question of oral language production of anaphora and reader level, the following hypothesis was formu-

lated:

Hypothesis 7.1

There will be no significant difference between High and Low Readers in their oral language production of anaphora.

To determine the total anaphora production, oral language production of all three anaphoric categories (Category 1, 2, and 7) was summed. The statistical procedure used was a two-way analysis of variance with grouping by reader level and sex. The mean totals and standard deviations of the sample on the oral language elicitation task are presented in Table 7.1.

TABLE 7.1

MEAN SCORES AND STANDARD DEVIATIONS FOR ANAPHORA PRODUCTION IN ORAL LANGUAGE, BY READER LEVEL AND SEX (N=48)

	Total Anaphora Production	
Group	Mean	S.D.
High Readers	46.58	17.60
Low Readers	38.58	10.09
Boys	40.25	14.04
Girls	44.79	15.40

Although high achieving readers produced more anaphora than the low readers, and the girls' oral language output indicated more anaphora than the boys, the two-way analysis of variance did not reveal any significant main effects for reader level ($F. = 3.657$, df. = 1/44, n.s.) or sex ($F. = 1.143$, df. = 1/44, n.s.). While main effects for reader level were not indicated, the level of probability did approach

the .05 level of confidence (actual p = .062).

Hypothesis 7.1 cannot be rejected in light of the findings by the two-way analysis of variance.

The next hypothesis was formulated to examine whether these groups differed in their production of individual anaphoric categories. Hypothesis 7.2 was formulated as follows:

Hypothesis 7.2

> There will be no significant difference between High and Low Readers in their oral language production of Category 1, Category 2, and Category 7.

Mean production and standard deviations for the three anaphoric categories are shown in Table 7.2.

TABLE 7.2

ORAL LANGUAGE PRODUCTION MEAN SCORES AND STANDARD DEVIATIONS FOR CATEGORIES 1 2, AND 7, BY READER LEVEL AND SEX (N=48)

	Category 1		Category 2		Category 7	
Group	Mean	S.D.	Mean	S.D.	Mean	S.D.
High Readers	31.29	12.38	4.71	3.34	9.33	5.23
Low Readers	27.21	7.47	4.29	2.82	6.96	3.39
Boys	27.42	10.15	4.17	2.93	7.42	3.48
Girls	31.08	10.38	4.83	3.22	8.88	5.33

The statistical treatment of the data indicated no significant main effects for any of the anaphoric categories (Category 1--F. = 1.823, df. = 1/44, n.s.; Category 2--F. = 0.521, df. = 1/44, n.s.; Category 7--F. = 1.243, df. = 1/44, n.s.). Sex difference did not reach statistical significance in any of the analyses (Category 1--F. = 1.823, df. = 1/44,

n.s.; Category 2—F. = 0.203, df. = 1/44, n.s.; Category 7—F. = 3.298, df. = 1/44, n.s.). No interaction between reader level and sex was found.

The results of these analyses show that Hypothesis 7.2 cannot be rejected.

The final question examined concerned the relative output of High and Low Readers in terms of ratio of anaphora to the total number of words. Hypothesis 7.3 was formulated to explore this question.

Hypothesis 7.3

> There will be no significant difference between High and Low Readers in their ratio of anaphora to total number of words produced on the oral language task.

Of the three hypotheses formulated to examine the production of anaphora, Hypothesis 7.3 is probably the most important. This is because the other analyses were dependent on such factors as sentence length which could affect the total number of words produced. However, in calculating the percentage of total anaphora to total words produced, there is a built-in equalizing effect in terms of the ratio of anaphora produced to total words produced.

Table 7.3 contains the mean percentage and standard deviations of anaphora to total number of words produced on the oral language elicitation task.

Interestingly enough, Low Readers produced a higher percentage of anaphora than High Readers. The difference between the two groups was over one percentage point. The difference between the sexes was only about .40 per cent with girls producing the higher percentage.

The two-way analysis of variance showed that the difference between the reader groups was significant (F. = 4.91, df. = 1/44,

TABLE 7.3

MEAN PERCENTAGES AND STANDARD DEVIATIONS OF ANAPHORA IN RELATION TO TOTAL NUMBER OF WORDS PRODUCED, BY READER LEVEL AND SEX (N=48)

	Percentage of Anaphora to Total Number of Words	
Group	Mean	S.D.
High Readers	10.71%	1.58%
Low Readers	11.77%	1.63%
Boys	11.08%	1.57%
Girls	11.47%	1.76%

$p < .05$). No main effects were observed for the sexes ($F. = .945$, $df. = 1/44$, n.s.). Significant interaction effects were not present ($F. = .232$, $df. = 1/44$, n.s.).

Hypothesis 7.3 was rejected on the basis of the analysis which found a significant difference between the means of the reader groups.

Summary

A two-way analysis of variance, with grouping by reader level and sex, was carried out to determine if High Readers differed significantly from Low Readers in their oral language production of anaphora. The oral language production, obtained from an elicitation task, was calculated in several ways. Only in the analysis which considered the percentage of anaphora produced to the total number of words was a significant difference between the means of the reader groups noted. Hypothesis 7.3 was therefore rejected since the approximately one percentage point difference between High and Low Readers was significant

at the .05 level of confidence.

The Performance of High and Low Anaphora Producers on the TAR-C and TAR-MC

The selected subsample of students was dichotomized with the dividing point being 11.1 per cent, that is, those subjects who produced 11.1 per cent or more of anaphora in relation to the total number of words were assigned to the High Anaphora Producers group while the subjects who produced 11.0 per cent or less were assigned to the Low Anaphora Producers group. Using t-tests, the performance of these groups on the TAR-C and TAR-MC was analyzed to determine if the means differed significantly. The hypothesis formulated to examine the performance of these groups is as follows:

Hypothesis 7.4

There will be no significant difference in the performance of the High and Low Anaphora Producers on the TAR-C and TAR-MC.

Table 7.4 reports the means and standard deviations of the two groups on the TAR-C and TAR-MC. All forms of the TAR-C and TAR-MC were used in the comparisons.

Low Anaphora Producers scored higher than High Anaphora Producers on all TAR-C and TAR-MC. The results of the t-tests which were applied to the data are reported in Table 7.5.

None of the t-test comparisons were significant although one did approach the required level of confidence (TAR-MC, Form 1). Hypothesis 7.4, therefore, cannot be rejected.

TABLE 7.4

MEAN SCORES AND STANDARD DEVIATIONS OF HIGH AND LOW ANAPHORA PRODUCERS ON THE TAR-C AND TAR-MC (N=48)

	Low Anaphora Producers		High Anaphora Producers	
Test	Mean	S.D.	Mean	S.D.
TAR-C, Form 1	29.83	7.35	26.75	6.78
TAR-C, Form 2	28.75	6.24	26.33	6.55
TAR-MC, Form 1	16.54	4.21	13.96	5.30
TAR-MC, Form 2	15.08	4.33	13.71	4.51

TABLE 7.5

t-TEST COMPARISONS FOR THE TAR-C AND TAR-MC BY ORAL LANGUAGE PRODUCTION GROUP (N=48)

	High Anaphora Prod	ow Anaphora Producers
Test		level of significance
TAR-C, Form 1		n.s.
TAR-C, Form 2		n.s.
TAR-MC, Form 1		n.s.
TAR-MC, Form 2		n.s.

The Relationship between Intelligence and Comprehension of the Antecedent/Anaphora Relationship

Computations of correlations were conducted to determine the relationship between intelligence, as measured by the Lorge-Thorndike Intelligence Test, Level 2, Form A, and performance on the TAR-C and

TAR-MC. It was noted earlier (see Chapter 5, Table 5.3) that the mean I.Q. of the High Reader group was nearly six and one-half points higher than the Low Reader group. The difference between the boys and girls was .10 points.

The correlations between the total scores on the TAR-C and TAR-MC and the total sample (N=100) are given in Table 7.6.

TABLE 7.6

CORRELATIONS BETWEEN INTELLIGENCE AND SCORES ON THE TAR-C AND TAR-MC (N=100)

Correlation of Student Scores on:	with	I.Q. Scores on the Lorge-Thorndike Intelligence Test, Level 2, Form A
Test		correlation
TAR-C, Form 1		.443*
TAR-C, Form 2		.475*
TAR-MC, Form 1		.374*
TAR-MC, Form 2		.396*
TAR-C, Form 1 (0-2 Propositions)		.391*
TAR-C, Form 1 (3-5 Propositions)		.412*
TAR-C, Form 2 (0-2 Propositions)		.426*
TAR-C, Form 2 (3-5 Propositions)		.450*
TAR-MC, Form 1 (0-2 Propositions)		.310*
TAR-MC, Form 1 (3-5 Propositions)		.415*
TAR-MC, Form 2 (0-2 Propositions)		.358*
TAR-MC, Form 2 (3-5 Propositions)		.389*
TAR-C, Form 1 (Category 1)		.339*
TAR-C, Form 1 (Category 2)		.443*
TAR-C, Form 1 (Category 7)		.396*
TAR-C, Form 2 (Category 1)		.415*
TAR-C, Form 2 (Category 2)		.456*
TAR-C, Form 2 (Category 7)		.319*
TAR-MC, Form 1 (Category 1)		.355*
TAR-MC, Form 1 (Category 2)		.337*
TAR-MC, Form 1 (Category 7)		.247**
TAR-MC, Form 2 (Category 1)		.360*
TAR-MC, Form 2 (Category 2)		.272**
TAR-MC, Form 2 (Category 7)		.251**

* indicates significance at the .001 level
** indicates significance at the .01 level

All correlations were significant at the .01 level of confidence. The range of correlations for the TAR-C and TAR-MC was from .251 to .475. In general, the correlations were higher for the TAR-MC than the TAR-C.

The Relationship between Visual Memory Span and Performance on the TAR-C and TAR-MC

The scores obtained from the Detroit Tests of Learning Aptitude, Subtest 16, were correlated with scores on the TAR-C and TAR-MC to determine the relationship between visual memory span for letters and comprehension of the antecedent/anaphora dualism. The correlations for the total sample are shown in Table 7.7.

The correlations that were significant ranged from .243 to .411. Three of the correlations were not significant at the .01 level of confidence. Typically, the correlations for visual memory span and the TAR-C and TAR-MC were not as high as those found between intelligence and the TAR.

Summary

The relationship between the two variables (intelligence and visual memory span) and the subjects' performance on the TAR-C and TAR-MC was examined by means of computations of correlations. All of the correlations between intelligence and scores on the TAR-C and TAR-MC were significant at the .01 level or better. They ranged from .251 to .475. Only three of the correlations between visual memory span and scores on the TAR-C and TAR-MC were not significant at the .01 level or better.

TABLE 7.7

CORRELATIONS BETWEEN VISUAL MEMORY SPAN SCORES ON THE TAR-C AND TAR-MC (N=100)

Correlation of Student Scores on:	with Visual Memory Scores for Letters
Test	correlation
TAR-C, Form 1	.384*
TAR-C, Form 2	.345*
TAR-MC, Form 1	.334*
TAR-MC, Form 2	.298**
TAR-C, Form 1 (0-2 Propositions)	.411*
TAR-C, Form 1 (3-5 Propositions)	.295**
TAR-C, Form 2 (0-2 Propositions)	.239
TAR-C, Form 2 (3-5 Propositions)	.399*
TAR-MC, Form 1 (0-2 Propositions)	.322*
TAR-MC, Form 1 (3-5 Propositions)	.312*
TAR-MC, Form 2 (0-2 Propositions)	.345*
TAR-MC, Form 2 (3-5 Propositions)	.218
TAR-C, Form 1 (Category 1)	.361*
TAR-C, Form 1 (Category 2)	.231**
TAR-C, Form 1 (Category 7)	.339*
TAR-C, Form 2 (Category 1)	.298**
TAR-C, Form 2 (Category 2)	.243**
TAR-C, Form 2 (Category 7)	.340*
TAR-MC, Form 1 (Category 1)	.312*
TAR-MC, Form 1 (Category 2)	.254**
TAR-MC, Form 1 (Category 7)	.264**
TAR-MC, Form 2 (Category 1)	.294**
TAR-MC, Form 2 (Category 2)	.292**
TAR-MC, Form 2 (Category 7)	.113

* indicates significance at the .001 level
** indicates significance at the .01 level

CHAPTER 8

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Few models of reading today ignore the reader's active use of syntactic and semantic cues in the reading act. Therefore, it is important to determine how various readers comprehend grammatical phenomena found in written materials. It is especially important to determine the abilities of these readers in the acquisition stage of reading.

While it may be the task of the reading specialist to determine how children comprehend grammatical phenomena, it is the teacher of reading who must apply this knowledge in an effective manner. It is the teacher, knowledgeable of the characteristics and capabilities of the learner, along with an understanding of the grammatical phenomena the child will encounter, who will be the facilitator of the child's acquisition of the reading process. Children in the primary grades are still acquiring the ability to comprehend certain grammatical structures in oral language. With the current emphasis on the relationship between oral language and reading, it is important to know the exact extent of this relationship. Too many current authors have glibly talked of this relationship in terms that are sweeping in scope. Specifically, some seem to imply that any structure understood in oral language will be reciprocably understood in written language, provided adequate word identification is available. However, as Fagan (1969) has asserted, there is no guarantee that a child who is fluent with oral language will be equally fluent with written language since the structure of the two is different (p. 245). Further support for this statement is found in the results of studies by Cosens (1973) and Holt (1974).

It was the purpose of this study to examine one element of the total grammatical structure of the language, namely, anaphoric reference. The focus of the investigation was on the relative abilities of High and Low Readers in their second year of school, as defined by performance on a measure of general reading comprehension, to understand the antecedent/anaphora relationship. The variables examined in regard to this relationship were as follows:

a. The effects of number of antecedents in a discourse on the comprehension of the antecedent/anaphora relationship.

b. The effects of distance between antecedent and anaphora on the comprehension of this dualism.

c. The effects of certain anaphoric categories (representing case) on the comprehension of the antecedent/anaphora relationship.

A secondary purpose of the study was to investigate the relationship between oral language production of anaphora and the understanding of the antecedent/anaphora dualism in written language.

This chapter will present a brief summary of the investigation and its findings. In addition, the conclusions, educational implications, and certain limitations of the study will be put forward.

Summary of the Study

This study was concerned with effects of a particular grammatical phenomenon on the ability of children who were in the acquisition stage of the reading process, and who were assumed to be in the acquisition stage of oral language development. Thus, three distinct, yet obviously interrelated reviews of the literature were carried out.

The initial review of the literature focused on establishing a theoretical position in terms of the reading process. Essential

aspects of the reading act were identified and examined. While not negating the importance of the other components (discrimination and word identification) this investigation was basically concerned with comprehension, and particularly with the semantic and syntactic cues used by the reader to acquire meaning. It was established that while the grammatical phenomenon in question (anaphora) does contain certain semantic information, it is basically a syntactic aspect of language. The importance of the syntactic element in language, in general, was established by reviewing several pertinent studies, including two that dealt directly with anaphora and its effect on comprehension of written language.

The second review of literature involved the description (including a definition) of the grammatical phenomenon being investigated, namely, anaphoric reference. A historical review was carried out to establish which elements of the language are considered anaphoric in nature. Also, certain approaches to the description of language were examined for applicability to the study.

Finally, studies dealing directly with anaphora, in written and oral language, were analyzed for relevance to this investigation. Several decisions as to the scope and direction of the study resulted from this review. These included the choice of anaphoric categories that were investigated, the inclusion of the distance factor, and the selection of the oral language task.

The testing instruments used in the study were the specially designed Tests of Anaphoric Reference (TAR). Two basic testing formats were used in the TAR. The antecedent/anaphora relationship is a dualism in the sense that both elements need to be identified. Therefore, the

first TAR incorporated a selected cloze procedure where the subject was provided with the antecedent and was required to supply the proper anaphora while the second format of the TAR required the subject to identify the antecedent when provided with the anaphora.

Two forms of each format of the TAR were devised. Form 1 of each format contained two interacting antecedents, one male and one female. Four interacting antecedents, two male and two female, were present in Form 2 of each TAR. The forms were also designed so that the variables of distance and anaphoric category could be analyzed.

Upon evaluation of the results of the pilot study, certain modifications were made on the TAR and the directions used with the tests. The TAR were administered to 160 students of the Edmonton Catholic School System. In addition, various other instruments were administered to the children. These included an intelligence test, a test for visual memory span, and a specially designed word recognition test. A selected subsample of forty-eight children, drawn from the main sample, was given an oral language production task and protocols from this task were obtained.

The basic design of the study was a 2x2x2 factorial with three dependent variables--number of antecedents, distance between antecedent and anaphora, and anaphoric category. Statistical procedures used to evaluate the data included two-way analyses of variance, two-way analyses of covariance, one analyses of variance, t-tests, and Pearson product moment correlations. The findings of these analyses are contained the next section.

Main Findings and General Conclusions

In this section the most significant findings from Chapters 6 and 7 are summarized. The implications of these findings are also discussed.

Main Findings

The main findings, as presented in Chapter 6 and 7 will be discussed under the following headings: High-Low Readers; boy-girl readers; the effects of number of antecedents in a discourse; the effects of distance; the effects of anaphoric category; and, the relationship between oral language production of anaphora and comprehension of the antecedent/anaphora relationship.

High-Low Readers. In his thesis dealing with cognitive synthesis and reading comprehension, Latham (1973) reasoned that "...while a knowledge of verbal concepts is necessary for the comprehension of written language, it is not a sufficient condition to ensure that such comprehension will occur (p. 368)." A second factor which, though important for comprehension, cannot ensure that it will be achieved was shown by the results of this study. This second factor is word recognition.

The students who were included in the final sample had to demonstrate adequate word recognition ability, yet, there was a variance in the ability of the students to comprehend the antecedent/anaphora relationship in written language. This study showed a consistent pattern of significantly higher scores on the TAR by the High Reader group when compared with the Low Reader group. This superiority was especially

evident when the number of antecedents was considered or when the distance between antecedent and anaphora was taken into account. Only in analyzing the data concerning the effects of anaphoric category was the evidence less than overwhelming. However, even in these comparisons, the totality of the evidence can only lead one to conclude that High Readers outperform Low Readers. In order to appreciate these results one must realize that the High and Low Reader groups were dichotomized by a band of scores. The scores were ranked and an arbitrary cut-off point of 3.6 was chosen so that equal numbers fell above and below the score.

In examining the relative performance of High and Low Readers in more detail, the first analysis focused on the number of antecedents interacting throughout a discourse. With all results significant at the .001 or better, the High Readers outscored the Low Readers on both forms of the TAR-C and TAR-MC. Thus, neither format nor number of antecedents affected the superior performance of the High Readers over the Low Readers.

Highly significant results, favoring the High Reader group over the Low Readers, was evidenced in examining the effects of distance between antecedent and anaphora on the TAR. The higher scores of the High Reader group were maintained whether the distance was 0-2 or 3-5 propositions intervening. In addition, this superiority was evident on both forms of the TAR which indicates that neither format nor number of characters influenced the findings.

The performance of the two reading groups on the anaphoric categories built into the passages, and reflected on the TAR, basically followed the pattern established in the other analyses. While the High

Readers typically scored higher than the Low Readers, there were two instances of no significant difference between the two groups. This break in established patterns was noted on the TAR-C, Form 2 and the TAR-MC, Form 1. In both cases the level of significance approached the .05 criterion for rejection of the hypothesis. There was no pattern to these exceptions as they occurred on a different test format and in two different categories.

It is interesting to note that, generally, test format did not influence the performance of the reader groups. This fact lends support to the early contention that the antecedent/anaphora relationship is indeed a dualism and that comprehension is contingent upon awareness of both elements, that is, the antecedent and anaphora.

In summary, it has been shown that High Readers achieved significantly higher scores on the TAR regardless of the variable being considered. This superiority was evidenced in spite of the fact that all children in the sample had to demonstrate adequate word recognition of the words contained in the test passages. To further rule out the effects of word recognition, the statistical procedure of analysis of covariance, with the covariate being word recognition, was used to analyze the data. This would appear to present strong evidence that word recognition ability cannot be used to explain the difference in scores by the sample.

Why then, do High Readers continually demonstrate such a distinct superiority in scores on the TAR? Latham (1973) contends that "...the ability to select the appropriate information processing strategy appears to be a necessary condition for the comprehension of language (p. 369)." Intuitively, this is a satisfying statement and it could be

that High Readers have adopted superior information processing strategies, however, it is not known why these readers have adopted better strategies or more important, how they acquired superior strategies.

If the antecedent/anaphora relationship is examined it is possible to speculate on two approaches the reader might use to identify the antecedent if he is given the anaphora. First, it could be identified by an association process through the use of memory recall. Given the capacity of short term memory the reader might recall the antecedent from this store if the distance factor is sufficiently short (cf. Lesgold, 1972). However if the distance between antecedent and anaphora is increased it is possible that the information has been passed on and processed in long term memory. If the reader can recall the proper antecedent from the appropriate memory store comprehension of the antecedent/anaphora relationship will take place.

A second strategy could occur when the reader realizes he cannot recall the information (the proper antecedent) and reverts to a visual regression process. It is probable that the reader uses a visual search scan of the print rather than a complete rereading of the text. Borrowing Hochberg's (1970b) idea of "cognitive search guidance", one might speculate that High Readers are better able to use this system--in reverse.

While the above speculations focus on the correct identification of the antecedent it is, of course, possible to identify an improper antecedent. As an explanation to improper identification of the antecedent Lesgold (1973) possibly would contend that the child did not know the interpretation rules required to understand the antecedent/anaphora relationship in the semantic context that it was present. Of course,

to prove this contention, one would need to devise a set of rules that adequately describe the language the child was reading. As yet, this task has defied all attempts.

Another way of applying Lesgold's explanation would be that the child actually knew the rules but failed to apply them properly. This interpretation would coincide with Chomsky's distinction between competence and performance and would claim a psychological reality for such rules--a concept being questioned by a number of current psycholinguists.

Boy-Girl Readers. As Carroll (1971) has observed, "...it is rather universal finding that on the average girls do better than boys on reading tests (p. 182)." While Carroll noted that his observations applied mainly to studies completed in the United States there is no reason to believe this observation is invalid for the children of Canada (see also, Weintraub, 1966). Yet, in this study there were no significant differences revealed on any of the analyses that were carried out. This finding was consistent whether one considered the number of antecedents, the distance between antecedent and anaphora, or the anaphoric category. In addition, the ngs remained constant on both the cloze and multiple choice formats of the TAR.

The absence of any significant differences between the mean sco produced by boys and girls might be explained by the mean silent reading comprehension scores obtained by the two groups. There was only a difference of .1 between the mean scores of the two groups. This, of course, is assuming that reading achievement rather than sex is the determining factor.

The equality of the mean comprehension scores could not explain

the significant interaction obtained between sex and reader group on several of the analyses. Four instances of significant interaction were noted and in each case the nature of the interaction was similar. The High Readers who were girls outscored the High Readers who were boys but the reverse situation was observed in the case of the Low Readers, that is, boys scored higher than girls.

The interaction can be explained in terms of I.Q. Referring to Table 5.3 one can see that the mean I.Q. of High Girl Readers was 116.12 while the mean I.Q. of High Boy Readers was 113.88. The difference for the Low Readers was reversed with the boys mean I.Q. being 109.76 and the girls 107.56.

All instances of interaction were recorded on the TAR-C. Three cases were found on Form 1 of the TAR-C and the other was observed on Form 2 of the TAR-C.

Number of Antecedents. The effects of number of antecedents interacting throughout a discourse on the subjects' ability to comprehend the antecedent/anaphora relationship was examined by means of t-tests. For all reader groups, the mean scores obtained on Forms 1 and 2, on both the TAR-C and TAR-MC, were compared. A total of sixteen comparisons were carried out.

The findings indicated that an increase in the number of antecedents, in this case from two to four, resulted in a decrease in the mean scores of all groups on the TAR-C comparisons. All findings were significant. In addition, all but one group (boys) demonstrated a similar pattern of achievement on the TAR-MC. Thus, there are strong indications that an increase in the number of antecedents interacting throughout discourse precipitates a decrease in comprehension of the

antecedent/anaphora relationship.

Returning to the explanation of "why" certain groups or individuals do not comprehend the antecedent/anaphora relationship as well as others, it is possible to integrate the above conclusion with the previous discussion. The addition of antecedents to discourse would add to the memory burden of the reader. This burden would be twofold in that one would need to contend with both storage and retrieval of the proper antecedent. If the reader did not use the memory stores to recall the proper antecedent then a visual regression search would have to ensue. The addition of antecedents would increase the complexity of the visual search.

It is an interesting finding that all groups found the addition of antecedents an interfering factor. From the previous findings, it would have been logical to speculate that the Low Reader group only might be affected by the analyses indicated that all reader group scores were significantly lowered by the additional two antecedents.

Distance between Antecedent and Anaphora. The literature indicated that an increase in distance between antecedent and anaphora would correspondingly effect a decrease in the reader's ability to understand this grammatical relationship. The results of this study did not fully support this contention. As with the comparisons concerning the number of characters, t-tests were carried out to test the difference between the means. Sixteen separate comparisons were made in this manner.

Out of the sixteen possible comparisons the increased distance, as measured by number of intervening propositions, proved to be a significant factor in seven instances. One additional comparison approached,

but did not reach significance.

While only slightly less than half were significant, a pattern was revealed as predominant in reference to the Low Reader group. In three cases, out of a possible total of four, the mean scores of the Low Reader group were significantly lowered by the additional distance between antecedent and anaphora. High Readers and girls were least affected by the increased distance with only one instance of significantly lowered scores. A possible explanation for this finding is that the superior visual memories of the High Readers and girls facilitates the recall of the proper antecedent. The mean visual memory score of the High Readers was over two points higher than the Low Readers (see Table 5.4). While the difference between the girls and boys was not as great (almost one point) it does offer a possible explanation. Since the results for the boy readers were equivocal it is difficult to offer a logical explanation as to the effects of increased distance between antecedent and anaphora.

Harris (1948) and Mosberg and Shima (1969) speculated that distance between antecedent and anaphora affects understanding of this relationship. While these authors did not support their speculations with any evidence it is, nonetheless, an intuitively satisfying contention. Why then, did the results of this study not fully support this idea? It is possible that the distances used in the investigation were not sufficiently large to be discriminating. In other words, if the investigator had used a distance of 0-2 and 8-10 propositions a significant decrease in comprehension might have occurred. Obviously, this is a non-realistic proposal. Since the typical distance found in the passages selected for the study was 0-5 propositions, then the use of

a greater distance was not justified.

It is possible that certain relationships exist in discourse that defy analysis by means of propositions. For example, consider the following sentences:

a. John turned to Mary and said, "You...

b. John turned to Mary and said, "I...

c. John smiled at Mary and said, "You...

d. John smiled at Mary and said, "I...

e. John said to Mary, "I...

Of course, this list of sentences could be expanded but the basic point is that the reader must perceive the correct relationship between the addresser and addressee (cf. Weir, 1962). It is interesting to note that the propositional distance between antecedent and anaphora would be in the 0-2 category. Perhaps, as Lesgold (1974) has argued, imagery factors play a role in comprehension of the antecedent/anaphora relationship. It might be that the reader who could mentally picture the situation would be better equipped to understand the antecedent/anaphora relationship.

It would appear that, from the results of this study, a more detailed investigation of the distance factor, especially by anaphoric category, is warranted.

Anaphoric Categories. The anaphoric categories investigated in this study approximately correspond to case relationships typically referred to as nominative (Category 1), objective (Category 2), and genitive (Category 7). The review of literature indicated that both the objective and genitive case categories should prove more difficult than the nominative. Comparisons of the three anaphoric categories

were made for all reader groups on both the TAR-C and TAR-MC. This resulted in a total of forty-eight comparisons.

Overall, there were twenty separate instances where one anaphoric category was found to be more difficult for a particular reader group than another category. Several patterns of performance emerged from these analyses. The clearest of the findings focused on the relative ease of the nominative case category (Category 1). At no time did any of the groups score lower on this category than either Category 2 or 7. These findings support the earlier work of Fagan (1969) and Coleman (1971). If indeed, the relationship between oral and written language is interwoven as close as some would have us believe, there is also support for the findings of Hatch (1969).

An examination of the findings in relation to the number of antecedents, as found in the TAR-C and TAR-MC, indicated that significant differences in the mean scores of the anaphoric categories were most likely to occur on the TAR that contained four antecedents. Since it has been shown that the subjects' scores were lowered by the addition of antecedents in discourse it is possible that the anaphoric category scores were affected by this factor.

As previously mentioned, the nominative case category (Category 1) did not prove as difficult for the subjects as either the objective case (Category 2) or the genitive (Category 7). Of the three categories, the genitive proved to be the most difficult for the subjects. In the instances where significant differences were reported, Category 7 proved to be more difficult than Category 1 a total of nine times. In comparing Category 7 with Category 2, the genitive was more difficult in four instances.

Oral Language Production of Anaphora and Comprehension of the Antecedent/Anaphora Relationship in Written Language. To argue that there is a relationship between oral language and written language is tautological. That the relationship exists is not the crucial question [illegible] the real issue is the exact nature of this relationship that requires study.

The present study attempted to determine the relationship between oral language production of the anaphoric categories, which contained personal pronouns, and comprehension of the antecedent/anaphora relationship in written language.

Oral language production and performance on the TAR was examined by two methods. First, the oral language output of the anaphoric categories under study was analyzed to determine if the reader groups differed significantly. Next, the sample was dichotomized into High and Low Producers of the anaphoric categories and the performance of these groups on the TAR was analyzed.

Three separate analyses, using a particular tabulation of oral language production and the scores of the subjects on the TAR, were carried out. The first analysis used the raw tabulations of the subjects' oral language production of the anaphoric categories. It was recognized that these scores could have been influenced by such factors as mean sentence length, that is, one group might consistently produce longer sentences than another group. Needless to say, a group that produced longer sentences might also produce more of the pronouns in the anaphoric categories.

The two-way analysis of variance carried out on the data did not reveal any significant differences in total production for any of

the reader groups (High and Low Readers) or sex groups (boys and girls).

The second analysis compared the scores of the reader and sex groups on the TAT and oral language production of the three anaphoric categories devised for the study. Again, no significant differences were reported for any of the comparisons.

Recognizing the limitations imposed by using the raw totals of anaphora production on the oral language task, a more equitable method of calculating production of the categories was devised. This method took into consideration the possible effects of sentence length. For this analysis the total production of the anaphoric categories was divided by the total number of words produced (fifty sentences were analyzed for each subject). This produced a percentage of total anaphoric category production to total number of words. In this analysis the findings were significant. High Readers produced a significantly smaller percentage of anaphora than Low Readers. Main effects for the sex groups were not noted.

The results of the third analysis tend to support the previous suspicion that mean sentence length might influence the production totals of the anaphoric category under study. Examining the mean total for the reader groups one finds that the High Readers produced more pronouns that fit into one of the three anaphoric categories than Low Readers, although this difference was not significant. However, when the production of the anaphoric categories was tabulated in the form of a percentage (anaphora to total number of words), the High Reader group produced a smaller percentage of pronouns that fit the three anaphoric categories than the Low Readers.

To further explore the question of oral language production

and comprehension in written language, the subsample (43 subjects drawn from the main sample of 100) was dichotomized into High and Low Anaphora Producers (see Chapter 7 for information concerning the dichotomization). The mean scores of the two oral language groups were compared by means of t tests. While the means indicated that the High Anaphora Producers scored lower on the TAH-C and TAH-MC none of the comparisons actually reached the .05 level of confidence. Several of the comparisons approached, but did not reach significance.

The most important finding from the investigation of oral language production and written language comprehension was that those subjects who best understood the antecedent/anaphora relationship in written language produced a smaller percentage of anaphora (the three anaphoric categories under study) in oral language. It would appear that the work of Hawkins (1969) offers at least a partial explanation for this finding. He associated high production of anaphora (his categories were not the same however as those used in this study) with children who use a restricted language code (in a Bernstein sense). While this investigator is not prepared to posit that the children in this study who were Low Anaphora Producers possess a restricted language code it is possible that anaphora production is linked to language maturity. For example, it is quite difficult, if not impossible, to modify personal pronouns in any effective manner. Thus, one can say The sad, wandering minstral, but it is intuitively wrong to say The s.d. wandering he. Therefore, it seems to this writer that the children who exhibit maturity in their language will use pronouns, and perhaps anaphora in general, in a judicious manner.

The Contributions of this Study

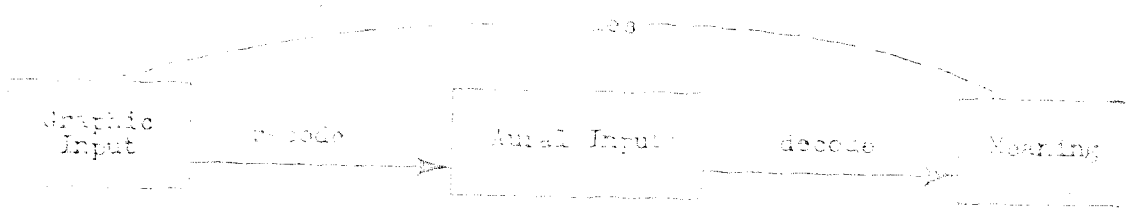
The findings of this investigation support several [illegible] contributions to reading theory, instructional programs in reading, and [illegible]

Reading Theory

Although this study was not based on any [illegible] theory of reading, the works of several writers were used to extract the essential elements that must be accounted for in the reading act. The model of silent reading proposed by Goodman (1970) was discussed in Chapter II and is reproduced here (Figure 5.1).

FIGURE 5.1

AN ADAPTION OF GOODMAN'S 1970 MODEL TO ILLUSTRATE EARLY SILENT READING



This model may still be used to describe the reading process of beginning readers. This study, hopefully has added more information about what happens during decoding.

This investigation focused on the abilities of beginning readers and their understanding of one, primarily syntactic, relationship in language. The study clearly demonstrated that in spite of adequate word recognition ability, Low Readers do not comprehend the

antecedent/anaphora relationship as accurately as High Readers.

It was also demonstrated that the beginning reader's ability to comprehend the antecedent/anaphora relationship is diminished by the presence of certain linguistic factors, especially factors that directly impinge upon the understanding of the antecedent/anaphora relationship (e.g., the number of antecedents in a discourse, the distance between antecedent and anaphora, etc.).

As Latham (1973) has pointed out, "...the ability to effect both semantic and syntactic processing is dependent upon a knowledge of language (p. 391)." The findings of this study indicate that mere production of a given element in oral language does not guarantee comprehension of that element in written language. Thus, while Latham's statement warrants consideration, careful thought will have to be given to the methods of evaluating the child's knowledge of language and how this knowledge of language relates to written language comprehension. Reception of written language (reading) appears to be one of possibly several peculiar language processes. The fact that a certain phenomenon is present in oral language does not necessarily mean it is equally available in written language. This conclusion is derived from the finding that High Readers outscore Low Readers on the TAR but when oral language production is considered High Anaphora Producers do not correspondingly outperform Low Anaphora Producers on the written language measures (TAR).

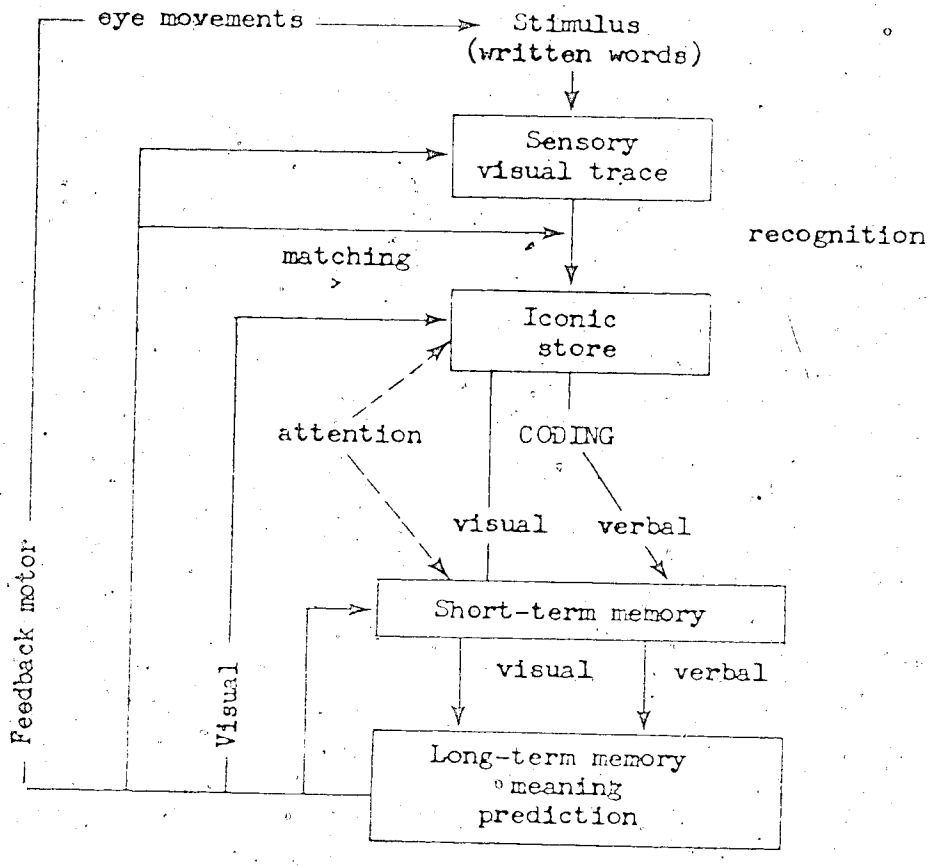
Psycholinguistics

Although the term "psycholinguistic" is actually redundant since it is difficult to imagine a normal language situation where the

mind would not be involved, many reading experiments now adopt this label. Using a partial replication of J. Mackworth's schematic model of the reading process the role of memory (and its interaction with language) will be explored. Figure 8.2 depicts the model.

FIGURE 8.2

PARTIAL REPLICATION OF THE J. MACKWORTH SCHEMATIC MODEL OF THE READING PROCESS



In this study it was assumed that the children possessed adequate discrimination ability, and since word recognition was accounted for, the recognition stage of the J. Mackworth model will not be discussed. The reading task (TAR) required the subjects to use both short-

term memory (STM) and long-term memory (LTM). Three distinct aspects of memory must be accounted for in both STM and LTM. They are: coding, storage and reorganization, and retrieval. While not diminishing the importance of the first two aspects it would appear that retrieval is quite important in comprehending the antecedent/anaphora relationship. The study indicated that High Readers comprehend this relationship better than Low Readers. Also, the variables that tend to increase the comprehensibility of the antecedent/anaphora relationship affected the High Readers less than the Low Readers. Two of the variables, number of antecedents and distance, relate directly to the three aspects of memory as forwarded by J. Mackworth. While the three aspects of STM and LTM are present in the antecedent/anaphora relationship the study did not indicate any direct indication as to the importance of each.

Implications for Instructional Programs

If indeed, there was a perfect correlation between oral language production of a given grammatical element and the comprehension of that element in written language, there would be little need to "teach comprehension". Teachers of reading would basically have to ensure the child was equipped with adequate word identification skills. Since this correlation has not been demonstrated one must decide the relative emphasis to place on various aspects of written language comprehension.

The investigator does not view the grammatical phenomenon that was studied as occupying a major role in the general schema of teaching comprehension. The antecedent/anaphora relationship is but one of many such inter- and intra-sentence phenomena that needs to be understood by

the reader. However, some direct teaching of the relationship is obviously warranted. At the primary level of schooling, the relationship can be introduced in sentences where the antecedent and anaphora are present in one utterance. As children progress in their general comprehension ability more complexity may be added to the antecedent/anaphora relationship. For example, the addition of antecedents to a discourse has been shown to affect comprehension of antecedent and anaphora. Stories that contain several characters would be a logical step in increasing the complexity of the antecedent/anaphora relationship. Both direct teaching and follow-up practice would be called for in these situations.

The selected cloze procedure used in this study to test the subjects' ability to comprehend the antecedent/anaphora relationship could be readily applied as a tool for developing the child's awareness of this grammatical phenomenon. The use of this technique would eliminate the need for specially designed exercises since it is adaptable to any written material.

The more familiar multiple choice format could be applied to practice exercises focusing on the antecedent/anaphora relationship. A viable alternative to the traditional multiple choice format would be the "wh" type questions proposed by Bormuth (1970). It must be remembered that both methods are considered either testing or practice procedures. Direct teaching, prior to these procedures, is a prerequisite. It is the contention of this writer that the classroom teacher must do more than merely provide the opportunity (or provide experiences) for the manipulation of this grammatical phenomenon. Formats such as those presented by Wallen (1972) or Otto et al., (1974) can be adapted

for the teaching of the antecedent/anaphora relationship. Regardless of which teaching format is used it is important that the child be aware of the focus of instruction and not merely provided with a general language manipulation experience.

While it was not the purpose of this study to examine children's writing, at least one instructional implication seems to apply. As Hawkins (1969) has pointed out, pronouns are difficult to modify in any effective manner. Thus, it would appear that an over-reliance on pronouns is an undesirable trait in writing.

The suggestion concerning children's writing would also seem to have some application to the use of oral language. So-called language maturity measures are still in an embryonic state of development. While it is obvious that the individual language situation would dictate whether or not the use of a substitute form was more appropriate than the use of the referent, it might be generally suggested that an over-reliance on substitutes would lead to a lack of precision in oral language.

It is perhaps too ambitious to suggest that publishers of children's written materials, especially basal readers, consider the use of anaphora. Although the writer is not advocating "anaphora control", in the manner that vocabulary control has been adopted, certain aspects of the antecedent/anaphora relationship should be taken into account. For example, the introduction and continued interaction of a large number (e.g., four or more) of characters is not justifiable in the written materials of beginning readers. This is not to say several characters cannot enter a story; it is only advocated that complex interaction of these characters, as indicated by pronominal

reference, not take place.

The findings of this study did not conclusively demonstrate that distance between antecedent and anaphora is an interfering factor in comprehension except for the Low Reader group. However, until more is known about this factor common sense would mitigate against placing great distance between these two elements. In the analysis of basal readers for this study one instance was recorded where the distance between antecedent and anaphora was 123 words. Distance of this magnitude would appear to be unwarranted, especially for readers who are low in general comprehension ability.

The scores of the Low Readers in this study were those typically most affected by the various factors that can influence comprehension of the antecedent/anaphora relationship. Existing research on the differences between achieving and non-achieving readers tends to be correlational in nature. Few studies have focused on the specific aspects of reading that differentiate the achieving and non-achieving reader. In this study it was found that the scores of the Low Readers were significantly lower than those of the High Readers in practically all of the comparison focusing on the comprehension of the antecedent/anaphora relationship. Since many schools in North America group on some basis of reading comprehension achievement these characteristics of Low Readers appear important if one is to adequately plan an instructional program in reading.

Implications for Teacher Education

In her succinct, yet encompassing statement regarding a definition of reading Mackworth (1971) has stated that "..."reading" can

only be defined in terms of "who" is reading what in what state for what reason (p. 8-67)." Teachers of reading need to know about these four facets of reading (this writer considers "who" a facet) in order to facilitate the acquisition of the reading process. The writer views this study as adding a dimension of knowledge to the who and what components of Mackworth's definition.

Teachers will need to be aware of the linguistic development of the child and how this development relates to acquisition of the reading process. To acquire this type of knowledge a substantial linguistic component will need to be incorporated into the teacher training program. This requirement will need to be specially tailored to meet the requirements of teachers. Thus, the writer is not arguing for a block of theoretical linguistic courses. A specially designed course (or courses) dealing with language acquisition and the description of language (in general) is required. Needless to say, the components of this course would be interrelated with the teaching of reading.

Comprehension is too often thought of in terms of content. Teachers need to be aware of the syntactic structures by which information is signalled in language. This study demonstrated the lack of ability, by some students, to comprehend one syntactic aspect of language. Other studies have amply shown that there are many syntactic phenomena that are not fully comprehended by students in the primary and elementary school.

While a great deal of lip service is given to "meeting individual needs" in children, little attention has been paid to the characteristics of certain groups of readers. There is obviously variability

in the individual performance of students who were classified as either High or Low Readers, yet, the knowledge of general performance patterns by these groups of readers can provide the teacher with many insights.

The relationship between oral and written language is the focus of a great deal of recent research. Inclusive approaches to the teaching of reading are based on the assumption that there is a high correlation between oral and written language ability (e.g., the so-called Language-Experience Approach). It was argued in this study that the oral-written language relationship may not be as straightforward as it may appear. However, complex as the relationship may be, teachers of children who are in the acquisition stage of both oral and written language need to know the characteristics and capabilities of these learners.

Suggestions for Further Research

This study investigated one facet of the total grammatical phenomenon of substitution. Although a rationale was forwarded for the study of only this particular aspect of substitution, there is an obvious need for further investigation into this grammatical phenomenon of language. Many interesting elements of substitution, especially anaphora, are suggested by the work of Bormuth et al. (1970) and Lesgold (1974). Indeed, the sometimes conflicting findings of these two investigations have opened up many new avenues of research.

The effects of distance between antecedent and anaphora require further investigation. The findings of this study were mixed as to whether or not this was a significant element in comprehension. Possible avenues of research lie in devising new methods of measuring the distance

between antecedent and anaphora.

Certain anaphoric categories contain limited semantic information. Such pronouns as he and she reveal both the gender and number of the antecedent while such words as you render no such information. The relative difficulty of such anaphora offers an intriguing area for study. For those interested in imagery factors this area seems to offer fruitful [illegible].

Although an analysis of basal readers was carried out to establish the incidence of anaphora in the grade two texts, further, and more detailed analyses need to be conducted. As more is learned about the ability to comprehend such inter- and intra-sentence grammatical phenomena such as anaphora the incidence of these elements in the readers will take on more importance.

Mackworth (1972) has asserted that three aspects of each type of memory (short term and long term) must be accounted for in reading. She names these aspects as: (a) coding into memory, (b) storage and reorganization in memory, and, (c) retrieval from memory. She further contends that, for children, the most important aspect is coding into memory. However, to understand the antecedent/anaphora relationship, retrieval from memory would appear to be equally important. The role of memory in the understanding of substitution forms in general and anaphora in particular appears to offer many possibilities for research.

Many reading specialists today feel that visual regressions are an integral part of the reading act. Just as Goodman and his associates have enlightened us that oral reading miscues, or errors as they frequently are named, are not equal in value, one might infer that visual regressions vary in value. The writer has argued that readers

use either a memory retrieval process or a visual regeneration process to identify the proper referent for a given anaphora. Since it is unlikely that the High Reader group relied exclusively on the memory retrieval process one might assume they were better able to accurately locate the referent by means of visual regeneration. It is possible that further investigation of visual regeneration, i.e. relating it to [illegible] could be worthwhile.

This study could not be based on a theory of grammar which dealt adequately with the antecedent/anaphora relationship. [illegible] authors-generative, which offers one of the best views of grammar but not adequately accounts for discourse phenomena. Tagmemics, which has attempted to describe discourse, suffers in that it is not really a theory of grammar at all. As linguists devise more adequate and theoretically viable means of describing language, especially discourse phenomena, studies such as the present one need to be modified and repeated.

Since the grammatical phenomenon under study is intersentential and intrasentential the print stimulus for the S.M. was discourse. Many recent psycholinguistic experiments have used the sentence as the means of presentation. It would appear that presenting sentences in isolation is not consistent with the normal act of reading. This study showed that several variables which are associated with discourse can influence comprehension (e.g., number of antecedents in the discourse). It would appear that further research in reading must consider the normal presentation mode of the phenomenon under study.

Finally, as Farr and Weintraub (1971) have recently noted, longitudinal studies are conspicuous only by their absence in the literature.

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Rudloff, [illegible]

Rudloff, [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Singer, [illegible]

[illegible]

Smith, [illegible]

Smith, [illegible]

[illegible]

[illegible]

Stefanski, [illegible]

Sweet, [illegible]

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APPENDICES

APPENDIX A

Tests of Anaphoric Reference

Cloze Directions

You are going to read a story from which some words have been taken out. Whenever you see a blank, you are to try and guess what word has been left out. Write or print this word on the line. Look at your example sheet (hold up correct sheet). Here is an example.

The _____ began to moo.

What word might fit in the blank? (accept answers)

Let's try another one.

Red and _____ are my favorite colors.

What word would you want to write on the line? (Accept answers from the children). Now we see sometimes more than one word can be correct. Most of the time only one word has been taken out of the story. But if you want to put a name on the blank line you may need a title such as Mrs. Smith or Mr. Jones. This is the only time you will use more than one word. All the blanks are exactly the same length, but the words that fill them may be long or short.

Try to fill in every blank. If you cannot think of a word go on to the next blank. Don't be afraid to guess. Watch for punctuation marks such as periods. They tell you where a sentence ends. When you finish go back and try to fill in any blank you skipped. If you want to change an answer cross out the word on the blank and write the new one above it.

If you don't know how to spell a word, hold up your hand. I will come to your desk and spell it for you.

Before we begin the big story let's practice on the small story. Look at example 3. I want you to try and fill in the three blanks in the story. Ready? Begin. (Allow time for completion of the task. Ascertain all children understand the task.)

Name _____

1. The _____ began to moo.
2. Red and _____ are my favorite colors.
3. The two bears were _____ for something to eat. The mother found some _____. Just as they started to eat another bear came.

"_____ out of my berries," said the big bear.

THE STORM (TAR-C Form 1)

One afternoon Jimmy was working in his garden. Mitten, the cat, was playing near by. Jimmy's father was in bed with a bad cold.

Mrs. Green came out of the lighthouse and said to Jimmy, "___1A___ will not be visiting ___7A___ grandmother today. A storm is coming. ___1B___ just heard the news on the ___Nil___.

"Mother," Jimmy asked, "May ___1A___ play out in the rain if ___1B___ put on the new raincoat ___1B___ bought for ___2B___?"

"Not this time," answered ___7B___ mother. "The man on the radio said the ___Nil___ will be bad."

Mrs. Green went down to the dock. Mitten went with ___2A___. First, ___1A___ moved the boat into the boathouse and shut the windows. Then ___1B___ went back into the house.

Jimmy took Mitten into the lighthouse. A small drop of rain fell. The clouds were getting darker. ___2A___ helped ___7B___ mother shut the ___Nil___ in the house.

"The storm is coming very quickly," said Mrs. Green.

As the two of ___2B___ looked out the window, Mrs. Green pulled down her hat. ___1A___ saw that the lake was not blue anymore. The waves were splashing up ___Nil___ the island. Soon rain began to fall hard.

Mrs. Green went into the lighthouse, took off ___7A___ raincoat, and turned on the radio.

Mrs. Green said, "___1A___ hope all the small boats get to the docks safely. ___7A___ friend Judy ___Nil___ sailing today."

Jimmy answered, "____1A____ hope so too. The small boats can upset very easy. ____1B____ must go up in the lighthouse and turn on the lamp."

When Jimmy climbed to the top of the lighthouse, Mrs. Green went with ____2A____. The water looked wild. ____1A____ looked out over ____Nil____ lake with the field glasses. ____1B____ could see the small boats trying to find a safe place to stay.

Mrs. Green said, "____1A____ won't get much sleep tonight. A boat may get into trouble and ____1B____ will have to keep watch. Anything can happen in such a ____Nil____ storm." She looked at Jimmy and said, ____1A____ have to go to bed."

Jimmy didn't like going to bed but it was best to listen to ____7B____ mother. It took ____2B____ a long time to fall asleep.

The next morning Jimmy was up early. Mrs. Green was ____Nil____ the kitchen making breakfast. Putting on ____7B____ new jacket, Jimmy ran into the room. Outside it was sunny again.

"Do ____1B____ think there will be another storm today?" ____1B____ asked.

Mrs. Green smiled. "No, Jimmy," ____1A____ said. "The storm has blown away. Anyway, ____1B____ have a long list of ____Nil____ for ____2B____ to do."

Jimmy hung ____7A____ head. ____1A____ liked watching the stormy seas and listening to the wind. ____1B____ could still remember the crashing waves. Jimmy wanted to stay. But when mother tells ____2A____ to work there is no way of getting out of it. Jimmy's cat ran to ____2A____. Then ____1A____ picked

up a rake and ___N1___ for the garden.

Key: 1,2,7 = respective categories of anaphora included in the study.

A = anaphora/antecedent separated by 0-2 propositions

B = anaphora/antecedent separated by 3-5 propositions

THE LITTLE FOX (TARGET Form 2)

Mr. Painter, Judy and Jim had left the car to take a walk in the woods. Beside a big tree Mr. Painter found a baby fox. Its eyes were shut.

"Is something wrong with the fox?" asked Jim. "It is so quiet."

"Yes" 7A father answered, "1B think 1B needs food. Something must have happened to the mother. This fox won't live if left alone here."

Judy and Jim petted the fox but the Nil did not move.

They asked, "May 1B take it home? The fox needs help. 1B will take care of it until it gets better."

Mr. Painter picked up the fox, put 2A in his coat, and took it to the car. Then 1B and the kids started Nil.

Before long the car came to a stop in the Painter's garage. Jim and Judy hopped out and ran to find a box. A large Nil box was found in the house. 1B put some rags in the box to make a bed and 7B father carried the fox over to it.

Judy looked at Jim and said, "Maybe 2A should get some food for the fox. It looks hungry to 2B."

Judy went to the kitchen to get some Nil for the fox. 1A placed the food beside the fox. Then 1B sat down and watched 2A. The fox opened its eyes but did not make a sound.

Jim said, "1A think the fox should be left alone.

Then it will eat something."

Jim and Judy left the garage, but the next morning they were back early. Nil of the food was gone. Their plan had worked. The fox sat watching them.

Jim said to the fox, "7A nose is cold and wet! 1A will be better soon."

Then Mr. Painter came into the garage. 1A smiled at the little fox which was now standing on its feet. Jim and Judy were standing Nil the fox watching every move.

Mr. Painter said, "1A think the fox is going to get well. That was a kind thing the two of you did for it. Just look at 7B pretty eyes!"

The little fox kept on growing stronger. Before long it began to act like a pet. Jim and Judy played with the fox as if 1A were a puppy.

One day Mr. Painter said to Jim and Judy, "The fox is growing fast. 1A must keep it tied up in the yard. 1B might jump over the fence and run after the chickens."

1B thought their father was right and Nil the fox in the garage.

The Nil day Judy and Jim were eating breakfast in the house when 1A heard a loud noise. Judy rushed to the window. When 1A looked out, the fox was chasing the chickens and Mr. Painter was chasing the fox. Taking 7B shoes she ran to help.

Jim rushed outside but by this time the fox had run away. He looked around and saw 7B father. Mr. Painter looked at

Jim gave a shake of the head.

" must get rid of the fox," he said.

Just then Judy came running out of the house. Jim told the sad news. The fox must be set free in the hill.

Mr. Painter knew the kids were very sad. He looked at the fox and said, "We know a wild fox is not happy when it is kept tied up. So we must give it a chance to be free."

Judy and Jim felt sad, but they knew that their father was right. They fed the fox a big breakfast. Then they rode off with their father in the car.

When the three of them found a good place in the woods the fox was set free. It ran into the woods. The Painters stood by the car and watched it. Judy closed her eyes and when she opened them the fox was gone.

Key: see previous sheets

Multiple Choice Questions

The Lost Turtle

(TAK MC Form .)

On your desk you have a story and two answer sheets. After you read the story I am going to ask you some questions and you will circle the answer on the answer sheets.

First, print your name at the top of each answer sheet (check that they don't print their names on the story sheets).

NOW I WANT YOU TO READ THE STORY. BEGIN. (Allow time for reading.)

Now let's take Answer Sheet #1.

Put your finger on line 3 in the story. Find the word that tells where Tom and Jill were going. Circle the word in number 1 on your answer sheet. (Check)

Put your finger on line 11. Find the word her. On your answer sheet in number 2 circle the word that means the same as her.

Put your finger on line 12. Find the word which tells what Jill couldn't find and circle the word in number 3 on your answer sheet.

Now let's begin the next answer sheet.

The Great Turtle Contest

Put your finger on line ____. Find the word ____.

Mark your answer sheet in number ____.

this word that is in the same as ____.

a, I, ..., I

Y, its, ..., his

e, you, ..., you

Put your finger on line 1. Find the word that is in what I say

the turtle will pick the word in number 1 on your answer sheet.

I, I, ..., I

is, your, ..., your

he, you, ..., you

..., it, ..., it

Put your finger on line 1. Find the word in what I say when I say

the turtle will circle the word in number 1 on your answer sheet.

it, you, ..., you

Put your finger on line ____.

we, his, it, he

us, his, it, his

Put your finger on line 1. Find the word that is in which you will

pick, and you want to pick up the turtle and circle the word in number

1 on your answer ____ sheet.

it, I, it.

us, we, it, us

you, it, it, it

The Lost Turtle

Mrs. Coats, Jill, and Tom were taking the train home after a long visit on the farm. Tom and Jill were happy to be going home again. Tom wanted to show his friends the new turtle he found on the farm.

Tom said, "I know the first thing I'm going to do when I get back home. I'm going to find something for my turtle to live in. I think I will take a look at him now. Jill, where did you put his box?"

"I don't see it," said Jill. "We each have a snowman box but I don't see the little box for the turtle."

Jill helped her brother look all over their car in the train. But they couldn't find the turtle anywhere.

"Oh Tom!" said Jill. "I'm sorry your turtle is lost. I know how much you liked it."

All at once Tom cried, "My turtle isn't lost. I know where the box is. I didn't bring it. I put it on a chair at the farmhouse before we left today. Then I came off without it."

Mrs. Coats said, "Tom, maybe our friends will send you the turtle. I'll phone the farm when we get home. I'll ask them to send you the turtle right away."

Tom sat down and began looking out the window. But he couldn't help thinking about his pet.

At last the trip was over and the Coat's family was home. Mrs. Coats went to phone the farm to ask for the turtle. By the phone was a note for the family from Mr. Coats. The

note said that the turtle was being shipped by plane and the family could pick it up at the airport.

Jill and Tom yelled happily.

Tom cried, "My turtle came by plane."

Mrs. Coats, Jill, and Tom got into the car and went to the airport. Soon, Mrs. Coats stopped the car.

"Jill, you wait in the car," said Mrs. Coats. "Tom and I will go get the turtle. We know where to go so it won't take us long."

In five minutes Tom and his mother were back.

Tom cried, "I got my turtle. A letter came with it."

Tom laughed when the letter was read.

"Our friends wrote that I have the fastest turtle in the world," he said.

The next morning Tom and Jill were up early. They couldn't wait to show the turtle to their friends. Jill brought some food for the turtle but it was not in the box. Mrs. Coats and Tom came running from the kitchen.

Mrs. Coats said, "Tom, you look in this room. Jill and I will look upstairs. The turtle couldn't have gone too far. He must be here somewhere."

A short time later Jill let out a yell.

"Here it is!" she said.

Jill had found the turtle swimming around in the goldfish bowl. Jill put her hand into the bowl and lifted the turtle out. Then Mrs. Coats took the turtle downstairs to Tom.

Answer Sheet Number 1 (TAR-MC Form 2)

Name: _____

1. a. friends
   b. home
   c. turtle
   d. farm

2. a. brother
   b. car
   c. Jill
   d. train

3. a. train
   b. car
   c. brother
   d. turtle

Answer Sheet Number 2 (TAR-MC Form 2)

Name: _____

1.	a.	Jill	
	✓ b.	Tom	1B
	c.	Mrs. Coats	
	d.	the turtle	
2.	a.	Mrs. Coats	
	b.	Jill	2B
	c.	Tom	
	✓ d.	the turtle	
3.	a.	Tom	
	b.	the turtle	1A
	c.	Mrs. Coats	
	✓ d.	Jill	
4.	a.	car	
	b.	home	
	c.	box	
	d.	farm	
5.	a.	Jill	
	b.	Mrs. Coats	1A
	c.	the turtle	
	d.	Tom	

6. ✓a. Tom
   b. Jill — 7A
   c. Mrs. Coats
   d. the turtle

7. a. Jill
   b. Mrs. Coats — 1B
   c. the turtle
   ✓d. Tom

8. a. the turtle
   b. Jill — 1B
   ✓c. Tom
   d. Mrs. Coats

9. a. box
   b. chair
   c. train
   d. home

10. a. Mrs. Coats
    ✓b. Tom — 2A
    c. the turtle
    d. Jill

11. a. the turtle
    b. Jill — 1A
    ✓c. Tom
    d. Mrs. Coats

12. a. Mrs. Coats
✓b. Tom 7B
c. the turtle
d. Jill

13. a. farm
b. airport
c. home
d. train

14. a. Jill
✓b. Mrs. Coats 1A
c. Tom
d. the turtle

15. a. Mrs. Coats and Jill
b. Tom and Jill 2B
c. Tom and the turtle
✓d. Mrs. Coats and Tom

16. a. Tom
✓b. the turtle 2A
c. Jill
d. Mrs. Coats

17. a. Mrs. Coats
b. Jill 1B
✓c. Tom
d. the turtle

18. a. Jill
✓b. Tom 1B
c. the turtle
d. Mrs. Coats

19. a. Tom and the turtle
b. Jill and the turtle 7B
c. Mrs. Coats and Tom
✓d. Tom and Jill

20. a. water
b. milk
c. breakfast
d. food

21. a. Mrs. Coats
✓b. the turtle 1A
c. Jill
d. Tom

22. a. Mrs. Coats
b. Jill 1A
✓c. Tom
d. the turtle

23. a. Jill
✓b. the turtle 1B
c. Tom
d. Mrs. Coats

24. ✓a. Jill

b. Tom

c. Mrs. Coats

d. the turtle

KEY: 1,2,7 = respective categories of anaphora included in the study.

A = anaphora/antecedent separated by 0-2 propositions

B = anaphora/antecedent separated by 3-5 propositions

✓ = appropriate answer

Multiple Choice Questions

The Mice

(TAR-MC Form 1)

On your desk you have a story and two answer sheets. After you read the story I am going to ask you some questions and you will circle the answer on the answer sheets.

First, print your name at the top of each answer sheet (check that they don't print their names on the story sheet).

NOW I WANT YOU TO READ THE STORY. BEGIN. (Allow time for reading.)

Now let's take answer sheet #1.

Put your finger on line 1. Find the word that tells the name of the witch and circle the word in number 1 on your answer sheet.

Put your finger on line 3. Find the word that tells the name of the cat and circle the word in number 2 on your answer sheet.

Put your finger on line 8. Find the word <u>it</u> and on your answer sheet in number 3 circle the word that means the same as <u>it</u>.

The Mice (cont.)

Put your finger on line _____. Find the word _____. On your answer sheet in number _____ circle the word that means the same as _____.

6, I; 1, I

8, us, 2, us

9, I, 3, I

Put your finger on line 13. Find the word that tells why Crackle wanted to stay in the house and circle the word in number 4 on your answer sheet.

17, she, 5, she

18, her, 6, her

20, he, 7, he

Put your finger on line 20. Find the word which tells who Crackle called and circle the word in number 8 on your answer sheet.

21, him, 9, him

22, my, 10, my

TURN OVER THE SHEET

1, I, 11, I

2, you, 12, you

3, we, 13, we

Put your finger on line 6 and find the word which tells what awakened Crackle and circle the word in number 14 on your answer sheet.

7, her, 15, her

7, his, 16, his

19, the second she, number 17, the second she

Put your finger on line 11 and find the word that tells on what Crackle fell and circle the word in number 18 on your answer sheet.

12, you, 19, you

13, my, 20, my

15, us, 21, us

16, I, 22, I

17, he, 23, he

19, she, 24, she

THE MICE

Once upon a time there was a witch whose name was Crackle. She lived with two dogs, Ginger and Sam, and a large cat named Fluffy. They lived in a house at the edge of the forest. Crackle's house was very old.

On stormy nights Crackle would say to Fluffy, "Sometimes I think this house is getting too old for the two of us. Maybe we should live in a new place."

Fluffy would answer, "Yes, the house is old and it leaks in a storm. But I like this broken-down place. Except on stormy nights, the house is very quiet.

On days when the sun was shining, Crackle would say to herself, "I have decided Fluffy is right. If I left this old house I would still need a new place. I need a quiet place where I can get a good night's sleep. I am sure there isn't a quieter house than this one."

One day trouble started. Crackle came home late. She was tired. She had been shopping all day for a new hat. She went to the cupboard for some food but her cupboard was empty.

Crackle went to the door and called, "Fluffy!" He came running in a second. Crackle said to him, "Look in this cupboard. Someone has taken my bread and cheese."

Fluffy smelled the cupboard. "Mice!" he said. "I want mice!" Fluffy looked at Crackle and said, "You go to bed. I will stay up and take care of the mice. Then we will both be happy." The cat slid in the cupboard.

Crackle turned off the light and went to bed. She was almost [illegible] when she heard a noise. It was Fluffy knocking over [illegible]. Fluffy had jumped from his hiding place and was running after the mice and bumping into everything in the dark. Crackle jumped out of bed and ran downstairs. At the bottom of the stairs she missed a step. She tripped over Fluffy and fell on the floor. Crackle looked at Fluffy and asked, "Did you catch those mice?"

"No," said Fluffy, "I tried my best. But I did frighten them away."

"Good," said Crackle. "Now both of us can have a good night's sleep. I am tired, and it's getting very late."

Fluffy was sorry that he had not caught the mice. Crackle and Fluffy ate some food before going back to bed. Then Crackle put out the light and she went upstairs. Fluffy stayed downstairs. The house got quiet again.

"This is better," he said. "No mice!"

Answer Sheet Number 2 (TAR-MC Form 1)

Name: _____

1.	a.	Sam	
	✓b.	Crackle	1A
	c.	Ginger	
	d.	Fluffy	
2.	a.	Crackle and Ginger	
	b.	Sam and Ginger	2A
	c.	Fluffy and Sam	
	✓d.	Crackle and Fluffy	
3.	✓a.	Fluffy	
	b.	Crackle	1B
	c.	Ginger	
	d.	Sam	
4.	a.	old	
	b.	quiet	1B
	c.	new	
	d.	good	
5.	✓a.	Crackle	
	b.	Ginger	1B
	c.	Fluffy	
	d.	Sam	

6. a. Sam
   b. Fluffy — 7B
   ✓ c. Crackle
   d. Ginger

7. a. Ginger
   b. Crackle — 1A
   c. Sam
   ✓ d. Fluffy

8. a. Ginger
   b. Sam
   c. Crackle
   d. Fluffy

9. a. Sam
   ✓ b. Fluffy — 2A
   c. Ginger
   d. Crackle

10. a. Fluffy
    b. Ginger — 7B
    ✓ c. Crackle
    d. Sam

11. a. Crackle
    ✓ b. Fluffy — 1B
    c. Sam
    d. Ginger

12. a. Fluffy
    b. Ginger — 1A
    c. Sam
    ✓ d. Crackle

13. ✓ a. Crackle and Fluffy
    b. Fluffy and Sam — 1B
    c. Fluffy and Ginger
    d. Crackle and Ginger

14. a. noises
    b. mice
    c. light
    d. tired

15. a. Sam
    b. Ginger — 2B
    ✓ c. Crackle
    d. Fluffy

16. a. Ginger
    b. Crackle — 7A
    c. Sam
    ✓ d. Fluffy

17. a. Sam
    b. Fluffy — 1B
    ✓ c. Crackle
    d. Ginger

18. a. bed
    b. stairs
    c. floor
    d. step

19. ✓a. Fluffy
    b. Sam
    c. Ginger
    d. Crackle

1A

20. a. Crackle
    ✓b. Fluffy
    c. Sam
    d. Ginger

7A

21. a. Crackle and Sam
    ✓b. Crackle and Fluffy
    c. Crackle and Ginger
    d. Ginger and Sam

2B

22. a. Fluffy
    b. Ginger
    ✓c. Crackle
    d. Sam

1B

23. ✓a. Fluffy
    b. Sam
    c. Ginger
    d. Crackle

1A

2A. a. Sam

b. Ginger 1A

✓ c. Crackle

d. Fluffy

KEY: 1,2,7 = respective categories of anaphora included in the study.

A = anaphora/antecedent separated by 0-2 propositions

B = anaphora/antecedent separated by 3-5 propositions

✓ = appropriate answer

APPENDIX B

Word Recognition Test

Word Recognition Test

Dir -tions: On your desk you will find some papers with words on them. (Hold up the Word Recognition Test so that all children can see it.) Write or print your name at the top. (Point to the place provided for the children's names and ascertain all have completed this task.) All the lines on the papers are numbered and there are four words on each line. (Point to the numbered lines.) I am going to say a word from each line and I want you to draw a circle around the word I say. Remember I will only say one word from each numbered line. Are there any questions? (pause for questions)

Number 1. smiled--smiled

Administrator will continue calling the words until all words are pronounced. (See master list)

Name _____

1.	where	next	smiled	petted
2.	listening	at	would	cheese
3.	broken	floor	seas	lived
4.	island	knew	went	trouble
5.	us	jacket	frighten	care
6.	awakened	eyes	give	think
7.	hat	name	morning	walk
8.	pretty	large	he	bread
9.	there	upstairs	dogs	found
10.	still	both	ate	tired
11.	leaks	woods	outside	day
12.	she	boat	ran	of
13.	list	waves	back	except
14.	shut	when	took	man
15.	called	two	splashing	darker
16.	soon	blue	food	happen
17.	remember	with	just	them
18.	Crackle	small	hung	the

19.	head	kept	see	began
20.	turned	watch	away	hoe
21.	right	into	safe	yes
22.	his	they	breaking	sleep
23.	wind	from	stay	on
24.	liked	way	blown	empty
25.	news	phone	until	anyway
26.	red	do	such	came
27.	off	but	herself	witch
28.	as	picked	lost	with
29.	Jimmy	find	anymore	edge
30.	may	light	set	very
31.	turtle	me	house	kitchen
32.	be	lake	this	stood
33.	won't	bad	field	out
34.	helped	sad	will	I
35.	mother	time	visit	Fluffy
36.	yelled	show	clouds	anything

37.	better	nome	it	farm
38.	told	mice	hungry	did
39.	baby	noises	we	Jim
40.	friends	quiet	miss	know
41.	caught	animal	should	their
42.	beside	right	car	now
43.	once	chance	wanted	around
44.	sun	big	happy	first
45.	three	family	isn't	hurried
46.	shine	rode	Mrs. Painter	here
47.	coat	old	without	airport
48.	over	carried	each	had
49.	five	start	Jill	wait
50.	shop	home	breakfast	downstairs
51.	making	night	again	stairs
52.	bumping	trip	door	wrong
53.	all	garage	fox	him
54.	those	jump	bottom	run

73.	room	crashing	upon	storm
74.	afternoon	cat	easy	now
75.	wait	a	bed	you
76.	by	Mitten	have	send
77.	down	swimming	world	for
78.	radio	too	short	garden
79.	somewhere	in	wrote	cold
80.	was	today	bad	stopped
81.	and	rain	one	let
82.	plants	lifted	shipped	work
83.	Mrs. Green	bought	fall	heard
84.	getting	hear	little	sorry
85.	thing	upset	glasses	came
86.	asked	early	later	snowman
87.	watering	shake	coming	laughed
88.	train	second	cried	looked
89.	make	opened	bring	anywhere
90.	left	brought	smell	oh

91.	long	no	fantast	cut
92.	Mod	stay	goldfish	far
93.	kids	Tom	happily	letter
94.	Pan	chair	about	minutes
95.	bowl	stop	taki...	note

APPENDIX

Oral Language Tests

Oral Language Production Task

Picture #1

Directions: Here is a picture of Jim and his dog Susie. (Point to Jim and Susie as the words are pronounced.) I want you to look at the picture for a while. After you look at the picture I'm going to ask you to make up a story about the picture and tell me all you can about the picture. Remember, you are not to just tell me about what you see in the picture. Use the picture to give you ideas for your story. Before you begin let's meet the people in the picture again. (Point to Jim and Susie and pronounce their names.) (Allow time for viewing.)

Are you ready to begin your story?

(Allow child to begin story. If probing is necessary, suggest that the child begin by saying Once upon a time...)

Picture #2

Directions: Here are some pictures of Mrs. Brown and Tom. (Point to Mrs. Brown and Tom as the words are pronounced.) I want you to look at the pictures for a while. After you look at the pictures I'm going to ask you to make up a story about the pictures and tell me everything you can about the pictures.

Remember, you are not to just tell me about what you see in the pictures. Use the pictures to give you ideas for your story. Before you begin, let's meet the people in the pictures again. (Point to Mrs. Brown and Tom and pronounce their names.)

(Allow time for viewing.)

Are you ready to begin your story?

(Allow child to begin story. If probing is necessary, suggest that the child begin by saying Once upon a time...)

Picture #3

Directions: Here is a picture of the White family--Mrs. White, Mr. White, Judy, and their dog Sam. (Point to the members of the family as you say their names.) I want you to look at the picture for a while. After you look at the picture I'm going to ask you to make up a story about the picture and tell me everything you can about the picture.

Remember, you are not to just tell me about what you see in the picture. Use the picture to give you ideas for your story.

Before you begin let's meet the people in the picture again.

(Point to Mrs. White, Mr. White, Judy, and their dog Sam.)

(Allow time for viewing.)

Are you ready to begin your story?

(Allow child to begin story. If probing is necessary, suggest that the child begin by saying Once upon a time...)

Picture #4

Directions: Here are some pictures of the Hill family--Mr. Hill, Mrs. Hill, Mary Ann, and Don. (Point to Mr. Hill, Mrs. Hill, Mary Ann, and Don.) I want you to look at the pictures for a while. After you look at the pictures I'm going to ask you to make up a story and tell me all you can about the pictures.

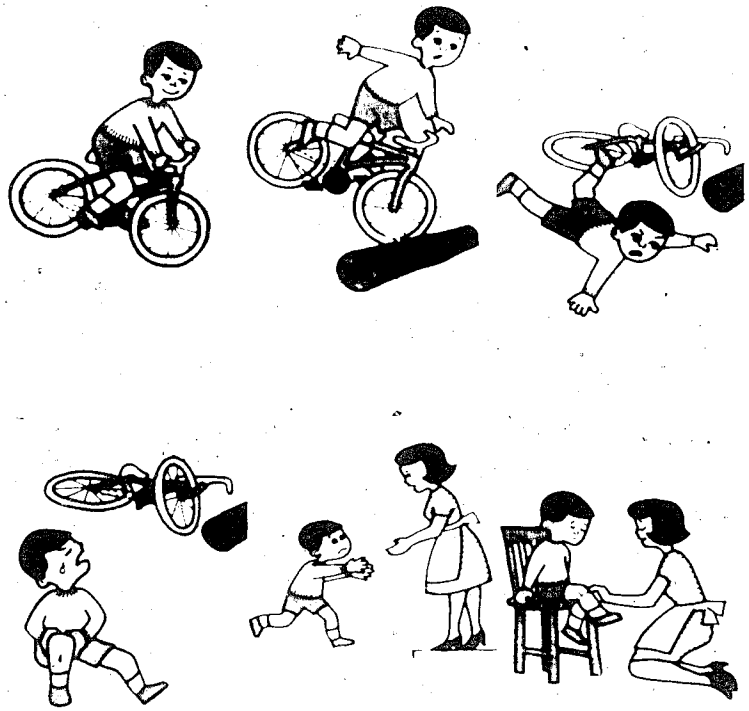
Remember, you are not to just tell me about what you see in the pictures. Use the pictures to give you ideas for your story. Before you begin let's meet the people in the pictures again. (Point to Mrs. Hill, Mr. Hill, Don, and Mary Ann.)

(Allow time for viewing.)

Are you ready to begin your story?

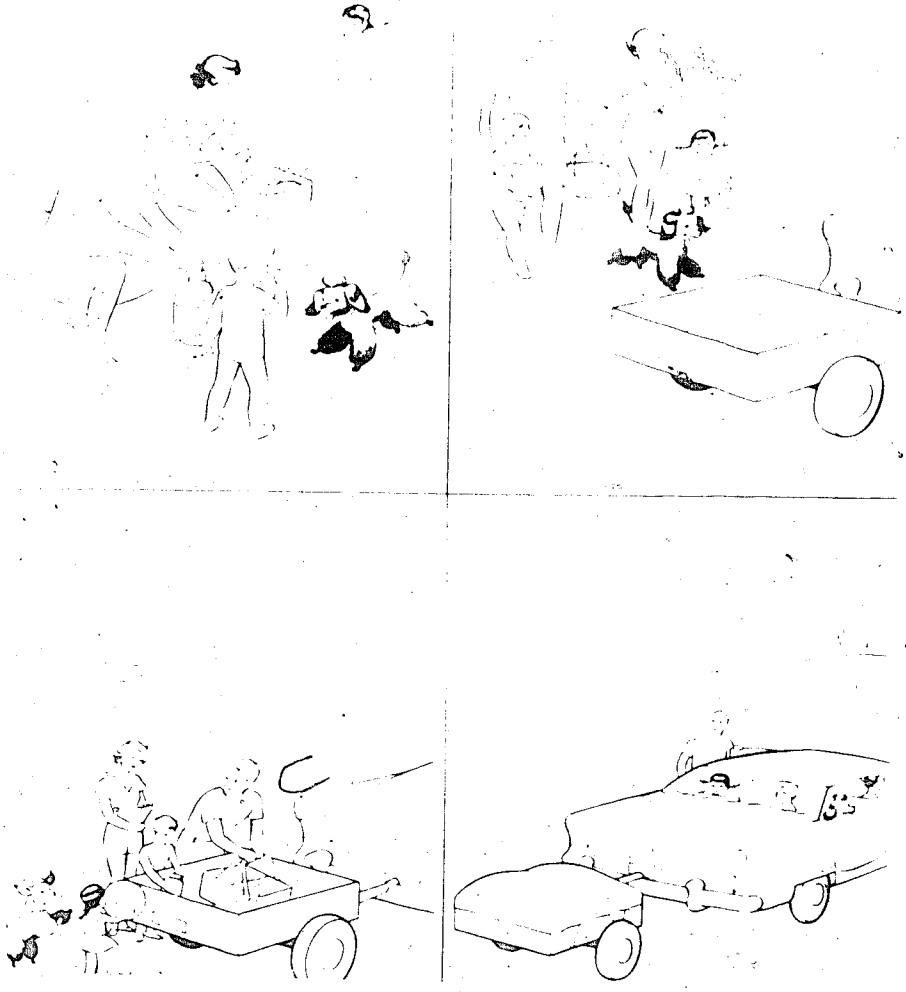
(Allow child to begin story. If probing is necessary, suggest that the child begin by saying Once upon a time...)

Picture #1



Picture #2

Picture #3



Picture #11

APPENDIX D

Guidelines for Determining a Proposition

Guidelines for Determining a Proposition

In addition to the general requirement that a proposition must contain a finite verb, either implicitly or explicitly stated, the following guidelines are presented for certain specific constructions:

Adjectives: All adjectives, even though they may have been derived from finite verb constructions, are included within the general expression and do not constitute a proposition.

Adverbs: See adjectives, treated same.

Appositives: Appositives do not constitute a proposition.

Auxillaries and Modals: These expressions (e.g., have, do, shall, will, can, may, etc.) become part of the verb.

Clauses: All clauses, independent and dependent, contain a finite verb and therefore are considered propositions. This includes noun, adjective, and adverb clauses.

Catenation: In the case of a string of verbs, each finite verb will be considered a separate proposition.

Complex sentence: Each clause, depending upon its complexity of finite verb, constitutes one or more proposition.

Compound sentence: See complex sentence, treated same.

Copula: The copula and linking verbs (e.g., seem, appear, smell, taste, feel) and their complements constitute a proposition.

Conjunctions: All expressions containing a coordinating or subordinating conjunction constitute topics. For example, in the sentence I see a dog, and a man, and a girl., three propositions are noted. In this case the verb is implied.

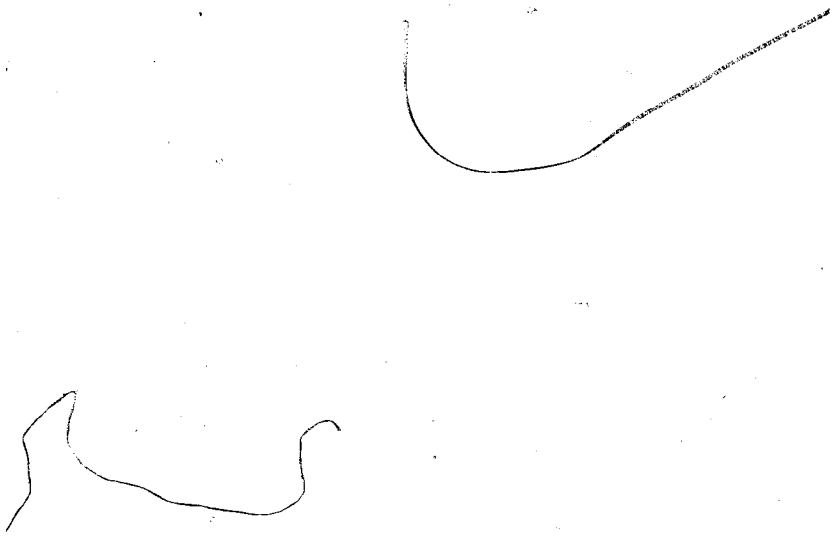
Direct address: The introductory words in direct address are considered a proposition. For example, She said, "Get out of my house.", two propositions are noted.

Elliptical expressions: Partial expressions will be treated as if they were complete.

Verbals: Gerunds, infinitives, and participles constitute propositions.

APPENDIX E

Scheme for Classification of Anaphora



Anaphoric Categories

Category	Forms	Function
1	I, we you he, she, it, they	To replace or refer to an animate noun or nouns. These forms function as the subject of a sentence.

Example: John walked into the room. He had an apple in his hand.

2	me, us you him, her, it, them	To replace or refer to an animate noun or nouns. These forms function as direct objects, indirect objects, and objects of prepositions.

Example: John walked into the room. Susan gave an apple to him.

3	it, they	To replace or refer to an inanimate noun or nouns. These forms function as the subject of a sentence.

Example: The book is on the table. It has a green cover.

4	it, them	To replace or refer to an inanimate noun or nouns. These forms function as direct objects, indirect objects, and objects of prepositions.

Example: The books are on the table. The green covers are for them.

5	mine, ours yours his, hers, its, theirs	To replace or refer to an animate noun or nouns. These forms function as subjects, direct objects, indirect objects, and objects of prepositions.

Example: John said, "The books on the table are mine."

6	its, theirs	To replace or refer to an inanimate noun or nouns. These forms function as

Category	Forms	Function
		subjects, direct objects, indirect objects, and objects of prepositions.

Example: John said, "Do you remember that book I saw ?"
"Yes," Judy replied. "I think this cover me ."

7	my, our your his, her, its, their	To replace or refer to an animate noun or nouns. These forms function to indicate possession and function to modify a noun or nouns.

Example: John said [illegible] her house. He had an apple in his hand.

8	its, their	To replace or refer to an inanimate noun or nouns. These forms function to indicate possession and function to modify a noun or nouns.

Example: John said, "See those books?" On the table are their covers."

9	this, that, these, those	To replace or refer to a noun or nouns. These forms may function as subjects, direct objects, indirect objects and objects of prepositions.

Example: "[illegible]!" cried John. "That is what I said."

10	here, there	To replace or refer to a noun or nouns. These forms function to indicate location or place.

Example: The boys rested under a tree where the boys ate their lunches.

11	first, second, third, etc. one, two, three, etc. latter, former, some, etc.	To replace or refer to a noun or nouns. These forms function to indicate a numerical subset.

Example: John and Mary walked into the room. The former was wearing a suit.

Category	Forms	Function
1c	all, none, etc.	To replace or refer to a noun or nouns. These forms indicate inclusiveness or exclusiveness.

example: John, Mike, and Pete raced into the room. All grabbed a sandwich.

1d	myself, himself, ourselves, etc.	To replace or refer to a noun or nouns. These forms function as reflexives.

}

Notes: This scheme is delimited so that only nominals are replaced or referred to. It is recommended that some of these forms can replace other grammatical elements (e.g., the forms this, that, etc. in Category 2 may replace verbs, objectives, or even sentences (to mention a few)).

The above classification scheme does not include all possible categories of pronominal substitution. The inclusion of those categories was based on the findings of the review of literature and a preassessment of grade two basal readers.

The notion of coreferentiality is inherent in all antecedent/anaphora relationships.