A psycholinguistic investigation of the influence of prior knowledge on the oral reading miscues and comprehension of selected high school seniors.

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A PSYCHOLINGUISTIC INVESTIGATION OF THE INFLUENCE OF PRIOR KNOWLEDGE ON THE ORAL READING MISCUES AND COMPREHENSION OF SELECTED HIGH SCHOOL SENIORS

A Dissertation Presented

By

DAVIDA WARRINGTON MUTTER

Submitted to the Graduate School of the University of Massachusetts in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

May 1979

Education
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A PSYCHOLINGUISTIC INVESTIGATION OF THE INFLUENCE
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Dedicated
to
David and Ryan
ACKNOWLEDGEMENTS

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ABSTRACT

A Psycholinguistic Investigation of the Influence of Prior Knowledge on the Oral Reading Miscues and Comprehension of Selected High School Seniors

(May, 1979)

Davida W. Mutter, B.S., Old Dominion University
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Directed by: Professor Rudine Sims

This study was concerned with the reading proficiency of high school students. Ten high school seniors were selected from high, middle, and low percentile ranks on a standardized subtest of reading comprehension. These students orally read six informational passages taken from a textbook, standardized test, car manual, and consumer magazine. Before the oral reading sessions, each reader's prior knowledge of the content of the passages was assessed by a short-answer survey. In addition to assigned passages, readers chose to read a recreational passage based on their interest and knowledge of the topic. Before and after reading, students rated their interest in each passage. The reading miscues generated during the oral reading sessions were analyzed to determine the proficiency of these readers within a psycholinguistic definition of reading competence. The influence of the reader's depth of prior knowledge and interest on processing strategies and comprehension was examined and described.
The reading miscues of subjects in this study were analyzed according to the Reading Miscue Inventory (RMI) (1972). The focus of analysis was on two measures. (1) A comprehending percentage was calculated for each passage read. This percentage is a process measure of reading competence. (2) A retelling percentage was used as the retention measure of comprehension. Due to the level of difficulty and informational character of the passages, the retelling task was altered in this study. Following the retelling procedures specified in the RMI, the reader was reminded of the topics discussed in the passage. Additional information recalled by the reader was evaluated and included in his prompted retelling percentage. Minimum competency guidelines based on standards outlined in the RMI were established for these two measures in order to determine the reading proficiency of subjects.

The specific purposes of this study were to (1) assess the influence of a reader's prior knowledge and interest on comprehending and prompted retelling performance, and (2) explore the feasibility of miscue analysis as an alternative to standardized tests in determining minimum reading competence at the high school level.

General findings of this study:

1. On passages read by all readers, the high percentile group had higher means on prior knowledge, comprehending, and prompted retelling than the low percentile group. The middle percentile group had prior knowledge, comprehending, and prompted retelling
means that fell between these two groups.

2. The data suggested that comprehending and prompted retelling performances were dependent upon readers' background knowledge in the content of a passage.

3. All readers in the sample, regardless of percentile rank, made effective use of reading strategies when prior knowledge was adequate.

4. When prior knowledge was low, readers in each percentile group performed less effectively; comprehending percentages dropped; reliance on graphophonemic cues increased.

5. Regardless of standardized-test percentile rank, nine of the ten readers demonstrated minimum proficiency according to the standards based on mis-cue analysis.

6. Quantity of miscues: (a) A reader's comprehending percentages were more indicative of reading proficiency than the quantity of his miscues; (b) the quantity of miscues tended to increase when a reader's prior knowledge fell in the low range. The increase in miscues resulted from the reader's comprehension difficulty.

7. A reader's interest in a passage was related to (a) his perception of his background in the
subject, and (b) his ability to personally identify with the topic.

8. Interest in a topic appeared to affect prompted retelling performance when (a) a topic dealt with an area of interest which the reader had actively pursued on his own over a period of time or (b) when a reader's interest was strongly negative.
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CHAPTER I

INTRODUCTION

The Problem

Reading ability at the high school level is a subject of concern in this country. Increasingly, it is reported that a number of students graduate from the secondary school system lacking reading proficiency in a wide range of materials. Concern centers on the student considered functionally illiterate and the student experiencing difficulty with reading in academic subject areas. As a step toward resolving the problem, school systems across the country are steadily moving to adopt minimum literacy standards for high school graduation. As literacy standards are established, educators are faced with the problem of accurate assessment of reading ability and instructional planning based on that assessment. Therefore, the ways in which reading competence will be evaluated are of importance to educators; it is of critical importance to students.

The source of information on reading ability most often cited as evidence of the reading problem at this level is the standardized reading test. These tests are likely to serve as the major criterion for determining the reading ability of secondary students. Confidence in standardized reading tests continues despite the questionable value of
these measures. With new insights on the nature of the reading process now available, teaching and evaluation must be based on an accurate view of reading. Assessment of reading ability must account for the active involvement of the reader, his language knowledge, and his understanding and experience with the subject matter. Therefore, there is a need to examine the nature and extent of the reading problems among high school students from perspectives other than that provided by single test scores. In short, there is a need to evaluate the reading performance of high school students based on the psycholinguistic nature of the reading process as a search for meaning.

The student in high school is expected to read a variety of materials for different purposes—textbooks, driver's manuals, popular magazines, newspapers. Because reading instruction in the secondary school is a new development, it is important to explore the question of whether students reported to vary in proficiency can in fact understand different types of materials read for different purposes. Specifically, the following questions require answers: Are students in the lower percentile ranks of standardized tests able to understand popular magazines and newspaper articles to which they bring experience and interest? Does the reading process for these students break down as the conceptual depth of the material increases? Do students in all percentile ranks experience difficulty in academic reading in which they lack initial understanding? These questions can only be answered by an in-depth look at the reading process as it functions for individual students in a variety of reading situations. The study
described in this dissertation is an exploration of these questions through in-depth reading analysis.

The general purpose of this study was to analyze from a psycholinguistic perspective the reading proficiency of selected high school students in a range of reading tasks similar to those expected of the high school graduate. The research specifically focused on the oral reading of ten high school seniors falling within the high, middle, and low percentile ranks on a standardized reading achievement test. Each student orally read six informational selections from both academic and nonacademic categories. Prior to the reading sessions, each reader's initial understanding of the content of the selection was evaluated. His oral reading was then analyzed according to the Reading Miscue Inventory (Y. Goodman and Burke, 1972). The collection, analysis, and description of data was carried out with the intent of broadening understanding of the problems of reading and evaluation at the high school level.

A Qualitative View of Reading Comprehension

Developments in psycholinguistics and reading in the past five years offer reading educators a clearer understanding of reading comprehension. Research has suggested that (1) reading is a constructive language process rather than a matter of translating words into speech (Goodman, 1976a; Kolers, 1970; Smith, 1973; Weber, 1970), and (2) comprehension is a thinking function rather than a collection of skills (Goodman, 1973b; Huey, 1908; Thorndike, 1917). Since reading is known
to be a matter of relating knowledge, thought, and language in order to understand a printed message, the final meaning which the reader derives is influenced by factors unique to the reader. These factors center on the reader's language processing strategies as well as the specific background and experience he brings to the task. Therefore, reading comprehension is not a single ability but a complex function which varies according to the demands of the material. From this viewpoint, current evaluation measures, both standardized and criterion-referenced, inadequately assess reading ability. These measurement techniques do not consider the reader's familiarity with the content or the language-based strategies which he applies. In addition, these measures assess only the reader's performance after reading has taken place. In contrast, the evaluation of reading can focus on performance which occurs as the reader reads. The research of Goodman (1969) and others has demonstrated that reading competence can be inferred by examination of oral reading. Judgment is based on the effects of a reader's misreadings, or miscues, on meaning.

The Reading Miscue Inventory (RMI) is a reading analysis tool that is based on several premises: (1) Reading is a process involving language and thought; (2) Reading entails the selective processing of semantic, syntactic and graphophonemic information; (3) A reader's reliance on semantic and syntactic information is indicative of his attempt to recover meaning; (4) These search-for-meaning strategies are synonomous with competence in reading. With the RMI, each miscue made by a reader is analyzed to determine the extent to which it alters
the meaning of the selection read. Miscues compatible with the content are of a higher quality than those which cause a distortion in the reader's understanding. The framework for analysis is based on the characteristics of proficient readers. For example, the miscues of competent readers show evidence that the reader is relying on grammatical structure and meaning (i.e., Do not disturb those books.). Competent readers provide evidence of comprehension by correcting miscues incompatible with syntax and meaning (i.e., The oratorio, as a form, became established during the seventeenth century.). Word substitutions produced by proficient readers are often equivalent terms (i.e., I pulled in to the curb without hesitation.). Skillful readers frequently omit redundant elements in sampling (i.e., He has two brothers; both boys play baseball.) and ignore miscues which have limited effect on meaning (i.e., We rushed over the hill to meet them.).

When selections of sufficient length and difficulty are read orally, it is possible to obtain an evaluation of comprehension which Goodman (1976b) defines as the reader's "concern for meaning" (p. 68). A comprehending percentage is obtained by adding the percentage of the reader's semantically acceptable miscues plus the miscues successfully corrected. This measure, along with an evaluation of the reader's retelling of the selection, provides insight into the degree of the reader's understanding. These evaluations are qualitative attempts to determine the reader's ability to process written material. A basic assumption underlying this study is that reading is a matter of relating language strategies and thinking processes, and as such, the most
valid indicators of reading ability are the psycholinguistic measures proposed by Kenneth Goodman. Therefore, these measures formed the basis for evaluating reading competence in this study.

**The Goodman Model of Reading**

A major assumption underlying this study is that the Goodman Model of Reading is an accurate account of the reading process. According to Goodman (1968, 1973d), reading along with listening is a receptive language process. Reading involves continuous selection, prediction, confirmation, adjustment, and integration of meaning. On the basis of minimal cues (graphic, phonological, syntactic and semantic), the reader is able to efficiently construct a message which taps the author's meaning. Because reading is a language process, comprehension (decoding) is the act of processing from surface to deep structure. In silent reading, the reader infers a deep structure by sampling surface structure expressed in graphic form and projects a semantic interpretation. Initial translation of the print into speech (recoding) is not a necessary part of the comprehension process. In oral reading, the skillful reader encodes from deep structure into an oral representation. Frequently, the oral product varies in grammar and vocabulary from the written version but does not change the essential message. A reader's misreadings are not haphazard errors. Miscues are rule-governed responses indicative of the reader's strategies in handling graphic information. Research has determined that all readers produce miscues; yet all readers do not produce miscues of equal quality.
Quality is appraised according to the extent to which a miscue changes the message of the writer.

The reader is continually drawing on internalized rules of how language works. Therefore, through analysis of a reader's miscues, the effectiveness of the reading process for that reader can be determined. The reader's strategies cannot be studied when he responds accurately; however, because the reader uses the same processing strategies in producing miscues, oral reading analysis of difficult material can reveal processing patterns.

As Goodman (1970) explains, the reader simultaneously relies on three cueing systems--graphophonemic, syntactic, and semantic--in his attempt to process printed information for meaning. The continuous interaction of these systems supports the reader. Specifically, Goodman (1976a) describes the model of silent reading in the following manner:

1. The reader scans along a line of print from left to right and down the page line by line.

2. He fixes at a point to permit eye focus. Some print will be central and in focus, some will be peripheral; perhaps his perceptual field is a flattened circle.

3. Now begins the selection process. He picks up graphic cues, guided by constraints set up through prior choices, his language knowledge, his cognitive styles, and strategies he has learned.

4. He forms a perceptual image using these cues and his anticipated cues. This image then is partly what he sees and partly what he expected to see.

5. Now he searches his memory for related syntactic, semantic, and phonological cues. This may lead to selection of more graphic cues and to reforming the perceptual image.
6. At this point, he makes a guess or tentative choice consistent with graphic cues. Semantic analysis leads to partial decoding as far as possible. This meaning is stored in short-term memory as he proceeds.

7. If no guess is possible, he checks the recalled perceptual input and tries again. If a guess is still not possible, he takes another look at the text to gather more graphic cues.

8. If he can make a decodable choice, he tests it for semantic and grammatical acceptability in the context developed by prior choices and decoding.

9. If the tentative choice is not acceptable semantically or syntactically, then he regresses, scanning from right to left along the line and up the page to locate a point of semantic or syntactic inconsistency. When such a point is found, he starts over at that point. If no inconsistency can be identified, he reads on seeking some cue which will make it possible to reconcile the anomalous situation.

10. If the choice is acceptable, decoding is extended, meaning is assimilated with prior meaning, and prior meaning is accommodated, if necessary. Expectations are formed about input and meaning that lies ahead.

11. Then the cycle continues (pp. 507-508).

The Purpose

Reading competence surfaces when the reader tackles a difficult selection. Under these conditions, his competence is indicated by (1) his ability to produce substitutions in harmony with semantic and syntactic structure, (2) his ability to correct disruptive miscues, and (3) his ability to retell the content of the selection. At the same time, a reader's overall comprehension ability is influenced by
his familiarity with the content. Thus, in order to obtain a clear picture of a reader's proficiency, it is useful to examine reading performance with multiple selections where the reader's initial knowledge of the content has been evaluated. Therefore, the specific purposes of this study were as follows:

1. To analyze the oral reading of a selected group of high school seniors in low, middle, and high percentile ranks as designated by a standardized test. The intent of this analysis was to determine the ability of these students to effectively process and comprehend a variety of academic and non-academic reading passages.

2. To describe the relationship between a psycholinguistic analysis of reading ability (comprehending percentage and retelling measure) and the reader's percentile rank.

3. To examine the effect of the reader's prior knowledge of the content of each selection on processing strategies and comprehension.

4. To explore the feasibility of miscue analysis as a tool for minimum literacy evaluation at the secondary school level.
Significance of the Study

Kenneth Goodman (1973a) reminds teachers of a fact of life that is not likely to change. "Never in the history of education have reading tests enjoyed as much status as they do today. They provide a data base used increasingly as a means (often the sole means) of evaluating pupil progress, teacher effectiveness, and program success" (p. 21). Until recently, standardized testing of reading achievement at the high school level has been a relatively benign activity. However, with the minimum literacy movement, reading test scores are likely to determine whether a student graduates or not. The issue of the validity of a measure for any particular student is of critical importance. Goodman suggests that in evaluating reading competence the following questions need to be addressed:

1. Is reading comprehension a general ability or is it one which varies with content, interest, or task within each reader depending upon his own background?

2. What different problems face the reader who is reading to acquire knowledge, as compared to the one who is reading for a message already within his grasp?

3. What role does the reader's background and interest play in successful reading (p. 32)?

In addition to these questions raised by Goodman, a fourth question is recommended for inclusion. What is the relationship between a reader's standardized test performance and a qualitative examination of the reader's search for meaning?
Percentile ranks and grade equivalences compare a student's question-answering performance with other students of his age and grade. No information is provided on the quality or effectiveness of the processing strategies the reader uses as he reads. No information is provided to compare a reader's success or difficulty with individual selections. This study was concerned with descriptively comparing a reader's percentile rank with comprehension measured from a language-processing viewpoint.

In addition to looking at the relationship between dissimilar measures of reading ability, this study was designed to provide insight into the reading "problem" at the high school level. It was hypothesized that for some students a reading problem stems from a lack of consistent reliance on grammatical and semantic structural patterns so that the reader is unable to process swiftly enough to maintain comprehension. For others, it is the lack of correction strategies so that the reader is not cued to reread when the message loses meaning. For others, it is the lack of interesting school-related assignments leading to a general avoidance of reading. And for others, it is the complexity of concepts and information load of some, but not all, content material. This study was formulated to explore with a limited number of students the occurrence of these problems among the high, middle, and low percentile readers in the study sample.

At present, the full understanding of students' reading ability is clouded by evaluation procedures that yield percentile ranks, grade level equivalents, or inaccurate skill profiles. In contrast, oral
reading reveals the reading process as it occurs. The methodology of miscue analysis provides a structured framework in which to examine the patterned strengths and weaknesses of specific individuals reading specific selections. It is hoped that the reading profiles which emerged from this research will provide additional insight into the reading problems at the secondary level and more clearly demonstrate the limitations of traditional measures of reading achievement.

Definition of Terms

The following terms are used frequently throughout the study:

Psycholinguistics: The science which views language processes as cognitive and linguistic functions.

Reading: A psycholinguistic process in which the reader selectively samples, predicts, and confirms information based on semantic, syntactic, and graphophonemic input.

Miscue: Any response made by the reader which differs from the print.

Comprehending Percentage: A process measure of reading competence derived by adding the percentage of the reader's semantically acceptable miscues within the total context and those miscues successfully corrected.

Retelling Task: A retention measure of comprehension in which the reader gives his own accounting of the selection read.
The Reader's Prior Knowledge: The reader's initial familiarity with concepts, terms, and information of the selection before reading.
CHAPTER II

REVIEW OF RELATED LITERATURE

The literature reviewed for this study covers several relevant areas. Selected definitions and models of the reading process are described along with related research findings. The intent of this section is to establish a sound theory-base for this study. Pertinent to the study is an understanding of the nature of reading comprehension. Therefore, prominent definitions of comprehension are discussed in light of current research in language and reading. Final sections review factors which affect reading comprehension and techniques used to measure this elusive cognitive function. It is because of the interrelated findings of this literature review that the Goodman Model of Reading has been adopted as the theoretical basis for this study.

Introduction to Model Research

Theodore Clymer (1968) has written that no question is educationally more significant than, What is reading? Our society has traditionally placed high value on reading ability thus making the teaching of reading a continuing subject of controversy. Clymer's question is central to the conflict because of the implication of the answer for what is taught, how it is taught, and how learning is assessed.
Since the turn of the century, researchers have approached the question of reading ability in several ways. During the late nineteenth century to the 1920's, research focused on understanding the process of reading in attempts to explain how we read. Much of our basic knowledge of skilled reading was discovered during this period. Significant research of the period is reviewed in Edmund B. Huey's 1908 publication (Levin and Gibson, 1975). Several trends developed after this period that influenced subsequent research efforts in reading. The rise of behaviorism in psychology emphasized only the study of observable behavior. Studying the reading process in its entirety became too complex for analysis. A second influencing trend occurred during the 1920's. Reading research became concentrated in schools of education. The main concern centered on improving teaching and learning. As a result, comparisons of teaching methods, tests and materials became a major research effort (McConkie, 1972). Educational researchers borrowed ideas and procedures that appeared potentially useful in the teaching of reading. For example, principles of operant conditioning were adopted for teaching readiness skills and establishing phoneme-grapheme correspondence (Williams, 1973).

Generally, from 1920 to 1960, curricula research was carried out. During the 1960's, several major studies examined the relationship between methodology and reading achievement among beginning readers. Jeanne Chall's (1967) study resulted in the controversial Learning to Read: The Great Debate. The United States Office of Education sponsored similar first- and second-grade reading studies. As studies of
this type continued, theory-based research on the process of proficient reading declined. Clymer (1968) suggests that confusion resulted among reading theorists. Often writers in the professional literature failed to distinguish between methods of teaching reading, skills and abilities used in reading, and the reading process itself.

During the 1960's, the fields of cognitive psychology and psycholinguistics emerged. Researchers interested in these areas have been influential in renewing efforts to develop comprehensive theories of the reading process. It is during this past decade that the work of Goodman and others has produced major breakthroughs in understanding the complexities of reading. These insights have gradually led to the development of a theory-base for educational planning and research. The section which follows is an attempt to describe influential definitions of reading prior to 1960 and several current models of the reading process. Selected examples which are discussed include descriptive, psychometric, psychological and psycholinguistic models of reading. Each definition and model is critiqued by major authorities as to its accuracy and suitability for the classroom and research. In addition, basic studies in psycholinguistics and reading are reviewed. These studies strongly support the Goodman Model of Reading.

**Descriptive Models**

William Gray, in 1960, described the major skills underlying reading. The abilities, attitudes, and understandings he defined are word perception (pronunciation and meaning), comprehension (understanding,
reaction, and evaluation of ideas), and assimilation (fusion of old and new ideas). Although Joanna Williams (1973) maintains that reading research is beyond the era of descriptive models, descriptive definitions of reading persist in current literature. Wilma Miller (1973) defines the reading process as a function of eye movements, word recognition, phonetic analysis, and semantics.

Psychometric Models

The Substrata Theory of Reading developed by Holmes during 1940 to 1950 is an attempt to define a comprehensive model of the reading process. Holmes, followed by Harry Singer, has attempted to define factors which account for variance in reading comprehension at different grade levels. Comprehension test results are statistically manipulated to determine variables that contribute to variance in scores. Identification of variables is thought to tap mental structures that are hierarchically arranged into "working systems" for the ability to read for speed and power (Williams, 1973). According to Singer (1976b), different working systems are appropriate to different tasks; different factors account for variance in comprehension at varying grade levels. As the reader matures in ability, mental working systems undergo shifts in arrangement eventually forming a hierarchy of word recognition, word meaning, and reasoning-in-context substrata. In mature reading, these subsystems function flexibly as the reader is able to reorganize mentally in shifting his reading purpose.
In a review of the model, Clymer (1968) suggests that the model does not predict reading behavior and therefore does not lead to researchable hypotheses. In addition, the model is limited to the grade level in which predictive variables are drawn (Singer, 1976c).

Psychological Models

Behavioral Definitions

Many writers influenced by behaviorism define reading as a discrimination task in which the reader associates verbal responses with the visual stimulus of letters or words. Behavioral definitions emerged under the influence of B. F. Skinner's *Verbal Learning*, written in 1957. Skinner's primary concern was not with reading; however, he describes reading as an auditory response to visual stimuli (Williams, 1973). John B. Carroll (1964) defines reading as a complex decoding skill consisting of many separate learnings to be acquired one by one in small units. His emphasis is on sound-symbol relationships. Carroll writes, "The further behavioral specification of reading behavior requires detailed identification of the stimulus-response relationships to be learned" (p. 346). George Spache (1964) emphasizes the perceptual aspects of reading, defining perception as the processes that occur between stimulus and response. "Thus in its simplest form, reading may be considered a series of word perceptions" (p. 12). Comprehension results as word meanings are sequentially combined. "As the meanings of successive words become clear, they are fused into thoughts or ideas" (p. 6).
Serial-Order Models

Skinner, Spache, and Carroll provide behavioral definitions of the reading process. Attempts to develop models based on information processing are considerably more complex. Serial-order models tend to view cognitive tasks as occurring primarily in sequential stages. One event initiates another, each event taking place within a definite time frame. The process begins with sensory input and concludes with a response (Levin and Gibson, 1975). According to Slobin (1973), this type of model appeals to behaviorists as it is in harmony with chain theories of behavior. A model by LaBerge and Samuels (1976) is a recently developed example of serial-order processing in reading.

LaBerge and Samuels have developed a model of automatic information processing in which processing events occur in a sequence of stages. Visual input from the printed page is initially analyzed by a component that detects distinctive features. Identified features are then coded into letters, followed by spelling pattern, to word, to word group coding. Phonological coding then occurs followed by semantic memory coding. When processing at this step is complete, a response occurs.

According to this model, reading is a complex skill composed of subskills. In fluent reading, the process is unitary as subskills operate automatically, freeing the reader to focus on meaning. Depending upon the task and the reader's expectations, stages in processing can be "eliminated" since alternative routes to meaning codes are available. Contact with comprehension processes can occur through
both visual and phonological systems. For example, when a reader comes to an unknown word, he may exercise one of five options in activating meaning codes. Two alternatives are explained as follows: "When he encounters a word he does not understand, his attention may be shifted to the phonological level to read out the word for sound. . . . At other times, he may shift his attention to the visual level and attempt to associate spelling patterns with phonological units, which are then blended into a word which makes contact with meaning" (LaBerge and Samuels, 1976, p. 569). Perceptual analyzers can focus attention on different information as varying perceptual levels (letters, words, word groups) are available to the fluent reader. Perceptual attention, however, is restricted to one aspect of the information at the time. Other processes take place automatically.

LaBerge and Samuels (1976; LaBerge, 1972) view learning to read as a matter of acquiring the ability to automatically process (without focusing attention) at each subskill stage. All readers from acquisition to fluency pass through similar subskill stages although at different rates. A first step for a beginner is identifying and processing relevant features of letters, followed by letter identification, word identification and so on. Automatic skill is achieved through practice in which the reader organizes stimuli into higher-order units (letters to words, words to phrases). Only when the reader is freed from having to attend to processing the print can he turn his attention to meanings.
Does Reading Occur As A Serial Order Process?

Serial-order models raise a pertinent question about the process of reading. Is printed material processed according to the order in which it appears on the page? The preceding definitions and models indicate that information is taken in by the reader one segment at the time. The reader scans and processes letters or word parts one after another until words are formed. Each word is processed for meaning one by one; meaning gradually accumulates in left to right progression. Much evidence suggests that such an explanation does not account for the cognitive complexity involved in reading.

In spite of general left to right scanning across the page, a number of studies reviewed by Huey (1908) conclude that words are not perceived letter by letter. Huey reports that Cattell, experimenting in the late 1800's, found that a reader can recognize a word in the same amount of time as that required to process a letter. Erdmann and Dodge discovered that the reading range of the skill eye is limited, yet the amount perceived by the reader varies with the character of the material. Therefore, in a single fixation, a reader can process either four or five separate letters, four or five unrelated words, or two or three short sentences. Huey explains that the amount that can be read during a reading pause is influenced by the language structure of the material and the reader's familiarity with what is read. "With increase of familiarity, fewer and fewer clews suffice to touch off the recognition of a word or phrase" (p. 81). According to Brewer (1972),
a letter-by-letter explanation of reading does not account for such higher-order linguistic processing. In addition, Smith (1973, 1975) maintains that the visual system is easily overloaded and that attempts to read for exactness retard reading for meaning. Meaning identification must precede word identification in order to meaningfully process a sentence such as, Who will house the speaker?

The work of Taylor and Buswell has confirmed that the reader's eyes do not move smoothly across the page. Regressive eye movements are characteristic of proficient reading. Huey (1908) explains that this forward and backward movement occurs in order to obtain fuller meaning; the focus of reading is behind the eye in the reader's thought processes. In experimentation by Kolers (1970), college students read textual material as separate letters presented one at a time. He found that at a rapid rate words are easier to name than letters. Kolers concluded that normal reading does not occur letter by letter.

In addition to the lack of evidence for letter by letter processing, there is little support for the assumption that words are fused into ideas in left to right progression. Karl Lashley (1960) explains that problems arise in explaining any complex behavior as simple chains of events. Words have no intrinsic order in and of themselves. Word arrangement is not due to direct association between adjacent words "but to meanings which are determined by broader relations" (p. 50). Chomsky (1972) describes the concept of broader relations in terms of structure-dependence, a general principle operating in all languages. Grammatical transformations are structure-dependent in that they apply
to phrase structures at the deep structure level of language where the relationship among the units is systematic. In a sentence such as, Anyone who says that is lying, a structural relationship exists between the separated words "anyone" and "is". Language is based on a hierarchy of grammatical relations; linear models of language processing fail to account for this basic principle.

The Issue of Subvocalization

Related to the subject of serial-order processing is the question of the role of subvocalization in reading. The issue is significant because the teacher's perspective on the necessity to translate print into sound affects what is emphasized in classroom instruction. According to Kolers (1970), linear views of the reading process are frequently built on the assumption that there is a one to one relationship between letters and sounds in English and that some form of auditory representation is essential in reading. Kolers argues that the evidence does not confirm either view.

Study of the nature of the English spelling system by Chomsky and Halle and Venezky over the past decade reveals that English orthography lacks direct phoneme-grapheme correspondence. As Carol Chomsky (1973) and Halle (1968) explain, the system does, however, exhibit regularity when the relationship between the underlying lexical system and the orthography is considered. Standard English spelling resembles the underlying word representation (lexical spelling) in the sound system more than the phonetic representation of spoken language. The spelling
system retains much of the derivational relationship of words (nation/nationality) as the shared relationship between lexical spellings and the orthography is meaning-based. Shifts in pronunciation that are not significant to meaning are not reflected in the writing system but are determined by phonological rules automatically applied by the native speaker. Carol Chomsky writes that for the mature reader "the spelling system leads the reader directly to the meaning-bearing items that he needs to identify, without requiring that he abstract away from superficial and irrelevant phonetic detail" (p. 99).

Studies with the literate deaf cast doubt on the necessity of subvocalization in reading. Conrad (1972) found that some deaf children learn to read by visual processing without the use of speech or speech imagery. Gibson (1970) concluded from studies with deaf college students unable to differentiate speech sounds that word translation to sound is not essential in reading. Further, Gibson discovered that deaf students are able to master spelling patterns of the orthography since the rules of writing are rules in their own right and can be learned without speech.

Levin and Gibson (1975) report a study by Venezky in which the researcher studied the reading ability of Finnish children in grades one through three. Letter-sound relationships are highly regular in the Finnish language. Venezky concluded, however, that a highly regular orthography and well-developed letter-sound ability does not guarantee high reading ability. Goodman and Burke (1973b) arrived at similar conclusions. These researchers analyzed the oral reading of readers
varying in proficiency in grades two through ten. Goodman concluded that variation in proficient reading is not a difference in ability to handle sound-symbol relationships. Proficiency is a function of the ability to integrate multiple information in reconstructing meaning.

Among theorists, the subvocalization issue remains unsettled. Some researchers (Levin and Gibson, 1975; Conrad, 1972) conclude that with an alphabetic orthography the addition of sound makes reading easier, particularly for the beginner. Others (Huey, 1908; LaBerge, 1972; Levin and Gibson, 1975) take the view that the degree of subvocalization varies with the difficulty of the task and is an optional recourse for the fluent reader. Others (Mattingly, 1972) see some form of speech representation as essential in recovering meaning due to the complex interaction between language levels. Still others (Smith, 1975) regard the writing system as an independent language system that can be understood without the intervention of speech. Wardhaugh (1974) explains that in any case, "Any conversion (to speech) that does take place is not the end point of the process since additional semantic and syntactic processing is necessary" (p. 107).

Many teachers teach reading as if print to speech translation is an end point in instruction. According to Singer (1976c), the child is typically taught to read by learning "to reconstruct printed messages into spoken language through the use of vocal, subvocal, or even inner speech so that he can then comprehend printed messages with his subsystems for spoken language" (p. 639). As a result, instructional emphasis in reading acquisition and remediation often centers primarily
on breaking the code, viewing comprehension as a passive, automatic result of oral translation (Bloomfield, 1942). Educators recommend that language be segmented into isolated elements of letters and words; instruction is a matter of stimulus-response association (Carroll, 1976). A hierarchy of skills is established, each level becoming a prerequisite for the next (LaBerge and Samuels, 1976). As Wardhaugh (1974) explains, students are frequently given insufficient opportunity to read, learning instead about reading. In addition, much of the instruction leads readers astray. Carol Chomsky (1973) maintains that this is the case when readers are taught under a system that emphasizes English orthography as a system of direct correspondence between letters and sounds. Savin (1972) suggests that children do not perceive speech at the level of the phoneme; therefore, many first graders fail to read under systems that require letter-phoneme matching. Perhaps most importantly, code-emphasis and word-emphasis instruction ignores the fact that students bring semantic and syntactic knowledge to the reading task.

Cognitive Models

Cognitive models of the reading process tend to view reading skill as a matter of efficient cognitive processing of information from multiple sources. According to Williams (1973), emphasis is placed on the psychological variables of processing (perception, short-term and long-term memory, etc.). An influential cognitive model is that developed by Frank Smith. Smith (1971) proposes a feature analytic model of
information processing in which letter, word, and meaning interpretation occur separately. According to the model, the brain can take the same printed information and process it as either letters, words or meaning since separate "feature lists" exist for each. The identification process is a matter of searching feature lists in the cognitive domain and categorizing the visual configuration. Comprehension of meaning is based on feature analysis of the semantic and syntactic aspects of cognitive structure. Identification of distinctive features reduces possible alternatives and the reader's uncertainty. The more redundant the information, the fewer critical features are required for identification. The brain contributes nonvisual information allowing the reader to chunk information into larger units. Therefore, depending upon the reader's prior experience, expectations, and knowledge, his degree of uncertainty will vary. The amount of required visual information is a function of these factors. Smith concludes that a feature analytic model accounts for Cattell's finding that with equivalent visual exposures, the more meaningful the material, the greater the amount of information the reader can process.

Smith's Model, as well as the Goodman Model, challenges the assumption that letter identification is required in order to identify words and that words must be recognized in order to process for meaning. Both models assert that although reading is a visual activity, it is only partially a visual process. Both agree that two types of information are processed in reading--visual and nonvisual. Nonvisual information is the reader's contribution which includes his prior knowledge
of language structure and content. In comparison with the Goodman Model, feature analysis attempts to explain in finer detail the cognitive aspects of the reader's memory search for semantic, syntactic, and graphophonemic cues. Smith (1975) maintains that his model is compatible with the hypothesis-testing theory and research findings of the Goodman studies.

**Psycholinguistic Models**

**A Transformational-Generative Origin**

Models in this category have been developed within transformational-generative theory in which language is conceptualized as both a cognitive and linguistic process. A key concept is that language is composed of structural levels. According to Chomsky (1965), surface structure is the organization of language elements and grammatical relationships directly related to the physical representation of the sentence. Deep structure is an underlying abstract structure—a system of categorized elements and phrase structures which determine sentence meaning. Deep and surface structure are not identical. The central idea of transformational-generative grammar is that the surface representation of a sentence is determined by the application of grammatical transformations. These formal operations operate on the abstract elements in the base of the grammar to yield a surface representation. A generative grammar includes syntactic, semantic and phonological components. All three components are involved in processing from deep structure to surface level representation.
Psycholinguistic models suggest that the reader must go beyond the simple word level. Reading comprehension is a matter of processing sentence data from surface to deep structure level. As explained by Wardhaugh (1969), "Sentences are perceived at the level of surface structure, but they are comprehended only at the level of deep structure" (p. 68).

Robert Ruddell's Systems of Communication Model

Within the psycholinguistic category, Robert Ruddell (1976; Williams, 1973) has developed a language communication model which interrelates speech, listening, reading and writing. Reading is one aspect of the model. Three levels of language processing are involved in reading: (1) Surface structure (syntactic and morpheme-phoneme relationships); (2) Transformational component; and (3) Deep structure (integration of syntactic and semantic relationships). According to Ruddell, surface structure is important in the print to sound decoding of language, particularly in reading acquisition. With increased reading skill, the reader relies less on the orthographic system. He develops alternative processing strategies relying more on language context and meaning. Comprehension is a complex process involving relationships between surface and deep structure, the transformational component and the context of the material. The model includes an affective and cognitive dimension as well. These components account for variation in readers' motivation, persistence, interest, and cognitive strategies. Singer (1976c) maintains that the model is derived from an attempt to logically interrelate psycholinguistic
research. No specific research has been conducted in support of the model.

The Goodman Model of Reading

In contrast to Ruddell's Model, the Goodman Model is a psycholinguistic explanation of reading supported by a significant amount of research. The Goodman Model of Reading offers an alternative to serial-order processing models which view reading as the precise, segmental processing of letters, words, and larger language units. Goodman (1976a) views reading as a selective process in which the reader makes partial use of graphic information. Sampling of print is possible because the reader has semantic and syntactic expectations based on his implicit knowledge of language as well as his personal background of experience and knowledge of content. The reading process is defined as tentative, psycholinguistic decision-making in which thought and language interact. Comprehension is the central and only significant goal in reading.

Relying on Language in Reading

A number of classical studies in reading support the Goodman view of reading as a language process in which semantic and syntactic constraints guide the reader's expectations. Huey (1908) reports that the perception of words and phrases is influenced by the reader's search for meaning; the reader fills in missing parts in an attempt
to make sense of what he reads. "This appears in perceiving phrases in which words are 'seen' which are not there but make sense" (p. 116). Levin and Kaplan (1970) conducted experiments measuring eye-voice span (the distance the eye is ahead of the voice in oral reading). Levin concluded that grammatical constraint influences the length of eye-voice span. The span is longer in reading sentences than with lists of words. Huey (1908) found that mature readers in normal reading generally ignore meaningful substitutions. Huey comments that such substitutions show "that the real expectation was rather of the expression of a desired meaning than of any particular words" (p. 158). Kolers (1970) obtained similar results in analyzing the substitution errors of college students. Only substitutions which violated normal grammatical patterns signaled the reader to reread. Burke (1969) analyzed the oral reading of proficient sixth graders. She found that some miscues alter the grammatical structure of the sentence without altering meaning. Burke concluded that readers are inferring the author's deep structure but producing an alternate surface structure. Kolers (1970) studied the oral reading of adult, bilingual speakers who read texts written partly in French and English. Translation errors occurred; at times readers read the correct word in terms of meaning but in the wrong language. Kolers suggests that readers are more intent on deeper meaning than visual processing. Hochberg (1970) reports that skilled readers make fewer fixations (eye pauses) and longer saccades (distance between pauses). Mature readers do not have larger eye-spans; rather these readers need fewer cues as they are
relying on implicit knowledge of language redundancy in spelling, grammar, and content.

The research reviewed above supports the assumption that the reader's expectations are guided by the structural constraints of his language. Brown (1970) reached similar conclusions in a review of the research of Hochberg, Kolers, Weber, Gibson and others. Brown characterizes skilled reading in terms of selective sampling and hypotheses formation based on implicit knowledge of language and orthographic constraints. Brown, borrowing from Neisser, offers this summary:

To paraphrase Neisser's (1967) captivating metaphor, the skilled reader constructs meaning rather as the archaeologist reconstructs the past--from fragmentary evidence and a lot of general knowledge (p. 184).

In addition, Jerome Bruner (1973) concludes that underlying all cognitive phenomena such as concept formation, utilizing language redundancy, or formulating scientific theory, the mental processes are constructive in nature. The learner is engaged (in varying degrees of consciousness) in a strategy of hypothesis formation, testing, and adjustment.

A Reading Model for All Seasons

A number of researchers suggest that the reading process differs for beginning and mature readers (LaBerge and Samuels, 1976; Ruddell, 1976; Shankweiler and Liberman, 1972). Goodman (1976b), as well as Ryan and Semmel (1969), maintains that the process is essentially the same at all ages. Ryan and Semmel state the issue in this way:
A clear distinction between beginning and mature reading is often stressed. Precise identification of letters and words is considered important for young readers while mature readers depend much less upon identification for comprehension. . . . the present writers believe that beginning reading must involve the same basic strategies as mature reading. Some degree of comprehension is a prerequisite for identification (p. 61).

Research suggests that beginning readers are in fact sensitive to the grammatical constraints of language. Young readers make meaningful substitutions and rely on limited graphic information. Goodman (1965) compared the ability of children in first through third grade to read words from a list and their reading in story context. In all three grades, children could read in context 50 percent of the same words missed in list reading. Yetta Goodman (1968, 1976) analyzed the development of oral reading in six first graders over a period of eleven months. She found that better readers are more sensitive to complex language structure. These readers make more corrections when their deviations alter syntax and meaning. However, all beginners make use of graphophonemic, semantic, and syntactic cueing systems in processing print. Weber (1970) also analyzed the oral reading of first graders to determine their sensitivity to grammatical context. She found that 90 percent of oral reading errors were grammatically acceptable with the preceding language structure. According to Weber, "the notable finding was that weaker readers do not differ from their more skilled classmates in respect to use of grammatical constraint for the identification of words in a string. It is as though the children resisted uttering a sequence that did not conform to an acceptable sentence" (p. 162).
Clay (1969) sampled the oral reading of one hundred five-year-olds in their first year of school. Clay concluded that beginning readers rely on grammatical constraint in developing a self-correction strategy for handling misreadings that are not acceptable in terms of structure and meaning; ninety percent of all children showed evidence of self-correcting before beginning the basal reading series. More recently, Forrester (1975) studied the reading behavior of first graders. She concluded that the concept of a "word" is unclear to children at this age. "Children appear to deal with language in patterns and semantic units" (p. 59). She further speculated that the beginner abstracts the rules of reading by relying on language and practice with reading.

The Miscue Research Studies

During the period of 1965-1975, a number of studies were conducted at Wayne State University to examine oral reading patterns in depth within the psycholinguistic framework of the Goodman Model of Reading. These studies have helped to specify the reading process in terms of universal strategies. Separate studies (four federally funded grants and ten doctoral dissertations) examined the reading process with readers of all ages and backgrounds, reading a variety of textual materials (Allen, 1976a). The following section is a review of these studies.

Goodman and Burke (1968) confirmed that proficient fourth and fifth graders use graphic information within the context of grammar and meaning; most miscues result from a reliance on semantic and syntactic constraints; the reading process involves the interdependence
of these three language systems. Goodman and Burke (1973b) studied readers varying in proficiency in grades two through ten. They concluded that the reading process is essentially the same across age groups and proficiency levels; readers differ in control over efficient and effective strategies. Further, Goodman confirmed that use of the semantic system is an indication of comprehension and reading competence.

Carlson (1970, 1975) analyzed the oral reading of six fourth graders reading literature, social studies, and science selections. Readers relied on graphophonic, syntactic, and semantic cues in all subject areas. His study suggests that readers encounter some difficulty in semantic processing when background in the subject is limited; however, Carlson concluded that there is no indication that readers need to shift strategies in content-area reading.

Rousch (1972) examined the oral reading of average fourth grade readers to determine the influence of prior conceptual knowledge of a topic on oral reading behavior. Rousch concluded that knowledge of concepts prior to reading affects the quality of miscues. Readers with a strong background of knowledge tended to show higher quality semantic and syntactic processing. Correspondingly, these readers comprehended in greater depth as evidenced by their retelling scores.

Sims (1972, 1976) analyzed the oral reading of ten second grade dialect speakers. Students read two versions of the same story, one in standard English and the other in black dialect. Sims found that
readers frequently shifted between dialects in both stories without distorting meaning. According to Sims, the reading process was the same in both dialect and standard English selections. Therefore, she concluded that differences in reading proficiency among dialect speakers is not attributable to dialect interference in reading standard English.

Gutknecht (1976) studied the oral reading of upper elementary students designated as perceptually handicapped (learning disabled). He found that the learning disabled students tended to overuse graphophonemic strategies; however, all of the children relied on syntactic and semantic cueing as well. Gutknecht concluded that the reading process was not substantially different for these children labeled as exceptional.

Reading Generalizations

On the basis of research in miscue analysis, it is now possible to formulate generalizations about the reading process (Goodman, 1976b; Goodman, Yetta, 1976; Allen and Watson, 1976b).

1. The reader actively contributes his language knowledge, conceptual development and experience in reconstructing the writer's message.

2. Proficient readers develop strategies in reconstructing the author's message. These strategies include effective sampling, predicting, confirming, and comprehending.
3. All readers use graphophonemic, syntactic, and semantic information in processing print.

4. The reading process is essentially the same at all ages, proficiency levels, and across content areas. Readers vary in control over the ability to integrate graphophonemic, syntactic, and semantic information.

5. Proficient readers obtain maximum understanding (effectiveness) by processing the least possible amount of information (efficiency).

6. All readers produce miscues; miscues vary in quality depending upon their effect on meaning.

7. Proficient readers make effective use of correction strategies when meaning has been lost. This strategy and the reader's ability to produce meaningful substitutions are an indication of reading comprehension and competence.

8. The reader may produce an alternate surface structure and not change the writer's meaning. It is also possible for the reader to produce the author's exact surface structure and not arrive at the same meaning.

9. Reading is a language process; the nature of the process is determined by the interdependence of the graphophonemic, semantic, and syntactic
systems. Dividing language structure into component skills alters the character of the process and the constituent elements.

10. Reading proficiency is always a function of factors related to the reader, the material, and instruction.

Guidelines for Adopting a Theory Base

Brown (1970) states that prior to the 1960's reading research generally concentrated on the areas of visual discrimination of letters and letter to sound translation. Combined together, these two concepts constituted a definition of reading. Research is moving theorists beyond this simplistic view. Geyer (1972), in a review of forty-eight comprehensive and partial models of reading, reasons that in spite of obvious diversity, there is an information-processing perspective underlying most models. Processing during reading is no longer understood as a matter of simple stimulus-response associations, but rather a complex interaction of data. Williams (1973), in a similar review, reaches the same conclusion. According to Williams, recent models tend to conceive of reading as a cognitive skill based on a complex language system. Geyer suggests, however, that models vary considerably in origin and applicability to instruction. Geyer offers this caution:
It seems clear that the application of normal reading to most of the models is still some way off. Most of the models have been developed under highly controlled laboratory conditions, and care should be exercised in extending their implications beyond these conditions (p. 583).

Singer and Ruddell (1976a) suggest a number of guidelines for assessing models in terms of their validity. A model should be evaluated according to how it explains the following reading phenomena:

1. Developmental differences in acquisition of identification and processing of a word, a sentence or a paragraph.
2. Decoding, recoding, associating and testing meaning, storage and retrieval, and encoding of responses to print.
3. The role of reasoning processes, such as concept formation, problem solving, critical and creative thinking in comprehending and evaluation printed communication.
4. The way in which cognitive and affective processes interact in response to the reader's purpose and demands of the task.
5. Developmental changes in perception, language, cognition, culture, and values.
6. What occurs when a word cannot be recognized from constraints and minimal cues? When a reader's purpose changes? Or when a reader is not deriving meaning from print. (pp. 450-451)

The Goodman Model of Reading is the only current model compatible with the above guidelines. In addition, the model is not a "laboratory" model. Rather, it offers to the reading educator a theoretical framework for both instruction and research because it is applicable in both settings.
Definitions of Reading Comprehension

Differing models of the reading process logically lead to different conceptualizations of reading comprehension. Geyer (1972) suggests that a number of definitions of reading comprehension can be classified within three viewpoints: (1) comprehension is a hierarchical arrangement of related skills; (2) comprehension is a set of independent skills; (3) comprehension is a global reasoning process. The following section attempts to reveal the limitations and inaccuracy of the first two explanations.

Several researchers have attempted to identify separate dimensions or subcomponents of reading comprehension. Barrett (1967) has developed a taxonomy which defines both affective and cognitive dimensions of comprehension. His taxonomy includes literal comprehension (identification of explicit ideas and statements), inferential comprehension (conjecturing beyond explicit information), evaluation (critically judging), and appreciation (aesthetic reaction). Each major dimension is further subdivided into a hierarchy of subskills. In reviewing Barrett's taxonomy, Simons (1971) concludes that in spite of its surface orderliness, the categories lack psychological substance: many of the defined areas are common to general mental behavior and not specifically confined to reading. Further, Barrett fails to distinguish between teaching procedures, uses of comprehension, and processes of comprehension. In a similar review, Clymer (1968) maintains that "most important of all, perhaps the taxonomy cannot take
into account the background which the reader brings to the comprehension task" (p. 19).

Davis (1968) also attempted to identify separate components of comprehension. Using factor analysis to determine factors which account for variance in test scores, he identified nine components of reading comprehension (e.g., understanding word meanings, identifying the central idea). Farr (1969) extensively reviewed the research studies of Davis and others who attempted to separate comprehension processes. He reports that studies by Davis, Thurstone, and Hunt have not confirmed the existence of separate subskills. Only two factors have accounted for the majority of variance in scores—understanding word meanings and a general comprehension factor related to reasoning processes. In contrast to Farr's conclusions, Carroll (1972) maintains that through factor analysis Davis has been able to distinguish "pure" comprehension (linguistic processing) from inference ability. According to Carroll, comprehension involves two basic stages: "(a) apprehension of linguistic information; (b) relating information to a wider context" (p. 13). Carroll, however, questions his own dichotomy by rhetorically asking whether it is possible to separate inference from linguistic processing in comprehension of textual material. "A question that researchers should address is whether it is possible in fact to distinguish 'pure' comprehension of language texts from processes of inference, deduction, and problem solving that often accompany the reception of language" (p. 3). Considerable work has gone into psychometric analysis in order to understand reading comprehension. Geyer
(1972), however, concludes that in spite of this effort, factor analytic procedures have not explained the complex operations of the reading process.

In contrast to subcomponent definitions of comprehension, the following explanations view reading as a reasoning function. Levin and Gibson (1975) review recent attempts by Trabasso, Dawes, and Frederickson to develop models of comprehension. These models attempt to provide a framework for organizing data so that hypotheses can then be tested. Since these models are in a state of development, they are to date highly speculative. A brief description of these comprehension theories follows.

As explained by Levin and Gibson (1975), information processing models suggest that comprehension occurs in a sequence of stages. Comprehension breaks down when a component in the sequence is missing. Trabasso is one theorist who has developed a model within this framework. According to Trabasso, comprehension occurs when an appropriate match takes place between encoded linguistic information and existing cognitive structures. Levin and Gibson argue that the model is oversimplified. Comprehension involves more than a simple match between the reader's constructed meaning and existing mental structures. Trabasso's model confines the reader only to confirming old knowledge and does not account for new learning.

Models of discourse analysis are an attempt to analyze contextual information beyond the sentence unit. Dawes proposes that set relations between subject and predicate are expressed in declarative
sentences. Comprehension involves the reader's ability to remember these set relations. Frederickson has hypothesized that connected discourse involves a logical network of semantic units from simple concepts to interrelated semantic structures at the paragraph level. Various units are utilized in comprehension tasks. Both Dawes and Frederickson conclude that mature learners search for semantic structure. Readers tend to generalize specific semantic information into simplified but meaningful relationships. Levin and Gibson (1975) conclude that comprehension theories based on discourse analysis are highly speculative and therefore presently not useful for reading practitioners.

Edward Thorndike (1917) proposed over 60 years ago that reading comprehension is a reasoning process closely related to general problem-solving behavior. Thorndike explains that the reader is required to select and relate essential information while ignoring irrelevant data. Due to the complexity of the mental functions involved, Thorndike disputed the opinion of his day that reading "is a rather simple compounding of habits" (p. 323).

Recent research by Olshavsky (1977) further substantiates reading as a problem-solving activity. Olshavsky found that readers apply two strategies in comprehension: (1) strategies which identify comprehension problems, and (2) strategies which seek to eliminate comprehension barriers. Problem-solving strategies include such activities as rereading, substituting a synonym, hypothesizing, and so forth. Readers vary in the frequency with which they apply these strategies.
Frequency was found to be a function of the reader's proficiency and interest and the abstractness of the material. Olshavsky concludes that reading is not a hierarchy of subskills but a sophisticated reasoning process.

The following theorists define reading as a reasoning function in which the reader actively processes information. According to Smith (1975), the reader relies on both visual and nonvisual sources of information. Nonvisual information is the reader's contribution to the reading task which includes his implicit knowledge of language and prior understanding of the content of the text. Comprehension involves reduction of uncertainty in which the reader is involved in "relating new experiences to the already known" (p. 11). Comprehension takes place when the expectations of the reader are confirmed.

Within a similar perspective, Goodman (1973c), Wardhaugh (1969), and Page (1976) contend that reading comprehension involves understanding underlying relationships between elements in deep structure. Determining the writer's meaning by relating surface and deep structure is the central goal of reading. Reading, therefore, is a comprehension-centered process involving the interaction of thinking and language. Inferring the author's meaning is a continual process for the reader. The particular inferences made by the reader are the result of interrelating his automatic understanding of language and his own conceptual knowledge and experience. As Page explains, the process is essentially constructive as opposed to reconstructive "since it produces personal knowledge that is uniquely the possession
of the reader" (p. 90). Because reading is an inquiry process involving an active search for understanding, the reader must find the language and concepts presented in print reasonably predictable. The problem-solving process of comprehension is possible only when the reader is able to grasp the ideas, thoughts, and language of the writer.

The weight of recent research confirms reading as a language-based reasoning function. The definitions proposed by Thorndike, Goodman, Smith, Wardhaugh, and Olshavsky are in basic agreement. The work of Thorndike predates the 1960's; however, the other four theorists derive their viewpoint from current understandings of language and cognitive processes. This perspective excludes simplistic skill definitions which diminish the language and thinking contribution of the reader. The position underlying this study is that reading is a reasoning function intimately tied to the receptive language processing of printed information.

Factors Affecting Comprehension and Retention

Identifying and appropriately weighing factors which affect comprehension of written material is a difficult task. Levin and Gibson (1975) suggest that in general factors affecting comprehension of written material fall within two categories: (1) factors related to the text, and (2) factors related to the reader.
The Text

Bormuth (1968) reports that readability formulas are an inadequate but widely accepted means of assessing the comprehensibility of materials. Mathematical formulas attempt to relate various factors within the material, such as vocabulary, sentence length, and number of syllables, in order to determine grade equivalency of the material. Formulas fail to account for two significant factors: (1) complexity and predictability of language structure, (2) conceptual depth of the topic discussed (Smith, 1976). In addition, Sticht (1972) concludes that formulas developed on the basis of elementary school materials grossly inflate the difficulty of technical material appropriate for adults.

Analysis of comprehensibility of materials has moved beyond simple readability formulas. A number of studies have attempted to determine the effect of sentence structure on comprehension. Ruddell (1965) examined the relationship between oral language patterns and comprehension of written materials among fourth grade students. He concluded that comprehension is significantly better when written language patterns are highly similar to oral language patterns. Laura Smith (1976) analyzed elementary texts and determined that predictability of language patterns is a more significant factor in readability than sentence length.

Cromer (1970) examined the effect of language structure in the comprehension of college students. He identified a group of students with adequate intelligence and vocabulary knowledge, but poor
comprehension. Cromer conjectured that these readers (which he labeled "difference group") did not process reading material in meaningful syntactic structures but rather read word by word. Cromer found that difference readers comprehended as well as proficient readers when the material to be read was presented in meaningful phrase units.

Levin and Gibson (1975) report on several studies by Coleman and Rothkopf which attempt to determine the relationship between comprehension and grammatical complexity. Coleman (1965) had subjects read a long passage followed by questions to answer. He then varied the passage by substituting simpler grammatical forms for some sentences. Semantic content of the selection was held constant; only grammatical structures were altered. Coleman found a twenty-five percent increase in comprehension on those passages where simpler transformations were used.

Smith, Rothkopf, and Koether (1970) conducted a related study in which subjects read fifteen-hundred word passages. The content of the passages was held constant while style and structure were varied; different authors composed the selections. The researchers found that factors of style did not significantly influence comprehension. Rothkopf concluded that if the mature reader is not pressured by time limitations, then factors such as sentence complexity and vocabulary have a lesser effect on learning from reading.

The specific content of the material to be read influences comprehension. Smith (1976) suggests that concept-related factors inherent in the content affect readability. Comprehension is influenced by
the frequency of specialized vocabulary, the amount of unfamiliar
genral vocabulary, and concept complexity (the number of abstract
ideas presented). An additional variable relates to how fully con-
cepts are developed. Bormuth (1968) maintains that repeated reference
to preceding words or phrases (anaphora) "indicates the extent to which
a passage deals in depth with a single topic" (p. 4). Many textbooks
fail to adequately develop concepts before introducing additional
ideas, facts and details.

Textual features of sentence structure, sentence order, and logi-
cal semantic relationships interact in context. The reader relies on
cues from these interrelating factors which Levin and Gibson (1975)
refer to as features of "style". These features, along with the sub-
ject matter and physical aspects of the text, affect comprehensibility.
Bormuth (1968) contends that refined assessment tools are needed in
order to determine more clearly the relative impact of these factors
on reading comprehension.

The Reader

The reader is an active participant in the comprehension process.
Yet analysis of comprehension in reading has primarily emphasized
characteristics of the text. A number of cognitive and affective
dimensions related to the reader have been underestimated. These
factors include the reader's specific knowledge, background, experi-
ence, interest, and effort.

The reader's degree of concentration, attention, and ability to
select and organize information influence comprehension and retention.
Wanat (1977b) explains that as in all information processing activities, the reader must be actively "tuned in" as he mentally processes data; otherwise the reader completes the task but lacks understanding. Fisher and Smith (1977) also identify active processing on the part of the reader as a major comprehension variable. "The reader must act in those situations which allow for implicit processing. The possession of the required knowledge and logical skills is not sufficient for the generation of text structure. The reader must apply what he knows in the appropriate situations" (p. 24). The research of Olshavsky (1977) suggests that a reader's attention may be related to his interest in the material. Olshavsky found that readers with a high interest in the material tended to apply problem-solving strategies such as rereading, synonym substitution, etc., more often than readers with low interest.

Textbook information is often not inherently interesting to many readers. Therefore, a number of instructional devices and teaching strategies have been developed which attempt to influence the reader's activity as he reads. Techniques include oral and written questioning by the teacher or text, note-taking strategies and study-techniques in which the reader is encouraged to question himself at appropriate points (Gibson, 1975). Rentel (1975) suggests that although such instructional techniques are helpful, they are limited in their usefulness; distributing questions throughout difficult material does not solve the comprehensive problem. According to Rentel, "to gain from reading, considerable semantic input is required" (p. 169). In order
to learn from reading, the content of the subject matter must be written within the range of the reader's conceptual experience.

Cognitive psychologists hypothesize that the sum total of an individual's experience is organized systematically in hierarchically arranged mental structures. New information is not randomly acquired; rather, it is incorporated into existing cognitive structures (assimilation) or cognitive structures are modified (accommodation) (Smith, 1975). Much of school learning centers on conceptualizing new information. Concepts represent categories which differentiate and relate experience. Categories form complex interrelationships. According to Ausubel (1968), it is the perpetual interacting and reorganizing of ideas into "structures of knowing" that make possible the establishment and retention of new learnings. Comprehension therefore is a relative term because it is dependent on what is already known.

Singer (1976) suggests that even though mental capability may be present, gaps in experience make effective communication in a content area impossible. "Whether or not an individual comprehends a message then is a function in part of the degree to which the concepts transmitted by the sender are congruent with the concepts elicited in the receiver of the message" (p. 636). According to Goodman and Smith (1976c), the writer's message must be generated by the reader. This process is dependent upon what he knows and is able to relate to in reconstructing meaning. These cues "within the reader" are as important in the reading process as the cues within words and language structure.
Reading comprehension problems occur when materials contain ideas, meanings, and grammatical structures well beyond the reader's experience. These factors interact to cause comprehension difficulty. Menosky (1976) explains the nature of the difficulty. "At those points where the distance between the author and the reader is greatest--where the language patterns and experiences differ most--the reader finds the material least predictable. As the predictability of the material decreases, the chance for confusion or misconception increases" (p. 103). According to Rentel (1975), students at the high school level and above meet with varying degrees of concept shock in school. "Each student brings to school meanings he has learned from his encounters with life in all its diversity. The give and take between these concepts, those of the classroom and of the student, is the critical prelude to meanings that will grow out of the interaction between student and book" (p. 169).

**Reading in the Academic Disciplines**

Specific fields of knowledge differ in the perspective from which reality is viewed. Differing perspectives result in specialized concepts, generalizations, and procedures of investigation. Communication within a discipline is facilitated by the development of a unique sub-language or academic dialect. Goodman and Smith (1976c) explain: "The expertise of these disciplines is merely a language effort to embrace ideas that attempt to describe the world from different vantage points" (p. 161). "The concepts, language and procedures specific
to a field of study constitute the 'syntax of the discipline'" (p. 162). Ruddell (1976) contends that as a consequence of specialization there is a great deal of functional variety of language. This variety influences the semantic language dimension in language processing. One would expect the lexicon of the organic chemist to differ in some respects from that of the journalist. Effective communication between the chemist and journalist on professional subjects would depend in some degree upon shared knowledge.

Shared background between writer and reader is essential in learning from reading. Concept density of reading material depends upon the number of ideas new to the reader, the degree of abstraction in those ideas, and how succinctly they are presented. As Goodman and Smith (1976c) explain, these factors affect the reader's comprehension and not necessarily his ability to respond appropriately to the words on the page; the ability to translate graphic symbols into an oral counterpart is not an indicator of understanding. Nor is the problem simply a matter of understanding the vocabulary presented. Rather, "the profusion of new concepts, the special ways that language is used, the reading tasks that are particular to each area of study . . ." (p. 258) interrelate to create difficulty in comprehension.

The fact that the concepts of a field of study are often abstract is usually acknowledged and then dismissed when researchers consider problems of comprehension. "Since concepts included in the content are necessarily abstract and difficult, there is very little we can say about content and learning from reading that is not self-evident"
(Levin and Gibson, 1975, p. 421). The problem has not been self-evident to teachers of content-area subjects or researchers in content-area reading. Mallison (1972) reviews the research on reading in the sciences from 1900 to 1970. He identifies two periods of emphasis—the vocabulary load period and the reading formula period. During the first period (1900-1950), publishers relied on word lists and glossary terms to establish the difficulty level of a text. Researchers disagreed over the effect of technical terms on comprehension. Some equated simple definitions with comprehension; others insisted that understanding the concepts related to the term indicated comprehension. A second period, from 1950-1960, stressed readability formulas which included sentence and word length as well as vocabulary. Both periods revealed that readers had difficulty reading in the sciences. Mallison has identified a third trend, developing since 1960. Studies have attempted to define "scientific literacy" which is vaguely defined as the ability of the layman to read the literature of science and understand its cultural implications.

Estes (1972) reviews the research since 1950 that has attempted to identify the reading skills necessary for achievement in social studies. He concludes that attempts to identify skills have been inconclusive; no evidence exists that specific comprehension skills can be isolated. Estes acknowledges the fact that the concept load of material has not traditionally been considered in determining the difficulty level of material; however, in establishing directions for future research, his argument is circular. He suggests that an
important question must be answered, "What reading skills are most crucial to social studies achievement?" (p. 186). In this research review and that of Mallison, little emphasis is placed on what background the reader brings to the reading task; no emphasis is placed on reading as a language process in which the reader contributes his knowledge and experience.

Farr (1969) reviews the research attempts that have sought to predict comprehension in content-area subjects by general reading comprehension tests. Research indicates that measures of general reading comprehension are not adequate predictors of comprehension in a specific subject. Farr speculates about why reading comprehension varies with each content area. "Students may be performing poorly in academic subjects not because they lack reading comprehension abilities in general, but because they lack the specific ability to apply this skill to various subject areas" (pp. 116-117). He argues that with future research, "it may be possible to determine if the student goes through different mental procedures in comprehending science material than he does in social studies material" (p. 121).

Farr fails to consider the reader's knowledge of basic concepts or experiential background. His view reflects the prevailing attitude that the reading process itself must vary substantially when reading in different subject areas. Research does not support this conclusion. Carlson (1970), Rousch (1972), and Kolczynski (1973) analyzed the oral reading of students in content-area subjects. Each concluded that the reading process is the same regardless of the material read. All
readers used sampling, predicting, confirming, and correction strategies; all readers made use of graphophonemic, semantic, and syntactic information. Kolczynski summarizes in this manner: "The implication of this study is that instructional strategies based upon the assumption that readers need to 'shift' skills according to the content of materials are open to question" (p. 102).

Levine (1970) contends that adequate comprehension in a particular field of study is attributable to experience and wide reading in that area. The ability to determine main ideas and supporting information is not a skill to be taught and automatically transferred to all content areas. Understanding a body of information is assured only when the material is within the reader's conceptual grasp. Similarly, the reader's ability to infer meaning beyond the information presented in print is not a skill to be taught directly. Instead, the reader's degree of inference ability varies from subject to subject depending upon his depth of knowledge (Smith, 1975).

A number of authorities mentioned suggest that there are limits on the amount of new learning that can be acquired totally by reading (Ausubel, 1968; Goodman, 1973c; Rentel, 1968; Smith, 1975). The following studies support this position. In a study with sixth and eighth grade readers, Chall (1947) measured students' general understanding of tuberculosis prior to reading. High and low scores on the pretest significantly correlated with scores on paragraphs covering the same subject. Scores on a general standardized reading test did not predict how well students would read the health materials. Chall
concluded that students who know more about a subject are better able
to understand related reading materials. Kolczynski (1973) analyzed
the oral paraphrasing of content-area reading. He concluded that stu-
dents failed to recall terms that represented concepts they had not
fully acquired. Rousch (1972) found that the reader's knowledge of
concepts prior to reading affected the quality of semantic and syntac-
tic processing. Readers who demonstrated conceptual knowledge of the
content produced more semantically and syntactically acceptable mis-
cues. These readers also had higher comprehension scores as mea-
sured by their oral retelling of the passage. Carroll and Freedle
(1972) also emphasize the role of the reader in semantic processing.

Naively, one might suppose that all the semantic infor-
mation that a reader (or listener) extracts from a dis-
course passage is contained in the strings of words on
the page. . . . But we have argued above that in most
discourse-understanding situations the perceiver must
contribute his background knowledge and his presupposi-
tions in the understanding of the message. What is
explicitly given in the discourse represents only cues
to underlying semantic structure (p. 363).

Goodman (1973c) explains that whenever the semantic input
required of the reader is beyond what he can provide at that time, the
reading task involves "deciphering nonsense" (p. 253). "In this sense,
all readers, regardless of their general reading proficiency, are
incapable of reading some material in their native language" (Goodman,
1969, p. 165). Therefore, relevant reading material is an important
element in reading. Smith (1975) summarizes in the following manner:

As a student grows older, he is expected to assimilate
a good deal of new information through reading. Many
students in high school and beyond are accused of
functional illiteracy, which often means that they are expected to read material that is fundamentally incomprehensible to them. Yet, it is obvious that many of these students can read: They read articles that interest them in newspapers and magazines; they read correspondence, advertisements, menus. But they do not read school books. . . . Reading is made difficult whenever a book makes too many demands (p. 187).

It logically follows from the work of Chall (1947), Goodman (1973c), Olshavsky (1977), Rousch (1972), and Smith (1975) that procedures designed to measure comprehension of subject-area materials require a dimension which accounts for the reader's familiarity with the content of the material as well as his interest in the subject. The factors of background knowledge and interest affect the reader's degree of mental involvement as he reads. As a result, the reader's language processing, understanding, and retention of the material are affected. It is the position of this researcher that assessment measures of reading which do not consider the reader's interest and background as well as his processing and retention ability potentially miscalculate a reader's proficiency. This issue is of particular importance in certifying literacy competence in our schools.

Measuring Reading Comprehension

Many procedures have been developed which attempt to measure reading comprehension. The following discussion explains current measures in use and others which have been recently proposed. Reviews by scholars in the field of reading place these assessment measures in proper perspective. The conclusion of this section explains why
the comprehending and retelling measures proposed by Goodman provide the reading practitioner the most accurate assessment of reading comprehension now available.

Perhaps the most widely used measure of comprehension of textual material is the standardized reading test. These tests usually consist of a number of short passages based on literacy and subject-area content considered appropriate for the grades tested. Passages are followed by five to eight multiple-choice questions. The reader is expected to select the answer which best answers the question. Items are intended to reflect the reader's understanding of the material (Diederich, 1969).

Standardized measures of comprehension have a number of limitations due to their basic construction and format. For example, the norm-referenced nature of standardized tests makes them useful only to the extent that they allow one student's performance to be compared with another. As explained by Singer (1977), in norm-referenced testing, the test is constructed so that the ablest readers are challenged. Test questions are selected so that the average reader gets fifty percent correct. Since these tests always sort readers according to achievement, a student's individual intelligence becomes a significant factor at some point. No information is revealed about whether the student can in fact comprehend the passages; all that is known is whether a particular student performed better or worse than other students his age.

Once a percentile rank is obtained, there is a low possibility
that the difference between two scores is real because of error factors inherent in the test. This criticism applies to research by Davis (1968) which is reputed to be a detailed and careful analysis of reading comprehension subskills. As reported by Wanat (1977a), Thorndike concluded in a 1973 review of research by Davis that when two scores vary by one standard deviation there is only a twenty-five percent chance that the difference is actual. Yet the two scores may be separated by forty percentile points. It becomes obvious that the prevailing confidence in the accuracy of standardized test scores is not warranted.

In addition to the above criticisms, research by Tuinman (1973) indicates that reading comprehension tests do not measure understanding from reading because questions are often not passage-dependent. Stated differently, items can be answered correctly without reading the passage. Tuinman explains that relating content to prior learning is a necessary condition in reading. Prior knowledge, however, should not be a sufficient condition in a measurement situation. According to Livingston (1972), confidence in testing is derived primarily from face validity—what the test appears to measure rather than what it actually measures. Livingston argues that comprehension tests measure knowledge of content rather than reading comprehension and therefore lack content validity. Simons (1971) contends that tests also lack construct validity since they are not constructed on the basis of a clear theory of the reading process. In addition, Goodman (1973a) maintains that attempts to develop a format suitable for testing large
groups have resulted in distortion of the reading task. Standardized reading selections consist primarily of brief paragraphs. Miscue analysis research has revealed that the reader's expectations accumulate in reading, making longer selections easier to read than shorter ones. Robinson (1975) suggests that perhaps the biggest limitation to standardized testing is that it draws attention to the general outcome score only. Specific information about the student's reading behavior is ignored.

Recently, a number of authorities (Singer, 1977; Reismann, 1977) have suggested criterion-referenced testing as an alternative to norm-referenced testing. In this type of test situation, the task is within the reader's ability and speed is not a factor. The student is judged on whether he can or cannot perform the task; his performance is not compared with that of other students. Reismann warns, however, that frequently "the materials developed are based on norm-referenced logic and statistical design" (p. 47). Therefore, the original intent of the criterion-concept is distorted. Reismann also explains that a major assumption behind the criterion-referenced testing strategy is that all knowledge is composed of learning hierarchies which can be broken into assessible component parts. When applied to reading comprehension, component skills are identified and separately evaluated.

As previously discussed, reading is a unitary language-reasoning process and is not divisible into discrete units. Thus, this type of testing does not accurately evaluate the reading process. In addition, any test which is based on silent reading followed by questions
is limited in the type of information it reveals about the reader's ability.

The cloze procedure is another attempt to measure reading comprehension that has received much attention over the past decade. Any passage can be used in developing a cloze test. Every fifth word within the selection is deleted and replaced with a blank space. The test is administered to students who have not read the selection. Readers are instructed to fill in each blank with the word thought to be deleted. Responses are scored correct when the reader replaces the exact deletion. Research by Bormuth and Rankin has shown the cloze procedure to correlate highly with standardized measures of comprehension (Bormuth, 1975). Carroll (1972), reviewing research on the cloze procedure, questions its validity and concludes the following:

There is no clear evidence that cloze scores can measure the ability to comprehend or learn the major ideas or concepts that run through connected discourse. It is even possible to secure cloze scores on the basis of meaningless material so long as grammatical cues are present; thus, cloze scores are probably more dependent on deletion of grammatical than semantic cues (p. 19).

Rousch (1976) also concludes that the cloze task primarily reflects syntactic processing. He found that both low and high proficiency fourth grade readers had difficulty with the cloze procedure. Rousch explains that whereas reading is a receptive language task, the cloze procedure is primarily a productive language task.

Carroll (1972) explains the "chunked comprehension" test developed by R. P. Carver. In this test, the subject first reads a selection. The reader is then presented with a reproduction of the
passage that contains a section or chunk of information not included in the original. The reader is asked to identify the section added to the test passage. The procedure overcomes the problem of answering questions without reading the selection first; however, it does not evaluate the processing strategies of the reader or his retention of information.

Simons (1971) proposes that the reader's ability to recover deep structure represents a means of measuring comprehension. Several alternatives are possible: (a) Readers identify from several sentences those with alternative surface structure but equivalent meaning; (b) Readers are presented with a sentence and are asked to complete an additional sentence so that both sentences have equivalent meaning (Example: He painted the house that was red. He painted the ___ ___ [pp. 359-360]); (c) Readers are asked to paraphrase written material. Simons acknowledges that comprehension measures which focus on specific sentences do not reflect the interpretation required of the reader in longer selections.

Carroll (1972) suggests that reproduction of a message in the reader's own words is a useful measure of comprehension if guidelines for evaluating the paraphrasing are included. Validity of this procedure is derived from findings that it is the meaning of a message that is retained whereas verbatim semantic and syntactic content is forgotten. Miscue analysis methodology includes evaluation of the reader's oral retelling of a passage (Goodman and Burke, 1972). Studies in miscue analysis have confirmed this procedure as an
Selection of a Measurement Procedure

The major measures of reading comprehension have been reviewed. It is the conclusion of this researcher that any procedure which purports to measure reading comprehension should be examined in relationship to the following questions:

- Is the measurement procedure based on a valid view of reading as a cognitive-linguistic function?
- Does the procedure explain substantiated differences in reading proficiency or derive differences statistically?
- Does the measure provide a look at the reading process in use?
- Does the measure provide a view of what the reader has understood by allowing him to explain it in his own words?
- Does the procedure account for the degree of the reader's knowledge and interest in a particular selection?
- Is the procedure applicable to classroom reading tasks?

When examined according to these criteria, it is clear that comprehension is most accurately evaluated by both a process measure (comprehending percentage) and retelling measure (comprehension percentage) of the reader's understanding. Both of these measures are basic tools of miscue analysis. Of the two assessments, Goodman (1976b) maintains that a comprehending measure is a better indicator of the reader's competence since the oral retelling takes place after
reading. Neither score is a precise measurement formula. These measures are qualitative yet accurate attempts to evaluate the reader's ability to meaningfully process written material. In addition, this researcher suggests additional evaluation components when passages are primarily informational in nature. With this type of material, components are needed which evaluate a reader's initial knowledge of the content and his interest in the subject. These suggested additions are derived from the research of Chall (1947), Olshavsky (1977), and Rousch (1972). This study applied these procedures to the task of evaluating the reading competence of selected high school seniors. The specific procedures and results are explained in detail in Chapter III - Chapter VI.

Conclusion

A significant amount of research on the reading process, comprehension, and evaluation has been discussed in this literature review. The theories and research studies cited have been influential in formulating current reading instruction and assessment practice in our schools. Much of this practice is based on a behaviorist conception of reading ability as a hierarchy of skills acquired one by one through repeated practice. In the mature reader, these skills are described as aspects of literal, inferential, and critical comprehension (Barrett, 1967; Davis, 1968) which are somehow applied differently in various content subjects (Farr, 1968). This view of proficient comprehension is an extension of the reductionist theory of reading
acquisition which suggests that the proper sequence of instruction is from part to whole (letters to words to sentences to meaning). In upper level reading, the sequence begins with specific details followed by main ideas and evaluative reading. Current measurement procedures at the secondary level either reflect this inaccurate view of comprehension or are based on no theory at all.

Although the field of psycholinguistics and reading is in its infancy, the past decade has yielded valuable information on how reading ability is acquired and matures. Psycholinguistic evidence confirms that reading is a nonreductionist language-thinking function. Therefore, the reader's depth of understanding is not a result of applying isolated skills. Instead, reading comprehension is a dependent variable determined by the reader's psycholinguistic processing ability, background knowledge, interest and effort in attempting to understand specific reading material. The literature reviewed in this chapter overwhelmingly suggests that the Goodman Model of Reading predicts, describes, and evaluates reading proficiency within a non-reductionist framework. Important factors related to both the material and the reader can be considered. Therefore, the Goodman Model was adopted as the theory base in which to describe and analyze the data generated in this study.

Miscue analysis is a respected tool for understanding and evaluating the reading ability of elementary school readers. The research described in Chapter III was directed toward high school readers. This group has recently captured the attention of educators as well as
the public in general. The intent of the study was (1) to arrive at a further understanding of reading problems at the high school level, (2) to examine the effect of readers' prior knowledge of content on processing strategies and comprehension, and (3) to study the feasibility of using evaluation measures of comprehension based on miscue analysis as alternatives to standardized reading tests. Research which examines reading performance based on an accurate view of comprehension as a language-thinking function is needed. This type of research is particularly important as the minimum competency movement strengthens at the high school level.
The specific purposes of this study were to (1) assess the influence of a reader's prior knowledge and interest on comprehending and prompted retelling performance, (2) explore the feasibility of miscue analysis as an alternative to standardized tests in assessing minimum reading competence at the high school level, and (3) further understand the reading problems at the secondary school level. In keeping with these purposes, this study included an analysis of the prior knowledge, oral readings, and prompted retellings of ten secondary students who read a number of different passages.

Subjects

Ten high school seniors were selected from a southern secondary school. Students were drawn from the above average, average, and below average percentile ranks as designated by the reading comprehension subtest of a standardized test taken during the previous school year. The three percentile divisions are defined by the test manual as follows: 10-25, below average; 40-60, average; 78-90, above average. These divisions correspond to the third, fifth, and seventh stanines respectively. All students selected fell within the average I.Q. range
as measured by a standardized intelligence test. Since this was not an experimental study, no attempt was made to control for sex, race, or socioeconomic background in subject selection. Students included in the sample were those who met the I.Q. and percentile rank criteria and whose parents granted permission to participate. The oral reading of the following students provided the data for analysis:

<table>
<thead>
<tr>
<th></th>
<th>I.Q.</th>
<th>Percentile Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reader 1, black male</td>
<td>108</td>
<td>78</td>
</tr>
<tr>
<td>Reader 2, white female</td>
<td>112</td>
<td>81</td>
</tr>
<tr>
<td>Reader 3, white male</td>
<td>102</td>
<td>85</td>
</tr>
<tr>
<td><strong>Middle Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reader 4, black male</td>
<td>109</td>
<td>55</td>
</tr>
<tr>
<td>Reader 5, white female</td>
<td>93</td>
<td>45</td>
</tr>
<tr>
<td>Reader 6, white male</td>
<td>111</td>
<td>55</td>
</tr>
<tr>
<td><strong>Low Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reader 7, white female</td>
<td>110</td>
<td>19</td>
</tr>
<tr>
<td>Reader 8, black male</td>
<td>92</td>
<td>22</td>
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<tr>
<td>Reader 9, white female</td>
<td>107</td>
<td>16</td>
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<tr>
<td>Reader 10, white male</td>
<td>108</td>
<td>16</td>
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Data Collection Procedures

Prior Knowledge Surveys

At least one day before reading a passage, each student was asked to answer a series of sixty correct or incorrect statements concerning the content, terms, and concepts of six informational passages (see Appendix A). The researcher administered the prior knowledge survey orally and students answered orally. The number of correct answers provided an estimate of the reader's prior knowledge of the topic of a passage.

Operational Definition of Prior Knowledge

The "guess factor" was accounted for in final scoring of the prior knowledge survey by asking students to indicate their confidence in each answer. The scoring of a question was weighted depending upon the student's confidence rating. According to Ebel (1965), confidence weighting is designed to improve reliability in objective testing. An adaptation of the method devised by Ebel for true and false testing was used to weight students' answers on the prior knowledge survey. The scale used in this study was as follows:

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Score Value</th>
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<tbody>
<tr>
<td>I am very sure.</td>
<td>10</td>
</tr>
<tr>
<td>I am somewhat sure.</td>
<td>5</td>
</tr>
<tr>
<td>I am not very sure.</td>
<td>0</td>
</tr>
<tr>
<td>(no basis for a response)</td>
<td>0</td>
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</tbody>
</table>
Ebel suggests subtracting the maximum number of points (10) if a student is confidently wrong—if he answers incorrectly and yet was "very sure." It was not considered necessary to include this factor in scoring as there was no reason for a student to attempt to inflate his score. Students were aware that the prior knowledge survey score did not affect their permanent record or grades.

The weighted score was considered the more accurate estimate of a reader's prior knowledge of passage content. Therefore, it is this score that appears in Chapters IV, V, and VI. A reader was considered to have either high, moderate, or low prior knowledge of passage content. Weighted scores were categorized within one of the following ranges:

Prior Knowledge:  
High -- 70%-100%  
Moderate -- 30%-65%  
Low -- 0%-25%  

The prior knowledge estimates for passages provided information related to the cognitive dimension of the reading process.

**Operational Definition of Reader Interest**

A reader's interest in passages was assessed in two ways. First, readers were asked to rate their interest in a passage before and after reading on the following scale: The passage is (a) very interesting, (b) somewhat interesting, (c) not very interesting. Second, after reading all passages, readers chose one as "the most interesting."

Chapter VI concludes with a descriptive analysis of readers' interest along three dimensions: (1) comparison between prior and subsequent interest ratings, (2) the influence of readers' interest, (3) the basis
for readers' interest. This information relates to the affective dimension of reading.

**Oral Reading and Retelling Sessions**

Each student read a number of passages differing in content. Six one-hour sessions with each student were distributed over a one-month period. During these sessions, the subject was asked to read without aid or correction by the researcher. Immediately following the oral reading of a passage, the reader was asked to retell as much of the information as he remembered unprompted by the researcher. At the conclusion of his recall effort, the researcher attempted to get the reader to expand his retelling while not revealing additional information. The above procedures were in accordance with those specified in the Reading Miscue Inventory (RMI).

An additional retelling procedure was included in this study due to the level of difficulty and character of the reading passages. The selections read were informational and written in an expository style. It was assumed that the information load of the passages would in some cases overload a reader's memory and produce a distorted picture of comprehension. To compensate for this possibility, readers were reminded of the general topics discussed in a passage following the conclusion of the expanded retelling. The format of this procedure was as follows:

**Researcher:** I am going to prompt your memory by reminding you of the topics discussed in the
passage to see if you want to add any information.

Example: The article discussed the tanning process. Is there anything you want to add on that subject?

Information added by the reader was evaluated and included in the prompted retelling percentage. Retellings were evaluated according to retelling guides developed by the researcher which subjectively divided passage information into generalizations and details (see Appendix C).

In the case of story passages read by half of the sample, only retelling procedures specified in the RMI were included. On passages from standardized tests, students were asked to answer test questions after the retelling task. On one test passage, questions were read and answered orally. All oral readings and retellings were preserved on audiotape for subsequent analysis.

A Comparison of Retelling and Prompted Retelling Performance

This section compares subjects' retelling and prompted retelling percentages and explains the rationale for using the prompted retelling percentage in analysis of data. Table 3.1 shows that in 51 out of 54 instances there was a difference between a reader's retelling and prompted retelling percentage. In some cases, the increase was substantial with differences as high as 30-50 points, i.e., Readers 4, 5, and 10. Large differences apparently occurred when the reader had a
table 3.1
comparision of retelling and prompted retelling percentages for all informational passages

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<td>High Group</td>
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<td>1</td>
<td>47%</td>
<td>47%</td>
<td>0%</td>
<td></td>
<td>61%</td>
<td>84%</td>
<td>24%</td>
<td>43%</td>
<td>49%</td>
<td>6%</td>
<td>96%</td>
<td>97%</td>
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<tr>
<td>2</td>
<td>0%</td>
<td>12%</td>
<td>12%</td>
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<td>52%</td>
<td>62%</td>
<td>10%</td>
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<td>68%</td>
<td>2%</td>
<td>47%</td>
<td>51%</td>
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<td>3</td>
<td>52%</td>
<td>52%</td>
<td>0%</td>
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<td>58%</td>
<td>80%</td>
<td>22%</td>
<td>51%</td>
<td>51%</td>
<td>0%</td>
<td>83%</td>
<td>88%</td>
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<td>Middle Group</td>
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<td>4</td>
<td>36%</td>
<td>42%</td>
<td>6%</td>
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<td>38%</td>
<td>82%</td>
<td>44%</td>
<td>22%</td>
<td>54%</td>
<td>32%</td>
<td>52%</td>
<td>55%</td>
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<td>5</td>
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<td>6</td>
<td>27%</td>
<td>30%</td>
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<td>46%</td>
<td>50%</td>
<td>4%</td>
<td>40%</td>
<td>58%</td>
<td>18%</td>
<td>53%</td>
<td>58%</td>
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<td>Low Group</td>
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<td>8</td>
<td>(Omitted)</td>
<td>(Omitted)</td>
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</tr>
<tr>
<td>9</td>
<td>(Omitted)</td>
<td>24%</td>
<td>27%</td>
<td></td>
<td>6%</td>
<td>10%</td>
<td>4%</td>
<td>37%</td>
<td>39%</td>
<td>2%</td>
<td>48%</td>
<td>66%</td>
</tr>
<tr>
<td>10</td>
<td>(Omitted)</td>
<td>76%</td>
<td>77%</td>
<td>1%</td>
<td>55%</td>
<td>75%</td>
<td>20%</td>
<td>70%</td>
<td>95%</td>
<td>25%</td>
<td>45%</td>
<td>65%</td>
</tr>
</tbody>
</table>

1See section on Materials for an explanation of omitted passages.

Key:

Ret. = Retelling
P. Ret. = Prompted Retelling
Dif. = Difference
clear grasp of the material and simply was unable to recall all the information without assistance. If, however, a reader had understood little of a selection, reminding him of the general topics had an insignificant effect on his retelling percentage, i.e., Reader 8. Generation Gap passage. Table 3.2 shows that mean differences between retellings and prompted retellings for individual readers. The range of means was from 7 to 23 percentage points; the highest occurred for the middle group and Reader 10.

Prompting the reader appeared to reduce the memory variable in the retelling of informational material. The prompted retelling percentage was therefore considered to be the more accurate assessment of the reader's comprehension. This figure was used as the final retelling score in the analysis of comprehension on the informational passages.

**Materials**

Students in the sample orally read six informational passages in academic and nonacademic categories. Passages were selected according to the following guidelines with regard to content, style, and source: (1) content which conveyed information on a specific subject; (2) style which was direct and journalistic rather than essay, story, etc.; (3) sources which one would expect high school seniors to be able to read. Passages are described as to content and length in Appendix B.

Four passages were read by subjects in all three percentile groups and are referred to as the core passages in data analysis chapters. In
### TABLE 3.2

**MEAN DIFFERENCE IN RETELLING AND PROMPTED RETELLING PERCENTAGES FOR INDIVIDUAL READERS**

<table>
<thead>
<tr>
<th>Reader</th>
<th>High Group</th>
<th>Middle Group</th>
<th>Low Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Difference</td>
<td>Retelling/Prompted Retelling</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>9</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td></td>
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<td></td>
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<td>8</td>
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<td>9</td>
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<td></td>
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<tr>
<td>10</td>
<td></td>
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</tr>
</tbody>
</table>
addition, each student read one recreational passage chosen from six optional selections. Choice was based on the reader's knowledge and/or interest in the subject and source of the passage. Certain percentile groups read an additional passage. The high group as well as two readers from the middle group read a second standardized test passage. This passage was chosen to challenge the high group. The lower percentile group and one middle group reader read one of two short-story passages.

The reading tasks were structured in this way so that (1) comparison on core passages was possible; (2) readers were provided a passage in which they expressed interest and background knowledge; (3) the high group was challenged by a passage with a number of unfamiliar terms and concepts; (4) the low group was provided a story passage structured around plot, theme, and character development. The range of passages for each student made possible individual proficiency profiles which represented the reader's comprehension in diverse reading situations. The charts on the following pages list passages and reading tasks assigned to groups.

**Analysis of Data**

Data generated during the oral reading sessions were analyzed according to the Reading Miscue Inventory. The strength of the RMI is that it allows for each miscue to be examined in relationship to the total context of a passage. The RMI allows the researcher to ask a key question: How often does the reader produce miscues which create
These are two exceptions related to core passages: (1) An additional test passage on Chemistry was read by the sample. Readers' performance on this passage is reported only in Chapter V in the section, Test Passages. (2) The least proficient reader in the study (Reader 8) did not read either the Chemistry passage or Renaissance passage due to the difficulty and length of the selections.

The test was unnamed so that references to the passage and questions in data analyses did not affect the usefulness of the test in future testing.
### READING TASKS FOR INDIVIDUALS BY GROUPS

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Group</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Core Passages, Oratorio, Popularity</td>
</tr>
<tr>
<td>2</td>
<td>Core Passages, Oratorio, Debby Boone</td>
</tr>
<tr>
<td>3</td>
<td>Core Passages, Oratorio, Elvis Presley</td>
</tr>
<tr>
<td><strong>Middle Group</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Core Passages, Oratorio, Popularity</td>
</tr>
<tr>
<td>5</td>
<td>Core Passages, My Father Played For Me, Popularity</td>
</tr>
<tr>
<td>6</td>
<td>Core Passages, Oratorio, Craig Morton</td>
</tr>
<tr>
<td><strong>Low Group</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Core Passages, The Christmas Cat, Popularity</td>
</tr>
<tr>
<td>8</td>
<td>Core Passages (3), My Father Played For Me, Craig Morton</td>
</tr>
<tr>
<td>9</td>
<td>Core Passages, My Father Played For Me, Debby Boone</td>
</tr>
<tr>
<td>10</td>
<td>Core Passages, My Father Played For Me, Elvis Presley</td>
</tr>
</tbody>
</table>
disruptive syntactic and semantic structures that change the message developed in the passage? The goal of miscue analysis is to determine the effect each miscue creates on meaning and as a result abstract the reader's patterns of processing from the data. All of a reader's miscues were analyzed up to a total of fifty miscues. In cases in which the reader miscued more than fifty times, the middle fifty miscues were selected for analysis. If a reader miscued less than ten times on a passage, the passage was eliminated in discussions of the reader's processing ability.

In order to derive patterns of miscue quality, each miscue was examined in relationship to the following RMI questions:

1. GRAMMATICAL ACCEPTABILITY: Does the miscue result in a grammatically acceptable structure?
2. SEMANTIC ACCEPTABILITY: Does the miscue result in a semantically acceptable structure?
3. MEANING CHANGE: Does the miscue create an alteration of meaning?

A comprehending percentage was derived by adding the percentage of miscues which were semantically acceptable within the entire passage (question 2) and the percentage of miscues which were corrected (question 4). The comprehending percentage formed the process measure of comprehension. A retention measure of comprehension was determined by an evaluation of the reader's ability to retell a passage in terms of its specific information, major concepts and generalizations. Comparisons between the processing patterns which emerged and what a reader
recalled in retelling substantiated final conclusions regarding a reader's conceptual knowledge and depth of comprehension. Comparative analysis focused on profiles of a reader's performance in comprehending and comprehension across passages. These data were descriptively compared to a reader's percentile rank, interest, and prior knowledge of passages.

Pearson product-moment coefficients of correlation were calculated to compare statistically by passage the relationship between (a) prior knowledge and comprehending, (b) prior knowledge and prompted retelling, and (c) comprehending and prompted retelling. Due to the small sample size, implications of these data are confined to the readers in this study.

A frequency count of Miscues Per Hundred Words (MPHW) was calculated for individuals by passage. From these data, mean MPHW were determined for individuals and groups. Frequency counts of miscues and percentages for prior knowledge, comprehending, and prompted retelling are presented in tables in Chapters IV, V, and VI.

**Criterion for Minimum Proficiency: Comprehending**

Burke and Y. Goodman (1972) specify that a proficient reader should have a comprehension pattern in which a reader has no less than 60% of his miscues categorized as "no loss" of comprehension. In determining

---

1Miniuw (1970) cautions that coefficients of correlation calculated on sample sizes under 50 tend to be unstable.
minimum proficiency for the readers in this study, a comprehending percentage was adopted as the base standard. This section describes the rationale for this decision.

Table 3.3 compares a reader's comprehending percentage with the percent of his miscues which resulted in "no loss" of comprehension. In nearly half of the instances (13 out of 31), the two percentages varied by only five percentage points. In the remaining cases, wider discrepancies occurred even when readers made as many as 30 to 50 miscues, i.e., Reader 1 and Reader 5.

The variation in the two percentages can be explained by the way in which the two percentages are derived. The comprehending percentage is calculated by tallying miscues which are semantically acceptable within the entire sentence and entire passage with those miscues successfully corrected. The comprehension pattern includes syntactic and semantic acceptability and the category "meaning change." This latter category considers the fact that a miscue may not be fully acceptable within the sentence or passage and yet result in no loss of comprehension on the part of the reader. The following example illustrates this type of miscue:

The study of Latin and Greek languages was essential.

The above miscue was not fully acceptable and yet was limited in the extent to which it changed meaning. Repeated miscues of this type produced for a reader a no loss of comprehension pattern that was higher than his comprehending percentage. The opposite pattern occurred as well (comprehending percentage higher than no loss of comprehension).
<table>
<thead>
<tr>
<th>Reader</th>
<th>Renaissance No Loss Of Comprehension</th>
<th>Generation Gap No Loss Of Comprehension</th>
<th>Gas Mileage No Loss Of Comprehension</th>
<th>Suntan Lotions No Loss Of Comprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Comprehending</td>
<td>Comprehending</td>
<td>Comprehending</td>
<td>Comprehending</td>
</tr>
<tr>
<td>1</td>
<td>76%</td>
<td>84%</td>
<td>69%</td>
<td>80%</td>
</tr>
<tr>
<td>2</td>
<td>85%</td>
<td>90%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>3</td>
<td>77%</td>
<td>81%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>98%</td>
<td>94%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>5</td>
<td>52%</td>
<td>70%</td>
<td>43%</td>
<td>58%</td>
</tr>
<tr>
<td>6</td>
<td>78%</td>
<td>70%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>84%</td>
<td>69%</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>8</td>
<td>(Omitted)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>54%</td>
<td>52%</td>
<td>36%</td>
<td>50%</td>
</tr>
<tr>
<td>10</td>
<td>72%</td>
<td>80%</td>
<td>77%</td>
<td>87%</td>
</tr>
</tbody>
</table>

*The reader made less than 10 miscues on the passage.*
In these cases, miscues had full semantic acceptability and yet resulted in "partial" comprehension loss. The following example illustrates:

Reapply every one or two hours after swimming or perspiring.

The preceding discussion explains how a comprehending percentage varied to some extent from the "no loss" of comprehension percentage. In spite of variations in the two percentages, Table 3.3 reveals the following pattern: When the no loss of comprehension percentage was below 60%, the comprehending percentage was also below 60%. When the no loss of comprehension percentage was above 60%, the comprehending percentage was also above 60%. This relationship in the two percentages was true in 30 out of 31 cases. The only exception was with Reader 5 on the Renaissance passage. Table 3.4 shows that the same relationship held for comprehending means and mean percentages of no loss of comprehension. Therefore for the readers in this study, a comprehending percentage of 60 appeared to be reliable evidence of reading proficiency.

The minimum literacy movement is an attempt to establish criteria for reading proficiency. The expectation of the public and educators is that after twelve years of schooling a reader is proficient according to a reasonable standard. Therefore, a comprehending percentage of 60 was adopted as a reference point of minimum proficiency for the twelfth grade readers in this study.
TABLE 3.4
A COMPARISON OF COMPREHENDING MEANS AND NO LOSS OF COMPREHENSION MEANS ON CORE PASSAGES

<table>
<thead>
<tr>
<th>Reader</th>
<th>Comprehending Means</th>
<th>No Loss Of Comprehension Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Group</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>72%</td>
<td>82%</td>
</tr>
<tr>
<td>2</td>
<td>88%</td>
<td>95%</td>
</tr>
<tr>
<td>3</td>
<td>86%</td>
<td>88%</td>
</tr>
<tr>
<td></td>
<td>Middle Group</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>92%</td>
<td>92%</td>
</tr>
<tr>
<td>5</td>
<td>51%</td>
<td>61%</td>
</tr>
<tr>
<td>6</td>
<td>75%</td>
<td>67%</td>
</tr>
<tr>
<td></td>
<td>Low Group</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>89%</td>
<td>82%</td>
</tr>
<tr>
<td>8</td>
<td>32%</td>
<td>43%</td>
</tr>
<tr>
<td>9</td>
<td>47%</td>
<td>51%</td>
</tr>
<tr>
<td>10</td>
<td>77%</td>
<td>83%</td>
</tr>
</tbody>
</table>
Criterion for Minimum Proficiency:

Prompted Retelling

Goodman and Burke (1972) suggest that a proficient reader should have a retelling percentage of 50% or greater. Table 3.5 presents prior knowledge and prompted retelling percentages for individual readers on the core passages. Examination of the table shows that 88% (28 out of 32) of the cases in which a reader had at least moderate prior knowledge of the subject his prompted retelling percentage was 50% or greater. In 100% of the instances where a reader's prior knowledge was in the low range his prompted retelling percentage was also below 50%. Table 3.6 shows the same pattern for prior knowledge and prompted retelling means for 9 of the 10 readers. The pattern suggests that if a reader's background in the topic of an expository passage was at least moderate, a reasonable expectation was that he could retell 50% of the information. Therefore, a prompted retelling percentage of 50% was adopted as a minimum measure of comprehension competence for this study.

The Qualitative Character of the Study

The researcher spent a total of six hours with each of the ten high school seniors in the sample. The one-hour sessions took place

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2 Three of the four exceptions to this pattern occurred for Reader 7. The lower prompted retellings for this reader are due to characteristics unique to this reader (see Chapter V, High Comprehending and Low Prompted Retelling).
<table>
<thead>
<tr>
<th>Reader</th>
<th>Renaissance</th>
<th>Renaissance</th>
<th>Generation Gap</th>
<th>Generation Gap</th>
<th>Gas Mileage</th>
<th>Gas Mileage</th>
<th>Suntan Lotions</th>
<th>Suntan Lotions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prior Know</td>
<td>Prompted Retelling</td>
<td>Prior Know</td>
<td>Prompted Retelling</td>
<td>Prior Know</td>
<td>Prompted Retelling</td>
<td>Prior Know</td>
<td>Prompted Retelling</td>
</tr>
<tr>
<td></td>
<td>High Group</td>
<td></td>
<td>High Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>55%</td>
<td>85%</td>
<td>80%</td>
<td>49%</td>
<td>90%</td>
<td>97%</td>
<td>60%</td>
<td>85%</td>
</tr>
<tr>
<td>2</td>
<td>30%</td>
<td>62%</td>
<td>50%</td>
<td>68%</td>
<td>40%</td>
<td>51%</td>
<td>45%</td>
<td>69%</td>
</tr>
<tr>
<td>3</td>
<td>75%</td>
<td>80%</td>
<td>70%</td>
<td>51%</td>
<td>90%</td>
<td>88%</td>
<td>100%</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Middle Group</td>
<td></td>
<td>Middle Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>65%</td>
<td>82%</td>
<td>45%</td>
<td>54%</td>
<td>70%</td>
<td>55%</td>
<td>60%</td>
<td>61%</td>
</tr>
<tr>
<td>5</td>
<td>30%</td>
<td>62%</td>
<td>60%</td>
<td>41%</td>
<td>20%</td>
<td>43%</td>
<td>65%</td>
<td>84%</td>
</tr>
<tr>
<td>6</td>
<td>40%</td>
<td>50%</td>
<td>35%</td>
<td>58%</td>
<td>60%</td>
<td>58%</td>
<td>55%</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td>Low Group</td>
<td></td>
<td>Low Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>55%</td>
<td>42%</td>
<td>50%</td>
<td>43%</td>
<td>35%</td>
<td>36%</td>
<td>85%</td>
<td>62%</td>
</tr>
<tr>
<td>8</td>
<td>(Omitted)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>25%</td>
<td>27%</td>
<td>20%</td>
<td>10%</td>
<td>25%</td>
<td>39%</td>
<td>35%</td>
<td>6%</td>
</tr>
<tr>
<td>10</td>
<td>50%</td>
<td>77%</td>
<td>55%</td>
<td>75%</td>
<td>60%</td>
<td>95%</td>
<td>30%</td>
<td>65%</td>
</tr>
</tbody>
</table>

Prior Knowledge:  
High -- 70% - 100%  
Moderate -- 30% - 65%  
Low -- 0% - 25%
### TABLE 3.6

**COMPARISON OF PRIOR KNOWLEDGE AND PROMPTED RETELLING MEANS FOR INDIVIDUALS ON CORE PASSAGES**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Prior Knowledge Means</th>
<th>Prompted Retelling Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>High Group</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>71%</td>
<td>79%</td>
</tr>
<tr>
<td>2</td>
<td>41%</td>
<td>63%</td>
</tr>
<tr>
<td>3</td>
<td>84%</td>
<td>74%</td>
</tr>
<tr>
<td></td>
<td><strong>Middle Group</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>60%</td>
<td>63%</td>
</tr>
<tr>
<td>5</td>
<td>44%</td>
<td>59%</td>
</tr>
<tr>
<td>6</td>
<td>48%</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td><strong>Low Group</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>56%</td>
<td>46%</td>
</tr>
<tr>
<td>8</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>9</td>
<td>26%</td>
<td>35%</td>
</tr>
<tr>
<td>10</td>
<td>49%</td>
<td>78%</td>
</tr>
</tbody>
</table>
within the regular school day and were distributed over an entire month. These sessions consisted of informal discussions as well as the oral reading and retelling activities. As a result of frequent contact with the readers during the data collection period, students began to share of themselves--their outside interests, career plans, academic frustrations and successes. This study was primarily a search for patterns of reading performance; however, the researcher was aware that what readers bring to and take from reading in terms of interests, background, and motivation is uniquely personal. Therefore, in keeping with the qualitative character of the study, personal information obtained both formally and informally was included in the analysis of data when it was pertinent to the explanation of a reader's performance on a passage.

Due to the tremendous amount of data generated in this study, it was impossible to present all information in equal depth. Therefore, in addition to explaining patterns of reading performance, certain significant portions were explained more fully than others. In particular, information was stressed where the procedures of miscue analysis gave a more accurate picture of a reader's competence than was indicated by his standardized test percentile rank. Again in keeping with the qualitative nature of the study, illustrative miscue examples and comments made by the reader's themselves are included throughout Chapters IV, V, and VI.
Limitations and Strengths of the Study

Limitations

Due to the following limitations, research conclusions were confined to the readers and passages used in this study:

1. The nature of miscue analysis limits the sample size for any one researcher.
2. The structure of the study was qualitative rather than experimental; therefore, control for a representative sample was not applicable.
3. A descriptive analysis of the data confined the researcher to discussing one variable at a time.

Strengths

1. Reading performance was evaluated within a defined model of the reading process.
2. A qualitative, in-depth study of reading can yield information not generated by larger studies in which depth is sacrificed for scope.
3. Students read from typical school and non-school materials.
CHAPTER IV

PRIOR KNOWLEDGE AND COMPREHENDING

Ten high school seniors were selected from high, middle, and low percentile ranks on a standardized measure of reading comprehension. These students read six informational passages taken from academic and nonacademic sources. The reading miscues generated were analyzed to determine the proficiency of readers in terms of comprehending performance. Comprehending refers to the extent to which the reader produces semantically acceptable miscues and corrects those miscues which disrupt meaning. This chapter discusses the comprehending patterns of readers in this study.

Percentile Rank and Comprehending

Group Data

A basic question explored in this study was the relationship between readers' standardized test percentile rankings and a psycholinguistic measure of reading ability. Mean comprehending percentages were computed from the core passages for the high, middle, and low percentile groups. The percentages presented in Table 4.1 show that for groups standardized test percentile rank corresponded to comprehending means. In other words, the high group had a higher comprehending mean (82%) than the low group (62%). The middle group fell between
TABLE 4.1

COMPREHENDING MEANS ON CORE PASSAGES
BY GROUPS

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Middle</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>82%</td>
<td>73%</td>
<td>62%</td>
</tr>
</tbody>
</table>
the high and low at 73%. When group data were examined, percentile rank predicted comprehending and thus group proficiency.

Individual Data

The data in Table 4.2 are the mean comprehending scores on the core passages for individuals in the high, middle, and low groups. The data indicate that the correspondence between an individual's percentile rank and comprehending percentage was no longer as strong as the relationship between percentile rank and comprehending percentages for groups. Although all three readers of the high group had high comprehending means, Reader 4 in the middle group had the highest comprehending mean of the sample at 92%. Also, Reader 6 in the middle group had a slightly higher comprehending mean (75%) than Reader 1 (72%). More surprisingly, Reader 7 and Reader 10 in the low group had comprehending means equivalent or above those in the high group. In summary, standardized test percentile ranking predicted a group's proficiency fairly well; however, it underestimated the proficiency of Readers 4, 7, and 10.

Comprehending Range for Individuals

Table 4.3 shows the range of individual reader's comprehending percentages depending upon the passage. Comprehending percentages tended to vary when the most difficult selections and selections which readers chose were included. Readers 8 and 9 had the lowest comprehending percentages on the core passages read for this study. However, when the recreational passage was included, the comprehending performance for
### Table 4.2

**Comprehending Means on Core Passages for Individuals**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Comprehending Means</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Group</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>72%</td>
</tr>
<tr>
<td>2</td>
<td>88%</td>
</tr>
<tr>
<td>3</td>
<td>86%</td>
</tr>
<tr>
<td><strong>Middle Group</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>92%</td>
</tr>
<tr>
<td>5</td>
<td>51%</td>
</tr>
<tr>
<td>6</td>
<td>75%</td>
</tr>
<tr>
<td><strong>Low Group</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>89%</td>
</tr>
<tr>
<td>8</td>
<td>32%</td>
</tr>
<tr>
<td>9</td>
<td>47%</td>
</tr>
<tr>
<td>10</td>
<td>78%</td>
</tr>
<tr>
<td>Reader</td>
<td>Comprehending Means</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------</td>
</tr>
<tr>
<td>High Group</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>72%</td>
</tr>
<tr>
<td>2</td>
<td>88%</td>
</tr>
<tr>
<td>3</td>
<td>86%</td>
</tr>
<tr>
<td>Middle Group</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>92%</td>
</tr>
<tr>
<td>5</td>
<td>51%</td>
</tr>
<tr>
<td>6</td>
<td>75%</td>
</tr>
<tr>
<td>Low Group</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>89%</td>
</tr>
<tr>
<td>8</td>
<td>32%</td>
</tr>
<tr>
<td>9</td>
<td>47%</td>
</tr>
<tr>
<td>10</td>
<td>78%</td>
</tr>
</tbody>
</table>
Reader 8 ranged from 28% to 54%—a difference of 16 percentage points. The comprehending percentage for Reader 9 varied from 28% to 62%, a difference of 24 points.

This same degree of variability appeared in the middle and upper groups as well. Reader 1 had a comprehending range of 50% to 76%, a range of 26 percentage points. Comprehending for Reader 5 ranged from 43% to 68%, a difference of 23 points. Most dramatic of all, Readers 4 and 6 had comprehending percentages which spanned over 39 percentage points. The wide difference in the range of comprehending scores provided evidence that for these readers reading was not an ability that could be represented by a single score. Rather, comprehending performance tended to vary depending upon the passage. Data analyzed in subsequent sections indicated that variation in comprehending was related to the depth of the reader's background in the content of the passage.

Prior Knowledge and Percentile Rank

Prior Knowledge Means for Groups

Table 4.4 presents the mean prior knowledge percentages computed for the core passages for the high, middle, and low groups. Also included in the table are the comprehending means for each group. Examination of the data shows that percentile rank predicted the general trend of prior knowledge percentages when readers were considered by group placement. In general for the passages read in this study, the high group was bringing greater knowledge to the reading
**TABLE 4.4**

PRIOR KNOWLEDGE AND COMPREHENDING MEANS ON CORE PASSAGES BY GROUPS

<table>
<thead>
<tr>
<th>Prior Knowledge Means</th>
<th>Comprehending Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Group</td>
</tr>
<tr>
<td>65%</td>
<td>82%</td>
</tr>
<tr>
<td></td>
<td>Middle Group</td>
</tr>
<tr>
<td>51%</td>
<td>73%</td>
</tr>
<tr>
<td></td>
<td>Low Group</td>
</tr>
<tr>
<td>37%</td>
<td>62%</td>
</tr>
</tbody>
</table>
tasks than the low group. The middle readers fell between the high and low group. Table 4.4 shows that group prior knowledge means varied in the same direction as group comprehending means.

Prior Knowledge Means for Individuals

Table 4.5 presents prior knowledge and comprehending means for individual readers on the core passages. The range of prior knowledge percentages is included also. Prior knowledge percentages varied somewhat depending upon the passage; however, in general individual readers in the high group had prior knowledge means in the high range (70% - 100%), middle readers had prior knowledge means in the moderate range (30% - 65%), and low readers had low prior knowledge means (0 - 25%).

There were several exceptions in this trend. Reader 2 of the high group had only a moderate prior knowledge mean. This reader had seventeen correct answers distributed throughout the survey which were answered "not very sure" and therefore were not counted as correct in the survey scoring. It was suspected that in some cases this reader actually felt "somewhat sure" and yet responded with less confidence. If this was the case, the prior knowledge percentage for Reader 2 would be substantially higher. This would cause the prior knowledge mean for the upper group to be higher as well. Readers 7 and 10 in the low group had prior knowledge means in the same range as middle group readers; therefore, their moderate prior knowledge percentages diminished the difference in prior knowledge means between the lower and middle group. The adequate prior knowledge and high comprehending percentages for Readers 7 and 10 suggested that their placement in the
TABLE 4.5

PRIOR KNOWLEDGE MEANS AND COMPREHENDING MEANS ON CORE PASSAGES FOR INDIVIDUALS

<table>
<thead>
<tr>
<th>Reader</th>
<th>Prior Knowledge Means</th>
<th>Prior Knowledge Range</th>
<th>Comprehending Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High Group</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>71%</td>
<td>55% - 90%</td>
<td>72%</td>
</tr>
<tr>
<td>2</td>
<td>41%</td>
<td>30% - 50%</td>
<td>88%</td>
</tr>
<tr>
<td>3</td>
<td>84%</td>
<td>70% - 100%</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle Group</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>60%</td>
<td>45% - 70%</td>
<td>92%</td>
</tr>
<tr>
<td>5</td>
<td>44%</td>
<td>20% - 65%</td>
<td>51%</td>
</tr>
<tr>
<td>6</td>
<td>48%</td>
<td>35% - 60%</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Group</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>56%</td>
<td>35% - 85%</td>
<td>89%</td>
</tr>
<tr>
<td>8</td>
<td>18%</td>
<td>5% - 25%</td>
<td>32%</td>
</tr>
<tr>
<td>9</td>
<td>26%</td>
<td>20% - 35%</td>
<td>47%</td>
</tr>
<tr>
<td>10</td>
<td>49%</td>
<td>30% - 60%</td>
<td>78%</td>
</tr>
</tbody>
</table>
low percentile group was due to factors other than low prior knowledge or processing difficulty. Data analyzed in later sections substantiated this assumption.

The relationship between prior knowledge, comprehending, and percentile rank was particularly clear with certain readers. Readers 8 and 9 of the low group were the only readers with prior knowledge means in the low range. These two readers also had the lowest comprehending means. For both readers comprehending means based on the core passages fell well below minimum comprehending performance (60%) at 32% and 43% respectively. Examination of comprehending and prior knowledge means for Readers 1 and 3 of the high group and Readers 4 and 6 of the middle group suggested that any ability differences in readers were related to differences in background knowledge on the passages read in this study.

In summary, the percentile ranking of groups corresponded to group prior knowledge means. Differences in prior knowledge scores suggested that the high readers as a group brought greater content knowledge to the reading of the core passages than did the lower group. The prior knowledge of the middle group was between that of the high and low group. As discussed previously, the comprehending of individual readers within groups varied considerably depending upon the passage. Prior knowledge percentages did as well. The data discussed in the following section further suggested that for readers in this study, depth of content knowledge influenced comprehending performance.
Prior Knowledge and Comprehending: Individual Examples

This section discusses the comprehending performance of selected readers on different passages. Readers' prior knowledge of the content of a passage was surveyed before reading. Comprehending percentages were compared to prior knowledge scores obtained for each core passage.

Table 4.6 profiles each reader's prior knowledge percentage and comprehending percentage across passages in which the reader miscued ten or more times. The prior knowledge percentage is not an absolute measure but a relative measure of a reader's knowledge of the subject matter before reading. If two prior knowledge scores differed widely, it is reasonable to assume that a reader's depth of background varied in these two areas. The influence of prior knowledge on comprehending for an individual reader was particularly evident when comprehending on a low prior knowledge passage (0% - 25%) was compared with comprehending on a passage in which the reader had moderate (30% - 65%) to high (70% - 100%) prior knowledge.

The Least Proficient Readers

The influence of prior knowledge was particularly pronounced for the least proficient readers in the study--Readers 5, 8, and 9 (see Chapter VI). Table 4.6 shows that for these readers comprehending percentages were below 60% on passages where prior knowledge was in the low range. Reader 8 was the least proficient of all readers in the
### TABLE 4.6
PRIOR KNOWLEDGE AND COMPREHENDING PROFILES FOR INDIVIDUAL READERS

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55% 50%</td>
<td>55% 76%</td>
<td>80% 69%</td>
<td>90% 74%</td>
<td>60% 70%</td>
</tr>
<tr>
<td>2</td>
<td>*</td>
<td>30% 85%</td>
<td>*</td>
<td>*</td>
<td>45% 91%</td>
</tr>
<tr>
<td>3</td>
<td>*</td>
<td>75% 77%</td>
<td>*</td>
<td>*</td>
<td>100% 94%</td>
</tr>
</tbody>
</table>

#### High Group

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>25% 61%</td>
<td>65% 98%</td>
<td>45% 100%</td>
<td>70% 85%</td>
<td>60% 84%</td>
</tr>
<tr>
<td>5</td>
<td>(Omitted)</td>
<td>30% 52%</td>
<td>60% 43%</td>
<td>20% 43%</td>
<td>65% 64%</td>
</tr>
<tr>
<td>6</td>
<td>5% 18%</td>
<td>40% 78%</td>
<td>*</td>
<td>*</td>
<td>55% 71%</td>
</tr>
</tbody>
</table>

#### Middle Group

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>(Omitted)</td>
<td>55% 84%</td>
<td>*</td>
<td>*</td>
<td>85% 94%</td>
</tr>
<tr>
<td>8</td>
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<td>(Omitted)</td>
<td>25% 36%</td>
<td>5% 32%</td>
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<tr>
<td>9</td>
<td>(Omitted)</td>
<td>(Omitted)</td>
<td>25% 54%</td>
<td>20% 28%</td>
<td>35% 62%</td>
</tr>
<tr>
<td>10</td>
<td>(Omitted)</td>
<td>(Omitted)</td>
<td>50% 72%</td>
<td>55% 77%</td>
<td>30% 70%</td>
</tr>
</tbody>
</table>

#### Low Group

Prior Knowledge:
- High -- 70% - 100%
- Moderate -- 30% - 65%
- Low -- 0% - 25%

*Reader made less than 10 miscues on the passage.

1^See Chapter III for an explanation of omitted passages.
study. The influence of content knowledge on his comprehending performance was the most dramatic. Examination of Table 4.6 shows that his prior knowledge percentages on the core passages were all in the low range; his highest comprehending percentage reached only 36%.

The effect of background knowledge became evident on his recreational selection. Reader 8 chose the article about Craig Morton, the Denver Broncos' quarterback, whose team played in the 1977 Superbowl. This reader explained that he played high school football and followed professional football on television. His background knowledge for this passage could be considered to be in the moderate to high range. On the Craig Morton passage, the reader's comprehending percentage rose to 54%, almost within the range of proficiency. Two examples from Reader 8's miscues on separate passages demonstrate the difference in miscue quality.

Reader 8: Craig Morton Passage

Before beating Pittsburgh and defending Superbowl Champion Oakland in the playoffs, the Broncos voted Morton their MVP.

Reader 8: Gas Mileage Passage

Consult this manual and the maintenance schedule for the proper lubricants to use and the lubrication intervals.
Reader 8 consistently overused graphophonemic cues to the exclusion of semantic cues; however, it appeared that his background affected his ability to make meaningful predictions. With regard to the Gas Mileage passage, Reader 8 indicated that he neither drives nor works on cars.

The Proficient Readers

Prior knowledge appeared to affect the comprehending performance of more proficient readers as well. Table 4.6 indicates that the drop in comprehending on the Oratorio passage for Reader 6 was the most dramatic example for these readers. His prior knowledge was very low at only 5%. It is likely that the reader's comprehending percentage would have been higher than 18% had the passage been longer. The comprehending percentage was based on only fourteen miscues. Nonetheless, the example which follows demonstrates how a generally proficient reader began to experience difficulty when the written message no longer made sense.

Reader 6: Oratorio Passage

Handel more than makes up for this by a wonderful sense for the dramatic nuance, by the elegance of his melodic lines, and by the brilliance and power of his sonorities. All these are illustrated in Messiah and, lest we overlook
his contrapuntal skill, one of his most impressive movements of all is the fugue *And With His Stripes*.

Reader 1, a proficient reader in the high group, also experienced difficulty on the Oratorio passage due to its brevity and heavy concept load. The examples below are sample miscues made by Reader 1 on this passage.

Reader 1: Oratorio Passage

Sometimes a narrator, who helped guide the story was used as a framing element.

All these are illustrated in the least. Messiah, and lest we overlook his contrapuntal skill, one of the most impressive movements of all is the fugue *And With His Stripes*.

Table 4.6 and the examples above show that the comprehending performance of Readers 1, 4, and 6 on Oratorio, the most difficult passage, was similar to that of less proficient readers.

**Exceptions**

The data discussed above indicated a relationship between a reader's prior knowledge and comprehending performance. It is clear, however, from Table 4.6 that a higher prior knowledge percentage did
not guarantee higher comprehending nor did equivalent prior knowledge scores yield equal comprehending percentages. Stylistic features of passages combined with conceptual depth of the content to affect processing ability. For example, Readers 5 and 9 had fairly high comprehending percentages on the Renaissance passage in spite of low prior knowledge percentages. It is possible that the predictability of the syntax and the lengthy explanations of the cultural advances of the Renaissance Period accounted for the higher comprehending on this passage. Reader 5 had moderate prior knowledge on the Generation Gap passage, yet her comprehending was as low as that on the Gas Mileage passage (43%) where her prior knowledge was also low (20%). Here the technical nature of the information and multiple clauses within portions of this passage caused some difficulties for this reader. The example below for Reader 5 illustrates this point.

Reader 5: Generation Gap Passage
Conflict between generations was less in evidence by virtue of the high mortality rate among parents. More recently, the trend toward early marriages and early child rearing has resulted in a period in middle age in which the parents are still in their prime when the last child has left home.
Summary

For readers in each percentile rank, depth of subject knowledge appeared to influence comprehending performance. This influence emerged most strongly when a reader's content knowledge dropped into the low range. Adequate background knowledge positively influenced comprehending performance among less proficient readers. On passages in which prior knowledge was adequate, these readers had comprehending percentages in the 60% range of minimum proficiency.

Prior Knowledge and Comprehending:

Coefficients of Correlation

The previous sections were descriptive explanations of the relationship between prior knowledge and comprehending for readers in this study. Correlation coefficients were calculated to statistically compare the relationship between prior knowledge percentages and comprehending percentages for the core passages as well as the Oratorio selection. Only comprehending percentages based on ten or more miscues were included in the calculations. Table 4.7 includes Pearson product-moment coefficients of correlation for prior knowledge and comprehending by passage. Because of the extremely small sample size, it is not possible to generalize to other populations based on data derived from this sample. It is notable, however, that for this group of readers, the range of correlations was consistent with the expectation that a reader's prior knowledge of passage content was an
<table>
<thead>
<tr>
<th>Renaissance</th>
<th>Generation Gap</th>
<th>Gas Mileage</th>
<th>Suntan Lotions</th>
<th>Oratorio</th>
</tr>
</thead>
<tbody>
<tr>
<td>.56</td>
<td>.53</td>
<td>.88</td>
<td>.73</td>
<td>.62</td>
</tr>
</tbody>
</table>
important influence on comprehending. These correlation coefficients suggested a moderate (.53) to high (.88) correlation between these two variables for readers in this study.
CHAPTER V

PRIOR KNOWLEDGE AND PROMPTED RETELLING

A reader's ability to retell in his own words the information read in a passage was the measure of reading comprehension adopted for this study. This procedure is a basic component of miscue analysis. Due to the informational character of the passages, readers were prompted or reminded of the major topics covered in each passage after the reader's initial attempt to recall information. Additional information recalled was included in the readers retelling score and is referred to as the reader's prompted retelling percentage. The strategy of prompting a reader on expository material is an addition to the procedures specified in the Reading Miscue Inventory. This chapter describes the prompted retelling patterns for readers in this study.

Percentile Rank and Prompted Retelling

Individual and Group Data

The patterns which emerged for the relationship between percentile rank and comprehending, emerged for prompted retelling as well. Table 5.1 shows that the high group had a higher prompted retelling mean (72%) than the low group (42%); the middle group (62%) again fell between the high and low readers. The data in Table 5.1 indicate that prompted retelling means for groups varied in the same direction as
<table>
<thead>
<tr>
<th>Prior Knowledge Means</th>
<th>Prompted Retelling Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Group</td>
<td></td>
</tr>
<tr>
<td>65%</td>
<td>72%</td>
</tr>
<tr>
<td>Middle Group</td>
<td></td>
</tr>
<tr>
<td>51%</td>
<td>62%</td>
</tr>
<tr>
<td>Low Group</td>
<td></td>
</tr>
<tr>
<td>37%</td>
<td>42%</td>
</tr>
</tbody>
</table>
prior knowledge.

Table 5.2 presents prior knowledge means and prompted retelling means for individuals on core passages. Readers 8 and 9 of the low group had the lowest prior knowledge and prompted retelling means; Readers 1 and 3 had the highest. This pattern indicated the influence of prior knowledge. Any ability differences between Readers 1 and 3 of the high group and Readers 4 and 6 of the middle group appeared to be differences in content knowledge on the core passages. Table 5.2 shows that the variations within groups were considerable. Readers 2, 5, 6 and 10 all had similar prior knowledge percentages. These readers represent all three percentile groups. Yet Reader 10, the low group reader, had the highest prompted retelling of these four subjects. Reader 10 again emerged as one of the strongest readers in the study in spite of his low percentile standing.

Prompted Retelling Range for Individuals

Table 5.3 shows the range of readers' prompted retellings on core passages and all informational passages read. Prompted retelling percentages varied substantially for all readers depending upon the passage. When the range for the core passages was examined, Reader 2 had the lowest range at 18 percentile points; the highest was for Readers 1 and 9--50 percentage points. When the most difficult and recreational passages were included, the variation in individual prompted retellings was even greater. For example, Reader 2 had a range of 88 percentage points, Reader 8 a range of 66 percentage points.
<table>
<thead>
<tr>
<th>Reader</th>
<th>Prior Knowledge Means</th>
<th>Prompted Retelling Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Group</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>71%</td>
<td>79%</td>
</tr>
<tr>
<td>2</td>
<td>41%</td>
<td>63%</td>
</tr>
<tr>
<td>3</td>
<td>84%</td>
<td>74%</td>
</tr>
<tr>
<td></td>
<td>Middle Group</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>60%</td>
<td>63%</td>
</tr>
<tr>
<td>5</td>
<td>44%</td>
<td>59%</td>
</tr>
<tr>
<td>6</td>
<td>48%</td>
<td>63%</td>
</tr>
<tr>
<td></td>
<td>Low Group</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>56%</td>
<td>46%</td>
</tr>
<tr>
<td>8</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>9</td>
<td>26%</td>
<td>35%</td>
</tr>
<tr>
<td>10</td>
<td>49%</td>
<td>78%</td>
</tr>
<tr>
<td>Reader</td>
<td>Prompted Retelling Means</td>
<td>Prompted Retelling Range, Core Passages</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>High Group</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>79%</td>
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<td>2</td>
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<td>51% - 69%</td>
</tr>
<tr>
<td>3</td>
<td>74%</td>
<td>51% - 88%</td>
</tr>
<tr>
<td></td>
<td><strong>Middle Group</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>63%</td>
<td>54% - 82%</td>
</tr>
<tr>
<td>5</td>
<td>59%</td>
<td>41% - 84%</td>
</tr>
<tr>
<td>6</td>
<td>63%</td>
<td>50% - 87%</td>
</tr>
<tr>
<td></td>
<td><strong>Low Group</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>46%</td>
<td>36% - 62%</td>
</tr>
<tr>
<td>8</td>
<td>17%</td>
<td>2% - 26%</td>
</tr>
<tr>
<td>9</td>
<td>35%</td>
<td>10% - 64%</td>
</tr>
<tr>
<td>10</td>
<td>78%</td>
<td>65% - 95%</td>
</tr>
</tbody>
</table>
Examples from the data discussed in the following sections suggested that the degree of a reader's content knowledge in the topic of a passage accounted for the variations in prompted retellings.

Prior Knowledge and Prompted Retelling:

Individual Examples

The Least Proficient Readers

Table 5.4 presents a profile of prior knowledge and prompted retelling percentages for individual readers. The prompted retelling profile for Reader 8, the least proficient reader, is a significant example of the influence of prior knowledge. Reader 8's prompted retellings of the core passages were very low ranging from 2% to 25%. These percentages reflect his low prior knowledge percentages. In contrast, his prompted retelling of the Craig Morton passage rose to 68% of the information. Reader 8 chose this passage on the basis of his content knowledge and interest in the subject. Table 5.4 shows that Readers 8 and 9 were the only readers who consistently had low prior knowledge percentages on the core passages. In all cases when prior knowledge was in the low range, prompted retellings dropped below 50%. When prior knowledge percentages were in the moderate range, prompted retellings were above 50%--the level of minimum competency defined in this study.

The Proficient Readers

The Oratorio passage was the most difficult of all passages and
TABLE 5.4
PRIOR KNOWLEDGE AND PROMPTED RETELLING PROFILES FOR INDIVIDUAL READERS

<table>
<thead>
<tr>
<th>Reader</th>
<th>Oratorio</th>
<th>Renaissance</th>
<th>Generation Gap</th>
<th>Gas Mileage</th>
<th>Suntan Lotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>55% 47%</td>
<td>55% 85%</td>
<td>80% 49%</td>
<td>90% 97%</td>
<td>60% 85%</td>
</tr>
<tr>
<td>2</td>
<td>55% 12%</td>
<td>30% 62%</td>
<td>50% 68%</td>
<td>40% 51%</td>
<td>45% 69%</td>
</tr>
<tr>
<td>3</td>
<td>60% 52%</td>
<td>75% 80%</td>
<td>70% 51%</td>
<td>90% 88%</td>
<td>100% 75%</td>
</tr>
<tr>
<td>Middle Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>25% 42%</td>
<td>65% 82%</td>
<td>45% 54%</td>
<td>70% 55%</td>
<td>60% 61%</td>
</tr>
<tr>
<td>5</td>
<td>(Omitted)</td>
<td>30% 62%</td>
<td>60% 41%</td>
<td>20% 48%</td>
<td>65% 84%</td>
</tr>
<tr>
<td>6</td>
<td>5% 30%</td>
<td>40% 50%</td>
<td>35% 58%</td>
<td>60% 58%</td>
<td>55% 87%</td>
</tr>
<tr>
<td>Low Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>(Omitted)</td>
<td>55% 42%</td>
<td>50% 43%</td>
<td>35% 36%</td>
<td>85% 62%</td>
</tr>
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<td>8</td>
<td>(Omitted)</td>
<td>(Omitted)</td>
<td>25% 2%</td>
<td>5% 26%</td>
<td>25% 24%</td>
</tr>
<tr>
<td>9</td>
<td>(Omitted)</td>
<td>25% 27%</td>
<td>20% 10%</td>
<td>25% 39%</td>
<td>35% 64%</td>
</tr>
<tr>
<td>10</td>
<td>(Omitted)</td>
<td>50% 77%</td>
<td>55% 75%</td>
<td>60% 95%</td>
<td>30% 65%</td>
</tr>
</tbody>
</table>

Prior Knowledge: High -- 70% - 100%
Moderate -- 30% - 65%
Low -- 0% - 25%

1See Chapter III for an explanation of omitted passages.
was selected to challenge the high group. The upper group as well as two middle group readers read this selection. The data in Table 5.5 show that with the exception of Reader 2, readers with higher prior knowledge were able to retell more of the information. Readers 4 and 6 had prior knowledge percentages in the low range. Correspondingly, each reader's prompted retelling fell below 50% as was the case with Readers 8 and 9 who were less proficient readers.

It is interesting to note that Readers 1 and 3 who have the highest prior knowledge and prompted retelling percentages were both actively involved with music. Reader 1 was a talented band student who plans to pursue music as a major in college. He participated in his school district's program for gifted and talented music students. The course taught was on musical masterpieces of the Renaissance Period. The content of the course was directly related to the content of the Oratorio passage. Reader 3 was an active chorus student. Yearly performances include cantatas and portions of the Messiah. Again, these experiences related directly to the content of this passage. In contrast, Reader 6 was a star athlete with little interest or background in music.

In the case of Reader 2, a moderately high prior knowledge percentage did not result in a high prompted retelling. The low retelling was not attributable to processing difficulty; Reader 2 made only two miscues--one was semantically acceptable and the other was corrected. This reader expressed a very low interest in the passage and found the profusion of musical concepts confusing. When the reader was asked to
TABLE 5.5
COMPARISON OF PROMPTED RETELLINGS
ON THE ORATORIO PASSAGE

<table>
<thead>
<tr>
<th>Reader</th>
<th>Prior Knowledge</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55%</td>
<td>47%</td>
</tr>
<tr>
<td>2</td>
<td>55%</td>
<td>12%</td>
</tr>
<tr>
<td>3</td>
<td>60%</td>
<td>52%</td>
</tr>
<tr>
<td>4</td>
<td>25%</td>
<td>42%</td>
</tr>
<tr>
<td>6</td>
<td>5%</td>
<td>30%</td>
</tr>
</tbody>
</table>
retell the selection, she stated the following:

Reader 2: "I can remember a couple of words, but
I don't remember how it went. I
didn't understand it, so I wasn't
paying any attention."

In summary, when proficient readers from the high and middle group
read the difficult Oratorio passage, prompted retellings were similar
to the least proficient readers falling below 50% of the information.

Explanation of Apparent Exceptions

Table 5.4 shows that for Readers 1, 2, 5, and 10, prompted retellings on the Renaissance passage were high when compared with prior
knowledge percentages. There are two possible explanations for this result. One explanation is that readers found this selection easier
in terms of content, style, and length. Another possibility is that
readers had more background in the Renaissance than was tapped by the
prior knowledge survey questions. This latter explanation is a reason-
able possibility. World History is a required course for high school
graduation in the readers' school district and Readers 1, 5, and 10
mentioned having studied the Renaissance Period at some point in junior
high school. A combination of these factors could have produced higher
prompted retellings than expected for these readers.

On the Generation Gap passage, Reader 1 had a fairly low prompted
retelling at 49% in spite of a high prior knowledge percentage (80%).
Evidence indicates that this was a case in which the reader was handi-
capped on a passage due to previous experience and preconceptions about
the topic "generation gap". During the retelling of the passage, Reader 1 explained that he had taken a course in psychology which emphasized the generation gap in terms of (1) teenage-parental conflict and (2) the unrest of the young during the 1960's. Reader 1 failed to grasp the passage's emphasis on the conflict between middle-aged and elderly groups. His retelling was limited to conflict between the young and middle-aged. From a subjective point of view, it appeared that the reader's previous experience with the generation gap topic influenced his ability to retell the passage in spite of initial knowledge of the terms and concepts discussed in the passages. In other words, a reader's prior knowledge may not be compatible with information presented in a passage.

High Comprehending and Low Prompted Retelling

Reader 7 was in the low percentile group in spite of adequate prior knowledge on all passages and high comprehending (mean prior knowledge, 56%; mean comprehending, 89%). Table 5.4 indicates that Reader 7's prompted retellings were fairly low falling below 50% on all but the Suntan Lotion passage (mean prompted retelling, 46%). It appeared that the reader's relatively low prompted retellings resulted from two sources: (1) lack of interest in the core passages and (2) emphasis on surface level processing. Reader 7 was the only reader in the sample to rate all of the core passages "not very interesting" after reading (see Chapter VI, The Influence of Low Interest). Reader 7 read with the greatest amount of oral expression and had the lowest mean MPHW (.88) of readers in the sample (see Table 6.12). The pattern
of concentration on exact surface processing rather than understanding probably accounted for this reader's low percentile ranking. In contrast, Reader 5 had lower prior knowledge (mean, 44%) and lower comprehending (mean, 51%), yet prompted retellings were higher (mean, 59%). This pattern indicated a greater emphasis on deriving meaning than the pattern for Reader 7 and probably accounted for Reader 5's ranking in the middle group.

Summary

The effect of prior knowledge influenced the prompted retelling performance of readers within all percentile ranks. In the case of the least proficient readers (Readers 8 and 9), prompted retellings rose above 50% when knowledge of the subject area was within a moderate range. When proficient readers were challenged by a difficult passage in which they lacked sufficient background, the prompted retelling performance of these readers resembled that of less proficient readers, falling below 50% of the information.

Examples from Readers' Retellings

Due to the qualitative character of this study, no attempt was made to statistically prove a cause and effect relationship between prior knowledge and prompted retelling. However, the following data taken from readers' retellings and prior knowledge survey answers indicate that such a relationship did exist.

The Gasoline Mileage passage taken from a 1977 manufacturer's
car manual yielded an interesting pattern on the relationship between depth of knowledge and retelling performance. The ten prior knowledge survey questions related directly to ten of the twelve topics discussed in this passage (see Appendix A). This was the only selection in which the match between prior knowledge survey questions and passage topics was this direct. The pattern which emerged was as follows: If a reader answered a survey question correctly and responded that he was either "somewhat sure" or "very sure", then that item tended to appear in the reader's retelling. If the answer was incorrect or the reader responded "not very sure", then the item tended not to appear in the reader's initial or prompted retelling. Table 5.6 shows the percentage of prior knowledge survey items which matched the reader's retelling of those items. A match occurred when an incorrect item was omitted from a reader's retelling or when a correct item was referred to and explained. The match between survey items and retelling was in the 70% to 90% range for eight of the ten readers. The narrative examples which follow illustrate this pattern more fully.

Gasoline Mileage Passage

A major topic of the Gasoline Mileage passage pertained to the structure and function of the catalytic converter. For eight of the ten readers, a consistent pattern emerged with regard to this topic. If a reader answered the prior knowledge survey question incorrectly or responded "not very sure" in the confidence of his answer, the topic was not referred to during the initial or prompted retelling. If, however, the catalytic converter question was answered correctly, the
### TABLE 5.6
THE DEGREE OF MATCH BETWEEN PRIOR KNOWLEDGE SURVEY ITEMS AND ITEMS INCLUDED AND OMITTED IN RETELLING OF THE GASOLINE MILEAGE PASSAGE

<table>
<thead>
<tr>
<th>Reader</th>
<th>Gasoline Mileage</th>
<th>High Group</th>
<th>Middle Group</th>
<th>Low Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>90%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>80%</td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>80%</td>
<td>70%</td>
<td>70%</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>60%</td>
<td>60%</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>70%</td>
<td>80%</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
reader supplied varying amounts of information on the topic depending on his depth of knowledge. Narrative examples for Readers 2, 5, 1, and 10 illustrate this pattern.

The specific information which Reader 2 recalled during her initial retelling were those items which she answered correctly on the prior knowledge survey. Correct answers pertained to general information about maintenance and driving techniques to save gas. The reader incorrectly answered the catalytic converter question and omitted the topic during her unprompted retelling. During the prompted retelling, the researcher asked the following:

    Researcher: "The article talked about the catalytic converter. Do you want to add anything about that?"
    Reader 2: "That totally lost me; I wasn't paying any attention."

Reader 2 also missed the prior knowledge survey question on gasoline octane. Again, this portion of her retelling was very incomplete.

    Reader 2: "The article said something about octane in gasoline. I didn't understand that either."

Reader 5's retelling of these sections from the Gasoline Mileage passage followed the same pattern. Correctly answered survey items emerged in retelling; incorrect items were omitted. Reader 5 correctly answered the question on the catalytic converter but responded "not very sure" indicating that she was guessing. Reader 5 failed to
mention this topic during her initial retelling. Even when reminded of the catalytic converter during the prompted retelling, her only statement was as follows:

Reader 5: "I don't remember anything about that."

Researcher: "How much of this was new information for you?"

Reader 5: "The part about the catalytic or whatever. I knew about the jack-rabbit starts and pacing your driving. The scientific 'yicky' part--I didn't know anything about that."

The retelling of this same section by Readers 10 and 1 provided an interesting contrast to that of Readers 2 and 5. Both Readers 10 and 1 indicated that they own cars and do occasional maintenance due to economic necessity. Reader 10 had a prior knowledge percentage of 60 on this selection and correctly answered the question about the catalytic converter. The reader recalled this topic without prompting and correctly stated the following:

Reader 10: "The catalytic converter removes hydrocarbons from the air. It is only effective with unleaded gasoline."

Reader 10 was unable to add any further information when prompted.
Reader 1 had a higher prior knowledge percentage (90%) than Reader 10. The reader's depth of knowledge and experience with the catalytic converter was revealed in his initial and prompted retelling.

Reader 1: "Unleaded gasoline is required for the catalytic converter; leaded gasoline will mess it up. You have to have it (catalytic converter) and they cost a lot. The catalytic converter is designed to cut down on carbon monoxide and other monoxide gases which harm the environment. It is a deterrent to pollution."

During the prompted retelling, Reader 1 was asked if he wanted to add any further information about the catalytic converter. He added the following:

Reader 1: "They still have not perfected them. Some people I know have had a lot of trouble with them. They get very hot if the material that surrounds the beads in the converter is defective. It messes up the whole emission control system."

It was evident that Reader 1's experience with car exhaust systems increased his knowledge of the catalytic converter. Correspondingly, his retelling of this topic had greater depth than the retelling of
Readers 2, 5, or 10 demonstrating the influence of prior knowledge on reading comprehension and retention. Reader 1's superior retelling at 97% of passage information was due to his superior prior knowledge of car maintenance and operation.

**Suntan Lotions Passage**

As would be expected, evidence emerged that readers learned from a passage despite incomplete prior knowledge. Two examples for Reader 9, taken from the retelling of the Suntan Lotions passage, illustrate this point. Reader 9 had moderate prior knowledge (35%) on this passage. She incorrectly answered the survey question dealing with the ultraviolet rays of the sun. In retelling, the reader never used the phrase "ultraviolet rays". However, the reader's following retelling statement indicated that she understood the concept that certain of the sun's rays are harmful.

Reader 9: "Sunscreens block the rays that

burn."

Reader 9 also missed the survey question that related to the production of melanin pigment during the tanning process. In retelling, Reader 9 again demonstrated that she understood the basic concept but was unsure of the terminology. In her initial retelling, Reader 9 explained the tanning process the following way:

Reader 9: "If you burn and peel, you have to

start all over again. Peeling
takes the 'moderation' away."
Reader 3 had a prior knowledge survey percentage of 100% on the Suntan Lotions passage. In explaining the tanning process, Reader 3 clarified both the concept and the terminology. It was clear that the reader's depth of knowledge on the subject was greater than that of Reader 9.

Reader 3: "It takes two days for your skin to start developing melanin. Two weeks after that, you start to develop a tan."

During the prompted retelling, Reader 3 included the following when asked if he wanted to add information about the tanning process:

Reader 3: "When you go out in the sun, the sun's rays cause your skin to develop pigment. That's what changes the color of your skin."

A basic assumption behind short-answer testing is that a reader's knowledge is absolute. The above examples for Readers 9 and 3 demonstrated that (1) subject matter knowledge is frequently relative and (2) paraphrasing of information is effective in tapping the depth of a reader's comprehension.

**Oratorio Passage**

Reader 6 was a competent reader on all core selections, yet he experienced some difficulty on the Oratorio passage (comprehending, 18%; prompted retelling, 30%). His difficulty was attributable to the brevity of the passage and his low knowledge of the subject at only
5% of the information. It was apparent from his miscues discussed previously that much of this passage made little sense to this reader. The following statement made during his retelling was fairly nonsensical as well.

Researcher: "The article talked about the Messiah. Is there anything you want to add about that?"

Reader 6: "It talked about how it was a treasure item for houses."

The reader was referring to the line from the text that stated that the Messiah "is a treasure house of musical riches and a compendium of baroque techniques of composition." The reader's recollection was not meaningful because the reader had derived little meaning.

Elvis Presley Passage

The relationship of prior knowledge and prompted retelling was also evident on the recreational passages which readers chose from optional selections. Reader 3 was one of the most competent readers in the study (prior knowledge mean, 84%; comprehending mean, 86%; high group percentile ranking). Yet on the Elvis Presley passage which he chose, he lacked the depth of knowledge of Reader 10. Consequently, his prompted retelling was only 60% whereas Reader 10's was 99%. Reader 10 was also a highly competent reader but in the lower percentile ranks. Reader 10 explained that he was an Elvis fan collecting albums, posters, and other Presley paraphernalia.
The content of the passage on Elvis Presley is primarily a recounting of specific information about the singer's life. Reader 10 remembered all of the generalizations and such obscure detail from the passage as the following: (1) Presley's birthdate (January, 1935); (2) exact weight (230 pounds); and (3) the name of his first little known record ("That's Alright Mama"). At one point during the retelling, Reader 10 commented, "I keep mixing up the information with several other articles I've read." The comment demonstrated the reader's own awareness of the fusion of old and new information. In contrast to Reader 10, Reader 3 recalled the generalizations of the passage but was unable to retell the detailed information supplied by Reader 10.

Summary

The narrative examples from readers' retellings of the informational passages read in this study demonstrate the effect of a reader's background on his ability to retain information acquired through reading. This effect crossed upper, middle, and low percentile ranks. The data suggested that differences in prompted retelling performances were a function of the reader's familiarity with the subject.

Prior Knowledge and Prompted Retelling:

Coefficients of Correlation

The preceding section qualitatively described the relationship between prior knowledge and prompted retelling performance for readers
in this study. Table 5.7 includes Pearson product-moment coefficients of correlation for prompted retelling percentages and prior knowledge percentages by passage. The correlation coefficients were in the moderate range from .51 to .76. Due to the small number of readers in this study, the implications of these data were restricted to readers in this sample.

**Comprehending and Prompted Retelling: Coefficients of Correlation**

Table 5.8 includes Pearson product-moment coefficients of correlation for comprehending and prompted retelling percentages calculated for the core passages. Three of the four correlation coefficients were in the moderate to high range (.62 to .84) suggesting a relationship between these two variables for readers in this study.

**Prior Knowledge, Comprehending, and Prompted Retelling**

The data in Table 4.7 and Table 5.7 suggested covariance between (1) prior knowledge and comprehending and (2) prior knowledge and prompted retelling for readers in this study. The data in Table 5.9 indicate that prior knowledge, comprehending, and prompted retelling all varied in the same direction. These demonstrated that when prior knowledge was higher, comprehending and prompted retelling were higher as well.
<table>
<thead>
<tr>
<th></th>
<th>Renaissance</th>
<th>Generation Gap</th>
<th>Gas Mileage</th>
<th>Suntan Lotions</th>
<th>Oratorio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.62</td>
<td>.56</td>
<td>.76</td>
<td>.51</td>
<td>.70</td>
</tr>
</tbody>
</table>
### TABLE 5.8

PEARSON PRODUCT-MOMENT COEFFICIENTS OF CORRELATION
FOR COMPREHENDING AND PROMPTED RETELLING FOR CORE PASSAGES

<table>
<thead>
<tr>
<th>Renaissance</th>
<th>Generation Gap</th>
<th>Gas Mileage</th>
<th>Suntan Lotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>.41</td>
<td>.84</td>
<td>.82</td>
<td>.62</td>
</tr>
</tbody>
</table>
TABLE 5.9
COMPARISON OF THE RELATIONSHIP BETWEEN PRIOR KNOWLEDGE, COMPREHENDING, AND PROMPTED RETELLING BY GROUPS

<table>
<thead>
<tr>
<th>Group</th>
<th>Prior Knowledge</th>
<th>Comprehending</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>65%</td>
<td>82%</td>
<td>72%</td>
</tr>
<tr>
<td>Middle</td>
<td>51%</td>
<td>73%</td>
<td>62%</td>
</tr>
<tr>
<td>Low</td>
<td>37%</td>
<td>62%</td>
<td>42%</td>
</tr>
</tbody>
</table>
Test Passages: Test Questions and Prompted Retellings

Readers in this study read two passages taken from separate standardized tests appropriate for high school students. Following the prompted retelling of these passages, readers were asked to answer the questions which accompanied the selections. If the test directions allowed the reader to refer back to the passage, the reader was allowed to do so. Readers were allowed as much time as needed in answering test questions.

Chemistry Test Passage

One selection was based on the chemistry of digestion. This 326 word passage dealt with the chemical breakdown of starches and sugars which is initiated by an enzyme in the saliva. The central focus of the content describes the procedures of an experiment designed to test the breakdown of starches into simple sugars. Chemical tests for starch and sugar are discussed and then specific instructions are given for replicating the experiment. Readers referred back to the passage as they wished in answering questions. Questions were answered silently.

The majority of the ten questions which accompanied the passage were related to but not directly based on the content of the passage. In order to answer the questions, the reader had to understand the purpose and procedures of the experiment and also apply a good deal of
scientific background and reasoning. Two of the ten questions were directly based on passage content; four required the reader to apply information learned from the passage to other experimental situations; three asked for responses based on previous experience in conducting scientific experiments. For example, the first question asked the reader why three test tubes were used in the experiment. This information was not given anywhere in the passage. The reader was required to know from experience that three test tubes are used so that the experimenter can determine the consistency of results.

Table 5.10 outlines readers' performances on this passage. The readers' prior knowledge percentages, prompted retelling percentages and the percentages of correct test answers are included. The prompted retelling percentage reflects the reader's understanding of the content of the passage—how digestion begins in the mouth and the intent and steps of the experiment. Readers 1 and 10 have the highest prompted retelling percentages at 81% and 77%, respectively. Both readers grasped the intent and procedures involved in the experiment; both students have had chemistry. Reader 6, in spite of chemistry instruction and moderate prior knowledge, failed to grasp the passage in one reading. Readers 2 and 9 had low prior knowledge percentages and low retellings. Neither has had chemistry. In general, prompted retelling performance reflected a reader's prior knowledge and experience in the subject area.

Comparison of the test question scores and prompted retelling percentages shows that performance on the test questions did not
TABLE 5.10

COMPARISON OF TEST QUESTION SCORES AND PROMPTED RETELLING PERFORMANCES ON TEST PASSAGES FOR INDIVIDUAL READERS

<table>
<thead>
<tr>
<th>Reader</th>
<th>Chemistry</th>
<th>Generation Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prior Knowledge</td>
<td>Prompted Retelling</td>
</tr>
<tr>
<td>High Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>60%</td>
<td>81%</td>
</tr>
<tr>
<td>2</td>
<td>25%</td>
<td>13%</td>
</tr>
<tr>
<td>3</td>
<td>60%</td>
<td>52%</td>
</tr>
<tr>
<td>Middle Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>65%</td>
<td>45%</td>
</tr>
<tr>
<td>5</td>
<td>20%</td>
<td>41%</td>
</tr>
<tr>
<td>6</td>
<td>35%</td>
<td>18%</td>
</tr>
<tr>
<td>Low Group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>45%</td>
<td>46%</td>
</tr>
<tr>
<td>8</td>
<td>(Omitted)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>10%</td>
<td>18%</td>
</tr>
<tr>
<td>10</td>
<td>65%</td>
<td>77%</td>
</tr>
</tbody>
</table>
necessarily reflect a reader's grasp of the passage. This was the case with Readers 2, 6, 9, and 10. It is interesting to note that Reader 2 scored high (70%) on the test questions in spite of a low prompted retelling (13%). Reader 10 scored low (40%) in spite of a high prompted retelling (77%). In all, six readers (Readers 2, 3, 4, 5, 7, and 9) scored higher on the test questions than Reader 10 and yet had much lower prompted retelling percentages. This group included Reader 9 who had the weakest background in the subject. Her retelling included only isolated specifics about experimental procedures. When asked to explain the purpose of the chemistry experiment which was the basic point of the passage, she answered, "I don't know." On four of her five correct test answers, she responded that she was "not very sure," indicating that her answers were guesses. Reader 9's performance on the chemistry test questions illustrated that it was possible to answer the test questions correctly and yet fail to grasp the central meaning of the passage. In contrast, an excerpt from Reader 10's retelling of this passage demonstrates the depth of meaning grasped by the reader even though he correctly answered fewer questions.

Reader 10: Chemistry Passage

"It is dealing with digestion of starches and sugars in the mouth. It discussed how saliva aided in the chemical breakdown of foods in the mouth. Saliva breaks down sugars
and starches into glucose and maltose. This is the part of digestion that starts in the mouth."

Reader 10's low percentile ranking can be explained by his slow, analytical approach to test questions. Reader 10 took twice as long as any other reader to answer the chemistry questions. His analytical style became clearer on the Generation Gap passage which is discussed in the next section. If a slow, thoughtful approach was characteristic of his test-taking strategy on tests with many passages, it would account for his slow standardized test performance despite a clear understanding of passage content.

Summary

The Chemistry passage was taken from the reading comprehension subtest which ranked readers in this study into high, middle, and low percentile groups. The test manual makes the following statement with regard to this subtest:

The designation of this instrument as a reading test, and its score as a measure of reading comprehension constitutes a convenient but possibly misleading simplification. Almost all questions require more than comprehension and restatement of ideas presented in the passage. . . . In some cases, he is forced to draw on background not presented directly in the passage. It aims at a high level of reading comprehension, not solely at the assimilation of ideas from the printed page.¹

The student profile sheet received by counselors, parents, and students

¹The test was not named so that references to passages and test questions would not affect the future usefulness of the test.
included no such explanation. The statement on the student profile sheet is addressed to students and reads as follows: "The Comprehension score represents your ability to understand and evaluate what you read." The subtest score is represented as a measure of the reader's ability to assimilate ideas from the printed page—an accurate measure of reading comprehension. The analysis discussed in the preceding section showed that for four of the nine readers the low relationship between prompted retelling performance and the test question scores on the Chemistry passage was due to the fact that the test questions were not directly based on passage content. Therefore, prompted retelling performances proved the more valid measure of a reader's comprehension of the passage because the reader made direct reference to information in the selection.

**Generation Gap Passage**

All of the readers in the study also read the passage "Generation Gap" taken from a second standardized test. The content of the selection is an explanation of the origin of the generation gaps that exist between the young, middle-aged, and old in society. Conflicts between the generations are explained in terms of demographic factors such as population growth, longevity and so forth. Following the prompted retelling, readers orally answered the accompanying questions. Readers were also asked to give a reason for why they had chosen a particular answer. In answering the questions, readers did not refer back to the text of the passage. This restriction was specified in the test directions.
Table 5.10 shows that readers' scores ranged from 58% - 100% correct. High scores did not necessarily reflect percentile ranking. For example, Reader 7, a low percentile reader, scored 100%. Her score was the highest in the sample. Readers 5, 6, 9, and 10 also scored as high or higher than the upper group. The fact that readers were allowed unlimited time in answering questions may account for this pattern. Table 5.10 also compares a reader's prompted retelling percentage with his score on the test questions. In general, if a reader's prompted retelling was at least 50%, his test question score was 60% or above. Readers 8 and 9, the least proficient readers, were exceptions to this pattern. Both readers had very low prompted retelling percentages (below 15%) and yet test questions were 50% or above. Reader 9 had a higher number of test questions correct than Reader 1. When compared to prompted retelling percentages, test question scores overestimated the comprehension of Readers 8 and 9.

Table 5.10 shows that all readers had moderate to high prior knowledge in the topic except Readers 8 and 9. This low background knowledge was reflected in their very low prompted retellings. In general, for the group, a reader's prior knowledge percentage was related to his prompted retelling performance. Two exceptions to this pattern were evident in the prompted retelling percentages of Readers 5 and 1. As previously discussed, Reader 5 experienced processing difficulty on this passage due to the technical presentation of the subject and multiple clauses characteristic of the syntax in latter sections. Reader 1's background preconceptions on the generation gap topic
appeared to account for his lower prompted retelling percentage in spite of high prior knowledge of the basic facts of the passage.

The reading competence of Reader 10 was again apparent on this passage in spite of his low percentile rank. He had the highest prompted retelling of all readers (75%). In contrast to the Chemistry passage, his test question score was also high at 75%. His higher test score was due to the fact that the twelve questions of the Generation Gap selection reflected the content of the passage. His understanding of the passage was clear; therefore, his performance on the questions was also high.

Reader 10's slow, analytical approach to test questions became clear as he answered passage questions orally and gave reasons for his choices. Compared with the other readers, Reader 10 answered questions at a much slower rate. Reader 10 gave in-depth reasons for each answer which revealed thoughtful analysis in which all sides of an issue were weighed before a decision was made. The following example was typical of his analysis of questions. The question read as follows:

According to the writer, aging people are becoming increasing --
1. conservative
2. resentful of their situation
3. dependent on young people
4. poverty stricken
Reader 10: "The answer could be poverty-stricken because of early retirement and low social security. The answer could also be '2' because they are resentful of their situation. They have been working all their lives and now they are in competition with younger workers. Older people also fear a takeover of their jobs by machines. The writers didn't go into that but it was more or less between the lines."

The reader relied on his background in the topic, voicing all the current arguments, regarding the plight of elderly employees. He selected answer "2" which, from his perspective, was the logical choice; however, answer "3" was correct. The reader was not under pressure of time in this situation. In a timed testing situation, Reader 10's detailed analysis would put him at a distinct disadvantage.

The reasons given for answer choices by Readers 8 and 9 provide an interesting contrast to Reader 10. Both readers had prompted retelling percentages below 15%, yet both scored as well as Reader 1 (58%) on the test questions. When Reader 8 was asked why he had chosen a particular answer, his response on all questions was "I think it fits." On eight of his twelve answers, he responded "not very sure" indicating that his basic strategy was to guess. The
miscues made by Reader 8 on the following test questions substantiated that guessing was his strategy.

Reader 8: The writer concludes that the existence of a generation gap is --

1. an inevitable occurrence
2. a blessing in disguise
3. a sign of decay
4. a temporary growth symptom

Reader 8 chose answer number one which was correct. The reader's prompted retelling percentage was more representative of his comprehension on this passage than his score on the test questions.

Reader 9 also guessed on the test questions giving reasons for her answer choices as "It just sounds better; I don't know why I picked it; I'm picking this one because none of the others sound right." When she answered correctly, she frequently could not give an adequate explanation for her choice. The following question illustrates:

What geometric figure is used to describe the conventional population structure?

1. cone
2. cylinder
3. pyramid
4. cube

Reader 9 identified pyramid as the correct answer; however, when asked
if she could explain how the pyramid described the population structure, she replied, "I don't know how they use it as a figure." She recalled the term from the passage but failed to grasp the underlying concept. In contrast, Readers 10, 1, 7, 3, and 5 were able to give a detailed explanation of how the relative size of population groups could be represented by this geometric figure. The performance of Reader 9 demonstrated how test questions alone can produce a misleading picture of a reader's comprehension.

Summary

A closer relationship emerged between prompted retellings and test question performances on the Generation Gap selection than on the Chemistry passage because the test questions directly reflected the content of the passage. However, when test question scores were compared to the prompted retellings for Readers 8 and 9, it was clear that the test questions overestimated the comprehension of these two readers. These readers were able to guess at answers and score as well as Readers 1 and 3 who had substantially higher prompted retellings. The performance of Readers 8 and 9 casts doubt on the value of standardized tests and criterion-referenced tests that rely on written short-answer questions. Again for the readers in this study, prompted retelling percentages were considered the more valid measure of the readers' comprehension of this passage.
CHAPTER VI

DETERMINING MINIMUM COMPETENCE AMONG READERS

Prior Knowledge, Comprehending and Prompted Retelling

The data analyzed in this study demonstrated that depth of prior knowledge in the subject of an informational passage affected the comprehending and prompted retelling performances of readers in all percentile ranks. Therefore, in determining minimum competence among the sample, a core passage was used in which nine of the ten readers had at least moderate prior knowledge of the subject (30-65%). Reader 8, the one exception, was evaluated on the basis of another passage. The comprehending and prompted retelling performance of readers was compared to the minimum standards of proficiency proposed in this study—comprehending 60% and prompted retelling 50%. The performance of Readers 5, 8, and 9 was at the borderline of comprehending competence although all three had prompted retellings above 50%. The determination of reading competence could have stopped here; however, the reading performance of these three readers was examined under other circumstances as well—(1) a story passage, and (2) a low prior knowledge passage. Final determination of proficiency was based on all information.

Table 6.1 presents prior knowledge, comprehending, and prompted retelling percentages for the Suntan Lotions passage taken from the
### TABLE 6.1

**PERFORMANCE OF READERS ON THE SUNTAN LOTIONS PASSAGE**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Prior Knowledge</th>
<th>Comprehending</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>High Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>60%</td>
<td>70%</td>
<td>85%</td>
</tr>
<tr>
<td>2</td>
<td>45%</td>
<td>91%</td>
<td>69%</td>
</tr>
<tr>
<td>3</td>
<td>100%</td>
<td>94%</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td><strong>Middle Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>60%</td>
<td>84%</td>
<td>61%</td>
</tr>
<tr>
<td>5</td>
<td>65%</td>
<td>64%</td>
<td>84%</td>
</tr>
<tr>
<td>6</td>
<td>55%</td>
<td>71%</td>
<td>87%</td>
</tr>
<tr>
<td></td>
<td><strong>Low Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>85%</td>
<td>94%</td>
<td>62%</td>
</tr>
<tr>
<td>8</td>
<td>25%</td>
<td>28%</td>
<td>24%</td>
</tr>
<tr>
<td>9</td>
<td>35%</td>
<td>62%</td>
<td>64%</td>
</tr>
<tr>
<td>10</td>
<td>30%</td>
<td>70%</td>
<td>65%</td>
</tr>
</tbody>
</table>
consumer magazine *Changing Times*. All of the readers except Reader 8 had adequate prior knowledge. The remaining nine readers had comprehending and prompted retelling percentages above minimum competency as defined in this study. Readers 5 and 9 were just above the minimum comprehending standard at 64% and 62%, respectively; however, prompted retelling percentages were more than adequate for both readers.

Reader 8 had low prior knowledge percentages on all core passages; however, his interest in football had provided adequate background for his recreational selection on Craig Morton, a Superbowl quarterback. His performance on this passage improved substantially with comprehending at 54% and prompted retelling at 68%. On this passage, the reader's performance approximated proficiency.

Low Prior Knowledge Passages

The data in Table 6.2 indicate that on passages in which his prior knowledge was low, Reader 8's processing strategies became increasingly unproductive with comprehending falling as low as 28%. Prompted retellings were low as well, ranging from 2-24%. In a comparable situation Reader 4, a highly proficient reader, continued to use prediction strategies which resulted in meaningful substitutions. Reader 4 read the difficult Oratorio passage in which his prior knowledge was 25%, the same as Reader 8's prior knowledge on the Suntan Lotions and Generation Gap passages. Comparison of the data in Table 6.2 reveals an obvious difference in the proficiency of the two readers. Readers 5 and 9 were less proficient than Reader 4 with comprehending only slightly above 60% on the Suntan Lotions passage (see Table 6.1).
TABLE 6.2
COMPREHENDING AND PROMPTED RETELLING PERFORMANCE ON LOW PRIOR KNOWLEDGE PASSAGES FOR READERS 4, 5, 8, 9

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>Prior Knowledge</th>
<th>Comprehending</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Oratorio</td>
<td>25%</td>
<td>61%</td>
<td>42%</td>
</tr>
<tr>
<td>5</td>
<td>Gas Mileage</td>
<td>20%</td>
<td>43%</td>
<td>48%</td>
</tr>
<tr>
<td>8</td>
<td>Suntan Lotions</td>
<td>25%</td>
<td>28%</td>
<td>24%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>25%</td>
<td>36%</td>
<td>2%</td>
</tr>
<tr>
<td>9</td>
<td>Gas Mileage</td>
<td>25%</td>
<td>43%</td>
<td>39%</td>
</tr>
</tbody>
</table>
Comprehending fell below 60% on low prior knowledge passages, but these readers continued to show moderately effective use of reading strategies with comprehending at 43%. Prompted retelling percentages were above those of Reader 8 as well.

**Story Passages**

In addition to the informational passages, the lower percentile group and Reader 5 of the middle group read one of two story selections. Table 6.3 outlines the performance of Readers 5, 8, and 9 on the story passages. In spite of the nontechnical nature of the content and the redundancy in plot and character development, Reader 8 had fairly low comprehending (36%) and retelling (45%). In contrast, the retelling of Readers 5 and 9 ranged between 80 to 95%. Reader 8's pattern on this selection demonstrated that he was making only limited use of effective reading strategies.

**Summary**

The data analyzed above demonstrated that all of the readers in the sample, regardless of percentile rank, made effective use of reading strategies when prior knowledge was adequate. Seven readers had comprehending and prompted retelling percentages well above minimum proficiency as defined in this study. Readers 5, 8, and 9 had adequate comprehending and prompted retelling percentages providing background in the subject was in the moderate to high range. When background in the topic was low, Readers 5 and 9 continued to be moderately effective in the use of reading strategies. Under similar circumstances,
TABLE 6.3

PERFORMANCE OF READERS 5, 8, and 9 ON STORY PASSAGES

<table>
<thead>
<tr>
<th>Reader</th>
<th>Story</th>
<th>Comprehending</th>
<th>Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>The Christmas Cat</td>
<td>58%</td>
<td>82%</td>
</tr>
<tr>
<td>8</td>
<td>My Father Played For Me</td>
<td>36%</td>
<td>45%</td>
</tr>
<tr>
<td>9</td>
<td>My Father Played For Me</td>
<td>58%</td>
<td>95%</td>
</tr>
</tbody>
</table>
Reader 8 made only limited use of sampling, predicting, and correction strategies resorting to an overuse of graphophonemic information. His prompted retelling percentages in turn reflected his low comprehension. Reader 8 had insufficient control of processing strategies under these circumstances to be considered a minimally proficient adult reader. The section which follows provides a detailed picture of Reader 8's processing strategies and clarifies the origins of his reading difficulties.

Graphophonemic, Syntactic, and Semantic Processing

Tables 6.4 to 6.9 are a comparison of the processing patterns of the three cue systems for Reader 8 and two proficient readers--Readers 1 and 6. The data were taken from the miscue inventory of the Suntan Lotions passage. Reader 8's prior knowledge was low on this and other core passages; therefore, data were included for Reader 8 on the Craig Morton passage as well. It was then possible to examine differences in processing patterns when background in the subject varied.

The data in Tables 6.6 and 6.8 indicate that Reader 8's attention to grammatical structure on both passages was similar to the more proficient readers. Percentages for grammatical function (92%; 94%) and full grammatical acceptability (70%; 84%) were in the high range. Use of correction strategies was similar for all three readers as well (see Table 6.7). Differences between Reader 8 and the two proficient readers were evident in the pattern of (1) graphophonemic similarity, and (2) semantic acceptability. Tables 6.4 and 6.5 indicate the degree
TABLE 6.4

GRAPHIC SIMILARITY: READERS 1, 6, AND 8

<table>
<thead>
<tr>
<th>Reader</th>
<th>High</th>
<th>Partial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>44%</td>
<td>12%</td>
<td>44%</td>
</tr>
<tr>
<td>6</td>
<td>60%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>8</td>
<td>82%</td>
<td>18%</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td>Craig Morton Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>70%</td>
<td>24%</td>
<td>6%</td>
</tr>
</tbody>
</table>

TABLE 6.5

SOUND SIMILARITY: READERS 1, 6, AND 8

<table>
<thead>
<tr>
<th>Reader</th>
<th>High</th>
<th>Partial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>32%</td>
<td>20%</td>
<td>48%</td>
</tr>
<tr>
<td>6</td>
<td>30%</td>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td>8</td>
<td>67%</td>
<td>31%</td>
<td>2%</td>
</tr>
<tr>
<td></td>
<td>Craig Morton Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>55%</td>
<td>32%</td>
<td>13%</td>
</tr>
</tbody>
</table>
## Table 6.6

**Grammatical Function: Readers 1, 6, and 8**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Yes</th>
<th>Indeterminate</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>Passage</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>76%</td>
<td>0%</td>
<td>24%</td>
</tr>
<tr>
<td>6</td>
<td>80%</td>
<td>0%</td>
<td>20%</td>
</tr>
<tr>
<td>8</td>
<td>92%</td>
<td>0%</td>
<td>8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Craig Morton Passage</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
</tr>
<tr>
<td>94%</td>
</tr>
<tr>
<td>0%</td>
</tr>
<tr>
<td>6%</td>
</tr>
</tbody>
</table>

## Table 6.7

**Correction: Readers 1, 6, and 8**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Corrected</th>
<th>Unsuccessful Correction</th>
<th>Not Corrected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>Passage</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12%</td>
<td>0%</td>
<td>88%</td>
</tr>
<tr>
<td>6</td>
<td>14%</td>
<td>0%</td>
<td>86%</td>
</tr>
<tr>
<td>8</td>
<td>18%</td>
<td>6%</td>
<td>76%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Craig Morton Passage</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
</tr>
<tr>
<td>14%</td>
</tr>
<tr>
<td>2%</td>
</tr>
<tr>
<td>84%</td>
</tr>
</tbody>
</table>
### TABLE 6.8

**GRAMMATICAL ACCEPTABILITY: READERS 1, 6, AND 8**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Yes</th>
<th>Partial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>72%</td>
<td>26%</td>
<td>2%</td>
</tr>
<tr>
<td>6</td>
<td>79%</td>
<td>21%</td>
<td>0%</td>
</tr>
<tr>
<td>8</td>
<td>70%</td>
<td>8%</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Craig Morton Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>84%</td>
<td>10%</td>
<td>6%</td>
</tr>
</tbody>
</table>

### TABLE 6.9

**SEMANTIC ACCEPTABILITY: READERS 1, 6, AND 8**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Yes</th>
<th>Partial</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>58%</td>
<td>26.0%</td>
<td>16.0%</td>
</tr>
<tr>
<td>6</td>
<td>57%</td>
<td>21.5%</td>
<td>21.5%</td>
</tr>
<tr>
<td>8</td>
<td>10%</td>
<td>18.0%</td>
<td>72.0%</td>
</tr>
<tr>
<td></td>
<td>Craig Morton Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>40%</td>
<td>26.0%</td>
<td>34.0%</td>
</tr>
</tbody>
</table>
of Reader 8's reliance on graphic and phonemic information with the percentages of high graphic (82%; 70%) and high sound similarity (67%; 55%). Reader 8's underutilization of semantic cues was apparent when contrasted with percentages of miscues with full semantic acceptability for the other two readers (see Table 6.9). On the Suntan Lotions passage, there was over 45% difference between Reader 8 and the more proficient readers. The percentage of Reader 8's semantically acceptable miscues increased by 30% on the Craig Morton passage, a noticeable improvement. In the following excerpts from that passage, miscues were both grammatically and semantically acceptable. It was evident that the reader was familiar with the football personalities discussed in the selection.

Reader 8: From summer camp on he played like a \underline{Gordy}, he has man who as Curt\underline{Gowdy} might say, had his future ahead of him.

kept
The Mortons keep several Bibles in \underline{prayed} their house and frequently pray together.

Evidence suggested that Reader 8's failure to rely to a greater extent on semantic cues involved the interaction of two difficulties: (1) a lack of sufficient background in the subject of the core passages, (2) reliance on sound/letter matching as the major strategy when experiencing comprehension difficulty. Examination of a number of Reader 8's uncorrected non-word and word substitutions illustrate
these points. The lists include both content and general terms. In nearly all cases, substitutions retained grammatical features and graphic relationships.

<table>
<thead>
<tr>
<th>Uncorrected Non-Word Miscues</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ spreadily</td>
<td>sparingly</td>
</tr>
<tr>
<td>$ substantive</td>
<td>sensitive</td>
</tr>
<tr>
<td>$ opeaquit</td>
<td>opaque</td>
</tr>
<tr>
<td>$ zonc</td>
<td>zinc</td>
</tr>
<tr>
<td>$ dioxy</td>
<td>dioxide</td>
</tr>
<tr>
<td>$ opemeats</td>
<td>ointments</td>
</tr>
<tr>
<td>$ sunscreen</td>
<td>sunscreen</td>
</tr>
<tr>
<td>$ faminist</td>
<td>pharmacist</td>
</tr>
</tbody>
</table>

Reader 8's difficulty with content words in part reflected his lack of background in the subject area. Uncorrected word miscues also exemplified his overuse of graphophonemic cues to the exclusion of semantic cues. In the following example, the reader substituted "following" for "allowing." This substitution and his failure to correct reflected an obvious lack of attention to meaning.

Reader 8: A sunscreen is a chemical agent that absorbs some of the ultraviolet rays, thereby preventing sunburn to one degree or another and allowing you to stay in the sun longer.

The same characteristics prevailed on the Craig Morton passage whenever the reader encountered difficulty as the example below illustrates. He abandoned attention to meaning and resorted to meaningless substitutions which approximated the graphic pattern. When asked what
he did when he no longer understood what he was reading, he answered
that he tried to "sound out" the word.

Reader 8: Morton could legiti mately pound his chest pads in front of all those experts in and out of the press box.

Table 6.10 outlines the comprehension pattern and prompted retell-
ing percentages for Readers 1, 6, and 8. Reader 8's pattern on the Suntan Lotions passage was characteristic of the reader making only limited use of effective reading strategies. The pattern for grammatical relations (see Table 6.11) showed the reader's attention to grammatical structure yet frequent lack of attention to whether or not the printed message made sense. It was clear that with his present processing patterns, Reader 8 was seriously handicapped when confronted with all but the most familiar reading tasks.

Miscues Per Hundred Words

Prior Knowledge and MPH W

Tables 6.12 and 6.13 present the mean MPH W scores for individual readers and groups on core passages. Two patterns emerged in relation to quantity of miscues and readers in this study: (1) There was a wide range of variation in the number of miscues made by individual readers; the range of mean MPH W spanned from .88 to 11.62. For nine of the ten readers, quantity of miscues was not related to proficiency
### TABLE 6.10

**COMPREHENSION PATTERN AND PROMPTED RETELLING: READERS 1, 6, AND 8**

<table>
<thead>
<tr>
<th>Reader</th>
<th>No Loss</th>
<th>Partial Loss</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>Passage</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>82%</td>
<td>4%</td>
<td>14%</td>
</tr>
<tr>
<td>6</td>
<td>64%</td>
<td>14%</td>
<td>22%</td>
</tr>
<tr>
<td>8</td>
<td>36%</td>
<td>8%</td>
<td>56%</td>
</tr>
</tbody>
</table>

**Craig Morton Passage**

<table>
<thead>
<tr>
<th>Reader</th>
<th>No Loss</th>
<th>Partial Loss</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>66%</td>
<td>6%</td>
<td>28%</td>
</tr>
</tbody>
</table>

### TABLE 6.11

**GRAMMATICAL RELATIONSHIPS: READERS 1, 6, AND 8**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Strength</th>
<th>Partial Loss</th>
<th>Weakness Loss</th>
<th>Over Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>Passage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>68%</td>
<td>10%</td>
<td>22%</td>
<td>0%</td>
</tr>
<tr>
<td>6</td>
<td>72%</td>
<td>14%</td>
<td>14%</td>
<td>0%</td>
</tr>
<tr>
<td>8</td>
<td>28%</td>
<td>54%</td>
<td>18%</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Craig Morton Passage**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Strength</th>
<th>Partial Loss</th>
<th>Weakness Loss</th>
<th>Over Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>50%</td>
<td>34%</td>
<td>12%</td>
<td>4%</td>
</tr>
</tbody>
</table>
TABLE 6.12
MEAN MISCUE PER HUNDRED WORDS FOR INDIVIDUALS
ON CORE PASSAGES

<table>
<thead>
<tr>
<th>Reader</th>
<th>Mean MPHW</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High Group</td>
</tr>
<tr>
<td>1</td>
<td>6.99</td>
<td>5.70-8.10</td>
</tr>
<tr>
<td>2</td>
<td>1.23</td>
<td>.99-1.34</td>
</tr>
<tr>
<td>3</td>
<td>1.44</td>
<td>1.16-1.58</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Middle Group</td>
</tr>
<tr>
<td>4</td>
<td>2.83</td>
<td>2.18-3.17</td>
</tr>
<tr>
<td>5</td>
<td>5.97</td>
<td>4.07-7.50</td>
</tr>
<tr>
<td>6</td>
<td>1.18</td>
<td>1.02-1.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Group</td>
</tr>
<tr>
<td>7</td>
<td>.88</td>
<td>.73-1.18</td>
</tr>
<tr>
<td>8</td>
<td>11.62</td>
<td>9.68-12.63</td>
</tr>
<tr>
<td>9</td>
<td>3.87</td>
<td>2.62-5.05</td>
</tr>
<tr>
<td>10</td>
<td>3.89</td>
<td>2.85-5.37</td>
</tr>
<tr>
<td>Group</td>
<td>Mean MPHW</td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>3.22</td>
<td></td>
</tr>
<tr>
<td>Middle</td>
<td>3.33</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5.06</td>
<td></td>
</tr>
</tbody>
</table>
or percentile rank. (2) The quantity of miscues made by individual readers tended to remain stable regardless of the selection's length as long as prior knowledge percentages remained in the moderate to upper range (see Table 6.14). This pattern was consistent for five of the seven readers who had adequate prior knowledge on all core passages.

Table 6.15 shows that the quantity of miscues tended to increase by two or more miscues per hundred words when a reader's prior knowledge percentage dropped into the low range (0-25%). The indication of these data is that more miscues resulted because the reader was having difficulty deriving meaning due to his limited background in the subject. An increase in quantity of miscues emerged as a result of the reader's comprehension difficulty and was not a cause of the reader's comprehension problem.

Quality and Quantity of Miscues

Table 6.16 compares the comprehending means with the mean MPHW for individual readers on the core passages. It is evident from the table that quality of miscues was more significant than quantity. For example, Reader 1 had a mean MPHW of 6.99 and a comprehending percentage of 72. Reader 9 made fewer miscues with a mean of 3.87 and yet her comprehending mean was lower at 47%. The quantity of miscues did not reflect reading proficiency except for Reader 8, the sample's weakest reader. Reader 8 had the lowest comprehending mean at 32% and the highest number of miscues with a mean MPHW of 11.62. On the Craig Morton selection, his comprehending rose to 54%, yet he miscued very frequently (MPHW, 10.16). Even on this familiar passage, Reader 8 was
TABLE 6.14
QUANTITY OF MISCUES ON CORE PASSAGES
OF ADEQUATE PRIOR KNOWLEDGE

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>MPHW</th>
<th>Prior Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Renaissance</td>
<td>8.10</td>
<td>55%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>5.70</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>7.20</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>6.97</td>
<td>60%</td>
</tr>
<tr>
<td>2</td>
<td>Renaissance</td>
<td>1.28</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>1.31</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>1.34</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>.99</td>
<td>45%</td>
</tr>
<tr>
<td>3</td>
<td>Renaissance</td>
<td>1.58</td>
<td>75%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>1.16</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>1.50</td>
<td>90%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>1.72</td>
<td>100%</td>
</tr>
<tr>
<td>4</td>
<td>Renaissance</td>
<td>3.17</td>
<td>65%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>3.05</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>2.18</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>2.90</td>
<td>60%</td>
</tr>
<tr>
<td>6</td>
<td>Renaissance</td>
<td>1.40</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>1.02</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>1.01</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>1.27</td>
<td>60%</td>
</tr>
<tr>
<td>7</td>
<td>Renaissance</td>
<td>.79</td>
<td>65%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>.72</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>.84</td>
<td>70%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>1.18</td>
<td>60%</td>
</tr>
<tr>
<td>10</td>
<td>Renaissance</td>
<td>4.20</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td>Generation Gap</td>
<td>5.37</td>
<td>55%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>2.85</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>3.15</td>
<td>50%</td>
</tr>
</tbody>
</table>
TABLE 6.15

COMPARISON OF MISCUES PER HUNDRED WORDS ON LOW AND ADEQUATE PRIOR KNOWLEDGE PASSAGES

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>MPHW</th>
<th>Prior Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Oratorio</td>
<td>4.88</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>2.18</td>
<td>70%</td>
</tr>
<tr>
<td>5</td>
<td>Gas Mileage</td>
<td>6.53</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>4.07</td>
<td>65%</td>
</tr>
<tr>
<td>6</td>
<td>Oratorio</td>
<td>3.83</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Gas Mileage</td>
<td>1.01</td>
<td>60%</td>
</tr>
<tr>
<td>9</td>
<td>Gas Mileage</td>
<td>4.18</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Suntan Lotions</td>
<td>2.62</td>
<td>35%</td>
</tr>
</tbody>
</table>
TABLE 6.16
COMPREHENDING MEANS AND MEAN MISCUES PER HUNDRED WORDS FOR INDIVIDUALS ON CORE PASSAGES

<table>
<thead>
<tr>
<th>Reader</th>
<th>Comprehending Mean</th>
<th>Mean MPHW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Group</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>72%</td>
<td>6.99</td>
</tr>
<tr>
<td>2</td>
<td>88%</td>
<td>1.23</td>
</tr>
<tr>
<td>3</td>
<td>86%</td>
<td>1.44</td>
</tr>
<tr>
<td></td>
<td>Middle Group</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>92%</td>
<td>2.83</td>
</tr>
<tr>
<td>5</td>
<td>51%</td>
<td>5.97</td>
</tr>
<tr>
<td>6</td>
<td>75%</td>
<td>1.18</td>
</tr>
<tr>
<td></td>
<td>Low Group</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>89%</td>
<td>.88</td>
</tr>
<tr>
<td>8</td>
<td>32%</td>
<td>11.62</td>
</tr>
<tr>
<td>9</td>
<td>47%</td>
<td>3.87</td>
</tr>
<tr>
<td>10</td>
<td>77%</td>
<td>3.89</td>
</tr>
</tbody>
</table>
making approximately one miscue for every ten words which was substantially higher than for any other reader (see Table 6.12). It appears that the high number of miscues produced by this reader was a symptom of lack of reading process control in which the reader relied primarily on graphophonemic and syntactic information while frequently excluding semantic cues.

**Summary**

The data indicated that differences between high, middle, and low percentile groups were not attributable to quantity of miscues. The quality of readers' miscues (expressed in comprehending percentages) was a more significant indicator of reading competence than quantity of miscues.

**The Effect of Reader Interest**

**The Influence of High Interest**

This study examined the effect of a reader's interest on comprehending and prompted retelling performance. After reading all passages, readers were asked to select the passage they found most interesting. Passages included the core informational selections and an informative recreational passage chosen from six options. The lower percentile group and Reader 5 of the middle group also read one of two story selections. Two readers of this group selected a story passage as most interesting. Several readers chose more than one passage.

Table 6.17 outlines the informational passage readers rated as
most interesting with comprehending and prompted retelling percentages on these selections. The table also includes the readers' mean comprehending and prompted retelling percentages for the core passages. Examination of the data revealed that comprehending on the passage of highest interest did not vary substantially from a reader's mean comprehending percentage. The differences between the two comprehending percentages were small ranging from 1-12 points. The exception to this pattern occurred with Reader 8 on the Craig Morton selection. Here the change in comprehending was substantial increasing by 22 points. In general, however, interest did not appear to affect readers' comprehending performances.

Interest in the topic of a passage did appear to affect prompted retelling performance, if the reader's interest in the topic was strong. The data in Table 6.17 revealed that in seven out of eight cases an informational passage chosen as most interesting had a higher prompted retelling percentage than the reader's mean prompted retelling. Readers 2, 3, and 5, however, stated that the passage chosen as most interesting was the most interesting selection among the choices available. None of these readers reported a strong interest in the passage. Table 6.17 revealed that for these readers, prompted retelling percentages showed only a small variation (less than fifteen percentage points) in favor of the passage of highest interest.

In contrast, for Readers 4, 6, 8, and 10 the prompted retelling percentage on the passage of highest interest ranged from 20 to 51
<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>Comprehending</th>
<th>Prompted Retelling</th>
<th>Mean Comprehending on Core Passages</th>
<th>Mean Prompted Retelling on Core Passages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Popularity</td>
<td>60%</td>
<td>36%</td>
<td>72%</td>
<td>79%</td>
</tr>
<tr>
<td>2</td>
<td>Suntan Lotions</td>
<td>91%</td>
<td>69%</td>
<td>88%</td>
<td>63%</td>
</tr>
<tr>
<td>3</td>
<td>Suntan Lotions Gas Mileage</td>
<td>94%</td>
<td>*</td>
<td>85%</td>
<td>74%</td>
</tr>
<tr>
<td>4</td>
<td>Renaissance</td>
<td>98%</td>
<td>92%</td>
<td>92%</td>
<td>63%</td>
</tr>
<tr>
<td>5</td>
<td>Renaissance</td>
<td>52%</td>
<td>62%</td>
<td>51%</td>
<td>59%</td>
</tr>
<tr>
<td>6</td>
<td>Craig Morton</td>
<td>*</td>
<td>98%</td>
<td>75%</td>
<td>63%</td>
</tr>
<tr>
<td>8</td>
<td>Gas Mileage</td>
<td>32%</td>
<td>26%</td>
<td>32%</td>
<td>17%</td>
</tr>
<tr>
<td>10</td>
<td>Elvis Presley</td>
<td>85%</td>
<td>99%</td>
<td>77%</td>
<td>78%</td>
</tr>
</tbody>
</table>

*Reader made less than ten miscues on the passage.*
percentage points higher than the readers' mean prompted retellings (see the following chart extracted from Table 6.17). Each of these readers reported an avid interest in the topic of the passage. Each of these readers also reported that his special interest in the subject had led him to pursue the field on his own. Active pursuit of the subject through sports, reading, and multi-media sources had expanded the reader's knowledge. Background knowledge in the subject, in turn, appeared to increase the reader's ability to retain the information of a particular passage read for this study. Therefore, for Readers 4, 6, 8, and 10, interest appeared to be a significant retention factor because it related directly to a reader's knowledge of the subject prior to reading.

PASSAGE OF HIGHEST INTEREST FOR READERS 4, 6, 8, and 10

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>Interest</th>
<th>Prompted Retelling</th>
<th>Mean Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Renaissance</td>
<td>Avid Interest in History</td>
<td>92%</td>
<td>63%</td>
</tr>
<tr>
<td>6</td>
<td>Craig Morton</td>
<td>Athlete--Football</td>
<td>98%</td>
<td>63%</td>
</tr>
<tr>
<td>8</td>
<td>Craig Morton</td>
<td>Athlete--Football</td>
<td>68%</td>
<td>17%</td>
</tr>
<tr>
<td>10</td>
<td>Elvis Presley</td>
<td>Collects Presley Memorabilia</td>
<td>99%</td>
<td>77%</td>
</tr>
</tbody>
</table>
The Influence of Low Interest

In several cases, a pronounced lack of interest appeared to have a negative effect on reading comprehension in spite of adequate prior knowledge. On the Oratorio passage, Reader 2 had a moderately high prior knowledge percentage at 55% and comprehending was 100%. Yet her prompted retelling was only 12%. The reader was emphatic about her lack of interest in the subject. When asked to retell the passage, she made the following comments:

Reader 2: "I don't remember anything. It was so boring I wasn't paying any attention."

Interest affected Reader 7's ability to concentrate and probably contributed to her low percentile ranking. As discussed previously, this reader had high comprehending and relatively low prompted retellings in spite of adequate prior knowledge on all core selections (mean comprehending, 89%; mean prompted retelling, 46%; mean prior knowledge, 56%). Reader 7 was the only reader in this study to rate all the informational passages "not very interesting" before and after reading. During the retelling of the Renaissance passage, she stated the following:

Reader 7: "Usually I can't concentrate on what I'm reading unless I'm really interested in it. I read with my mind blocked off. In my school work
I have to read things over and over because I just can't concentrate on it."

In addition to the informational passages, Reader 7 read the story selection "The Christmas Cat." In contrast to the other passages, Reader 7 had a high retelling at 90%. At the conclusion of the retelling, she expressed a strong liking for animals and rated the story as "very interesting."

In summary, the effect of a reader's interest on comprehending performance did not appear significant for readers in this study. The influence of interest on prompted retelling appeared significant under two circumstances: (1) when a topic dealt with an area of interest which the reader had actively pursued on his own, and (2) when the reader's interest was strongly negative. In the first case, active interest in the subject had enriched the reader's background and thus his reading comprehension of the subject. Here the effect was relatively long-term. In the second instance, interest appeared to affect the reader's willingness to concentrate and attend to the task. The influence here was relatively short-term.

Interest: A Dependent Variable

Readers were asked to rate their interest in the topic of each passage as "very interesting," "somewhat interesting," or "not very interesting," before and after reading. Reader interest frequently changed after reading. This finding paralleled the finding of
Olshavsky (1977) that a reader's interest is a dependent variable.  
Table 6.18 indicates the percentage of times a reader changed his  
interest rating in either a positive or negative direction after reading. The percentages are based on all passages read. The data indicates that eight of the ten readers altered their opinions on 50% or more of the passages.

Interest and Prior Knowledge

Readers expressed a variety of reasons for changing their interest rating in the passage. However, only two reasons were expressed frequently enough to emerge as patterns among the group. Interest in the informational passages was in part dependent upon a reader's perception of his knowledge of the subject. It appeared that there was an optimum amount of new information readers expected to learn. A selection tended to be more negatively rated if (1) the reader felt he had failed to learn anything new, or (2) if the selection was more technical or difficult than initially expected. These two patterns crossed percentile ranks.

In the chart below, readers negatively rated the selection after reading because they reported that they already knew most of the information discussed in the passage. Readers 1, 2, 5, and 10 had high prompted retellings, although this was not the case with Readers 4, 6, and 7. For this latter group, it appeared that perception of what was learned was the deciding factor.
<table>
<thead>
<tr>
<th>Reader</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83%</td>
</tr>
<tr>
<td>2</td>
<td>67%</td>
</tr>
<tr>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>4</td>
<td>50%</td>
</tr>
<tr>
<td>5</td>
<td>67%</td>
</tr>
<tr>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>7</td>
<td>16%</td>
</tr>
<tr>
<td>8</td>
<td>60%</td>
</tr>
<tr>
<td>9</td>
<td>67%</td>
</tr>
<tr>
<td>10</td>
<td>67%</td>
</tr>
</tbody>
</table>
In the following chart, selections were rated more negatively than the initial rating because the reader found the passage more technical and therefore more difficult than expected. This opinion was expressed by all of the subjects listed below even though six readers had adequate prior knowledge (30% or higher). The reader's expectation appeared to be the important factor.

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>Prompted Retelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gas Mileage</td>
<td>97%</td>
</tr>
<tr>
<td>2</td>
<td>Debby Boone</td>
<td>92%</td>
</tr>
<tr>
<td>4</td>
<td>Popularity</td>
<td>33%</td>
</tr>
<tr>
<td>5</td>
<td>Suntan Lotions</td>
<td>84%</td>
</tr>
<tr>
<td>6</td>
<td>Gas Mileage</td>
<td>58%</td>
</tr>
<tr>
<td>7</td>
<td>Suntan Lotions</td>
<td>82%</td>
</tr>
<tr>
<td>10</td>
<td>Gas Mileage</td>
<td>95%</td>
</tr>
</tbody>
</table>

Interest and Personal Identification With the Subject

There was considerable diversity among readers on the passage rated as "the most interesting" among the total. Five readers chose recreational passages; five readers selected one of the core passages. When
reasons given by readers were examined, high interest appeared to be related to the reader's ability to identify in a personal way with the subject. Identification occurred if the reader found the information useful, related to immediate experience, or intrinsically valuable. Table 6.19 presents the passages readers chose as "the most interesting" and reasons for that choice. Two readers chose more than one passage.

A Final Note on Reading Interest

Readers 8 and 9 were two of the least proficient readers in the study sample. Reader 9's prior knowledge was low on three of the four core passages. Reader 8 experienced processing difficulty with all of the core passages; he lacked an intuitive understanding of effective reading and the prerequisite background. Both Readers 8 and 9 revealed, quite by accident, reading experiences unrelated to school materials. When Reader 8 examined the optional recreational passages, he explained that he had already read the article on Elvis Presley that morning during a study hall. The selection was taken from a current edition of the Reader's Digest magazine. Reader 9 brought a True Story magazine with her for several taping sessions in a row. When asked about the magazine, she opened it to the table of contents and pointed out that she had checked off the five stories she had read and was planning to complete the remaining four. She and a friend shared a subscription and never missed an issue.

These two anecdotal incidents pragmatically demonstrate that reading proficiency is a matter of degree. Both of these readers who
### Table 6.19
**Readers' Choice of the "Most Interesting" Passage**

<table>
<thead>
<tr>
<th>Reader</th>
<th>Passage</th>
<th>Stated Reason</th>
<th>Personal Identification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Popularity</td>
<td>&quot;It is something you run across every day. You see how people act and react trying to be popular.&quot;</td>
<td>Immediate Experience</td>
</tr>
<tr>
<td>2</td>
<td>Suntan Lotions</td>
<td>&quot;Getting a suntan is one of my main summer hobbies. It came closest to my life right now; the others didn't.&quot;</td>
<td>Immediate Experience</td>
</tr>
<tr>
<td>3</td>
<td>a. Suntan Lotions</td>
<td>&quot;You can use that information every summer.&quot;</td>
<td>Useful Information</td>
</tr>
<tr>
<td></td>
<td>b. Gas Mileage</td>
<td>&quot;That had to do with my interest in electronics and mechanical things.&quot;</td>
<td>Immediate Experience</td>
</tr>
<tr>
<td>4</td>
<td>Renaissance</td>
<td>&quot;I am most interested in history. It talked about an historical period in Europe.&quot;</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>5</td>
<td>Renaissance</td>
<td>&quot;I like history better than other subjects.&quot;</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>6</td>
<td>Craig Morton</td>
<td>&quot;Right now I really enjoy sports. Anything to do with sports catches my attention.&quot;</td>
<td>Immediate Experience</td>
</tr>
<tr>
<td>7</td>
<td>The Christmas Cat</td>
<td>&quot;I love animals--particularly dogs--so I found this one interesting, but none of the others.&quot;</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td>8</td>
<td>a. Gas Mileage</td>
<td>&quot;I can use the information.&quot;</td>
<td>Useful Information</td>
</tr>
<tr>
<td></td>
<td>b. Craig Morton</td>
<td>&quot;I watched the Superbowl.&quot;</td>
<td>Immediate Experience</td>
</tr>
<tr>
<td>9</td>
<td>My Father Played</td>
<td>&quot;I like to read stories. It is more enjoyable than trying to learn something out of reading.&quot;</td>
<td>Intrinsic Value</td>
</tr>
<tr>
<td></td>
<td>For Me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Elvis Presley</td>
<td>&quot;I am an Elvis fan. I have several albums and posters.&quot;</td>
<td>Immediate Experience</td>
</tr>
</tbody>
</table>
experienced difficulty with the academic passages in this study
voluntarily read materials that fit their interests and background of
experience.
CHAPTER VII

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Summary of the Study

This study was concerned with the reading proficiency of high school students. Ten high school seniors were selected from high, middle, and low percentile ranks on a standardized subtest of reading comprehension. These students orally read six informational passages taken from academic and nonacademic sources. The reading passages were selected from a textbook, standardized test, car manual, and consumer magazine. The range of these reading tasks were those considered reasonable for the high school graduate. In addition to assigned passages, readers chose to read a recreational passage based on their interest and knowledge of the topic. Before the oral reading sessions, each reader's prior knowledge of the content of the assigned core passages was assessed by a short-answer survey. Before and after reading, students rated their interest in a passage. The reading miscues generated during the oral reading sessions were then analyzed to determine the proficiency of these readers within a psycholinguistic definition of reading competence. The influence of the reader's depth of prior knowledge and interest on processing strategies and comprehension was examined and described.
Reading was defined in this study within the Goodman Model which explains the reading process as a matter of simultaneously sampling, predicting, and confirming information in order to derive and integrate meaning from the printed page. In this process, the reader relies on cue systems within the structure of oral and written language and cues within the cognitive structure of his own knowledge--graphophonemic, syntactic, and semantic cues. Reading proficiency is a matter of efficiently and effectively drawing on information from these cueing systems. Assessment of proficiency is possible through an examination of the quality of a reader's miscues--the extent to which they alter meaning.

The oral reading miscues of subjects in this study were analyzed according to the Reading Miscue Inventory (RMI) by Burke and Y. Goodman (1972). The focus of analysis was on two measures of a reader's ability to process written material: (1) A comprehending percentage was calculated for each passage read. This percentage is a process measure of reading competence derived by totalling the percentage of a reader's miscues which are semantically acceptable within the total context and those miscues successfully corrected. (2) The retelling percentage is a retention measure of comprehension in which the reader gives his own accounting of the information of a passage. Due to the level of difficulty and informational character of the passages, the retelling task was altered in this study. Following the retelling procedures specified in the RMI, the reader was reminded of the topics discussed in the passage. Additional information recalled by the
reader was evaluated and included in his prompted retelling percentage. Minimum competency guidelines were established for these two measures in order to determine the proficiency of subjects in the high, middle, and low percentile ranks. The guidelines were as follows: If a reader had at least moderate prior knowledge of an informational topic, then analysis of his oral reading miscues and retelling of passage content should show (a) a comprehending percentage of not less than 60%, and (b) a prompted retelling percentage of not less than 50%. These guidelines were based on standards of proficiency outlined in the RMI and were field-tested with high school seniors in this study.

The specific purposes of this study were to (1) assess the influence of a reader's prior knowledge and interest on comprehending and prompted retelling performance, (2) explore the feasibility of miscue analysis as an alternative to standardized tests in assessing minimum reading competence at the high school level, and (3) further understand the reading problems at the secondary school level.

Summary of the Findings

Prior Knowledge and Percentile Rank

Groups. Prior knowledge was assessed on the core passages for each student. Group mean scores were computed for the high, middle, and low percentile groups. Differences in group prior knowledge means showed that on the core passages, the high group was bringing greater knowledge to the reading passages than the low group. The middle group's prior knowledge was between the high and low groups. A group's
relative percentile ranking (high, middle, and low) corresponded directly with a group's mean score for prior knowledge (high, 65%; middle, 51%; low, 37%).

**Individuals.** Two of the three readers in the high group had high prior knowledge means (70-100%); all of the middle group readers had moderate prior knowledge means (30-65%); two of the low group readers had moderate prior knowledge means and two had low prior knowledge means (0-25%). Prior knowledge percentages varied substantially when the scores on separate passages for individual readers were compared. The smallest range in prior knowledge for any reader was 15 percentage points; the largest was 50 percentage points. Variation in readers' prior knowledge on separate passages was evident in all three groups.

**Comprehending and Percentile Rank**

**Groups.** Comprehending performance was computed for each student on the core passages. Comprehending means were computed for the high, middle, and low percentile groups. The high group had a higher comprehending mean (82%) than the low group (62%). The middle group fell between the high and low group (73%). A group's relative percentile ranking (high, middle, and low) corresponded directly with a group's mean score for comprehending.

**Individuals.** Correspondence between percentile rank and comprehending was not as strong when comprehending means and percentile rank were compared for individual readers. All three readers in the high group had high comprehending means. However, Reader 4 of the middle group had the highest comprehending mean of the sample at 92%. Reader 6
of the middle group had a comprehending mean as high as Reader 1. More surprisingly, Readers 7 and 10 of the low group had comprehending means equivalent or above the high group readers. The standardized test percentile ranking underestimated the comprehending performance of these four readers on the core passages in this study.

Prior Knowledge and Comprehending Groups. Group comprehending means (high, 82%; middle, 73%; low, 62%) varied in the same direction as group prior knowledge means (high, 65%; middle, 51%; low, 37%).

Individuals. Comprehending percentages varied for individual readers on separate passages in all three percentile groups. When comprehending percentages for a reader were compared to his prior knowledge scores, the data indicated that comprehending performance was related to the depth of a reader's background in the content of a passage. The influence of prior knowledge was particularly evident when a reader's comprehending on a low prior knowledge passage (0% - 25%) was compared with his comprehending on a passage in which he had moderate (30% - 65%) to high (70% - 100%) prior knowledge.

For the least proficient readers in the study (Readers 5, 8, and 9), comprehending percentages were below 60% on passages where the reader's prior knowledge was in the low range. Moderate to high background knowledge in a topic positively influenced the comprehending performance of these readers. The result was that these readers had comprehending percentages in the 60% range of minimum proficiency as defined in this study. For proficient readers, the influence of prior
knowledge was particularly evident on the most difficult passage with the heaviest, unfamiliar concept load. On the Oratorio passage, the performance of Readers 1, 4, and 6 more closely resembled that of the least proficient readers; comprehending dropped and reliance on graphophonemic cues increased.

Prior Knowledge and Comprehending: Coefficients of Correlation

Pearson product-moment coefficients of correlation were calculated to statistically compare the relationship between prior knowledge percentages and comprehending percentages for the core passages. The sample size of ten subjects was extremely small; however, it is notable that for this group of readers the range of correlations was in the moderate (.53) to high (.88) range. This range was consistent with the expectation that prior knowledge of passage content was an important influence on comprehending performance.

Percentile Rank, Prior Knowledge, and Prompted Retelling Groups. Prompted retelling percentages were computed on the core passages for each subject. Mean prompted retelling scores were calculated for the high, middle, and low percentile groups. The high group had a higher prompted retelling mean (78%) than the low group (42%); the middle group (62%) again fell between the high and low groups. Correspondence between a group's relative percentile rank and prompted retelling mean was direct and varied in the same direction as group prior knowledge scores.
Individuals. The influence of prior knowledge was evident in the prompted retelling means of individual readers. Two of the low percentile readers had the lowest prior knowledge means and, as expected, also had the lowest prompted retelling means. Two readers in the upper group had the highest means in the sample in both prior knowledge and prompted retelling. The differences in the prompted retelling means between Readers 1 and 3 of the high group and Readers 4, 6, and 10 who had lower percentile rankings were not differences in reading ability but due to differences in content knowledge on the core passages.

Low prior knowledge did not account for the low percentile ranking of Readers 7 and 10. Reader 7 had a moderate prior knowledge mean and high comprehending, yet her prompted retelling mean was below 50%. Reader 7's low interest in the core passages plus emphasis on exact surface processing during reading probably accounted for her fairly low retellings and low percentile ranking. Reader 10 again emerged as one of the strongest readers in the study. His prompted retelling mean was equivalent to the highest in the sample.

Prompted retelling percentages varied on separate passages for readers in all percentile groups. The lowest range for any reader was 18 percentage points; the highest was 50 percentage points. As with comprehending performance, the data indicated that the degree of a reader's content knowledge in the topic of a passage was related to variation in prompted retellings.

For the least proficient readers in the study (Readers 8 and 9), prompted retellings were below 50% when prior knowledge in the subject
was in the low range. When prior knowledge percentages were in the moderate or high range, prompted retellings were above 50%--the level of minimum competency defined in this study. For the proficient readers, the same pattern held true for 4 of the 5 readers who read the difficult Oratorio passage. When these competent readers were challenged by a passage in which they lacked sufficient background, prompted retellings fell below 50%, resembling the performance of less proficient readers.

Prior Knowledge Survey Items and Retelling Items

The Gas Mileage passage taken from a car manufacturer's manual yielded an interesting pattern on the relationship between depth of knowledge and information recalled during retellings. The pattern was as follows: If a reader answered a prior knowledge survey question correctly and responded that he was either "somewhat sure" or "very sure," then that item tended to appear in the subject's retelling. If the answer was incorrect or the reader responded "not very sure," then the item tended not to appear in the subject's initial or prompted retelling. The match between prior knowledge items and retelling items was in the 70% to 90% range for eight of the ten readers, the pattern crossing all percentile groups.

Retelling Narratives

Narrative examples from reader's retellings of the informational passages demonstrated that the extent of a reader's background in a topic affected his ability to retain information acquired through
reading. The affect of prior knowledge crossed high, middle, and low
groups and was true for both recreational and academic passages.
Specific examples showed that (1) subject matter knowledge was fre-
quently partial rather than entirely absent or complete, and (2) retell-
ing and prompted retelling procedures were effective in tapping the
depth of a reader's comprehension. Differences in prompted retelling
performances were dependent upon the reader's familiarity with the
subject.

**Prior Knowledge and Prompted Retelling:**

**Coefficients of Correlation**

Pearson product-moment coefficients of correlation were computed
to statistically compare the relationship between prior knowledge and
prompted retelling percentages for the core passages. The correlation
coefficients for these two variables on separate passages were in the
moderate range, .51 to .76 for readers in this study. This range
was compatible with the expectation that a reader's prior knowledge
is an important influence on prompted retelling performance. Due to
the small sample size, the implications of these data were restricted
to readers in this study.

**Comprehending and Prompted Retelling:**

**Coefficient of Correlation**

Pearson product-moment coefficients of correlation for comprehending
and prompted retelling were computed for the core passages. Three
of the four correlation coefficients were in the moderate to high
range (.62 to .84), suggesting a relationship between these two
variables for readers in this study.

**Prior Knowledge, Comprehending, and Prompted Retelling**

When data were compared by groups, prior knowledge scores, comprehending percentages, and prompted retelling percentages all tended to vary in the same direction.

**Test Passages: Test Questions and Prompted Retellings**

Subjects read two passages taken from separate standardized tests appropriate for high school students. Following the prompted retelling of passages, readers answered the accompanying test questions and indicated their confidence in selected answers. On the Chemistry passage, prompted retelling performance was similar to test question scores for five of the nine readers who read the passage. For Readers 2, 6, 9, and 10, the relationship between test question scores and prompted retelling performance was low. This low relationship was due to the fact that the test questions were not directly based on passage content. A comparison of Reader 9's test question score and prompted retelling showed that it was possible to answer test questions correctly and yet fail to grasp the central meaning of the passage. Prompted retelling performances reflected a reader's prior knowledge in chemistry and was considered the more valid measure of a reader's comprehension of the passage because the reader made direct reference to passage content.

All of the readers in the study also read the passage Generation
Gap taken from a separate standardized test. Following the prompted retelling, readers orally answered the accompanying questions and gave reasons for their choices. High scores on the test questions did not necessarily reflect a reader's percentile rank and may have been due to the fact that readers were not under time constraints. Six of the middle and lower group readers had test question scores as high or higher than two readers in the upper group. An analysis of Reader 10's reasons for choosing answers to test questions revealed a slow, analytical approach to answering questions. If such an approach was characteristic of his general test-taking strategy, it would account for his low percentile ranking in spite of high comprehending and high comprehension of passage content.

A closer relationship emerged between prompted retellings and test question scores on the Generation Gap passage than on the Chemistry selection. On Generation Gap, the test questions directly reflected the content of the passage. However, analysis of reasons for answers and confidence ratings in answers revealed that Readers 8 and 9 were able to guess and score as high as Readers 1 and 3 who had substantially higher retellings. For readers in this study, prompted retelling percentages were considered the more valid measure of comprehension on this passage.

Determinations of Minimum Competence Among Readers

The data analysis in this study indicated that the depth of prior knowledge in the subject of an informational passage affected the
comprehending and prompted retelling performances of readers in all percentile groups. Therefore, in determining minimum competence among the readers in the sample, a core passage was used in which nine of the ten readers had at least moderate prior knowledge of the subject. Reader 8, the one exception, was evaluated on the basis of the recreational passage about Craig Morton, a 1977 Superbowl quarterback. This was the only passage in which Reader 8 had adequate background. The comprehending and prompted retelling performance of readers was compared to minimum standards of proficiency proposed in this study—comprehending 60% and prompted retelling 50%. Reading performance was also examined on a story passage and a low prior knowledge passage as well. Final evaluation of proficiency was based on all information.

The data indicated that all of the readers in the sample, regardless of percentile rank, made effective use of reading strategies when prior knowledge was adequate. Seven readers had comprehending and prompted retelling percentages well above minimum proficiency as defined in this study. The least proficient readers (Readers 5, 8, and 9) had comprehending in the 60% range only when background in the subject was in the moderate to high range. When background in the topic was low, Readers 5 and 9 continued to be moderately effective in the use of reading strategies (comprehending, 40%; prompted retelling, 40%). Under similar circumstances, Reader 8 made only limited use of sampling, predicting, and correction strategies (comprehending, 28% to 36%) resorting to an overuse of graphophonemic information. His low prompted retelling percentages (2% - 24%) reflected his low
comprehension. Analysis of Reader 8's use of graphophonemic, syntactic, and semantic information suggested that Reader 8's failure to rely to a greater extent on semantic cues involved the interaction of two difficulties: (1) a lack of sufficient background in the topics of the core passages, (2) reliance on sound/symbol matching as the major strategy when experiencing comprehension difficulty. Reader 8 had insufficient intuitive control of processing strategies to be considered a minimally proficient adult reader. The remaining nine readers in the high, middle, and low percentile groups demonstrated minimum proficiency in comprehending and prompted retelling according to the standards suggested in this study.

The Quantity of Miscues: Miscues Per Hundred Words

Three patterns emerged in relation to quantity of miscues and readers in this study: (1) When comprehending means for individual readers were compared to means for miscues per hundred words (MPHW), it was evident that the quality of a reader's miscues was more significant than quantity. For example, Reader 1 had a mean MPHW of 6.99 and a comprehending mean of 72. Reader 9 made fewer miscues with a mean of 3.87 and yet her comprehending mean was lower at 47%. (2) There was a wide range of variation in the number of miscues made by individual readers; the range of mean MPHW spanned from .88 to 11.62. For nine of the ten readers, quantity of miscues was not related to proficiency or percentile rank. For Reader 8 (mean MPHW, 11.62), the high number of miscues generated was a symptom of lack of reading
process control in which the reader relied primarily on graphophonemic and syntactic information to the exclusion of semantic cues. With the exception of this reader, differences between the high, middle, and low percentile groups were not attributable to quantity of miscues. (3) The quantity of miscues made by individual readers tended to remain stable regardless of passage length as long as prior knowledge percentages remained in the moderate to high range. This pattern was consistent for five of the seven readers who had moderate to high prior knowledge on all core passages. When prior knowledge dropped into the low range, the quantity of miscues tended to increase by two or more miscues per hundred words. The indication of this data is that more miscues resulted because the reader was having difficulty deriving meaning due to his limited background in the subject. An increase in quantity of miscues emerged as a result of a reader's comprehension difficulty and was not the cause of his comprehension problem.

The Effect of Positive and Negative Reader Interest

The study examined the effect of a reader's interest on comprehending and prompted retelling performance. After reading the passages that were assigned and chosen, readers were asked to select the passage they found most interesting. The effect of a reader's interest on comprehending did not appear significant for this group of readers. Interest did appear to substantially influence prompted retelling performance under two circumstances: (1) when a topic dealt with an area of interest which the reader had actively pursued over a period of
time, and (2) when the reader's interest was strongly negative. In

the first case, the effect of reader interest was relatively long-term.

Four of the ten readers in the sample expressed special interest in

the topic of one passage. In each case, the student's active interest

had enriched his background knowledge and thus his reading comprehen-

sion of the topic. In the second instance, a strongly negative opinion

of a passage topic appeared to affect the reader's willingness to con-

centrate and attend to the reading task. "Tuning out" by the reader

was reflected in a lower than usual prompted retelling percentage.

Such "tuning out" was pronounced for Readers 2 and 7. Here the influ-

ence of the reader's interest was short-term and confined to specific

selections.

Interest: A Dependent Variable

Readers were asked to rate their interest in the topic of each

passage as "very interesting," "somewhat interesting," or "not very

interesting" before and after reading. The data showed that eight of

the ten readers altered their opinions on 50% or more of the passages.

This finding paralleled the finding of Olshavsky (1977) that a reader's

interest is a dependent variable.

Interest and Prior Knowledge

Readers expressed a variety of reasons for changing their interest

rating in a passage. Only two reasons were expressed frequently enough

to emerge as patterns among the group. Interest in the informational

passages was in part dependent upon a reader's perception of his
knowledge of the subject. It appeared that there was an optimum amount of new information readers expected to learn. A selection tended to be more negatively rated if (1) the reader felt he had failed to learn anything new, or (2) if the selection was more technical or difficult than initially expected. This pattern crossed all three percentile groups.

Interest and Personal Identification with the Subject

There was considerable diversity among readers on the passage rated as "the most interesting" among the total. Five readers from the high, middle, and low groups chose recreational passages; five readers from the high, middle, and low groups chose core passages. When reasons given by readers were examined, high interest appeared to be related to the reader's ability to identify in a personal way with the subject. Identification occurred if the reader found the information useful, related to immediate experience, or intrinsically valuable. This pattern was evident among high, middle, and low percentile groups.

Reading Interest and the Least Proficient Readers

Readers 8 and 9 were two of the least proficient readers in the study sample. Both readers experienced difficulty with the academic passages read in this study. Both Readers 8 and 9 revealed, quite by accident, reading experiences unrelated to school materials. Reader 9 was an avid reader of True Story Magazine, carrying the latest edition
among assorted papers and books. Reader 8 was unable to choose the Elvis Presley passage as his recreational choice because he had already read it in the current Reader's Digest. These two readers demonstrated that reading proficiency and interest is a matter of degree. Both of these readers who had difficulty with the academic passages did read materials that fit their interest and background of experience.

**Implications and Recommendations**

This study was a qualitative analysis of the reading performance of only ten readers and, therefore, on its own, is limited in its implications for other high school populations. Nevertheless, findings of his study were compatible with the research of Carlson (1970), Chall (1947), and Rousch (1972). These studies with elementary and junior high students concluded that a reader's prior knowledge influenced his reading comprehension of a topic. In addition, the findings of this study supported the theoretical view of reading comprehension explained by Goodman (1976a), Rentel (1972), Smith (1976), and others. The following sections suggest general implications and recommendations for further research, instruction, and the minimum competency movement at the high school level.

**Future Research**

The following research suggestions are related to this study. Further research with high school students is suggested in order to
substantiate and extend the findings of this study.

1. There is a need to study the influence of prior knowledge on comprehending and prompted retelling performance with a larger, representative sample of high school students.

2. There is a need to determine the influence of prior knowledge on the percentile ranking of students by assessing prior knowledge of the passages within an entire standardized reading test.

3. There is a need to study the relationship between readers' prior knowledge and their ability to generalize and recall specific details of informational material.

Procedure for Informational Material

The findings of this study suggest additions to the procedures of miscue analysis when informational, expository materials are read by older students. It is recommended that (1) a component be included to systematically assess a reader's prior knowledge of passage content and (2) that the reader be prompted on the topics discussed in a passage following the retelling task as outlined in the RMI.

Implications for High School Teaching

The findings of this study underscore the necessity of evaluating the concept dimension of textbooks--the number of concepts, complexity of concepts, and the degree to which concepts are developed.
Readability formulas in present use fail to consider concept factors. The systematic means for evaluating the concept depth of textual material are yet to be developed. In the meantime, educators will have to rely on a basic question. What assumptions does a textbook make about a reader's background of knowledge and personal experience? Instructional experiences can then be planned to bridge the gap between reader and text.

The findings of this study suggest that factors related to readers--their personal information and unique interests and experiences--appear to be as important as factors pertaining to the reading material. Prior knowledge affected the comprehension of all subjects in this study, but particularly influenced the comprehension of the least proficient readers. The conviction that nonreaders exist in substantial numbers in high school classrooms needs reexamination. When prior knowledge was adequate, every student in this study was a minimally competent reader. At the same time, data indicated that reading is not a static ability. Reading proficiency is a matter of degree, largely influenced by the reader's background in a subject. Therefore, the issue of the concept gap is pertinent for readers at all stages of proficiency.

The findings of this study support the conviction that the involvement of content-area teachers is essential in school-wide reading improvement. It remains the responsibility of content teachers to bridge the information gap between readers' knowledge and textbook knowledge through teaching, i.e., demonstration, discussion,
experimentation, slides, films, and so forth. Instructional strategies traditionally regarded as "spoon-feeding the learner" are probably more accurately defined as good teaching. It is clear as well that there is a need for multi-text, multi-media materials varying in concept complexity to be available to students along with instructional guidance in their use. Departmental resource libraries are one approach to this problem since school systems continue to make single text adoptions for specific courses.

Ironically, it appears that teachers may be eliminating reading assignments from content courses. In informal interviewing, readers in all percentile groups indicated that they had few reading assignments. Advanced courses in content subjects, such as senior biology, made no use of text material, relying exclusively on the teacher's lecture. Rather than abandoning reading for learning, there is a need for appropriate and timely reading experiences to extend classroom learning.

**Instruction in the Secondary Reading Classroom**

Reading improvement courses are increasingly offered in high schools. A basic difficulty with this development is that reading is treated as a separate curriculum area. The teachers of content subjects are in many respects in the best position to assist the reader. However, the trend in high schools is in the direction of separate classroom instruction in reading. The findings of this study support the principle that regardless of course title, reading instruction
should always involve the reading of content in full textual context.

With the advent of the minimum competency movement, secondary reading courses for nonproficient readers are attempting to teach "survival reading skills." The reading of grocery lists, employment forms, and prescription labels, although useful, is not the same as reading textual material. In the attempt to provide remedial education, instruction in the strategies needed for the reading of extended discourse is likely to be ignored. It is possible to teach readers to successfully "bark" at printed signs and labels, but this is not the essence of functional literacy. There is a danger that such minimums will become reading maximums for the least proficient high school readers.

Developmental reading courses for more proficient readers in secondary schools tend to emphasize elusive reading "skills" in which the reader spends time completing a combination of the following: (1) brief paragraph exercises locating central ideas, specific facts, and so forth; (2) vocabulary and phonics exercises; (3) working with speed reading machinery or techniques. This type of instruction deemphasizes content and frequently destroys the context of discourse. As with the reading of forms and labels, such reading instruction does not fully support the reader's contribution by allowing him to make use of the interrelated, semantic, syntactic, and graphophonemic language systems. The following section briefly outlines the components of two secondary reading courses. The instructional strategies
suggested are compatible with a psycholinguistic perspective of the reading process.

Instructional programs for the nonproficient reader should include the following dimensions: (1) Miscue analysis in order to locate the nature and extent of a reader's difficulties. (2) Extended opportunities for sustained silent reading. Readers choose content and recreational books and magazines based on their interests and background. (3) Emphasis on strategy lessons which call the reader's attention to sampling, predicting, and confirmation dimensions of the reading process in natural language situations (see Reading Miscue Inventory, 1972). (4) Experience in generalizing main ideas and relevant details from textual materials of sufficient length to fully develop ideas around a central theme. The reader's background knowledge must be sufficient for the task. (5) Vocabulary development which concentrates on terms extracted from the recreational and informational materials read by students.

In study strategy courses for more proficient secondary readers, instruction should center around the materials used in regular classrooms rather than commercial workbooks bearing little resemblance to actual texts. (1) Students should be provided opportunities to extend content knowledge through available multimedia and a wide range of printed information. (2) Instructional experience in the use of textbook aids, surveying, outlining, summarizing, etc., should concentrate on the reader's own textbooks. (3) Rate flexibility in reading for study purposes, for test-taking, for general information, or recreation
should concentrate on materials actually used by students in and out of classrooms.

Only when reading evaluation and instruction are considered inseparable from content and context is comprehension improvement likely to become visible in secondary classrooms.

**Minimum Competency Movement**

The findings of this study suggested that it is necessary to evaluate the depth of a reader's content knowledge in assessing reading proficiency with material that is both informational and expository. It was found that a clearer profile of a reader's proficiency was obtained when students read a low prior knowledge passage as well as a passage in which prior knowledge was adequate. Providing the reader's background was sufficient, proficient readers made effective use of reading strategies. The minimum criteria were as follows: (1) comprehending approximating 60%, based on ten or more miscues; (2) prompted retelling approximating 50%. When the reader's prior knowledge was low, proficient readers continued to make moderately effective use of reading strategies: (1) comprehending approximately 40%, based on ten or more miscues; (2) prompted retelling approximating 40%.

The minimum competency movement in reading is likely to grow during the next decade in school systems across the country. The standards based on miscue analysis were useful in determining the reading proficiency of the high school seniors in this study. It is interesting to note that nine of the ten readers, regardless of percentile ranking on a standardized test, were determined to be
proficient readers according to standards based on miscue analysis. For six of the ten students, differences in prior knowledge on the core passages appeared to be the factor which accounted for variations in performance on passages rather than a difference in reading ability. For these readers, differences in test performance may have resulted from reading test passages based on specific content knowledge which was unfamiliar and uninteresting.

Four of the students in the sample were ranked in the third stanine on a subtest of reading comprehension. According to the test manual, ranking in the third stanine is an indication of below average reading ability. The test considered the reading ability of these readers to be the same. Only Reader 8 of this group was found to lack the proficiency to read all but the most familiar material. The data suggested that the reasons for the low percentile rank of Readers 7, 8, 9, and 10 were all quite different. Reader 9 lacked background information on the core passages. Reader 8 lacked background and effective processing strategies. Reader 7 had sufficient background knowledge but tended not to concentrate on deriving meaning on uninteresting passages. The result was low prompted retellings. Reader 10, one of the most effective readers in the sample, had slow, analytical test-taking strategies. Ironically, the reading "problem" of Readers 7, 9, and 10 resulted from the standardized test situation.

Gartner and Riessman (1977) summarize the dilemma in this way.

This testing format, like the organization of the school itself, rewards discipline, order, anxiety, directed learning, acceptance of traditional authority from above, concern with minute differences and detail, a great
emphasis on rote learning, and an ability to perform regardless of the level of one's interest in the task. Most of our standardized tests and, even more important, the testing situation itself reinforce these behaviors and, conversely, punish the child who has reasoned well but given the wrong answer or a different answer, the child who learns best what he/she is interested in, and the child who is uncomfortable with the testing situation and its requirements. Many children and adults perform in a totally different fashion in the real world, on problems with which they are intrinsically involved, independent of the constraints of the testing situation and its arbitrarily imposed limits. (p. 44)

The strength of miscue analysis is that it clarified the nature of students' reading proficiency that was clouded by a general test score. Miscue analysis is built around the best assumptions of criterion-referenced testing. The procedures provide a task within the reader's ability where speed is not a factor and where directions to the student are understandable. The reader's background knowledge is considered in selecting the passage to be read. In addition, assessment of comprehension does not rely on best-answer questions where the guess factor becomes significant as is the case with standardized tests.

As the minimum competency movement strengthens, the use of norm-referenced and criterion-referenced reading tests is likely to increase. These measures will serve to sort readers into two categories--those students meeting minimum standards and those who do not. The comprehending and prompted retelling performance of the low percentile readers in this study was very diverse. Only one of the four low percentile readers was a nonproficient reader. This finding suggests that it would be wise to use miscue analysis with all students failing to meet minimum competency standards on other measures.
The results of miscue analysis would separate those students who lack control of the reading process from those students who lack sufficient background in the subject of a passage or perform poorly in paper-and-pencil testing situations. The performance guidelines specified in this study could provide an alternative means of certifying minimum competence in reading. The addition of miscue analysis could reduce the unnecessarily large numbers of students who are predicted to fail reading competency tests.

The responsibility for further evaluation of low scoring students could be designated to personnel with expertise in the theory-base and procedures of miscue analysis. These teachers could form evaluation teams to perform two functions--assessment of the reading competence of low scoring students by miscue analysis and providing advice on instructional planning. Such teams could be shared by schools and school systems.

School districts implementing minimum competency standards will designate certain teachers and counselors with responsibility for testing and subsequent instructional planning regardless of the evaluation methods used. Therefore, the only major additional requirement suggested here is one of perspective on reading. Essential to miscue analysis is an understanding of the reading process. With miscue analysis, the standard of reading competence for secondary students is based on the quality of a reader's processing strategies as well as his retention ability with diverse reading passages. Confidence in these standards emerges when reading is understood as an integrated
language and thinking function in which factors related to the reader's language and background are considered as important as the demands of the reading task.
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APPENDICES
APPENDIX A

PRIOR KNOWLEDGE SURVEY QUESTIONS
PRIOR KNOWLEDGE SURVEY QUESTIONS

1. The digestion process begins in the
   a. stomach
   b. intestine
   c. esophagus
   d. mouth

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

2. The period of Western culture known as the Renaissance took place between
   a. 1400-1700 A.D.
   b. 1000-1300 A.D.
   c. 1700-1800 A.D.
   d. 1650-1950 A.D.

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

3. The Messiah is usually performed at
   a. Thanksgiving
   b. Christmas
   c. New Year's Eve
   d. none of the above

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure
4. The 1978 cars can use either regular or unleaded gasoline.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

5. The rays of the sun include invisible
   a. x-rays
   b. sonar rays
   c. ultraviolet rays
   d. gamma rays

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

6. Demography is the study of the democratic process.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

7. Chemical reactions always form a new substance.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure
8. During the period of the Renaissance, educated people became interested in the writings and art of

   a. ancient China
   b. ancient Phoenicia
   c. ancient Greece and Rome
   d. ancient Egypt and Mesopotomia

On this answer, I am

   a. very sure
   b. somewhat sure
   c. not very sure

9. An aria is a solo written for violin.

   a. correct
   b. incorrect

On this answer, I am

   a. very sure
   b. somewhat sure
   c. not very sure

10. "Jackrabbit starts" in cars increase the amount of gasoline used.

    a. correct
    b. incorrect

On this answer, I am

    a. very sure
    b. somewhat sure
    c. not very sure

11. Repeated exposure to the sun speeds up the aging of the skin.

    a. correct
    b. incorrect

On this answer, I am

    a. very sure
    b. somewhat sure
    c. not very sure
12. The number of citizens over 65 is
   a. increasing
   b. decreasing
   c. the same

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

13. Benedict's solution can be used to determine the presence of a
   a. sugar
   b. starch
   c. enzyme
   d. compound

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

14. "Humanism" was a view of life that suggested that
   a. life after death was more important than living in the present
   b. living in the present was more important than life after death

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

15. In music, counterpoint refers to
   a. a full, loud resonant sound
   b. a choral composition accompanied by piano
   c. an independent melody played above or below the central melody
   d. four-part harmony
On this answer, I am

   a. very sure
   b. somewhat sure
   c. not very sure

16. An idling car engine does not use gasoline.
   a. correct
   b. incorrect

On this answer, I am

   a. very sure
   b. somewhat sure
   c. not very sure

17. Clouds block the harmful rays of the sun.
   a. correct
   b. incorrect

On this answer, I am

   a. very sure
   b. somewhat sure
   c. not very sure

18. A generation consists of
   a. 50 years
   b. 30 years
   c. 10 years
   d. 70 years

On this answer, I am

   a. very sure
   b. somewhat sure
   c. not very sure

19. In chemistry, the presence of a precipitate refers to the amount of water in a compound.
   a. correct
   b. incorrect
On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

20. A **patron** of the arts is a person who

a. paints for a living
b. buys and sells paintings for a living
c. writes poetry for a living
d. financially supports other artists

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

21. The Medieval Period of history occurred from

a. 1500-1700 A.D.
b. 200-800 A.D.
c. 500-1500 A.D.
d. 1500-2000 A.D.

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

22. Frequent engine tuning improves gas mileage.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure
23. The ability to tan is determined by
   a. the type of skin you have
   b. the type of suntan lotion you use
   c. how long you stay in the sun
   d. all of the above

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

24. The period of the 1960's was a period of peace and calm among
    the citizens of this country.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

25. A beaker is another term that means the same as test tube.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

26. The paintings of the Renaissance were primarily sad, religious
    works lacking in color and beauty.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure
27. Handel and Bach are
   a. painters
   b. musicians
   c. poets
   d. sculptors

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

28. The catalytic converter on cars reduces
   a. engine knock
   b. exhaust pollutants
   c. engine friction
   d. spark plug wear

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

29. In tanning, the skin produces a pigment known as
   a. tytan
   b. carrotene
   c. resin
   d. melanin

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

30. Between 1950-1970, people retired from their jobs
   a. earlier than previous decades
   b. later than previous decades
   c. the same as previous decades
On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

31. A drop of iodine will turn blue-black on

a. sugar
b. compound
c. enzyme
d. starch

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

32. The word Renaissance means reawakening or rebirth.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

33. Baroque music is characterized by

a. contrast, complex structure, and powerful sound
b. simple harmony written for stringed quartets
c. unusual patterns for meter in voice parts

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure
34. Tires which "toe in" or "toe out" are properly aligned.
   a. correct
   b. incorrect

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

35. In order to prevent burning, the first time you go to the beach you should stay in the sun only
   a. 3 to 4 hours
   b. 1 to 2 hours
   c. 1/2 hour
   d. no more than six hours

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

36. Young people started the protest movements of the 1960's.
   a. correct
   b. incorrect

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

37. During the Renaissance, books became easier to obtain because of the invention of
   a. block carving
   b. paper
   c. ink
   d. movable type
On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

38. Glucose and maltose are examples of

a. sugar
b. starches
c. enzymes
d. solutions

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

39. In music, a fugue is made up of independent but related voice parts which enter one after another.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

40. In cars, a new air cleaner increases engine efficiency by mixing gasoline with clean air.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

41. Repeated exposure to the sun can cause skin cancer.

a. correct
b. incorrect
On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

42. Since 1900, the make-up of the population has changed.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

43. During the Renaissance, life improved for the peasants and laborers as well as the wealthy.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

44. An enzyme slows up a chemical reaction.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

45. In music, sonority refers to a

a. full, resonant sound
b. moderately loud sound
c. soft, gentle sound
On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

46. Emission control devices on new cars reduce the pollutants

a. carbon monoxide and hydrocarbons
b. nitrogen oxide and lead
c. sulphur dioxide
d. ozone and lead

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

47. The sun's harmful rays are stronger in August than they are in June.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

48. The phrase "generation gap" refers to the conflict between

a. brothers and sisters
b. old and young
c. educated and uneducated
d. none of the above

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure
49. The period known as the Renaissance began in
   a. America
   b. Far East
   c. Western Europe
   d. Asia

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

50. In chemistry, a suspension is another name for a chemical solution.
   a. correct
   b. incorrect

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

51. An oratorio is a musical piece which centers around
   a. a love story
   b. a tragic death
   c. a marriage feast
   d. a religious subject

On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

52. Underinflated tires cause unnecessary tire wear and gasoline waste.
   a. correct
   b. incorrect
On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

53. A sunscreen is a

a. hat which provides shade to the face
b. chemical agent which absorbs harmful rays
c. newly developed beach umbrella
d. shade for screened porches

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

54. The structure of a normally distributed population can be represented by the figure of a

a. pyramid
b. cone
c. cylinder
d. cube

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure

55. The Renaissance Period came

a. after a depressing period of poverty and lack of education
b. before a depressing period of poverty and lack of education
c. during a period of poverty and lack of education

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure
56. Sugars turn into starch during digestion.
   a. correct
   b. incorrect

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

57. A cantata is an elaborate melody sung by a single voice.
   a. correct
   b. incorrect

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

58. Unleaded gasoline should have an average octane number of at least
   a. 63
   b. 94
   c. 47
   d. 87

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure

59. Using a suntan lotion speeds up the tanning of the skin.
   a. correct
   b. incorrect

   On this answer, I am
   a. very sure
   b. somewhat sure
   c. not very sure
60. At the turn of the twentieth century, many young people had grandparents who were alive and active.

a. correct
b. incorrect

On this answer, I am

a. very sure
b. somewhat sure
c. not very sure
APPENDIX B

PASSAGES
Core Passage: "You and the Sun and Those Tanning Lotions"
Length: 1,105 words
Content: The passage discusses the harmful effects of exposure to the sun, the factors which determine one's ability to tan, precautions that can be taken to prevent burning, and the effectiveness of suntan lotion products.

Content-Specific Terms:
1. ultraviolet radiation
2. melanin pigments
3. genetic determination
4. opaque substances
5. sunblock
6. sunscreen
7. tannic acid, zinc oxide, titanium dioxide, dihydroxyacetone
8. inert ingredients

General Terms:
1. paucity of information
2. cumulative effect

Style: Sentence structure is predictable; information is organized clearly; concepts are explained and defined.

Sample paragraphs selected from the middle sections of the passage:

How much sun is too much depends largely on // your skin. Fair-haired persons with light skin and // blue eyes are more likely to burn than those who are // dark-haired and dark-skinned. Some people never // tan; some tan very quickly. Most people burn mod- // erately at first and then tan moderately. Some com- // monly used drugs may

---

1Slash marks indicate the end of a line in the original text.
make you more sensitive to // burning than you would be normally. And some peo- // ple may even have an allergic reaction to an antisun- // burn preparation (p. 19).

Although sunscreens vary in content and effective- // ness, you can't find out much about them by reading // their labels. At present, manufacturers are obliged // to list only active ingredients. They don't have to // state the concentration or name inert ingredients, the // other factors on which the effectiveness of a product // depends (p. 20).
Core Passage: "Generation Gap"

Source: Reading comprehension section of a reading achievement test for high school and community college students.

Length: 689 words

Content: The passage discusses the origin of the generation gaps that exist between the young, middle-aged, and old in society. The origins of these conflicts are explained in terms of specific changes in demographic, social, and economic factors.

Content-Specific Terms: 1. generation gap 2. demographic revolution 3. population pyramid 4. technological progress

Style: The use of multiple clauses and parenthetical expressions result in fairly complex sentence structures. A significant amount of information is presented, yet the information is organized and concepts are explained.

Sample paragraph selected from the middle section of the passage:

The condition of aging people introduces yet another // example of how the change to the timing of events affects // generational relations. In the past, advanced age has // usually been closely associated with the ending of work // effort. Now this relationship may no longer hold. It has // been pointed out by Seymour Wolfbein, for example, that // for the first time in history, the working life of men in the // United States decreased in the decade between 1950 and // 1960. The reason for this turns out to be early retirement, // provoked partly, it seems, by the necessity of providing a // chance for upward advancement on the part of younger // workers. This situation may, in
turn, lead to generation // conflict between the latter and the older employees, inse- // cure about what retirement may bring.
Core Passage: "Important Facts You Should Know About Gasoline Mileage and How to Improve It"


Length: 597 words

Content: The passage discusses information related to car maintenance and driving strategies that affect gasoline mileage. The content includes information already familiar to the public as well as technical information on the benefits of unleaded gasoline and the structure and function of the catalytic converter.

Content-Specific Terms: 1. emission control system  
2. octane number  
3. catalytic converter  
4. catalytic material--platinum and palladium  
5. tire "toe in" and "toe out"  
6. combustion chamber deposits

Style: Sentence structure is predictable following a subject, verb, object pattern. Information is presented in an organized format; however, twelve topics are briefly discussed making the information load of the passage heavy. In addition, technical concepts such as octane number are not explained.

Sample paragraphs selected from the middle portions of the passage:

Stop-And-Start Driving

Frequent stops and starts during a trip really cut down on your miles per gallon. Plan even your short shopping trips to take advantage of through streets to avoid traffic lights. Pace your driving like the professional drivers to avoid unnecessary stops (pp. 5-21).
Catalytic Converter

The catalytic converter is an emission control device added to the exhaust system to reduce hydrocarbon and carbon monoxide pollutants from the exhaust gas stream. The converter contains beads which are coated with a catalytic material containing platinum and palladium.

Use of the catalytic converter has the advantage of allowing the engine to be re-tuned for improved fuel economy and drive-ability (pp. 5-22).
"Renaissance"

A high school world history text:
Bowes, John C. The Human Achievement.

1,641 words

The passage describes the cultural advancements in fifteenth century Italy during the Renaissance. The passage focuses on a description of the following topics: humanistic philosophy and education, Renaissance art and architecture, and the development and influence of the printing press.

1. Renaissance
2. humanism
3. humanistic education
4. classical culture
5. classical architecture
6. patronage system

The sentence structure is predictable. Information is organized into units according to each topic discussed. All concepts (i.e., humanistic education) are fully developed by lengthy description, definitions, and examples.

Sample paragraphs selected from the middle sections of the passage:

A new philosophy. The humanists believed that the knowledge of how men should live in this world could be found in the works of the ancient writers. They thought that everyone who wanted to live more fully should be able to read them for himself. Hence, the study of the Latin and Greek languages and literature was essential. However, the humanists did not think that a knowledge of Greek and Latin and an understanding of classical works was all that was necessary. They had discovered the Greek ideal of...
perfect man, and they tried to follow it. They wanted their bodies made strong and active by physical exercise. They also wanted to learn the arts that made life gayer and more pleasant—singing, dancing, and playing musical instruments. What the humanists wanted to do was to create a well-rounded man who appreciated art and intellectual challenge, who was familiar with music and literature, and who was a sportsman or athlete. A complete, or liberal, education became desirable (p. 152).

The printing press, a great advance for man. There were many useful and practical inventions during the Renaissance, but the development of the printing press was the one that probably had the deepest impact on mankind. Without it, the new ideas of the Renaissance would probably have had little effect on European civilization, or their effect would have been long delayed. Ideas and knowledge were spread chiefly by books in the early Middle Ages, but books were few and expensive. They became less expensive by the end of the fourteenth century, when there were more people devoted to copying. But the hand process was long and tedious (p. 155).
Challenge Passage: "Oratorio"

Source: Standardized reading test for high school and entering college students.

Length: 287 words

Content: The passage describes the origin and musical form of the oratorio. Handel's Messiah is described as an example of the oratorio and is compared to works by Bach.


General Terms: 1. nuance 2. compendium

Style: Sentence structure is fairly complex as a result of multiple clauses and many concept terms. None of the concepts are fully explained. Due to the brevity of the passage, the concept load is very heavy.

Sample paragraph from the passage:

Handel's Messiah, familiar to all, and one of the most celebrated works ever composed, not only exemplifies the oratorio but is a treasure house of musical riches and a compendium of baroque techniques of composition. As a rule, we find Handel's music less dense than that of Bach; Handel's counterpoint is more likely to give way
to massive effects of sonority and brilliant passage-work; the intertwining of contrapuntal lines is more loosely carried out. // Handel more than makes up for this by a wonderful sense for the dramatic nuance, by the // elegance of his melodic lines, and by the brilliance and power of his sonorities. All these are // illustrated in the Messiah, and, lest we overlook his contrapuntal skill, one of the most impressive // movements of all is the fugue And With His Stripes.
Recreational and Story Passages:


APPENDIX C

RETELLING GUIDES: CORE PASSAGES
Generalizations (60 points)

1. The sun can be harmful.

2. The length of time a person can stay in the sun varies according to a number of factors.

3. The tanning process involves the gradual production of skin pigment.

4. Protection from the sun is possible.

5. Suntan lotions are not properly labeled.

6. Some preparations make false claims.

Specifics (40 points; 2 points per lettered item)

1. harmful effects
   a. ultraviolet rays
   b. aging
   c. skin cancer

2. factors affecting length of exposure
   a. geographic--closeness to Equator
   b. time of day or year
   c. type of skin--fair versus dark

3. tanning process
   a. ability to tan is determined genetically
   b. skin produces melanin pigments

4. protection from burning
   a. gradual exposure
   b. tightly woven clothing
   c. umbrella--partial protection
   d. sun blocks
   e. sunscreens
   f. apply sunscreens an hour before exposure
   g. reapply after swimming
5. **labeling of lotions**
   a. only active ingredients included
   b. proposed by FDA—length of safe exposure to be specified

6. **false claims**
   a. lotions increase rate of tanning
   b. dyes which stain the skin offer protection
   c. oils and tanning butters increase tanning
Prompted Retelling Probes: Suntan Lotions Passage

The article discussed:

1. the harmful effects of the sun
2. factors which determine the length of time you can stay in the sun
3. the tanning process—what happens when the skin tans
4. protecting your skin from the sun
5. labeling of suntan lotion packages
6. false claims made about suntan lotions
Retelling Guide: Generation Gap Passage

Generalizations (60 points)

1. There has been a population revolution.
2. The middle-aged group is shrinking in comparison to the young and old.
3. The timing of major life-time events has increased conflict among the generations.
4. The generation gap is not new and will likely increase.

Specifics (40 points; 3 points per lettered item)

1. population revolution
   a. historically two generations; today three or four
   b. elderly (65 or over) on the increase
   c. young (under 18) on the increase

2. middle-aged group decreasing
   a. typical population structure a pyramid
   b. pinching of the pyramid has occurred
   c. fewer middle-aged persons support young and old

3. shift in timing of events
   a. fathers remain alive longer
   b. early marriage
   c. parents dependent on children
   d. early retirement

4. generation gap exists
   a. rapid social and technological change
   b. protest movements by young
   c. employment for young and middle-aged must be found
Prompted Retelling Probes: Generation Gap Passage

The article discussed:

1. the population revolution--the change in the make-up of the population
2. middle-aged persons--numbers and responsibilities
3. timing of major life events and conflict
4. conclusions about the generation gap
Retelling Guide: Gas Mileage Passage

Generalizations (60 points)

1. How you drive and maintain your car affects gas mileage.

2. Unleaded gasoline is required for the proper function of the car.

3. The catalytic converter is an emission control device.

Specifics (40 points; 2.5 points per lettered item)

1. type of driving
   a. quick starts
   b. stop and start driving
   c. long idling periods
   d. sudden stopping

2. car maintenance
   a. frequent lubrication
   b. change of air cleaner
   c. engine tuning
   d. excess weight
   e. tire inflation
   f. wheel alignment

3. unleaded fuel
   a. average octane number 87
   b. prevents spark plug fouling
   c. reduces deposits in combustion chamber
   d. prevents lead contamination of catalytic converter

4. catalytic converter
   a. reduces carbon monoxide and hydrocarbons in exhaust
   b. catalytic material contains platinum and palladium
Prompted Retelling Probes: Gas Mileage Passage

The article discussed:

1. how you can drive to save gas
2. car maintenance and saving gas
3. the type of fuel to be used
4. benefits of unleaded gasoline
5. catalytic converter
Retelling Guide: Renaissance Passage

Generalizations (60 points)

1. Humanistic education emphasized the classical cultures of Greece and Rome.
2. Renaissance art became a more direct representative of nature.
3. Architecture followed the design of Greece and Rome.
4. The printing press was a significant advance.
5. The cultural influence was confined to the wealthy of society.
6. The Renaissance began in Northern Europe during the fifteenth century.

Specifics (40 points; 2 points per lettered item)

1. humanistic education
   a. knowledge of Greek and Latin
   b. physical fitness
   c. singing, dancing, playing instruments
   d. art and literature

2. art
   a. color and shading
   b. emotion
   c. perspective
   d. painting and sculpture displayed
   e. craftsmanship encouraged

3. architecture
   a. symmetrical design
   b. use of dome and columns
   c. gradual transition to new forms
4. **printing press**
   a. moveable type
   b. rediscovery of old Chinese process
   c. Gutenberg—father of printing
   d. Gutenberg Bible—Germany
   e. popularized native tongues
   f. ideas spread

5. **groups affected**
   a. wealthy—education, beauty, libraries
   b. peasant life continued to be hard
Prompted Retelling Probes: Renaissance

The article discussed:

1. humanistic education
2. Renaissance art
3. Renaissance architecture
4. printing press--invention and importance
5. groups in society affected
6. area of the world influenced
APPENDIX D

PRIOR KNOWLEDGE, COMPREHENDING, AND PROMPTED RETELLING PERFORMANCE FOR ALL READERS ON ASSIGNED PASSAGES
PRIOR KNOWLEDGE, COMPREHENDING, AND PROMPTED RETELLING PERFORMANCE FOR ALL READERS ON ASSIGNED PASSAGES

<table>
<thead>
<tr>
<th>Reader</th>
<th>Oratorio</th>
<th>Renaissance</th>
<th>Generation Gap</th>
<th>Gas Mileage</th>
<th>Suntan Lotions</th>
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Prior Knowledge (P.K.): High -- 70% - 100%
Moderate -- 30% - 65%
Low -- 0% - 25%

Comprehending (Comp.)
Prompted Retelling (P. Ret.)

*Reader made less than 10 miscues on the passage.

1See Chapter III for an explanation of omitted passages.