1987

The Effects of Semantic Mapping Instruction on the Text-External Inferences of College Developmental Readers.

Debbie Guice Longman
Louisiana State University and Agricultural & Mechanical College

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Longman, Debbie Guice, Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1987
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THE EFFECTS OF SEMANTIC MAPPING INSTRUCTION
ON THE TEXT-EXTERNAL INFERENCEs
OF COLLEGE DEVELOPMENTAL READERS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

Department of Curriculum and Instruction

by

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August 1987
ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to Dr. Alden J. Moe, my major professor, who has continually supported and motivated me in all my professional endeavors and to Dr. Ray Buss, my minor professor, whose prompt and dedicated assistance has been invaluable. In addition, for the continual support and affection I have received from Dr. Kaylene Gebert, I express my gratitude. Dr. Moe, Dr. Buss, and Dr. Gebert are my mentors and my friends.

Special thanks goes to the members of my dissertation committee, Dr. John Readence, Dr. David England, and Dr. Patricia Edwards. For their input and diligence, I am appreciative.

I sincerely appreciate the cooperation and support I received from the Louisiana State University Junior Division, particularly from Dr. Carol Bader and the faculty of the Reading Lab. Their encouragement and assistance made this endeavor possible.

A very special note of thanks goes to all my friends, but especially to three. First, Ann Fitzmorris—who sat through innumerable reading and two statistics courses and many study sessions with me—cajoled, threatened, and otherwise encouraged me when the going got rough. Second, Eleanor Howes—who helped my husband write his thesis, aided in the gathering of my research data, and edited my
dissertation—has long been a friend on whom I could depend without hesitation. Last, but by no means least, Rhonda Atkinson, my co-author, my colleague, my dear friend, encouraged me to pursue this degree and supported me every step of the way. In her pursuit of her own Ph.D., she trailblazed a path for me, showing me the mud holes to avoid. Words cannot express the love and gratitude I feel for Ann, Eleanor, and Rhonda.

Finally, for their encouragement and support, I gratefully acknowledge my Guice and Longman families. For their constant love, patience, and faith, I especially thank my husband, Richard, and my parents, Frlley and Lillian Guice, and brother, Keith. Without them... No, there could be no without them.
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ABSTRACT

In reading, text-external inferences are made when the reader integrates schemata with text information. Because inference generation occurs within the reader, background knowledge and reading skill affect inferential comprehension. This research consists of two studies to determine, first, whether college developmental and non-developmental readers activate prior knowledge when reading and making inferences (Experiment One) and, second, if direct instruction in semantic mapping increases activation of prior knowledge by developmental readers. The results of Experiment One indicated non-developmental readers with high prior knowledge use prior knowledge more than developmental subjects and that developmental subjects with high prior knowledge use that knowledge to compensate for lesser reading ability. Experiment Two indicated that semantic mapping did not increase the degree to which developmental readers activate prior knowledge, at least when measured by the methods of this study. Findings indicate that developmental educators need to place increased efforts in adding to students' pool of available background knowledge and on teaching them to activate prior knowledge before reading. Further research with semantic mapping is warranted.
CHAPTER I
INTRODUCTION TO THE PROBLEM

Comprehension involves translating a set of sentences into a chain of interrelated concepts. Inference generation is an essential part of building this chain. Readers make inferences by seeing relations between text information and the schemata (background information) they have in memory. The role of these schemata is to specify how readers' prior knowledge interacts with the text and how information must be organized to support this interaction (Monteith, 1979). Trabasso (1981) stated that if readers fail to perceive or understand these interactions then activities like the following are not possible: (a) recalling or summarizing the story; (b) finding main ideas; (c) answering questions about causes, consequences, or facts; (d) paraphrasing events; and (e) identifying points of view.

Readers less sophisticated in skill and/or world knowledge often find their comprehension disrupted and ineffective (Mavrogenes, 1983). Likewise, if readers possess adequate schemata but fail to activate or use them when reading, comprehension also is adversely affected (Bransford & Johnson, 1972). Almost by definition, college developmental readers are students who lack either skill (Roueche & Armes, 1980) or world knowledge (Drabin-Partenio
Maloney, 1982). Some studies have examined the idea of increasing the amount of background knowledge from which a college developmental reader has to draw (Crafton, 1983; Stevens, 1982), and others have examined the possibility that these readers possess knowledge they fail either to activate or to use to make inferences between explicit and implicit information (Crafton, 1983; Hansen, 1981; Raphael & Pearson, 1982).

Instructional strategies which will aid college developmental students in mastering the skills necessary for college-level work are needed. Such instruction needs to:

(a) assure students that its purpose is to improve their thinking and learning skills; (b) provide non-punitive feedback and evaluation; (c) provide opportunities for students to process written and spoken information; (d) yield study guides which set purposes, supply background information, and identify major concepts; (e) teach students to define terms and concepts through their own words and experiences; (f) teach thinking skills like breaking a larger concept into its component parts; (g) help students learn to relate and integrate diverse elements of a concept to aid understanding; and (h) use writing as a tool for helping students learn to evaluate, clarify, and expand upon concepts (Stephens & Weaver, 1985). Direct instruction in semantic mapping seems to fill these requirements. Because semantic mapping seeks to make the student self-directed in
practicing these skills, it fosters independence, confidence, and active learning.

Summary of Related Research

Bartlett (1932) initially proposed that underlying all stories is a schema, a set of expectations about text structure and content. Schema research has become a major factor in reading research (Anderson & Pearson, 1984). A schema represents generic knowledge and summarizes what is accepted as true or common to any concept (Anderson, Spiro, & Anderson, 1977; Rumelhart, 1980). Schema-theoretic research indicates that comprehension largely depends on a reader's schemata (Crowder, 1982). Essential to comprehension is inference generation (Bridge, Tierney, & Cera, 1977; Schank & Abelson, 1975; Trabasso & Nicholas, 1977). Two types of schemata correspond with inference generation. Text-specific, or textual-schematic, are inferences based on information stated explicitly in the text. Text external, or content schematic, are inferences which interrelate schemata or connect them with new information (Anderson, Pichert, & Shirey, 1983; Frederiksen, 1977; Pearson & Johnson, 1978; Rubin, Bruce, & Brow, 1976).

Anderson and Pearson (1984) indicate that the ability to make inferences, mental connections between the reader's schemata and the text, is a key component in a
schema-theoretic approach to reading comprehension.
Inferences are diverse in type (Anderson & Pearson, 1984; Trabasso, 1981; Warren, Nicholas, & Trabasso, 1979) and function (Flood, 1978). The inferences students make during reading are necessary for complete understanding. Often less skilled readers experience difficulty in making inferences (Anderson & Pearson, 1984; Bransford, et al., 1982; Carr, Dewitz, & Patberg, 1983). This difficulty arises for a variety of reasons including: (a) an unavailability of background knowledge (Chiesi, Spillich, & Voss, 1979; Omanson, Warren, & Trabasso, 1978; Pearson, Hansen, & Gordon, 1979; Townsend, 1980; Wilson & Hammill, 1982); (b) an inability to activate and use schemata (Bridge & Tierney, 1981; Feeley & Wepner, 1985; Holmes, 1983; Wilson, 1979); and (c) an inability to organize information (Cromer, 1970; Marshall, 1976).

Schema-activation methods fall into two classifications: (a) teacher-directed and (b) student-directed. Because students seem to remember better what they do rather than what they have heard or seen (Craik & Tulving, 1975), activation methods which are student-driven provide opportunities for active learning and are more effective (Brown, Smiley, Day, Townsend, & Lawton, 1977; Duffy, 1981; Duffy, Roehler, & Mason, 1984; Smith-Burke, 1982). Research by Crafton (1983), Hansen (1981), Langer and Niccolich (1981), Raphael and Pearson
Advance organizers, particularly effective with less capable students (Sledge, 1970), enhance learning because: (a) They help students organize and clarify thinking before learning, (b) they activate or develop schemata, and (c) they aid students in inferencing (Ausubel, 1968). Their effectiveness has been examined by Bean, Singer, and Cowen (1985); Carr, Dewitz, and Patberg (1983); and Dewitz, Carr, and Patberg, 1987. One form of advance organizer, the semantic map, permits students to actively engage in the activation and organization of their schemata before and after reading (Armbruster & Anderson, 1980; Hanf, 1971; Merritt, Prior, & Grugeon, 1977; Novak & Gowin, 1984). Studies considering the effectiveness of mapping either examined the general efficacy of the procedure (Armbruster & Anderson, 1980; Langer, 1981, 1984; Pittelman, Levin, & Johnson, 1985; Sweetland & Risko, 1986) or compared mapping with more traditional instructional approaches (Carter, 1984; Denner, 1986; Johnson, Pittelman, Toms-Bronowski, & Levin, 1984; Jones, 1984; Prater & Terry (1985); Sinatra, Stahl-Gemake, & Berg, 1984).

Although much research indicates that, in terms of prior knowledge, "more is better" (Lipson, 1982, p. 244), other studies indicate this is not necessarily the case (Alvermann, Smith, & Readence, 1985; Hynd & Alvermann,
In summary, schema-theoretic approaches to comprehension include the assumption that inferencing ability is essential to comprehension. Less skilled
readers, like post-secondary developmental students, often experience difficulty in making the bridging connections between schemata and information in the text. These difficulties result from: (a) unavailability of background knowledge, (b) inability to activate and use schemata, and/or (c) inability to organize information. Semantic mapping instruction allows students to activate schemata, graphically construct relationships between concepts, and organize information for recall. The proposed research examined whether instruction in semantic mapping facilitates inferencing skills in college developmental readers.

Rationale for the Study

Inferences, as defined by Hayakawa (1939), are statements about the unknown based on what is known. In reading, inferences are made when readers integrate schemata with text information (Meyer, 1981). Because inference generation occurs within the reader (Fisher & Peters, 1981; Langer, 1982), background knowledge and prerequisite reading skills affect comprehension. Thus, if readers either fail to have adequate prior knowledge or fail to activate that knowledge, integrate it with new information, and/or organize it for recall, inferential comprehension is lessened.
Necessary, then, for less sophisticated readers is instruction which helps students develop an understanding of the multiple layers of meanings and concepts a text contains, how these are interrelated, and how to apply new information to them (Stephens & Weaver, 1985). Semantic mapping, a strategy which provides activation of schemata, organization of concepts and reflective thinking before and after reading, enables students to practice these inferencing skills. Since semantic mapping is self-directed, its carry-over into other academic settings is likely (Smith-Burke, 1982).

The proposed research encompasses two studies. Experiment One responds to Lipson's (1982) question of how students use the information they possess in making inferences while reading. Experiment Two attempts to answer Pearson, Hansen, and Gallagher's (1979) call for instructional studies which provide strategies for helping students make inferences—in this case, a mapping strategy that helps students graphically make connections between concepts (Irwin, 1986).

The proposed research differs from previous research because it attempts, in the first experiment, to demonstrate that college developmental students fail to use the information they know about a topic as effectively as non-developmental college readers. The study also attempts to determine if developmental students make text-external
inferences as effectively as non-developmental readers. The second experiment attempts to demonstrate that college developmental readers who receive instruction in semantic mapping will use background information and make text-external inferences more effectively than similar students who do not receive instruction in semantic mapping.

The Research Questions

Four questions guide this research:

1. Do college developmental and non-developmental readers retrieve text-activated prior knowledge to the same extent when reading?

2. Do college developmental and non-developmental readers use text-activated prior knowledge to make inferences?

3. Can instruction in semantic mapping increase the degree to which college developmental readers use text-activated prior knowledge?

4. Can instruction in semantic mapping increase the degree to which college developmental readers make inferences?
Research Hypotheses

The purpose of the first study was to test the following hypotheses:

1. There will be differences in scriptal knowledge posttest scores for college developmental readers as compared with non-developmental readers with high and low prior knowledge of the target topic.

2. Inferential scores can be predicted from reader group, scriptal knowledge posttest scores, and the interaction of these two variables.

The purpose of the second study was to test the following hypotheses:

3. Instruction in semantic mapping will increase the scriptal knowledge posttest scores for college developmental readers as compared with a control group.

4. Inferential scores can be predicted from instructional group, scriptal knowledge posttest scores, and the interaction of these two variables.

Significance of the Problem

This study significantly impacts two areas of educational research: (a) schema theory, specifically inferential comprehension instruction; and (b) post-secondary developmental students. Rumelhart and Ortony
(1977) indicate that schemata are formed by networks of interrelationships between concepts. They see the purpose of instruction as communication of these relationships from the teacher to the student. If this communication fails to take place, the failure results from the students': (a) inadequate background knowledge and/or (b) ability to effectively access the correct schema. An assumption on which this study is based is that a communication similar to the one described by Rumelhart and Ortony also takes place between the reader and the text. The form of this communication is an inference, a connection which bridges gaps between text information and prior knowledge. In addition to the sources identified by Rumelhart and Ortony, difficulties in inferencing arise from students' inadequate organizational skills. This study addresses the issue of which is more crucial in making corrective inferences: (a) prior knowledge or (b) skill development.

This study's comparison of semantic mapping and traditional instruction will provide information about the efficacy of these two procedures in teaching inferences. In this research, semantic mapping instruction takes the form of concept mapping proposed by Novak and Gowin (1984) and follows the steps of direct instruction indicated by Pearson and Gallagher (1983). Mapping is compared with the same format of direct instruction using pre-packaged inferencing materials.
Instruction for post-secondary college developmental students comprises the second area which may be explored by this study. If semantic mapping instruction proves to be the more effective strategy for teaching inferences, instruction of college developmental readers will be affected in two ways. First, because college developmental readers have difficulty with higher-level thinking skills (Chaffee, 1984; Sotiriou, 1984), semantic mapping instruction which helps them to activate, relate, and organize schemata will increase their chances of understanding college-level materials. Second, because adult learners have difficulty learning information they have not dealt with concretely, especially when the learning involves integration or synthesis, selection, inference, memory, and verbal expression (Whyte, 1981), semantic mapping instruction may provide opportunities for concrete manipulation of abstract concepts.

Definitions of Related Terms

The following terms are defined for the purpose of this study:

1. Background knowledge/prior knowledge--knowledge and experience a person brings to reading (Langer, 1984).

2. Developmental students--students reading below 11.0 as measured by the Nelson Denny Reading Test (Brown,
Bennett, & Hanna, 1981) who are enrolled in post-secondary developmental reading at Louisiana State University.

3. Concept maps—semantic maps which show general and specific concepts hierarchically and the links between the concepts (Novak & Gowin, 1984).

4. Graphic organizers—visual displays of concepts contained in a passage and of the relationships between those ideas (Smith, 1986).

5. Schema (singular)/schemata (plural)—a generalized description, plan, or cognitive structure; a conceptual system for understanding information (Harris & Hodges, 1981).

6. Text-external inferences—infereces generated from a reader's background knowledge (Frederiksen, 1977; Rubin, Bruce, & Brown, 1976).

7. Schemata activation—the process of bringing to a reader's attention all parts of a schema (Anderson & Pearson, 1984).

8. Semantic maps—diagrams which help students graphically organize and relate concepts (Heimlich & Pittelman, 1986).

9. Self-directed schemata activation—a student-initiated and student-controlled process of bringing all parts of a schema to the mind's attention.

10. Text-activated prior knowledge—the background information students retrieve about a topic as a result of
reading a passage about that topic. In this study, this knowledge is measured by scriptal posttest questions.
CHAPTER II

REVIEW OF THE LITERATURE

According to Fisher and Peters (1981), the study of text-related and schema-related inferencing serves as an effective measure for understanding the comprehension process. The difficulties experienced by less fluent readers in using their prior knowledge of a topic to increase understanding, in integrating information and in recalling information in an organized manner (Bridge, Tierney, & Cera, 1977; Marshall, 1977) indicate the need for an instructional activity which teaches these skills. This chapter presents evidence to support this conclusion by summarizing research in these areas: (a) the effects of schemata on inferencing; (b) inferencing; (c) student-directed schemata activation and schemata use; (d) graphic organizers, specifically semantic mapping; (e) schemata interference; and (f) college developmental students.

Schema Theory as a Background for Inference-making

An Historical Perspective

The relationship of schemata to reading comprehension has long been acknowledged. Based on ideas in Gestalt
psychology, Bartlett (1932) let subjects in England read an American Indian folktale "The War of the Ghosts" and tested their recall of the story. He reported that English readers cast their recall and interpretation of the folktale into a framework more consistent with an English setting. Bartlett proposed that underlying all stories was a schema, a set of expectations about the structure and content of the material. Bartlett's notion of a schema finds its basis in work done by Kant. Kant defined a schema as a rule by which future experiences and concepts are judged.

Ausubel's (1963) "ideational scaffolding hypothesis" first related schema theory to reading research. However, a period of twelve years passed before Rumelhart (1975) sparked new interest and controversy about schema theory (Anderson & Pearson, 1984). Subsequently, schema theory has become "the driving force behind empirical investigations of the basic processes in reading" (Anderson & Pearson, 1984, p. 259).

**Definition of Schemata**

As a result of the application of schema theory to reading research (Ausubel, 1963), the information a reader has available in memory for use when reading has been called frames (Minsky, 1975), scripts (Schank & Abelson, 1977), plans (Miller, Galanter, & Pribram, 1960), parsers (Rumelhart, 1980), files (Lee, 1984) and plays (Rumelhart,
1980). Probably the most common name for these structures is, however, the one used by Bartlett--schema (singular) or schemata (plural). Schemata are defined as generic characterizations of people, places, events, and ideas. (Anderson, Spiro, & Anderson, 1977). A schema encompasses all our knowledge about a specific concept and the network of interrelations formed among other concepts (Rumelhart, 1980). Comprehension occurs as a result of the inferences a reader makes between schemata and the text (Anderson & Pearson, 1984).

According to Rumelhart and Ortony (1977), schemata have four common features. These include the following: (a) Schemata have variables, (b) schemata can be embedded, one within another, (c) schemata represent all levels of abstract knowledge, and (d) schemata represent knowledge rather than definitions. Rumelhart (1980) added two more characteristics to describe schemata: (a) schemata are active processes and (b) schemata attempt to determine the goodness of fit of data being processed.

Types of Schemata and their Role in Inferencing

Pearson and Johnson (1978) identified three types of questions and corresponding locations, two of which correspond with types of text-external inferences. These two include: (a) textually implicit questions whose answers require integration of two or more sentences and (b)
scriptally implicit questions whose answers come from the reader's schemata. Anderson, Pichert, and Shirey (1983) identified two general kinds of schemata used to read and recall text. Textual schemata provide an outline for the material students read. Content schemata consist of the reader's knowledge and perceptions about the world. They encompass the background knowledge readers bring to the material they are reading. These types correspond to Rubin, Bruce, and Brown's (1976) and Frederiksen's (1977) classifications of inferences as text-specific and text-external.

Anderson, Pichert, and Shirey indicated that although textual schemata and content schemata are different, both are used by and are important to a reader. However, they view content schemata as being more important to reading comprehension than textual schemata. Research by Nicholson and Imlach (1981) confirmed the conclusion of Anderson, Pichert, and Shirey. In two experiments with 8-year-old students, researchers attempted to discover how text and prior knowledge affect inferences made during reading. The first study altered text structure and content as well as text familiarity and accessibility. The second study added a causal preference. Results indicated that text information and background knowledge compete for priority in comprehension, but that students often resorted to prior
knowledge to answer inference questions even when the text explicitly stated needed information.

Summary

Anderson (1982) indicated that the schemata a student has available determine to a great extent what will be learned from a text. Comprehension, then, occurs when readers make inferences based on what they know from prior knowledge and what they find in the text. Thus, the reader has available two forms of schemata to aid comprehension. These include text-specific, or textual, which deal with the structure of text, and text-external, or content, which indicate a reader's background knowledge. Research (Anderson, Pichert, & Shirey, 1983; Nicholson & Imlach, 1981) indicates that schema-based knowledge is more important to reading comprehension and inferencing than is textual knowledge.

Inferencing

Bridging inferences—mental jumps between what is stated in a passage and prior knowledge—comprises one of the key steps in a schema-theoretic account of comprehension (Anderson & Pearson, 1984). Although these inferences depend on the text-external schemata a reader possesses, less sophisticated readers are more likely to have
difficulty making the bridges necessary to interweave
text-specific and text-external schemata into a unified,
understandable structure (Anderson & Pearson, 1984;
Bransford et al., 1982; Carr, Dewitz, & Patberg, 1983).
This is caused by the diversity and complexity of the
necessary inferences.

Types and Functions of Inferences

Essential to understanding inferences is an examination
of what they are and what they do. Trabasso (1981) stated
that inferences either (a) specify semantic and/or logical
relations between propositions or events or (b) interject
missing information necessary for forming these relations.
Based on Schank's (1975) theory of language and memory,
Warren, Nicholas, and Trabasso (1979) called the first type
of inference text-connecting and the second slot-filling.

According to Anderson and Pearson (1984), readers make
at least four types of inferences. First, inferences aid
the reader in deciding which schema to activate to process a
text. Second, inferences play a role in the instantiation
of slots within a selected schema. This occurs when a
reader uses given information to infer other characteristics
or concepts. Third, readers often make inferences when
faced with a concept they know nothing about or which is
inadequately explained. Fourth, a reader makes inferences
by assigning default values. This form of inferencing is
almost routine in comprehension (Anderson & Pearson, 1984). The default inference is the one most people think of when discussing the inferencing process. Because writers assume they and their readers share much background knowledge, they often omit information. When readers fill these gaps, they are assigning default values.

The functions performed by inferences in comprehension are as diverse and complex as the types of inferences identified by researchers. Flood (1978) specified six purposes for inferences in comprehension of text: (a) generation of macro- and microstructures, the creation of larger or smaller units of text information; (b) generation of cause, the establishment of a context through preceding and succeeding information to increase comprehensibility; (c) generation of dimension, creation of a spatial framework to help the reader understand; (d) accommodation of referents, the generation of referents to clarify ambiguous text; (e) generation of case frames for text elements; and (f) generation of attributes, the specification of information about characters, settings, or other dimensions. Trabasso (1981) also identified four functions of inferences in reading comprehension: (a) resolution of semantic ambiguity, (b) resolution of nominal and pronominal references, (c) establishment of context, and (d) establishment of a larger, interpretive framework.
Inferences are necessary for comprehension to occur (Warren, Nicholas, & Trabasso, 1979).

Causes of Inferencing Difficulties

Clark (1977) indicated that inferences play a central role in communication and that making inferences takes both skill and knowledge. A variety of reasons account for the difficulties some students have in drawing the inferences necessary for understanding (Haviland & Clark, 1974).

Unavailability of Background Knowledge

Because content schemata are necessary for comprehension (Anderson, Pichert, & Shirey, 1983; Nicholson & Imlach, 1981), a discussion of inferencing inability should begin with an examination of the role background knowledge plays in inferencing.

A research study conducted by Chiesi, Spillich, and Voss (1979) examined how knowledge of a given topic influences the acquisition of topic-related knowledge. Groups of college students with high and low prior knowledge of baseball were established through a pretest of terminology. In each of five experiments, passages containing information about baseball were presented. Performances for both groups were evaluated based on tests for recall of high and low importance ideas. Results of the
five experiments indicated that knowledge of a topic facilitates the acquisition of topic-related information.

Pearson, Hansen, and Gordon (1979) demonstrated the role background knowledge plays in determining a reader’s ability to process relations only partially specified by a text in comparison to those that are fully and explicitly given by the text. In the first of two experiments with 2nd-grade subjects, researchers found that there was an overall effect for prior knowledge on comprehension. The follow-up experiment generally confirmed that students with well-developed topic schema answer more questions about a passage than those with poorly developed schema. Their conclusions support the idea that if a schema is sufficiently developed, the integration of prior knowledge and new information is less difficult.

Research by Omanson, Warren, and Trabasso (1978) examined the inferential ability and recall of 5- and 8-year olds by altering the referential information necessary for understanding. Results led to the conclusion that available prior knowledge affects the number of inferences more than memory or control mechanisms. In addition, they found that the number of inferences made by the reader corresponded positively with comprehension.

A study by Wilson and Hammill (1982) supported the findings of Omanson, Warren, and Trabasso (1978). Four groups of 9th-grade subjects with differing ability levels
were asked to pause during reading and paraphrase clauses from a short geography passage. Paraphrases were evaluated in order to judge if differences in thinking processes related to the readers' ability. Findings suggest that good readers draw more inferences than poor readers, perhaps as a result of greater background knowledge.

Research by Townsend (1980) concluded that prior knowledge activation enhances comprehension and, specifically, higher-level comprehension. Forty-eight college students were divided into two groups, one group receiving appropriate contextual information before reading passages and one group receiving no or inappropriate contextual information before reading passages. Recall of students who received appropriate context exceeded that of students who did not.

**Inability to Activate and Use Schemata**

Although background knowledge is a prerequisite for making valid inferences, having background knowledge in memory does the reader no good if it is not activated and used when reading. Thus, the second area to be examined in inferencing inability consists of the non-activation and/or misuse of schemata.

Bridge and Tierney (1981) examined the amount and kind of explicit and inferred information in the free and probed recalls of able and less able 3rd-grade readers. Thirty-six
fluent and not-so-fluent readers orally read two basal passages having expository/informative and narrative/entertaining tendencies and retold all they could remember. Results indicated that good readers recall more explicit information and generate more inferred information than poor readers. Moreover, although poor readers stored information during encoding, they needed more probing and greater encouragement to retrieve that information from memory. Findings also showed poor readers were less able to differentiate between explicit and implicit information and needed more encouragement to recall the limited amount of information they were able to remember. Research by Wilson (1979) supports these conclusions.

Wilson (1979) examined the comprehension strategies of 36 average and below average readers in grades 6 and 7. Students read equivalent passages and answered four factual and four inferential questions before, during, and after reading. Wilson found that average readers answer inferential questions more accurately than below average readers and concluded these differences may result from average readers' abilities in synthesizing and organizing information.

Holmes (1983) conducted a study to determine whether poor 5th-grade readers were as adept as good readers in answering post-reading comprehension questions when their prior knowledge for the answers to the questions was judged
Holmes randomly selected 56 students with equivalent IQs from a population screened for reading ability and prior knowledge. The students were classified into four groups as good and poor readers with more and less general prior knowledge for the topics. Subjects read passages written at appropriate instructional reading levels and answered text-explicit and text-implicit questions. Findings indicated poor readers failed to use prior knowledge to the same extent as did good readers. Results also suggested poor readers experienced difficulty answering text-implicit questions even if they possessed adequate prior knowledge for the topic. Holmes found greater differences between good and poor readers with more prior knowledge for the topics than between good and poor readers with less prior knowledge for the topics. These findings contradict the idea that the inabilities of poor readers to answer text-implicit questions is due to a lack of prior knowledge.

Feeley and Wepner (1985) attempted to evaluate the effects of direct exposure to selections on common, everyday topics. In addition, the study investigated whether students exposed to the topics would indicate metacognitive awareness of this knowledge. Subjects consisted of 33 developmental college readers randomly assigned to experimental or control groups. The experimental group received articles on the topics of the a standardized basic...
skills examination to augment whatever skills were being taught in the course text. The control group received articles on topics unrelated to the standardized test passages. Although the students in the experimental group were more aware of their increased knowledge about the topics, exposure to related information failed to increase posttest scores as compared to the control group. These findings support the conclusion that possessing background knowledge is not the same as activating it.

Inability to Organize Information

Unless readers organize conceptual and textual schemata in such a way that they find meaning, inferencing cannot occur. Thus, a reader's disorganization of information forms a third factor to examine in inferencing inability.

Cromer (1970) compared poor readers who were assumed to read word-by-word and poor readers who were assumed to have relatively inadequate vocabulary skills with both good readers and each other. Subjects were asked to read 1 of 4 sets of 5 stories. Each set of stories was presented in 1 of 4 different modes: (a) regular sentences, (b) single words, (c) meaningful phrases, and (d) fragmented word groupings. Subjects read the first story in each set orally but comprehension was not assessed. The remaining stories were read silently with subsequent evaluation for comprehension. Findings support the idea that poor readers
typically fail to organize reading input in a way that facilitates good comprehension. However, when poor readers are encouraged to group their reading in a meaningful way, their comprehension scores were equal to those of good readers.

Marshall (1976) probed the structure of memory for text by analyzing the underlying semantic structure of text and comparing it with subjects' recalls. Subjects consisted of 112 community college students and 48 Cornell University undergraduates; the Cornell students were considered to be the more able readers. Subjects read randomly-assigned passages, recorded reading time, and wrote free and probed recalls. They then repeated this procedure with a different, but comparable, passage the next day. The community college students recalled significantly more content when information was explicitly stated in the text. In addition, community college students tended to recall more isolated concepts and fewer propositions whereas Cornell students tended to recall more propositions and fewer details.

Summary

The inability of less fluent readers to make inferences between textual and content schemata results from either a lack of sufficient and valid background knowledge, an inability to activate or use that information, or an
inability to organize it. Because schemata either provide frameworks upon which readers build understanding and memory or allow readers to fill-in information not specified by the text, less-fluent readers need to know about the content they are reading. They also need to develop the ability necessary to access and organize for use the schemata they possess for a topic.

Student-directed Schemata Activation and Schemata Use

Studies involving the activation of schemata fall into two categories: teacher-driven and student-driven. Instructional activities which provide active reading experiences and are more internally-driven (self-controlled) than externally-driven (teacher-controlled) provide students with skills for use in other academic settings (Smith-Burke, 1982). Brown, Smiley, Day, Townsend, and Lawton (1977) suggested that training students to generate information from their schemata improves their comprehension of ambiguous information. Craik and Tulving (1975) indicated that students remember what they do more often than what they see or hear. Additionally, current research on the development of comprehension seems to indicate that students need instruction in areas which make them more active readers (Duffy, 1981; Duffy, Roehler, & Mason, 1984).

Raphael and Pearson (1982) trained 6th-grade subjects
of differing ability levels in a system of identifying the location to answers of recall questions called QARs. The system, one which students implement independently, consisted of three QARs based on Pearson and Johnson's (1978) categories of text questions. These QARs include: (a) Right There--words which form both the question and answer are in the same sentence; (b) Think and Search--the answer is in the text, but words forming the question and answer are not in the same sentence; and (c) On My Own--the answer is not contained in the text. Findings indicated that low-ability students gained more from the instruction than did high-ability students and that performance was higher on the second and third types of QARs. Follow-up studies by Raphael, Wonnacot, and Pearson (1983) and Raphael and McKinney (1984) suggested that training in QARs enhances the quality of answers, particularly for average and low ability students.

Crafton (1983) determined that natural reading experiences allow readers to construct schemata which can be used to comprehend other texts. Thirty 11th-grade students were randomly assigned to experimental and control conditions. The experimental group read two related passages, and the control group read two unrelated passages. Subjects read the first passage without interruption; however, during the reading of the second passage, subjects stopped at pre-selected points to use specific, pre-taught
guidelines to talk about their reading and thinking. Verbalizations were analyzed and described in terms of four criteria: (a) size of segment of text focused on, (b) organization of the verbalization, (c) whether the verbalization was text explicit or from outside the text, and (d) the subjects' feelings about ideas presented in the text. Results showed that the experimental group consistently focused on larger segments of text, generated more inferences, and produced retellings that were better organized, lengthier, and more focused than did the control group.

In a study by Wittrock and Carter (1975), undergraduates received lists of words in proper, related, and random hierarchical order and were asked to either reproduce or copy the list exactly as written or to re-organize the words and copy their version. Findings indicated that the group allowed to generate their own lists did as well as the subjects who were given the proper hierarchy. Wittrock and Carter concluded that students learned through their manipulations of the listings.

An experiment by Langer and Nicolich (1981) tested the effect of a method similar to free recall on the activation of prior knowledge. After 36 high school subjects wrote free associations to concepts, researchers categorized their writings and examined them to determine the relations between overall level of prior knowledge and the
organization of recall. Results indicated that level of prior knowledge relates to passage recall, independent of subject's IQ.

Wilkerson (1986) examined 8th-grade subjects comprehension of a science text with two different instructional strategies, one teacher-manual generated lesson and one student-generated lesson. Findings indicated that the student-generated lesson facilitated comprehension to a greater degree than did the other treatment. In addition, the greatest effect was in inference-making, specifically, in relating text information to prior knowledge. Research by Allen (1985) also identified the correlation between self-generated information and quantity of inferences. In addition, Franks et al. (1982) in research with 5th-grade subjects found that poor readers learned more from implicit passages which required self-generated elaborations.

Research by Hansen (1981) looked at the efficacy of instruction intended to make 2nd-grade subjects more aware of the way schemata affect comprehension. Three treatment groups—a control group who received a mixture of literal and inferential questions, a question group who received inferential questions, and a strategy group who integrated text and background knowledge before reading—participated in the study. Subjects in the strategy group wrote on strips of paper: (a) what they'd do if involved in a
situation similar to the one outlined in the story and (b) what they predicted the main character would do. Subjects then wove these strips into a serrated, paper model of their brains. The weaving of these strips attempted to demonstrate how a reader needs to weave what he knows with the text. Her results indicated a training effect in which performance increased for posttest scores but had little effect when measured on a transfer of training task.

Summary

Schemata activation takes place through the initiatives of either the teacher or the student. Instruction which is student-directed makes the student a more independent, active learner and transfers more easily to other settings. In addition, it improves comprehension and recall. In conclusion, students remember not what they are told or shown but what they do.

Advance Organizers and Inferencing

Ausubel (1968) stated that advance organizers provide the ideational scaffolding for the retention of the material that follows. Stated in schema-theoretic terms, they either activate material that follows or help the reader develop a schema relevant to the text. He further indicated that advance organizers enhance learning because they help the
learner clarify and organize cognitive structures prior to learning. In addition, they aid readers in making inferences necessary to bridge gaps necessary for comprehension.

A review of the use of advance organizers, in general, found an overall positive effect for them (Luiten, Ames, & Ackerson, 1980). Sledge (1978) indicated that advance organizers are most beneficial with less able students. In addition, the use of one type of advance organizer, the structured overview, has been particularly effective with expository text (Moore & Readence, 1980).

Carr, Dewitz, and Patberg (1983) examined the effectiveness of a structured overview to activate schemata, a cloze procedure to develop inferential thinking, and a self-monitoring checklist to train students to use these procedures independently. Seventy-five 6th-grade students were divided into three groups—two treatment and one control. One treatment used the cloze to integrate text and schemata, and the other used both the structured overview and the cloze. The control group read the same materials but received no training on any strategy. Posttests measured increases in students' inferential comprehension skills. Results indicated that although students in both treatment groups increased their inferential comprehension skills, the less able readers gained most from training.
Dewitz, Carr, and Patberg (1987) examined the effects of four treatments on 101 high-, middle-, and low-ability 5th-grade students. These treatments included (a) a cloze strategy, (b) a structured overview, (c) a combination of these, and (d) a control. Results indicated the cloze strategy was more effective than the structured overview and as effective as instruction which combined the two in affecting inferential ability. Dewitz, Carr, and Patberg concluded the ineffectiveness of the structured overview may result from how it was used in instruction. Teachers gave the overview to students and discussed it. They suggested that if students were actively involved in the preparation of the overview, they may have made the mental connections necessary for inferencing.

**Semantic Mapping as a Means of Schema Activation**

Semantic mapping, a form of advance organizer, allows students to actively engage in the activation and organization of their background knowledge about a topic (Armbruster & Anderson, 1980; Hanf, 1971; Merritt, Prior, & Grugeon, 1977; Novak & Gowin, 1984). Heimlich and Pittelman (1986) stated that although semantic mapping is an old concept having many labels (semantic webbing, semantic networking, plot maps, etc.), its value has been rediscovered with an increased understanding of its
importance in prior knowledge activation. One generative form of the semantic map is the concept map, a graphic model which allows students to organize hierarchically and to show relations between general and specific concepts about a topic (Novak & Gowin, 1984).

According to Armbruster and Anderson (1982), mapping enables students to become involved with text meaning and provides a visual summary of text structure. More importantly, because maps graphically represent text meaning and the information a student knows about the text, they help students to relate new words and concepts to what is already known (Johnson, Pittelman, & Heimlich, 1986). Further, both instructors and readers find value in recognizing areas where new information is needed and can be easily added (Johnson, Toms-Bronowski, & Pittelman, 1981). Thus, the graphic representation of concepts allows students to see the relations between concepts, the weaving considered important by Hansen (1981) and Hansen and Pearson (1984). Finally, in addition to its value as a prereading, schema-activation device, a semantic map constitutes an effective post-reading activity. Used after reading, semantic maps stimulate recall, organization, and integration of information (Heimlich & Pittelman, 1986).

Although much research has examined the effects of mapping on vocabulary acquisition (Anders & Bos, 1984; Hagan, 1979; Johnson, Toms-Bronowski, & Pittelman, 1981,
1982; Karbon, 1982; Levin, Pittelman, Levin, Shriberg, Toms-Bronowski, and Hayes, 1984; Margosein, Pascarella, & Pflaum, 1982; Toms-Bronowski, 1982; Vost, 1983), other studies examined the efficacy of semantic mapping as a method of increasing comprehension and recall. These studies fall into two distinct categories: (a) studies examining the overall effectiveness of semantic mapping instruction and (b) studies contrasting semantic mapping with more traditional approaches.

The Efficacy of Semantic Mapping

The efficacy of semantic mapping as a means of activating schemata is basic to its use. Because a semantic map can be developed from a student’s own ideas prior to and after reading, it becomes more personal and less abstract, a key component in increasing the value of any advance organizer (Tierney, Readence, & Dishner, 1984).

Another strategy related to semantic mapping has been research-tested. Langer's (1981) Pre-Reading Plan (PReP) involves a three-step assessment/instructional procedure for use before reading. These three phases include: (a) initial associations with the concept, (b) reflections on initial associations, and (c) reformulation of knowledge, steps similar to the ones suggested by Johnson, Pittelman, and Heimlich (1986) for developing a semantic map.
To test the effectiveness of PReP, Langer (1984) conducted a study, first classifying 161 sixth-grade students into above-level, on-level, and below-level groups. Students were then randomly assigned to treatments. During the first session of the experiment, subjects completed either free association measures for two related passages or free association measures to stimuli unrelated to either passage. One week later, second and third sessions were held, each consisting of a pre-reading activity, a repeat of the free association measure, reading of the passage and completion of a twenty-item criterion measure (ten superordinate and ten subordinate questions). Findings indicate that PReP could be used to measure background knowledge. In addition, PReP was found to be highly related to passage comprehension and a reliable predictor of comprehension.

Sweetland and Risko (1986) used case studies to examine whether concept mapping, used with a language experience approach, would facilitate reading achievement of 1st-grade students and teacher effectiveness. Observations took place over a four-week period; additional quantitative measurements (oral reading samples, student diagnostic tests, etc.) were also taken. Results showed that when the teacher's behavior became more open, students' recall of sight words, oral reading, and comprehension increased. Additionally, students were better able to order concepts
hierarchically and to differentiate between more and less
important information.

Pittelman, Levin, and Johnson (1985) examined the
effectiveness of semantic mapping instruction with 4th-grade
poor readers in small groups of poor readers or in
mixed-ability classes. Instruction took place twice daily
for three days. After one-and-a-half weeks, a twenty-four
item vocabulary test administered prior to treatment was
given again. Although no significant differences between
poor readers in either the similar-ability small group or
mixed-ability larger group were found, poor readers who
received semantic mapping instruction had significantly
higher gain scores than did the control.

Semantic Mapping vs. Traditional Comprehension Instruction

Strategies such as semantic mapping which help readers
connect the schemata in their heads to text information are
important components of reading instruction, particularly if
these strategies foster independence and higher-level
cognitive processing (Shenkman, 1982). Comparing semantic
mapping to more traditional instructional approaches is
necessary to determine its overall effectiveness.

Research by Carter (1984) compared instruction in SQ3R
(Robinson, 1970) with instruction in semantic mapping for 20
learning-disabled 3rd-, 4th-, and 5th-grade subjects. SQ3R
consists of a reading/study strategy which consists of
previewing, questioning, reading, reciting, and reviewing in order to aid understanding and recall. Treatment took place over a 15-week period, and subjects were tested immediately following reading, following a 2-day delay, and following a 7-day delay. Results indicated that the semantic mapping groups had significantly higher mean scores than did the SQ3R groups.

Using 111 seventh-grade subjects, Denner (1986) compared the effects of notetaking, re-reading, and episodic organizers (semantic maps and webs) on encoding of complex narrative text. After reading passages, subjects constructed an episodic organizer, studied a provided episodic organizer, took traditional notes, or re-read. The following day, subjects provided written recalls of the story. Results indicated that the two more active notetaking methods, semantic maps and webs, increased recall of high-importance story items.

Sinatra, Stahl-Gemake, and Berg (1984) examined the differences between semantic mapping and verbal readiness instruction. Twenty-seven learning-disabled 8th-grade subjects participated in the study. Verbal readiness instruction took the form of traditional directed reading lessons in which the teacher announced and wrote the name of the selection on the chalkboard, discussed new content, and introduced new vocabulary terms orally and visually. Researchers found that 19 subjects had significantly higher
total comprehension when semantic mapping was used whereas two subjects had the same comprehension score on both approaches and six reacted more positively to verbal readiness instruction. In addition, both teachers and students reacted more positively to mapping instruction.

Three studies with basal readers compared the effectiveness of semantic mapping with traditional basal reading lessons. Johnson, Pittelman, Toms-Bronowski, and Levin (1964) compared semantic mapping and feature analysis (a instructional method involving the categorization of common features of various concepts) with a modified basal approach as pre-reading activities with 4th-grade students. Subjects receiving full treatment received prereading vocabulary instruction and read a basal passage; subjects in a partial treatment group either received the prereading instruction or read the passage; and subjects in the control group did not receive the instruction or read the passage. Results showed no significant treatment differences between groups on comprehension when grouped by prior knowledge. However, the comprehension scores of students instructed in mapping and feature analysis tended to be higher than those students who received traditional instruction.

Prater and Terry (1985) examined whether 5th-grade students who drew semantic maps before and after reading basals comprehended more and wrote better summaries than students who received traditional basal instruction.
Findings indicated that students receiving mapping instruction scored higher on a comprehension posttest than did the students receiving basal instruction. There were, however, no differences found in quality of summary writing.

Jones (1984) compared the effects of semantic mapping and a traditional basal approach as prereading instruction with 5th-grade, black, inner-city students. Three treatment sessions of approximately 45 minutes each consisted of instruction and posttesting. In addition, at the end of the final treatment, students completed an attitude questionnaire. The semantic mapping group scored significantly higher on vocabulary acquisition and passage-specific reading comprehension questions. No significant differences were found in the attitudes of students toward treatment.

Summary

Advance organizers help readers to either activate schemata, develop schemata relevant to the text, or organize and integrate schemata and new information. Semantic mapping, a form of advance organizer, is a student-directed activity which allows readers to graphically represent their background knowledge and information gained from text. Furthermore, maps help them identify gaps in existing knowledge. Finally, studies which compare semantic mapping instruction with more traditional approaches (i.e., SQ3R,
notetaking, basal reader instruction, etc.) find semantic mapping significantly more effective in increasing comprehension and recall.

**Schemata Interference**

Bartlett (1932) indicated that recall becomes more abstract and thematic as time passes. As time and other distortions affect memory, they also affect a reader's schemata. In turn, these schemata affect both the amount and structure of new information (Ausubel, 1963; Bartlett, 1932). This effect is adverse. Although much research has concluded that, in terms of prior knowledge, "more is better" (Lipson, 1982, p. 244), only a few studies have examined the effects of what Gordon and Rennie (1986) call incomplete, ill-defined, inaccurate, or vague schemata.

Research by Lipson (1982; 1984) indicated that average and below-average 3rd-grade subjects learned new information better when they modified inaccuracies in old information and that above average, upper-elementary students often disregarded text information when it conflicted with culturally-specific background knowledge. A previous study of culturally-specific information was conducted by Steffensen, Joag-Dev, and Anderson (1979). American and Indian subjects read accounts of American and Indian weddings. Findings indicated that subjects read faster and
remembered more elaborate and less distorted information about the culturally correct passage which did not conflict with information in their prior knowledge. In addition, research by Marshall and Glock (1978-79) and Berger (1978) indicated that poor readers experience difficulty in understanding and making use of text information which fails to support their background knowledge.

Peeck, van den Bosch, and Kruepeling (1982) attempted to determine the effects of a schema activation procedure on 5th-grade subjects. Subjects received text incongruous with their prior knowledge. Findings showed that students who activated prior knowledge recalled more of the incongruous information than those who did not activate schemata. Alvermann, Smith, and Readence (1985) extended Peeck, van den Bosch, and Kruepeling's study and examined the effects of prior knowledge activation on average 6th-graders. In contrast to the findings of Peeck, van den Bosch, and Kruepeling's results indicated that conflicting prior knowledge took precedence over text information. Researchers suggested instruction in textbook use and the adjustment of prior knowledge when confronted with misconceptions. In addition, they indicated the need for teachers to evaluate students' prior knowledge before instruction.

Hynd and Alvermann (1986a; 1986b) examined the effects of refutation text on developmental and nondevelopmental
college readers with misconceptions in physics. Although reading the refutation text affected misconceptions, findings of the first experiment indicated that activating misconceptions before reading failed to alter the learning of developmental students. However, the second study found that when nondevelopmental students activated misconceptions before reading, they recalled fewer important ideas than did subjects who did not activate misconceptions. Differences in results may be due to differences between developmental and nondevelopmental students (Hynd & Alvermann, 1986b). Nonetheless, results of the experiments indicate refutation text has minimal effect on restructuring misconceptions.

**Summary**

Although reading research indicates that increased prior knowledge positively affects recall, studies exist which indicate this is not necessarily the case. Incomplete, ill-defined, inaccurate, or vague schemata (Gordon & Rennie, 1986) adversely affect comprehension and recall. Thus, researchers and educators and readers need to assess the quality as well as quantity of students' schemata before and after reading. Errors in schemata activation and processing may result from students' inability to monitor their reading comprehension. Such metacognitive activity enables students to reflect on their reading and recognize what they do and do not understand (Brown, 1977). Pre- and
post-reading strategies, such as semantic mapping, which allow students to practice schema activation, manipulation, and evaluation could decrease difficulties in schemata interference.

College Developmental Students

The Developmental Population

Godby (1984) stated that post-secondary education has undergone what could be termed a fast evolution or a slow revolution in that the number of traditional post-secondary students (academically-able, 18-year-olds from college-preparatory schools) is decreasing. The students making inroads in these numbers, however, are not always disadvantaged, minority, working class students. Instead, they come from a wide variety of socio-economic backgrounds and ability levels (Stephens & Weaver, 1985). Their emergence into postsecondary education resulted from several factors.

The Emergence of a Developmental Population

The return of an increasing number of adults to college classrooms has been one factor in the alteration of the post-secondary population. This return began with by the end of World War II (Cross, 1976). During the war, the military identified and attempted to meet recruits' needs
for remedial training in reading and other basic academic skills. The success of this intensified training led to the development of remedial programs after the war. Once the war ended, the GI Bill also helped veterans pursue educational endeavors. The arrival of these adults to post-secondary campuses initiated a change which continues today.

By the year 2000, the National Center for Education Statistics reported, the majority of American citizens will be 30-44 years old, with a rising curve for 45-64 year olds (Golladay, 1976). As these adults grow older and retire, their lives change. Increases in their leisure time may lead to enrollment in college courses (Cross, 1981). Boaz (1978) reported that between 1969 and 1975, there was a 55% increase in the number of older adults involved in organized educational pursuits.

In addition, three other groups of adults will continue to affect enrollments in post-secondary institutions. First, unemployed workers and workers seeking career advancement or change will also continue to seek post-secondary education (Aslanian & Brickell, 1980). Second, the so-called "career students" will also continue to add to the numbers of adults who enroll in college courses. Research by Cross (1979) indicated that the more education people have, the more they want, and the more they tend to acquire. Finally, the increased numbers of older
women returning to the work force after long absences also increases the adult population on college campuses (Cross, 1981).

Equal educational opportunities for all races have also affected the post-secondary education landscape. Growth in the number of minorities enrolled on college campuses has resulted from availability of financial aid, emphasis on post-secondary degrees, increased numbers of immigrants, and greater educational alternatives (Cross, 1981).

Next, students' educational backgrounds also have contributed to changes in populations on college campuses. Research indicates that many students lack basic reading instruction which normally takes place during elementary school years (Durkin, 1978; Guszak, 1967). Durkin's (1978) study of reading instruction in elementary classrooms found that less than one percent of instructional time was spent in the actual teaching of comprehension. In 1982, Durkin followed-up this study by examining the teachers' manuals of six basal reader series for evidence of specific comprehension instruction suggestions. She found that the manuals emphasized assessment and practice rather than explicit instruction. One strong implication of her study was that students seldom saw the connections between reading in school and reading on their own. Other findings included the absence of instructional strategies for answering questions and explanations of answers. Guszak (1967)
examined reading/thinking skill development in elementary reading groups consisting of four classes at grades 2, 4, and 6. He found that teachers spent most instruction time on literal comprehension. In addition, the most dominant type of student/teacher interaction consisted of a question followed by a single congruent response.

Finally, students with special needs comprise a group who are changing the traditional college scene. The needs of handicapped Americans, emerging as a result of returning Vietnam veterans and compliance with Section 504 of the 1973 Vocational Rehabilitation Act, must be met (Tompkins, 1982). In addition, learning disabled students, prison populations, and hospital patients form a specialized segment of the nontraditional college population, needing other special educational services as well as remedial instruction.

Current State of Developmental Education Programs

Roueche (1981-82) hypothesized correctly that future post-secondary students will vary in age, experience, and race and ethnicity. He further postulated that these students would be identified by their collective abilities to perform basic academic skills well enough to pursue college level work. Roueche's prediction has been confirmed by Atkinson and Longman (1985) and, nationwide, by reports from the Department of Education's Center for Statistics.
Atkinson and Longman (1985) extended a study by Lane (1984) which examined 500 high school transcripts of entering freshmen at a major state university to determine the efficacy of increasing admission requirements. Students meeting the proposed requirements (95% enrolled in four years of English, 84% enrolled in three years of math, 40% enrolled in three years of social science, 35% enrolled in two years of foreign language, and 19% enrolled in one year of computer science) were deemed by Lane to be ready for college work. Examination of first-semester transcripts of these students showed that almost half (48%) were enrolled in one or more developmental courses.

The United States Department of Education (Center for Statistics, 1986) indicated that 4 out of 5 colleges and universities nationwide offered at least one remedial course in 1983-84. During that same year, 25% of freshmen were enrolled in remedial math, 21% took remedial English, and 16% were enrolled in remedial reading.

In a national survey of 1269 institutions, CUNY (Lederman, Ribaudo, & Ryzewic, 1985) found that 85% of respondents had experienced inadequate academic preparation among entering freshmen. While the percentage of students seen as needing remedial assistance varied depending on the type and size of the institution, 32% of students enrolled
In math, 31% enrolled in English, and 28% enrolled in reading needed assistance with basic skills.

In Missions of the College Curriculum, the Carnegie Foundation for the Advancement of Teaching (1977) indicated that colleges are obligated to give students any support necessary for helping them succeed in meeting educational goals. Bogue (1986) suggested that the admission of underprepared students will continue in the future and asserted that if colleges and universities admit such students, they must make plans to assure educational opportunity and quality for them. Doing so requires an examination of the educational characteristics of these students that separates them from the traditional collegiate students.

Characteristics of the Developmental Population

The programs which meet the variety of needs of college developmental students range from those which teach basic skills to those which enhance academic performance (Schmelzer & Brozo, 1982). Whatever the case, the formal lecture approach and other more traditional instructional approaches are ineffective with them. Research by Flippo and Terrell (1984) demonstrated this.

In a study of 149 developmental college students, Flippo and Terrell compared the effects of a more traditional instructional approach (prescriptive) and a more
personalized instructional technique. Subjects in the personalized treatment expressed more positive attitudes toward skill development and more self-confidence in their abilities to succeed in college than did the prescriptive group. In addition, they expressed a positive attitude toward the instructional approach they experienced. Thus, two decisions, made by the instructor of developmental classes, comprised the key to the success of developmental programs (Roueche & Snow, 1978).

First, the instructor decides what is to be learned. This decision is vital because content serves as a powerful motivator for developmental students, particularly if they find the content to be of practical utility or interest. In addition, content decisions are important because many developmental students lack the necessary background knowledge to successfully complete college courses (Drabin-Partenio & Maloney, 1982). They assessed the background knowledge of good readers, poor readers, and English as a Second Language (ESL) students in the areas of geography, American history and civics, and current events. Drabin-Partenio and Maloney found no significant difference in background knowledge scores between ESL (who had not lived in the United States for most of their elementary education years) and remedial readers (who had lived in the United States for most of their elementary education years). However, the ESL and remedial readers differed significantly
from the good reader group. As Obah (1983) indicated, cultural or knowledge gaps form concept gaps. Such gaps lead to difficulties in changing reading speeds, understanding and integrating information, making predictions about content, and other integral reading/studying processes.

Second, instructors decide how the subject matter is to be taught. Accommodating a variety of learning styles and backgrounds requires a variety of instructional methods. Utilization of such activities as programmed instruction, computer-managed instruction, computer-assisted instruction, contracting, and learning models enables instructors to assist this diverse population (Schmelzer & Brozo, 1982; Spears, Atkinson, & Longman, 1984). Instructional strategies meeting the needs of developmental learners include multisensory approaches, individualization, active involvement of learners, understandable goals, manageable units, and frequent feedback (Cross, 1976; Gayle, 1982; Peterson, 1979; Rouche & Snow, 1978).

In addition to method of instruction, the tone of the developmental classroom needs to differ from that of more traditional college classes. Developmental students who have experienced more than their share of failures, enter college suffering from performance anxiety, learned helplessness, and a lack of motivation (Teegarden & Tarvin, 1982). The socio-technical work environment, defined by
Thorsrud of the Oslo Work Research Institute, formed a good model for the developmental classroom (Wirth, 1982). Included in such a classroom would be: (a) freedom from excessive supervision, (b) assumption of responsibility for personal learning, (c) attainable goals and frequent evaluation, (d) variety of instructional methods, (e) mutual respect from peers and instructor, and (f) an understanding of the relevancy and value of course content.

Summary

Post-secondary populations will continue to vary in age, experience, academic skill, and race and ethnicity. If such students will be known by their inability to successfully complete college work, then it becomes the responsibility of the institution which admits them to remediate their skills. Such developmental programs range from basic skills instruction to academic performance enhancement. Whichever necessary, a wide variety of teaching methods and materials will be needed to accommodate students with diverse backgrounds and learning styles.

Summary

Because comprehension depends on the integration of text information with what a reader knows about a topic, the
inability of college developmental readers to make connections between text and schemata hinders their ability to read. The lack of sophistication of such readers may be the result of insufficient reading skills rather than cultural ignorance. That is, inferencing inability of poor readers might not necessarily be the result of inadequate stores of background knowledge but could instead be a product of an inability to activate, organize, or use background information. Since student-driven learning activities more effectively transfer to settings outside the reading classroom, semantic mapping, an advance organizer which allows students to activate and organize schemata before and after reading, seems to be a viable alternative instructional technique.
METHOD

The research consisted of two studies in an effort to determine whether college developmental readers and non-developmental readers activate prior knowledge when reading and making inferences (Experiment One) and if instruction in concept mapping increases the degree to which these readers activate prior knowledge and make inferences (Experiment Two). The study was undertaken in four stages: (a) the pilot study, (b) instrument and material refinement, (c) Experiment One, and (d) Experiment Two.

The Pilot Study

A pilot study was undertaken to determine the following:

1. Were there reading ability and prior knowledge differences on the three dependent measures (inferential, scriptal, and text explicit questions)?

2. Were the pretest and posttest measures reliable and valid?

3. Were the length and difficulty of the target passage and the pretest and posttest measures appropriate?
4. How much time should be allotted for each activity (i.e., reading the passage, and the administration of the pretest and posttest)?

5. Was the procedure for eliminating subjects from the total population based on the prior knowledge pretest scores appropriate?

**Method**

**Subjects**

The target population consisted of 69 students enrolled in college developmental reading at Louisiana State University during the 1986 fall semester. On a recently administered *Nelson-Denny Reading Test* (Form E) (Brown, Bennett, & Hanna, 1981), these subjects scored below 11.0. From this group, a sample of 16 subjects with high prior knowledge of the target topic and 45 with low prior knowledge of the target topic were selected following administration of the prior knowledge pretest. Subjects falling in the fifth stanine were omitted from the study.

From a target population of 82 non-developmental freshmen and sophomore subjects enrolled in psychology courses, a sample of 52 subjects (non-developmental readers) with high prior knowledge and 20 subjects with low prior knowledge of the target topic was selected. Subjects falling in the fifth stanine were omitted from the study.
Instruments

Interest Inventory. An interest inventory consisting of the question "Name the five (5) topics about which you would enjoy reading" was given to 250 college developmental reading subjects.

Prior Knowledge Pretest. Students' prior knowledge of these topics was measured with a 30-item multiple-choice test (16 spy/terrorism items, hereafter referred to as scriptal items, and 14 distractors on baseball and Abraham Lincoln). Items were randomly-ordered, and there were five alternatives for each item on the test. Scriptal questions were based on information from the World Book Encyclopedia (1985). Content validity for the items on this test was determined by a panel of 4 reading educators. Appendix A contains a copy of this pretest.

Posttest. The 16 scriptal questions (items whose answers called for background knowledge) on the posttest were repetitions of the questions on the target topic from the prior knowledge inventory. In addition, 10 inferential questions (items which ask the reader to connect background information with text information) and 10 text-explicit questions (items that had answers stated explicitly in the text) questions composed the posttest. Items were randomly-ordered, and five alternatives were presented for each item on the test. Four reading educators judged the
items and indicated that the items had content validity. Appendix B contains a copy of this posttest.

Materials

**Target Passage.** A 449 word passage on the topic, terrorist activities and torture, was selected from *The Matlock Paper* by Robert Ludlum (1973), a popular novel. Using the Fry (1977) Readability Graph, readability for this passage was computed to be 8.0. The passage also conformed to Armbruster's (1984) criteria for considerate text (obvious beginning and conclusion, connectives, wide margins, clear type, etc.) as judged by a panel of 4 reading educators. A copy of this passage appears in Appendix C.

Procedure

Sixty-nine developmental college readers at Louisiana State University were given the prior knowledge pretest during regular class hours, and 82 subjects enrolled in psychology courses at Louisiana State University were given the prior knowledge pretest in sessions conducted after regular class hours. Psychology subjects received 2 points of class credit for participating in this study. Pretest directions read as follows:

"Today you are going to take a test of general information. Read each question below, select the best answer, and blacken that answer on your computer sheet."
Although subjects had as much time as they needed to complete the pretest, examiners noted the amount of time subjects required. A delay of two weeks took place between the administration of the prior knowledge pretest and the posttest.

Following the delay, the posttest was administered to four groups. A group of developmental readers with high prior knowledge of the target topic ($n = 16$), a group of developmental readers with low prior knowledge of the target topic ($n = 45$), a group of non-developmental readers with high prior knowledge of the target topic ($n = 52$), and a group of non-developmental readers with low prior knowledge of the target topic ($n = 20$) were given the target passage to read. After reading the passage, subjects were asked to answer posttest questions. Directions read as follows:

"Today you are going to read a passage and answer some questions about what you have read. You will not be able to refer to the passage when answering questions. I am going to distribute the passages now. Take as long as you like to read them. When you have finished reading, raise your hand, and I'll give you a set of questions to answer. Code your answers on your computer sheets. Instructions for answering the passage questions appear on the test packet."

Subjects were not allowed to see the passage while they answered the posttest. Although subjects were allowed to take as long as they needed to read the passage and answer
posttest questions, the examiner noted the amount of time subjects required to complete the tasks.

Results

Interest Inventory

Totals from the interest inventories were tallied and ranged from 1 (philosophy) to 91 (murder/spy/thriller/adventure). Love and romance stories (90), True stories about people (65), and sports (64) were the second, third, and fourth most favorite topics. The target topic, terrorist activities and torture, was selected based on these tallies.

Reliabilities

The reliability of the pretest measure (scriptal items only) was .66. For the posttest, separate reliabilities were computed for scriptal, inferential, and text explicit items and were .71, .30, and .45 respectively.

Statistical Analysis

A 2 (reading ability) by 2 (prior knowledge) multivariate analysis of variance (MANOVA) was conducted to determine if there were differences on the scriptal and inferential measures. The MANOVA indicated significant effects for reading ability; multivariate $F(3, 127) = 9.01$, $p < .0001$; prior knowledge, multivariate $F(3, 127) = 14.22$, 
p < .0001; and reading ability by prior knowledge, multivariate F(3, 127) = 3.40, p < .0198. Follow-up univariate ANOVAs were conducted (See Table 1 for means). For the inference score, there was a significant effect for reading ability, F(1, 129) = 13.75, p < .0003. The non-developmental reading ability group (M = 6.24) scored higher than the developmental group (M = 5.26). For the inferential score, no other effects were significant. The follow-up ANOVA for the scriptal score indicated a significant effect for reading ability, F(1, 129) = 10.70, p < .0014. The non-developmental reading ability group (M = 11.07) scored higher than the developmental group (M = 9.56). A significant effect was also found for prior knowledge, F(1, 129) = 42.94, p < .0001. The high prior knowledge group (M = 11.81) scored higher than the low prior knowledge group (M = 8.84).
TABLE 1
Least Squares Means for 2 Reading Ability Groups by 2 Prior Knowledge Levels

<table>
<thead>
<tr>
<th>Question Type</th>
<th>Developmental</th>
<th>Non-developmental</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Inferential</td>
<td>4.96</td>
<td>5.56</td>
</tr>
<tr>
<td>Scriptal</td>
<td>6.69</td>
<td>7.79</td>
</tr>
</tbody>
</table>

Time Allowances

Averages of the time reported by examiners that subjects took to complete the passage, pretest, and posttest indicated that subjects needed 20 minutes to complete the pretest and 30 minutes to complete the passage and posttest. These times were used to calculate the time needed for testing; thus, subjects in Experiments One and Two continued to have as long as they needed to read and answer posttest questions.

Conclusions

Results of the pilot study indicated: (a) Reading ability and prior knowledge differences do exist; (b) although the length of the pretest and posttest seems
appropriate, the reliability of pretest and posttest
measures, particularly the inferential and text explicit
questions, need further refinement and testing; (c) subjects
required 20 minutes to complete the pretest and 30 minutes
to complete the passage and posttest; (d) the unequal
distribution of the population curve indicated a need for a
better method of determining high and low prior knowledge
subjects. Based on these conclusions, further instrument
and material development was undertaken.

Instrument and Material Refinement

Instrument and material refinement took place through
two reliability studies. These are described below.

Reliability Study I

After the pilot study, the posttest instrument was
changed in an attempt to improve reliability of scriptal,
inferential, and text explicit questions. One inferential
question and one text explicit question were replaced.
Distractors were adapted based on results of the item
analysis.

This version of the posttest contained 36 items (16
scriptal, 10 inferential, and 10 text explicit questions).
Items were randomly-ordered, and five alternatives were
presented for each item on the test. Scriptal questions
were based on information from the *World Book Encyclopedia* (1985).

The test was administered to 93 freshman and sophomore psychology subjects enrolled in one introductory psychology course during regular class time. Reliability for this test was measured by the Kuder-Richardson Formula 20. Content validity was determined by a panel of 4 reading educators. An item analysis of student responses was done for use in the refinement of the instrument. Reliabilities for scriptal (.63), inferential (-.01), and text explicit (.34) were obtained.

**Reliability Study II**

Five changes were made in a second attempt to improve reliability scores. First, the target passage was lengthened from 449 to 749 words. This provided the researcher with more information from which to draw questions. Second, 5 questions were added to both the inferential and text explicit subsets of the test, and 6 questions were added to the scriptal subset of the test. Thus, a pool of questions from which a posttest measure could be drawn existed. Third, distractors were adapted using results from the item analysis. Fourth, two additional educators were added to the panel which judged content validity. Fifth, the instrument was given to six
English classes of freshmen and sophomore subjects in an effort to obtain results from a heterogeneous population.

This version of the posttest contained 50 items (20 scriptal, 15 inferential, and 15 text explicit questions). Items were randomly-ordered, and five alternatives were presented for each item on the test. Scriptal questions were based on information from the World Book Encyclopedia (1985).

The test was administered to 125 freshman and sophomore English subjects during regular class time. Reliability for this test was measured by the Kuder-Richardson Formula 20. Content validity was determined by a panel of 6 reading educators. An item analysis of student responses was done for use in refining the instrument. Based on the results of the corrected item-total correlation, 5 questions were deleted from each of the three subsets. Reliabilities for the resulting posttest for scriptal (.75), inferential (.64), and text explicit (.58) were obtained. The final version of the posttest (See Appendix D) consisted of 15 scriptal, 10 inferential, and 10 text explicit questions.

Experiment One

Subjects

The target population consisted of all 211 subjects enrolled in college developmental reading at Louisiana State
University in the 1987 spring semester. On a recently administered Nelson-Denny Reading Test (Form E) (Brown, Bennett, & Hanna, 1981), these subjects scored below 11.0.

From this group, a sample of 34 subjects (15 with high prior knowledge of the target topic and 19 with low prior knowledge of the target topic) were randomly selected following administration of the prior knowledge pretest. Subjects falling within one-half standard deviation on either side of the mean score were omitted from the study.

From a target population of 61 non-developmental freshmen and sophomore psychology subjects, samples of 17 subjects (non-developmental readers) who possessed high prior knowledge and 21 subjects (non-developmental readers) who possessed low prior knowledge of the target topic were randomly selected.

**Instruments**

**Prior Knowledge Inventory**

Fifteen scriptal questions refined during the second phase of this research were used on the prior knowledge inventory in Experiment One. In addition, 20 distractors on John Kennedy were added. Appendix E contains the refined version of the pretest.
Posttest

The posttest refined during the second phase of this research was used in Experiment One (See Appendix D). It consisted of 15 scriptal, 10 inferential, and 10 text explicit items.

Materials

Target Passage

The target passage refined during the second phase of this research was used in Experiment One (See Appendix F). The passage had a length of 749 words and a readability level of 8.0 (Fry, 1977).

Procedure

Two hundred eleven developmental college readers at Louisiana State University were given the prior knowledge pretest during a regular class, and 64 subjects enrolled in psychology courses at Louisiana State University were given the prior knowledge pretest in sessions conducted after regular class hours. Pretest directions read as follows:

"Today you are going to take a test of general information. Read each question below, select the best answer, and blacken that answer on your computer sheet."

A delay of four weeks took place between the administration of the prior knowledge pretest and the actual study.
A group of developmental readers with high prior knowledge of the target topic (n = 15) and a group of developmental readers with low prior knowledge of the target topic (n = 19) were given the target passage and posttest in their regularly scheduled classes. Directions read as follows:

"Today you are going to read a passage and answer some questions about what you have read. You will not be able to refer to the passage when answering questions. I am going to distribute the passages now. Take as long as you like to read them. When you have finished reading, raise your hand, and I'll give you a set of questions to answer. Code your answers on your computer sheets. Instructions for answering the passage questions appear on the test packet."

A group of non-developmental readers with high prior knowledge of the target topic (n = 17) and a group of non-developmental readers with low prior knowledge of the target topic (n = 21) were given the target passage and posttest in sessions conducted after regular class hours. Directions were the same as those given to the developmental groups.
Experiment Two

Experiment Two was conducted to examine differences between two groups composed of developmental subjects with average to high prior knowledge of the target topic.

Subjects

The target population consisted of all 211 subjects enrolled in college developmental reading. On a recently administered Nelson-Denny Reading Test (Form E), these subjects scored below 11.0.

From this group, a sample of 54 subjects who possessed high and average prior knowledge of the target topic were randomly selected following administration of the prior knowledge pretest. Subjects attaining a minimum score greater than one-half standard deviation below the mean score were eligible to participate in the study. Two equivalent groups (containing approximately equal numbers of high and average prior knowledge subjects) of 27 subjects each were formed through random selection and assignment.

Experiment Two took place during 4 one-hour sessions after regularly scheduled classes. Subjects were reminded daily during their regular class periods to attend. In addition, subjects who attended all four sessions were eligible for a lottery drawing. Prizes were $25, $15, and
$10 gift certificates to a local department store. There were three winners in each group.

**Instruments**

Instruments used in Experiment One were utilized in Experiment Two.

**Materials**

In addition to the target passage refined during the second phase of this research and used in Experiment One, the following materials were utilized in Experiment Two.

**Instructional Passages**

For the treatment group, instructional passages of less than 900 words were selected by a panel of 4 reading educators from popular fiction and non-fiction based on tallies of the interest inventory. Using the Fry Readability Graph (Fry, 1977), readability for each passage was computed to be 9.0 or lower (See Table 2). Presentation of the passages also conformed to Armbruster's (1984) criteria for considerate text as judged by a panel of 5 reading educators. Packets consisting of an unlined piece of paper with the topic written in the center and the appropriate passage were created for each mapping practice. Appendix G contains a sample of these packets.
Published Inferencing Material

Instruction for the control group was based on 64 passages from *A Skill at a Time--Reading Between the Lines* by Walter Pauk (1975). Passages in this series are taken from fiction and nonfiction works, require inferences between the reader's background knowledge and the text, and range progressively between 9th- and 12th-grade in difficulty. Passages for this study were taken from the first 65 in the text to compensate for ability levels of subjects. Packets consisting of ten passages and a corresponding answer sheet were devised. Appendix H contains a sample of these packets.

Instructional Scripts

Instructional scripts for the two groups were developed to insure uniformity in teaching. Face validity was judged by a panel of 5 reading educators. Copies of these scripts are found in Appendices I (mapping treatment) and J (control).
Table 2

Title, Length, Readability, and Purpose of Instructional Passages

<table>
<thead>
<tr>
<th>Title, Author, and Copyright</th>
<th>Length of Passage</th>
<th>Readability</th>
<th>Day Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat on the Hoof (Shaw, 1972)</td>
<td>879 words</td>
<td>8.0</td>
<td>Day 1 Modeling</td>
</tr>
<tr>
<td>Walt Disney: An American Original (Thomas, 1976)</td>
<td>827 words</td>
<td>9.0</td>
<td>Day 1 Group</td>
</tr>
<tr>
<td>Elvis and Me (Presley &amp; Hammon, 1985)</td>
<td>701 words</td>
<td>7.0</td>
<td>Day 2 Individual Instruction with Help</td>
</tr>
<tr>
<td>Lincoln: A Novel (Vidal, 1984)</td>
<td>680 words</td>
<td>7.0</td>
<td>Day 3 Individual Instruction</td>
</tr>
</tbody>
</table>
Procedure

All subjects in the population of 211 developmental college readers at Louisiana State University were given the prior knowledge pretest during regular class time. Ineligible subjects (those falling below minus plus one-half standard deviation of the mean score) were eliminated on the basis of scores on the prior knowledge pretest. In addition, subjects from Experiment One were excluded. Fifty-four sample subjects with high and average prior knowledge of the target topic were randomly selected from eligible subjects and randomly assigned to two groups, one experimental (mapping) and one control (published materials). Pretest directions read as follows:

"Today you are going to take a test of general information. Read each question below, select the best answer, and blacken that answer on your computer sheet."

A delay of four weeks took place between the administration of the prior knowledge pretest and the actual study.

Following instructional scripts (located in Appendices I (treatment) and J (control)), trained instructors, three doctoral subjects in linguistics who were also college English instructors, utilized the principles of direct instruction (modeling, guided practice, corrective feedback, and independent practice) described by Pearson & Gallagher (1983) to teach either concept mapping or inferencing from
published materials during the first three sessions. Instruction in the two groups followed the same format. Instructors were provide supplies (pencils, packets, etc.) for instruction each day.

On Day One, the instructor of the treatment group explicitly demonstrated how to develop a concept map, read a passage, and then altered the map by adding new information gleamed from the passage. The instructor of the control group explicitly demonstrated how to read a short passage and make the correct inference. Then, instructors drew a map based on student input. Subsequently, subjects read a corresponding passage and offered suggestions to the instructor for altering the map. Control subjects read passages and made inferences. Instructors for both groups utilized overhead transparencies in modeling and the group activity. Copies of the transparencies generated through the modeling of mapping and in the group activity are found in Appendix K. Copies of the transparencies used in the modeling of published passages and the group activity are found in Appendix L. On the second day, subjects proceeded to work individually on the appropriate task (drawing a map, reading a corresponding passage, and altering the map or reading passages and making inferences) with the instructor giving assistance when needed. The third day of instruction provided subjects with independent practice. Instructors did not give assistance to subjects. Samples of the maps
randomly selected from those drawn by treatment subjects on the third day of instruction are found in Appendix M. Instructors rotated day-by-day between groups to reduce instructor effects. During the fourth session, both treatment ($n = 22$) and control ($n = 18$) groups were given the target passage and posttest. Posttest directions read as follows:

"Today you are going to read a passage and answer some questions about what you have read. You will not be able to refer to the passage when answering questions. I am going to distribute the passages now. Take as long as you like to read them. When you have finished reading, raise your hand, and I'll give you a set of questions to answer. Code your answers on your computer sheets. Instructions for answering the passage questions appear on the test packet."

Summary

The chapter described the four stages of research which comprised this study. These include: (a) the pilot study; (b) instrument and material refinement; (c) Experiment One, a comparison of non-developmental and developmental readers; and (d) Experiment Two, a comparison of direct instruction of semantic mapping and pre-packed inference materials with college developmental readers.
CHAPTER FOUR

RESULTS

The purpose of this study was to determine: (a) if college developmental and non-developmental readers activated prior knowledge during reading, (b) if college developmental and non-developmental readers use prior knowledge to make inferences, and (c) if instruction in semantic mapping could increase the degree to which college developmental readers activated prior knowledge.

Hypothesis One

A 2 (reading ability) x 2 (prior knowledge) analysis of variance was conducted on the posttest scriptal knowledge scores in Experiment One to evaluate the first hypothesis which stated that there would be differences in scriptal knowledge posttest scores for developmental readers as compared with non-developmental readers with high and low prior knowledge of the target topic.

Significant effects were found for reading ability,
\( F(1, 68) = 21.67, p < .0001, \text{MSE} = 5.46; \)

prior knowledge,
\( F(1, 68) = 27.77, p < .0001, \text{MSE} = 5.46; \)

and the reading ability by prior knowledge interaction,
\( F(1, 68) = 4.35, p < .05, \text{MSE} = 5.46. \) The mean scriptal knowledge posttest score of non-developmental readers (\( \bar{M} = 10.32 \)) was higher than
that of developmental readers ($M = 7.41$). The high prior knowledge group ($M = 10.58$) had higher scriptal knowledge posttest scores than the low prior knowledge group ($M = 7.31$). As shown in Table 3, the scriptal knowledge scores of non-developmental readers with high prior knowledge was substantially higher than those of their low prior knowledge counterparts, whereas this was not true for their developmental counterparts. See Table 3 for means and standard deviations.

Table 3

Means and Standard Deviations for groups by Reading Group and Prior Knowledge

<table>
<thead>
<tr>
<th>Reading Ability</th>
<th>Prior Knowledge</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developmental</td>
<td>High</td>
<td>15</td>
<td>8.40</td>
<td>2.92</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>19</td>
<td>6.63</td>
<td>2.14</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>21</td>
<td>12.14</td>
<td>1.98</td>
</tr>
<tr>
<td>Non-developmental</td>
<td>Low</td>
<td>17</td>
<td>8.06</td>
<td>2.38</td>
</tr>
</tbody>
</table>
Hypothesis Two

A regression analysis was performed to examine Hypothesis Two. Hypothesis Two stated that inferential scores could be predicted from reader group, scriptal knowledge, and the interaction of these two variables.

Results from the regression analysis indicated that scriptal knowledge was significant, $t = 4.70, p < .0001$. On the other hand, reading ability, $t = 1.63, p < .11$ was not significant. The reading ability by scriptal knowledge interaction, $t = -1.76, p < .08$; also was not significant. Scriptal knowledge was useful in predicting inferential score; whereas, reading ability and the interaction of reading ability with scriptal knowledge were not.

Hypothesis Three

A one-way analysis of variance with 2 instructional groups was conducted on the scriptal knowledge posttest scores in Experiment Two to evaluate the third hypothesis which stated that instruction in semantic mapping would increase the scriptal knowledge posttest scores of developmental students as compared with a control group.

No significant effect was found for instructional group, $F(1, 38) = 1.00, p < .33$, MSE = 7.27. The mean scriptal knowledge posttest score of the control group ($M = 9.14$, $SD = 2.57$) was only slightly higher than that of the treatment group.
Hypothesis Four

A regression analysis was performed to examine Hypothesis Four. Hypothesis Four stated that inferential scores could be predicted from instructional group, scriptal knowledge posttest scores, and the interaction of these two variables.

No significant results were found for instructional group, $t = -0.58, p < .57$; scriptal knowledge, $t = 0.69, p < .50$; and the instructional group by scriptal knowledge interaction, $t = 0.49, p < .63$. Hence, none of the predictors was useful in predicting inferential scores.

Summary

The results of Experiment One indicated: (a) significant effects for reading ability, prior knowledge, and the interaction of these two variables on scriptal knowledge posttest scores and (b) scriptal knowledge posttest scores were a valid predictor of inferential performance while reading ability and the interaction of scriptal knowledge posttest scores with reading ability were not. The results of Experiment Two indicated that semantic mapping instruction was ineffective in increasing scriptal
knowledge posttest scores and for enhancing inferential performance.
CHAPTER FIVE

SUMMARY AND DISCUSSION

The first experiment in this research study was conducted to determine whether college developmental readers use their background knowledge of a topic as effectively as non-developmental college students. In addition, it sought to determine if developmental students make text-external inferences as effectively as non-developmental college students. The second experiment was conducted to determine whether college developmental students who received instruction in semantic mapping would use background knowledge and make text-external inferences more effectively than similar students who did not receive instruction.

The results of Experiment One indicated significant effects for reading ability, prior knowledge, and the interaction of these two variables on scriptal knowledge posttest scores. In addition, results indicated that scriptal knowledge posttest scores were a valid predictor of inferential performance although reading ability and the interaction of scriptal knowledge posttest scores with reading ability were not. The semantic mapping instruction used in Experiment Two proved ineffective both for increasing scriptal knowledge posttest scores and for facilitating inferential performance.
The present investigation was conducted to determine how background knowledge of non-developmental readers and developmental readers is related to their ability to activate that knowledge in order to make text-external inferences. Inherent to both experiments in this study are specific implications and limitations.

The measurement of text-external inferences, in which the reader is required to connect background information with information found in the text, is a unique component of this research. A reader's ability to make text-external inferences enhances comprehension of text. Additional research is warranted in which investigators continue to examine this special type of inference as well as others. Comparisons of text-specific (connections within the text) and text-external inferential ability would assure a more complete understanding of how this skill influences total reading comprehension.

One limitation of this research was the fact that it was not possible to obtain a truly normal subject population for several reasons. Population normality in both the developmental and non-developmental groups was affected by the use of a prior knowledge pretest which eliminated subjects who either lacked or exceeded specified levels of prior knowledge. These restrictions were particularly
important in Experiment Two where mixed prior knowledge groups had to be used because of insufficient numbers of high prior knowledge developmental students. Problems with population normality reduce the generalizability of results and need to be considered in future research. For example, later studies might randomly sample similar populations. Or, they might sample other populations or age groups.

Another limitation found in both studies concerned the construction of the interest inventory. Generally, any time an interest inventory is used, treatment generalizability is affected. However, a particular problem with this research was that the interest inventory did not measure the amount of information students had on suggested topics. Thus, despite the fact that a student indicated interest in a topic, s/he may have had little familiarity with that topic. In addition, the format of the interest inventory was not specific enough to give the detailed information necessary for truly assessing the interests of students; therefore, the topics selected for the target and practice passages were randomly chosen from within general subject areas (i.e., Elvis Presley from the general subject "Famous People"). This method of topic selection may have affected prior knowledge scores, and, thus, sample size.
Experiment One

The results of the current research support important aspects of Holmes' (1983) study which indicated that less skilled readers failed to use prior knowledge to the same extent as good readers, and of Feeley and Wepner's (1985) investigation which indicated that college developmental students failed to use prior knowledge effectively. Findings of the present research indicated that non-developmental college readers with high prior knowledge activated and used prior knowledge 81 percent of the time (M/15 = %), whereas non-developmental college readers with low prior knowledge and college developmental readers with high prior knowledge activated prior knowledge 54 and 56 percent of the time, respectively. College developmental readers with low prior knowledge trailed the other groups, activating prior knowledge only 44 percent of the time.

Thus, results of this study indicate that non-developmental readers with high prior knowledge use it more effectively than developmental students. Implications of this result indicate developmental students need to increase both: (a) the amount of prior knowledge available to them and (b) their skills in activating it. This is particularly true because of the similar levels of prior knowledge activators by high prior knowledge college developmental readers and low prior knowledge non-developmental readers. If high prior knowledge college
developmental readers in some way compensate for their poorer reading ability by using prior knowledge, then a larger amount of information to draw from and instruction in ways to retrieve it are warranted.

One way to enhance the pool of prior knowledge at the disposal of college developmental readers is through natural reading experiences (Crafton, 1983). For example, the required reading of eight fiction or nonfiction books during one semester of developmental reading at Louisiana State University allows students to vicariously experience situations, events, locations, and so on. Other instructional methods, like the following examples, might also be effective. Students can be shown how reading relates to real-life experiences by being assigned topics of local campus interest to follow in the college paper and evaluate orally. Free-reading assignments and sustained silent reading are other ways students can be encouraged to build background knowledge. Finally, students need systematic instruction in reading college-level content texts to increase their chances of academic success.

Natural reading experiences provide developmental students with a viable method of acquiring background knowledge.

Another way to increase the amount of prior knowledge developmental readers have at their disposal is to encourage participation in campus activities. In addition to popular extra-curricular events like athletic competitions and
campus organizations, plays, lectures, and concerts are available. Students could also take advantage of visits to museums and art exhibits as well as of attendance at festivals and activities sponsored by various international organizations. Finally, the wide variety of courses offered on college campuses provide another alternative for increasing background information.

Once the knowledge is available, students need effective strategies for tapping it. These strategies must be student-directed and active in nature (Dewitz, Carr, & Patberg, 1987). Students learn best what they do for themselves. Constantly cueing developmental readers to activate appropriate schemata fails to train them to be independent readers. Reinforcing this dependency limits transfer of reading skills to real-life situations.

Methods which teach students to activate prior knowledge anticipation guides and feature analysis need to be utilized. Any pre-reading strategy, like SQ3R or PReP, may help students retrieve background information. In addition, anticipation guides are a pre-reading strategy which has students think through a series of controversial statements on the target topic. Feature analysis may also help students relate words to prior knowledge and categorize them. The possibility that semantic mapping could be such a student-directed activation strategy led to Experiment Two.
Experiment Two

The second experiment was used to compare direct instruction (Pearson & Gallagher, 1983) in semantic mapping with traditional instruction utilizing pre-packaged inferencing materials in order to assess the effectiveness of the two procedures. In addition, it was conducted to determine if semantic mapping would be more effective than traditional instruction in providing a method for the concrete manipulation of abstract ideas which is important to the integration or synthesis, selection, inference, memory, and verbal expression of information by adult readers (Whyte, 1981). No significant differences were found between the semantic mapping and pre-packaged instruction groups. Thus, the research indicates both methods are equally effective.

Two weaknesses in the design of Experiment Two account, at least in part, for the lack of statistical significance found in results. First, because the published passages that the control group subjects read as part of their instruction resembled the passage and multiple-choice format of the posttest, practice effects may have enhanced the scores of control subjects. In contrast, students in the treatment group were not given an opportunity to use the skills they had developed during instructional sessions to access scriptal knowledge on the target topic. Future research
could provide for this practice effect by allowing students in the control group to either map the target passage before the posttest or map a passage related to the target passage on one of the instructional days prior to receiving the target passage and posttest. An alternative design might be to compare semantic mapping with another type of instruction such as analogies.

Second, because instruction was limited to three sessions, it is unlikely that transfer took place. In addition, the brevity of training may not have provided sufficient practice to build up automatic use of the strategy when instruction takes place over a longer time period. Thus, future research might be conducted in which the amount of time spent on instruction is increased to at least eight sessions during a two-to-three-week period.

Summary

Four questions were raised in Chapter One. According to the data in this study, the answer to the first, "Do college developmental and non-developmental readers retrieve text-activated prior knowledge to the same extent when reading?", is "No." Non-developmental readers retrieve such information to a greater extent than do developmental readers. The answer to the second, "Do college developmental and non-developmental readers use text-activated prior knowledge to make inferences?" is
"Yes." The answer to the third and fourth questions, "Can instruction in semantic mapping increase the degree to which college developmental readers use text-activated prior knowledge?" and "Can instruction in semantic mapping increase the degree to which college developmental readers make inferences?" is "No" when taught by the methods of this study and/or as measured by the methods of this study.

In conclusion, text-external inferences are essential to the reading process. Research measuring the degree to which they are used and factors facilitating their occurrence should be pursued. In addition, the amount of prior knowledge developmental readers have at their disposal and their abilities in activating it affect their reading comprehension, particularly text-external inferences. Instruction in student-directed methods for activation of prior knowledge also should be examined. In particular, semantic mapping, although not proven effective in this research, deserves further study, especially in view of the limitations of the second experiment.
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APPENDIX A

Pilot Study Pretest
PRETEST

DIRECTIONS: Select the best answer for each question below. Then darken the corresponding circle on your computer answer sheet.

1. Who was Lincoln's opponent in the Great Debate?
   a. Andrew Johnson
   b. Ulysses S. Grant
   c. Stephen Douglas
   d. John Wilkes Boothe
   e. Robert E. Lee

2. Which of the following is not an instrument of torture?
   a. a detonator
   b. thumbscrews
   c. whips
   d. the rack
   e. stocks

3. Baseball is often referred to as _____.
   a. softball
   b. the pennant sport
   c. the game of nine
   d. the national pastime
   e. the game of kings

4. Which of the following wars was known as "The Reign of Terror"?
   a. World War I
   b. The Civil War
   c. The Vietnam War
   d. The French Revolution
   e. World War II

5. Which of the following is not a reason why people are tortured?
   a. for revenge
   b. to punish someone
   c. because they are revered
   d. to gain information
   e. because of their religious beliefs
6. Anarchism is a form of political terrorism that believes _____.
   a. it is the responsibility of a government to defend
      its citizens from terrorism
   b. policies of violence and terrorism do not affect
      lasting changes
   c. governments can be destroyed through violence and
      terror
   d. the acquisition and preservation of power cannot
      effectively be accomplished through terror
   e. all of these

7. The manager of a baseball team _____.
   a. is the same as the coach
   b. assists the coach
   c. is the same as the owner
   d. decides who will play in the game
   e. assists the umpire

8. Guerrilla terrorists _____.
   a. are groups of fighters who attack and then disappear
   b. move around from place to place
   c. are underground organizations
   d. find speed of movement essential
   e. all of these

9. The word terrorism was coined near the end of the
   1700's during _____.
   a. the French and Indian War
   b. the French Revolution
   c. the Hundred Years War
   d. during the signing of the Treaty of Versailles
   e. the liberation of Paris during World War II

10. Baseball involves what two major associations or
    leagues?
    a. the Southern Association and the Northern
       Association
    b. the Eastern Association and the Western
       Association
    c. the Independent League and the Affiliated
       League
    d. the American League and the National
       League
    c. the Professional League and the Amateur
       League
11. Three dictators who conducted widespread terrorism during the 1930's include _____.
   a. Castro, Mussolini, and Roosevelt
   b. Hitler, Mussolini, and Stalin
   c. Stalin, Genghis Khan, and Castro
   d. Hitler, Castro, and Roosevelt
   e. none of these

12. A modern form of torture that involves emotional and mental manipulation is called _____.
   a. sadism
   b. brainwashing
   c. masochism
   d. capital punishment
   e. bondage

13. Lincoln's nicknames included _____.
   a. Honest Abe
   b. Uncle Sam
   c. Father Abraham
   d. the Railsplitter
   e. all but b

14. Which of the following is not a purpose of terrorism?
   a. to maintain authority
   b. to gain power
   c. to eliminate political opposition
   d. to overthrow a government
   e. to victimize allies

15. Minor leagues _____.
   a. are divided into four classes
   b. support three major league teams each
   c. are the same as amateur leagues
   d. are not affiliated with major leagues
   e. serve as training grounds for major leagues

16. Baseball bats cannot be made from which of the following wood(s)?
   a. ash
   b. hackberry
   c. hickory
   d. rose
   e. both b and d
17. What two religious groups in Britain and Ireland often practice terrorism against each other?
   a. the Protestants and the Mormons
   b. the Roman Catholics and the Jews
   c. the Roman Catholics and the Moslems
   d. the Protestants and the Roman Catholics
   e. the Protestants and the Jews

18. When was Lincoln killed?
   a. shortly before his second inaugural
   b. three days before the end of the war
   c. five days after Lee surrendered
   d. on Easter Sunday
   e. immediately following the Gettysburg Address

19. Colonial Americans in Salem, MA, used torture during the trials of
   a. British soldiers
   b. petty thieves and peeping Toms
   c. witches
   d. heathens
   e. both a and b

20. What is the term which indicates that two or more countries are using terrorism against each other?
   a. counterterrorism
   b. war
   c. guerrilla warfare
   d. political harrassment
   e. detente

21. How many players are on a baseball team?
   a. eleven
   b. five
   c. six
   d. nine
   e. twelve

22. Which of the following is not a common act of terrorism?
   a. assassination
   b. bombing
   c. kidnapping
   d. euthanasia
   e. murder
23. During the Spanish Inquisition, people were tortured to force them to change their ___.
   a. religious beliefs
   b. financial institution
   c. nationality
   d. sexual orientation
   e. political affiliation

24. After Lincoln's death, his body traveled from Washington, D.C., to his home primarily by ___.
   a. horse-drawn carriage
   b. horseless carriage
   c. train
   d. boat
   e. covered wagon

25. Modern-day examples of terrorism include
   a. hijackings of planes and ships
   b. kidnappings of American citizens
   c. kamikaze-style car bombs
   d. assassination plots against political and religious leaders
   e. all of these

26. From what state was Lincoln elected to the presidency?
   a. Kentucky
   b. Indiana
   c. Illinois
   d. Louisiana
   e. Ohio

27. A designated hitter bats in the place of the ___.
   a. catcher
   b. first baseman
   c. pitcher
   d. center fielder
   e. shortstop

28. Who assassinated Lincoln?
   a. John Wilkes Booth
   b. Lee Harvey Oswald
   c. John Hinckley
   d. Gary Gilmore
   e. Robert E. Lee

29. What modern-day political organization used torture as a common practice?
   a. Facists
   b. Socialists
   c. Democrats
   d. Republicans
   e. Capitalists
30. What document signed by Lincoln freed the slaves?
   a. Declaration of Independence
   b. Gettysburg Address
   c. Emancipation Proclamation
   d. Constitution
   e. Bill of Rights
APPENDIX B

Pilot Study Posttest
POSTTEST

DIRECTIONS: Select the best answer for each question below. Then darken the corresponding circle on the computer answer sheet.

1. What was the purpose of the bomb?
   a. to gain entry
   b. to distract attention
   c. to kill Matlock
   d. to force Ballentine to talk
   e. both a and c

2. What modern-day political organization used torture as a common practice?
   a. Facists
   b. Socialists
   c. Democrats
   d. Republicans
   e. Capitalists

3. Which of the following does not describe the victim's injuries?
   a. cosmetic
   b. external
   c. internal
   d. superficial
   e. psychological

4. After seeing the victim, who or what did Greenburg ask to be summoned?
   a. the police and an ambulance
   b. Matlock and a stretcher
   c. Ballentine and some bandages
   d. Matlock and a doctor
   e. Ballentine and a doctor

5. What two religious groups in Britain and Ireland often practice terrorism against each other?
   a. the Protestants and the Mormons
   b. the Roman Catholics and the Jews
   c. the Roman Catholics and the Moslems
   d. the Protestants and the Roman Catholics
   e. the Protestants and the Jews

6. Which of the following is not an instrument of torture?
   a. a detonator
   b. thumbscrews
   c. whips
   d. the rack
   e. stocks
7. What color was Pat's hair?
   a. blonde
   b. red
   c. brown
   d. black
   e. gray

8. Who is Jamie?
   a. Matlock
   b. one of the torturers
   c. one of the bomb victims
   d. Greenburg
   e. Ballentine

9. What was the extent of Matlock's and Greenburg's injuries due to the explosions?
   a. Matlock was unharmed, but Greenburg had a broken leg.
   b. Both were bleeding from head wounds.
   c. Matlock had a chest wound, and Greenburg had a cut on his hand.
   d. Greenburg was unharmed, but Matlock's head was bleeding.
   e. Both were essentially unharmed.

10. Three dictators who conducted widespread terrorism during the 1930's include _____.
    a. Castro, Mussolini, and Roosevelt
    b. Hitler, Mussolini, and Stalin
    c. Stalin, Genghis Khan, and Castro
    d. Hitler, Castro, and Roosevelt
    e. none of these

11. Which of the following wars was known as "The Reign of Terror"?
    a. World War I
    b. The Civil War
    c. The Vietnam War
    d. The French Revolution
    e. World War II

12. The word terrorism was coined near the end of the 1700's during _____.
    a. the French and Indian War
    b. the French Revolution
    c. the Hundred Years War
    d. during the signing of the Treaty of Versailles
    e. the liberation of Paris during World War II
13. What was Matlock's profession?
   a. an English professor
   b. a preacher
   c. an insurance salesman
   d. an architect
   e. a policeman

14. What did Matlock see when he opened the door to his apartment?
   a. a terrorist setting a bomb
   b. Greenburg and the victim
   c. survivors of the bomb
   d. an empty corridor
   e. the body of the victim

15. Which of the following is not a purpose of terrorism?
   a. to maintain authority
   b. to gain power
   c. to eliminate political opposition
   d. to overthrow a government
   e. to victimize allies

16. During the Spanish Inquisition, people were tortured to force them to change their _____.
   a. religious beliefs
   b. financial institution
   c. nationality
   d. sexual orientation
   e. political affiliation

17. Which of the following is not a reason why people are tortured?
   a. for revenge
   b. to punish someone
   c. because they are revered
   d. to gain information
   e. because of their religious beliefs

18. Colonial Americans in Salem, MA, used torture during the trials of _____.
   a. British soldiers
   b. petty thieves and peeping Toms
   c. witches
   d. heathens
   e. both a and b
19. In what condition did Pat's body return from the terrorists?
   a. She was naked.
   b. She was unconscious.
   c. She had suffered lethal wounds.
   d. Her lungs had collapsed.
   e. She had been beaten and cut.

20. What do you know about the condition of the apartment after the bomb?
   a. the plumbing is intact
   b. the ceiling has collapsed
   c. the front wall is destroyed
   d. the kitchen was destroyed
   e. all of these

21. How many explosions took place?
   a. three
   b. one
   c. four
   d. two
   e. five

22. What is the term which indicates that two or more countries are using terrorism against each other?
   a. counterterrorism
   b. war
   c. guerrilla warfare
   d. political harrassment
   e. detente

23. Who carried the victim into the apartment?
   a. Greenburg
   b. Ballentine
   c. the police
   d. Matlock
   e. others who lived in the apartment building

24. Modern-day examples of terrorism include
   a. hijackings of planes and ships
   b. kidnappings of American citizens
   c. kamikaze-style car bombs
   d. assassination plots against political and religious leaders
   e. all of these

25. What implement did the torturers use?
   a. a whip
   b. a knife
   c. a club
   d. an electric cattle prod
   e. a gun
26. Where did the victim sustain many of her cuts?
   a. on her cheeks
   b. on her breasts
   c. on her stomach
   d. on her legs
   e. on her arms

27. Which of the following is not a common act of terrorism?
   a. assassination
   b. bombing
   c. kidnapping
   d. euthanasia
   e. murder

28. Who screamed the "single screech of terror"?
   a. someone seeing the victim
   b. Greenburg
   c. the victim
   d. a wounded survivor of the bomb
   e. Matlock

29. Anarchism is a form of political terrorism that believes _______.
   a. it is the responsibility of a government to defend its citizens from terrorism
   b. policies of violence and terrorism do not affect lasting changes
   c. governments can be destroyed through violence and terror
   d. the acquisition and preservation of power cannot effectively be accomplished through terror
   e. all of these

30. Where was the apartment located?
   a. on the second floor
   b. in the basement
   c. on the west side of the apartment building
   d. on the east side of the apartment building
   e. on the first floor

31. Guerrilla terrorists _______.
   a. are groups of fighters who attack and then disappear
   b. move around from place to place
   c. are underground organizations
   d. find speed of movement essential
   e. all of these
32. Why was "Jamie" the only word the victim said?
   a. She died.
   b. She fainted.
   c. She was gagged.
   d. She was too frightened to speak.
   e. Matlock kissed her.

33. What were the torturers' intentions toward the victim?
   a. They planned to kill her as soon as possible.
   b. They wanted to frighten her momentarily.
   c. They wanted to hurt her but keep her alive.
   d. They wanted to know where Matlock lived.
   e. They wanted to know where the bomb was planted.

34. A modern form of torture that involves emotional and mental manipulation is called ______.
   a. sadism
   b. brainwashing
   c. masochism
   d. capital punishment
   e. bondage

35. How did Matlock know the explosive was not strong enough to destroy the building?
   a. He knew how much explosive had been used.
   b. He had set the bomb.
   c. The ceiling blackened but did not fall.
   d. He smelled smoke.
   e. Greenburg told him.

36. Who planted the bomb?
   a. the victim
   b. Greenburg
   c. the terrorists
   d. Ballentine
   e. Matlock
APPENDIX C

Pilot Study Target Passage
**THE MATLOCK PAPER**

*** The Matlock Paper is an adventure story where one man, Matlock, sets out to stop a conspiracy that threatens the USA. ***

The second explosion came. Parts of the ceiling blackened. But Matlock knew it was not a killer explosive. It was something else, and he could not figure it out at the moment. It was an eyegrabber, a camouflage— not meant to kill, but to deflect all concentration. A huge firecracker.

Screams of panic could now be heard mounting from all parts of the building. The sounds of rushing feet pounded on the floor above his apartment.

And then a single screech of terror from outside Matlock's front door. It would not stop. The horror of it caused Matlock and Greenberg to struggle to their feet and race to the source. Matlock pulled the door open and looked down upon a sight no human being should ever see more than once in a lifetime, if his life must continue beyond that instant.

On his front step was Patricia Ballantyne wrapped in a bloodsoaked sheet. Holes were cut in the areas of her naked breasts, blood flowing from gashes beneath the nipples. The front of her head was shaved; blood poured out of lacerations where once had been the soft brown hair. Blood, too, came from the half-open mouth, her lips bruised and split. The eyes were blackened into deep crevices of sore flesh— but they moved! The eyes moved!
Saliva began forming at the corners of her lips. The half-dead corpse was trying to speak. "Jamie..." was the only word she managed and then her head slipped to one side.

Greenberg threw his whole weight against Matlock, sending him sprawling into the gathering crowd. He roared orders of "Police!" "Ambulance!" until he saw enough people running to execute his commands. He put his mouth to the girl's mouth, to force air into the collapsing lungs, but he knew it wasn't really necessary. Patricia Ballantyne wasn't dead; she'd been tortured by experts, and the experts knew their business well. Every slash, every crack, every bruise meant utmost pain but did not mean death.

He started to pick the girl up but Matlock stopped him. The English professor's eyes were swollen with tears of hate. He gently removed Greenberg's hands and lifted Pat into his arms. He carried her inside and stretched her out on the half-destroyed sofa. Greenberg went into the bedroom and returned with a blanket. Then he brought a bowl of warm water from the kitchen and several towels. He lifted the blanket and held a towel beneath the bleeding breasts. Matlock, staring in horror at the brutally beaten face, then took the edge of another towel and began wiping away the blood around the shaven head and the mouth.

"She'll be all right, Jim. I've seen this before. She'll be all right."

APPENDIX D

Experimental Posttest
POSTTEST

DIRECTIONS: Select the best answer for each question below. Then darken the corresponding circle on the computer answer sheet.

1. When Pat disappeared,
   a. She had been talking to Matlock on the phone.
   b. She was attending a class.
   c. She was on her way to a movie in Hartford.
   d. Greenburg knew where she was going.
   e. Matlock and she were at the Cheshire Cat.

2. What was the purpose of the bomb?
   a. to gain entry
   b. to distract attention
   c. to destroy Matlock's apartment
   d. to confuse Pat
   e. all of these

3. What modern-day political organization used torture as a common practice?
   a. Fascists
   b. Socialists
   c. Democrats
   d. Republicans
   e. Capitalists

4. After seeing Pat, for whom or what did Greenburg ask?
   a. the police and an ambulance
   b. Matlock to call for the police and a doctor
   c. a blanket and some bandages to prevent shock and bleeding
   d. a towel and warm water to bathe her wounds
   e. help to carry her inside the apartment

5. What two religious groups in Britain and Ireland often practice terrorism against each other?
   a. the Protestants and the Mormons
   b. the Roman Catholics and the Jews
   c. the Roman Catholics and the Moslems
   d. the Protestants and the Roman Catholics
   e. the Protestants and the Jews

6. Which of the following is not an instrument of torture?
   a. a detonator
   b. thumbscrews
   c. whips
   d. the rack
   e. stocks
7. What are covert operations?
   a. such activities as the claiming of responsibility for bombing by terrorist groups
   b. most frequently directed against foreign enemies
   c. only under the direction of the CIA
   d. the same as undercover activities
   e. always sponsored by the government

8. How did Matlock know Pat was still alive?
   a. Her eyes moved.
   b. Saliva formed at the corner of her lips.
   c. She tried to speak.
   d. She said "Jamie."
   e. She was still breathing.

9. What was the extent of Matlock's and Greenburg's injuries due to the explosions?
   a. Injuries were severe enough to warrant calling an ambulance.
   b. They were still standing.
   c. Matlock's eyes were injured.
   d. Greenburg was unharmed, but Matlock's head was bleeding.
   e. Both were essentially unharmed.

10. Three dictators who conducted widespread terrorism during the 1930's include ______.
    a. Castro, Mussolini, and Stalin
    b. Hitler, Mussolini, and Stalin
    c. Stalin, Marx, and Castro
    d. Hitler, Castro, and Stalin
    e. Hitler, Marx, and Mussolini

11. Which of the following is not a purpose of terrorism?
    a. to maintain authority
    b. to gain power
    c. to eliminate political opposition
    d. to overthrow a government
    e. to victimize allies

12. During the Spanish Inquisition, people were tortured to force them to change their ______.
    a. religious beliefs
    b. ethics
    c. nationality
    d. moral values
    e. political affiliation
13. Matlock's reaction to the first explosion indicated
   a. he panicked easily.
   b. his reflexes were slow.
   c. he depended on Greenburg's speed and strength.
   d. he knew about explosives.
   e. he was overcautious.

14. Which of the following is not a reason why people are tortured?
   a. for revenge
   b. to punish someone
   c. for committing a felony
   d. to gain information
   e. because of their religion

15. Colonial Americans in Salem, MA, used torture during the trials of
   a. women accused of adultery or prostitution
   b. men accused of murder
   c. women accused of sorcery and witchcraft
   d. men accused of supporting the English king
   e. men accused of stealing horses

16. In what condition did Pat's body return from the terrorists?
   a. She was naked.
   b. She was unconscious.
   c. She had suffered lethal wounds.
   d. Her lungs had collapsed.
   e. She had been beaten and cut.

17. What color was Pat's hair?
   a. blonde
   b. red
   c. brown
   d. black
   e. gray

18. What is the term which indicates that two or more countries are using terrorism against each other?
   a. counterterrorism
   b. war
   c. guerrilla warfare
   d. political harassment
   e. detente
19. Pat was probably the kind of person who _____.
   a. was sensitive to criticism
   b. always asked for help with her problems
   c. responded to orders quickly
   d. was patient with others
   e. did things her own way

20. Who carried Pat into the apartment?
   a. Greenburg
   b. Ballantyne
   c. the police
   d. Matlock
   e. other people who lived in the apartment building

21. Modern-day examples of terrorism include
   a. strategic defense initiatives
   b. hunger strikes
   c. religious rallies
   d. assassinations of political leaders
   e. social or political demonstrations

22. What did Matlock plan to do to locate Pat?
   a. He was going to make Greenburg tell him where she was.
   b. He was going to look for her.
   c. He was checking with local hospitals.
   d. He was to file a missing person report with the police.
   e. He was going to call Pat's friends.

23. Where did Pat sustain many of her cuts?
   a. on her face
   b. on her breasts
   c. on her stomach
   d. on her legs
   e. on her arms

24. Which of the following is not a common act of terrorism?
   a. assassination
   b. bombing
   c. kidnapping
   d. euthanasia
   e. murder

25. What did Pat usually do when she was angry?
   a. She cried.
   b. She went to a jazz concert or to see a play.
   c. She went shopping and bought a new dress.
   d. She found a place where she could be alone.
   e. She read a book.
26. Into what room do Matlock and Greenburg take Pat?
   a. the living room
   b. the kitchen
   c. the porch
   d. the bathroom
   e. the bedroom

27. Where was the apartment located?
   a. on the second floor
   b. on the west side of the building
   c. in the basement
   d. on the east side of the building
   e. on the first floor

28. Guerrilla terrorists ____________.
   a. are groups who attack and then disappear
   b. move around from place to place
   c. are underground organizations
   d. find speed of movement essential
   e. all of these

29. Why was "Jamie" the only word Pat said?
   a. She died.
   b. She fainted.
   c. She was gagged.
   d. She was too frightened to speak.
   e. Matlock kissed her.

30. What were the torturers' intentions toward Pat?
   a. They intended to kill her.
   b. They wanted to frighten her temporarily.
   c. They wanted to hurt her but keep her alive.
   d. They wanted to know where Matlock lived.
   e. They wanted information from Matlock and Greenburg.

31. Who planted the bomb?
   a. a homicidal maniac
   b. Greenburg's associates
   c. Ballantyne's captors
   d. a pyromaniac
   e. one of Matlock's neighbors

32. What was the Cheshire Cat?
   a. a pet store
   b. a restaurant
   c. a furniture store
   d. a department store
   e. a market/delicatessen
33. What did the first bomb smell like?
   a. smoke
   b. burning rubber
   c. chloride
   d. sulphur
   e. magnesium

34. In general, the purpose of a bomb is to
   a. start a fire.
   b. shatter a target.
   c. kill and maim.
   d. cause minimal damage.
   e. cause and spread radiation.

35. What happens when your lungs collapse?
   a. You suffocate.
   b. You get double pneumonia.
   c. Your rib cage also collapses.
   d. Your chances of lung disease are increased.
   e. Your windpipe enlarges.
APPENDIX E

Experimental Pretest
DIRECTIONS: Select the best answer for each question below. Then darken the corresponding circle on your computer answer sheet.

1. Who succeeded Kennedy as President?
   a. Johnson
   b. Nixon
   c. Eisenhower
   d. Ford
   e. Carter

2. How did Kennedy win fame as a war hero?
   a. He saved the lives of five men in World War II.
   b. He was honorably discharged from the army.
   c. He participated in the invasion of Cuba.
   d. He served in the Marine Corps during the Korean Conflict.
   e. He received a purple heart for being wounded in combat.

3. Three dictators who conducted widespread terrorism during the 1930's include_____.
   a. Castro, Mussolini, and Stalin
   b. Hitler, Mussolini, and Stalin
   c. Stalin, Marx, and Castro
   d. Hitler, Castro, and Stalin
   e. Hitler, Marx, and Mussolini

4. What two religious groups in Britain and Ireland often practice terrorism against each other?
   a. the Protestants and the Mormons
   b. the Roman Catholics and the Jews
   c. the Roman Catholics and the Moslems
   d. the Protestants and the Roman Catholics
   e. the Protestants and the Jews

5. Which of the following is not an instrument of torture?
   a. a detonator
   b. thumbscrews
   c. whips
   d. the rack
   e. stocks

6. How did Kennedy and Nixon use television during the 1960 campaign?
   a. for paid political speeches
   b. to debate the issues
   c. for free political advertisements
   d. for political rallies and demonstrations
   e. for news announcements
7. What modern-day political organization used torture as a common practice?
   a. Fascists
   b. Socialists
   c. Democrats
   d. Republicans
   e. Capitalists

8. What was the Kennedy era called?
   a. the Cold War
   b. the Final Frontier
   c. the Age of Civil Rights
   d. the Great Society
   e. Camelot

9. Which of the following wars was known as "The Reign of Terror"?
   a. World War I
   b. The Civil War
   c. The American Revolution
   d. The French Revolution
   e. World War II

10. Which of the following is not a reason why people are tortured?
    a. for revenge
    b. to punish someone
    c. for committing a felony
    d. to gain information
    e. because of their religion

11. What is the most common immediate reaction to a horrible sight?
    a. fainting
    b. vomiting
    c. screaming for help
    d. becoming pale and cold
    e. calling the police

12. Who is thought to have killed John Fitzgerald Kennedy?
    a. Ruby
    b. Boothe
    c. Harvey
    d. Johnson
    e. Oswald
13. Where did the Kennedy assassination take place?
   a. Washington, DC  
   b. Houston, Texas  
   c. Miami, Florida  
   d. Dallas, Texas  
   e. Boston, Massachusetts

14. Which of the following is **not** a purpose of terrorism?
   a. to maintain authority  
   b. to gain power  
   c. to eliminate political opposition  
   d. to overthrow a government  
   e. to victimize allies

15. During the Spanish Inquisition, people were tortured to force them to change their ____.
   a. religious beliefs  
   b. ethics  
   c. nationality  
   d. moral values  
   e. political affiliation

16. How is Kennedy's grave in Arlington National Cemetery marked?
   a. with a simple white cross  
   b. with a statue of Kennedy  
   c. with an eternal flame  
   d. with an armed guard 24 hours a day  
   e. with a tombstone containing his name and dates

17. The word *terrorism* was coined near the end of the 1700's during ____.
   a. the French and Indian War  
   b. the French Revolution  
   c. the Hundred Years War  
   d. during the signing of the Treaty of Versailles  
   e. the liberation of Paris during World War II

18. Colonial Americans in Salem, MA, used torture during the trials of ____.
   a. women accused of adultery or prostitution  
   b. men accused of murder  
   c. women accused of sorcery and witchcraft  
   d. men accused of supporting the English king  
   e. men accused of stealing horses
19. What is the term which indicates that two or more countries are using terrorism against each other?
   a. counterterrorism
   b. war
   c. guerrilla warfare
   d. political harrassment
   e. detente

20. During October, 1962, a dispute over Russian missiles in the American hemisphere brought the United States and Russia to the brink of war. This dispute is commonly referred to as
   a. the Cuban Missile Crisis
   b. the Cold War
   c. the Berlin Wall
   d. the Bay of Pigs Invasion
   e. the Freedom March
   f. Sputnik

21. Modern-day examples of terrorism include
   a. strategic defense initiatives
   b. hunger strikes
   c. religious rallies
   d. assassinations of political leaders
   e. social or political demonstrations

22. An American-sponsored attempt by Cuban exiles to overthrow Castro during the Kennedy administration is commonly referred to as
   a. Civil Rights
   b. the Cold War
   c. The Bay of Pigs Invasion
   d. The Charge of San Juan Hill
   e. the Korean Conflict

23. Which of the following is not a common act of terrorism?
   a. assassination
   b. bombing
   c. kidnapping
   d. euthanasia
   e. murder
24. Anarchism is a form of political terrorism that believes

a. a government has the responsibility to defend its citizens from terrorism
b. policies of violence and terrorism do not cause lasting changes
c. governments can be destroyed through violence and terror
d. the acquisition and preservation of power cannot effectively be accomplished through terror
e. the bourgeoisie can rebel against the proletariat.

25. What group, established in 1961 during the Kennedy administration, is responsible for sending volunteers to improve conditions in underdeveloped nations?

a. the March of Dimes
b. the Peace Corps
c. the Salvation Army
d. the Red Cross
e. the Freedom Fighters

26. Guerrilla terrorists

a. are groups who attack and then disappear
b. move around from place to place
c. are underground organizations
d. find speed of movement essential
e. all of these

27. A modern form of torture that involves emotional and mental manipulation is called

a. sadism
b. brainwashing
c. masochism
d. physical and verbal abuse
e. psychological neutralization

28. What happens when your lungs collapse?

a. You suffocate.
b. You get double pneumonia.
c. Your rib cage also collapses.
d. Your chances of lung disease are increased.
e. Your windpipe enlarges.

29. Who was premier of Russia while Kennedy was president?

a. Castro
b. Stalin
c. Lenin
d. Brezhnev
e. Khrushchev

30. For which of the following books did Kennedy win the
Pulitzer Prize in 1957?
   a. While England Slept
   b. Profiles in Courage
   c. Men at War
   d. The Making of a President
   e. JFK: An Autobiography

31. For what was Jacqueline Kennedy well-known as First Lady?
   a. her expensive designer clothes
   b. her hairdo and pill box hats
   c. her historic redecoration of the White House
   d. her popularity with European crowds
   e. all of these

32. What are covert operations?
   a. such activities as the claiming of responsibility for a bombing by terrorist groups
   b. most frequently directed against foreign enemies
   c. only under the direction of the CIA
   d. the same as undercover activities
   e. always sponsored by the government

33. Which of the following quotes is Kennedy known for saying?
   a. "Ask not what your country can do for you..."
   b. "With malice toward none, with charity for all...">
   c. "I am not a crook."
   d. "Whip inflation now."
   e. "War is hell."

34. In general, the purpose of a bomb is to
   a. start a fire.
   b. shatter a target.
   c. kill and maim.
   d. cause minimal damage.
   e. cause and spread radiation.

35. Kennedy was the first president to send military advisors to what country?
   a. Korea
   b. Japan
   c. Vietnam
   d. Cuba
   e. Germany
APPENDIX F

Experimental Target Passage
*** The Matlock Paper is an adventure story where one man, Matlock, sets out to stop a conspiracy that threatens the USA. ***

Matlock picked up the telephone, dialed Pat's number, and let it ring a dozen times. There was no answer. Matlock thought of several of Pat's friends and wondered whether to call them or not. When angry or upset, Pat usually did one of two things. She either went off by herself for an hour or so, or, conversely, sought out one or two friends and drove off to a film in Hartford or an out-of-the-way bar. It was just over an hour. He'd give her another fifteen minutes before phoning around. It had, of course, occurred to him that she might have been taken involuntarily—that had been his first thought. But it wasn't logical. The Cheshire Cat had been filled with people, the tables close together. Greenberg was right. Wherever she went, she went because she wanted to go.

Greenberg stood by the kitchen door. He hadn't moved. He'd been watching Matlock.

"I'll try in a quarter of an hour. Then, if there's no answer, I'll call some friends of hers. As you said, she's one strong-willed young lady." . . .

When the thunderous crash came, it was so ear-shattering both men threw themselves to the floor. It was as if the whole side of the building had collapsed in rubble. Dust was everywhere, furniture toppled, glass shattered, splinters of wood and plaster flew through the
air, and the terrible stench of burning sulfur settled over the room. Matlock knew the smell of that kind of bomb, and his reflexes knew how to operate. He clung to the base of his couch waiting, waiting for a second explosion—a delayed detonator which would kill any who rose in panic. Through the mist, he saw Greenberg start to get up, and he leaped forward, tackling the agent at his knees.

The second explosion came. Parts of the ceiling blackened. But Matlock knew it was not a killer explosive. It was something else, and he could not figure it out at the moment. It was an eyegrabber, a camouflage—not meant to kill, but to deflect all concentration. A huge firecracker.

Screams of panic could now be heard mounting from all parts of the building. The sounds of rushing feet pounded on the floor above his apartment.

And then a single screech of terror from outside Matlock's front door. It would not stop. The horror of it caused Matlock and Greenberg to struggle to their feet and race to the source. Matlock pulled the door open and looked down upon a sight no human being should ever see more than once in a lifetime, if his life must continue beyond that instant.

Oh his front step was Patricia Ballantyne wrapped in a bloodsoaked sheet. Holes were cut in the areas of her naked breasts, blood flowing from gashes beneath the nipples. The front of her head was shaved; blood poured out of lacerations where once had been the soft brown hair. Blood, too, came from the half-open mouth, her lips bruised and split. The eyes were blackened into deep crevices of sore flesh—but they moved! The eyes moved!
Saliva began forming at the corners of her lips. The half-dead corpse was trying to speak. "Jamie..." was the only word she managed and then her head slipped to one side.

Greenberg threw his whole weight against Matlock, sending him sprawling into the gathering crowd. He roared orders of "Police!" "Ambulance!" until he saw enough people running to execute his commands. He put his mouth to the girl's mouth, to force air into the collapsing lungs, but he knew it wasn't really necessary. Patricia Ballantyne wasn't dead; she'd been tortured by experts, and the experts knew their business well. Every slash, every crack, every bruise meant utmost pain but did not mean death.

He started to pick the girl up but Matlock stopped him. The English professor's eyes were swollen with tears of hate. He gently removed Greenberg's hands and lifted Pat into his arms. He carried her inside and stretched her out on the half-destroyed sofa. Greenberg went into the bedroom and returned with a blanket. Then he brought a bowl of warm water from the kitchen and several towels. He lifted the blanket and held a towel beneath the bleeding breasts. Matlock, staring in horror at the brutally beaten face, then took the edge of another towel and began wiping away the blood around the shaven head and the mouth.

"She'll be all right, Jim. I've seen this before. She'll be all right."

APPENDIX G

Sample Packet for Experimental Group
"DIRECTIONS: Please write your name and student identification number on the top of this sheet. Draw with your regular pencil a concept map of all you know about the topic listed in the middle of the page. Then read your passage. When you are through reading, raise your hand and your instructor will collect the passage. Then, use your red pencil to add whatever new concepts you know about the topic to your map. When you have completed your map for the second time, turn your map over. They will be collected when everyone has finished."
"Well, our faction carried the day. The moderates want both Stanton and Seward to go. But we said the departure of Seward was enough for now. With Seward to go. But we said the departure of Seward was enough for now. With Seward gone, the Cabinet can be reorganized."

"Seward is too much a politician for my taste." Chase arranged the papers on his desk in a neat line with the top of the blotter. "He has a sort of back stairs influence on the President that strikes me as dangerous. They constantly...joke with each other."

"Oh, he's a card, the governor," said Wade. "But I don't mind the jokes so much as I do the way he acts on his own, without consulting the President or the Cabinet, like that letter of instructions he wrote to Adams in London, mocking us abolitionists. Then, he goes and publishes it in that damned fool book of his. When Sumner showed the letter to Lincoln, he said he had never seen it before, and that it didn't reflect his own policy. Now that is serious."...

Seward was expecting the President. In fact, he had been sitting at his study window, looking out at the cold muddy expanse of Lafayette Square, and waiting for the tall, slouched figure to cross from the Mansion to the Old Club House accompanied by two soldiers from Company K of the 150th Pennsylvania Regiment, known as "Bucktails," now permanently assigned to guard the President. Just as the gaslights were
being lit along the avenue, the President appeared.

Seward opened the door himself; and showed Lincoln into the study. The President took off his top hat and placed it on the head of Pericles, a marble bust on a column that ornamented one corner of the room. "Well, our friends have been busy on the Hill." Lincoln poured himself a glass of water from a crystal decanter, and helped himself to an apple from the sideboard where Seward's numerous restorative bottles were kept. Then the President sat beside the fire and turned his gaze upon Seward, who noted that Lincoln had aged a decade in the last month; plainly, a number of harsh additional years were now about to be added to that unhappy decade. . . .

"You know," said Seward, "this may be difficult for anyone to believe, but I cannot wait to get back home to Auburn and private life. This is no joy to me, what we do here."

"Well, that's all very well for you, Governor. But I am like the starling in Sterne's story: 'I can't get out.'"

"What will you do?"

"I'm not sure yet. Naturally, I will listen to the senators. I've already had the pleasure of an interview with Thaddeus Stevens, who believes that only you stand between us and victory in the war."

Seward shook his head, with true wonder. "I am the author of the notorious--not to mention revolutionary--concept that there is 'a law higher than the constitution,' and though our Constitution may allow for slavery, that higher law does not. Now our Jacobins consider me indifferent to the issue and, secretly, pro-rebel."

"Mr. Seward, the inability of men to grasp an obvious truth is a constant in political life. I seem to spend most of my time explaining
what should be obvious to all. Now what is obvious to me is that you are of no particular interest to the Senate but I am. They wish to remove me; and they don't know how. So they strike at you."

"But these things change rapidly. A victory or two, and you will be a hero again." But Seward agreed, privately, with Lincoln's estimate of the matter. As a political force, the President was burnt out; and nothing could reignite the fire. The collapse of Burnside in the mud of Virginia was the end of the Administration. The fact that the pusillanimous Senate now dared to dictate to the President was a sign that all true authority was gone.

APPENDIX H

Sample Packet for Control Group
DIRECTIONS: For each of the exercise on the following pages, select the best answer. Then write your choice on the appropriate blank below.

1. ________

2. ________

3. ________

4. ________

5. ________

6. ________

7. ________

8. ________

9. ________

10. ________
He felt himself more in danger, nearer death, than ever since he had entered that room. An insane bandit is a deadly combination. He did not, could not know that Mr. Jones was quick-minded enough to see already the end of his reign over his excellent secretary's thoughts and feelings; the coming failure of Ricardo's fidelity. A woman had intervened! A woman, a girl, who apparently possessed the power to awaken men's disgusting folly. Her power had been proved in two instances already—the beastly innkeeper, and that man with moustaches, upon whom Mr. Jones, his deadly right hand twitching in his pocket, glared more in repulsion than in anger.

The feeling in this passage leads one to conclude that

☐ a. the woman is a part of the criminal's plan.
☐ b. it's all a misunderstanding.
☐ c. danger has been mounting gradually.
☐ d. Mr. Jones is calm.

I was not rich—on the contrary; and I had been told the Pension Beaurepas was cheap. I had moreover been told that a boardinghouse is a capital place for the study of human nature. I had a fancy for a literary career, and a friend of mine had said to me, "If you mean to write, you ought to go and live in a boardinghouse; there is no other such place to pick up material." I had read something of this kind in a letter addressed by Stendhal to his sister: "I have a passionate desire to know human nature, and have a great mind to live in a boardinghouse, where people cannot conceal their real characters."

The speaker implies to the reader that he

☐ a. can't make up his own mind.
☐ b. is stingy with money.
☐ c. is really serious about writing.
☐ d. likes to move from one boarding house to the other.
Cacambo manifested all his curiosity to his host; the host said to him: "I am very ignorant, and I get along all right that way; but we have here an old man who has retired from the court, who is the most learned man in the kingdom and the most communicative." Immediately he took Cacambo to the old man. Candide was now playing only second fiddle and going along with his valet. They entered a house that was very simple, for the door was only of silver and the paneling in the apartments only of gold, but wrought with so much taste that the richest paneling did not eclipse it. True, the antechamber was encrusted only with rubies and emeralds, but the order in which everything was arranged fully made up for this extreme simplicity.

One may infer from the passage that
☐ a. Cacambo is in a land in which everyone is friendly.
☐ b. the kingdom in which the old man lives is very rich.
☐ c. the old man is the king.
☐ d. everyone in the kingdom leads a very simple life.

I worked then only on Saturdays, thinking of those twelve hours in a shoe store as a parenthesis in my life. I remember myself on the way to work, the only one it seemed to me then fully awake among the half-asleep adult workers on the streetcar. I can still feel my eagerness and my fear; and for the moment I seem to be jolted again on the straw seat, my hair damp and unnaturally plastered back. I am wearing knickers; I have never shaved.

The speaker implies that in this part of his youth
☐ a. he was generally optimistic.
☐ b. he hated his routine.
☐ c. he disliked adults.
☐ d. he wanted to become a shoe salesman, permanently.
This narrative is supposed to commence immediately after the installation of Dr. Proudie. I will not describe the ceremony, as I do not precisely understand its nature. I am ignorant whether a bishop be chaired like a member of Parliament, or carried in a gilt coach like a lord mayor, or sworn in like a justice of peace, or introduced like a peer to the upper house, or led between two brethren like a knight of the garter; but I do know that everything was properly done and that nothing fit or becoming to a young bishop was omitted on the occasion.

The author indicates that the speaker must have known by instinct:
- a. that he could never figure out the ceremony.
- b. that he was incapable of doing his task well.
- c. that the ceremony went well.
- d. that one is serious on such occasions.

The fair Volumnia being one of those sprightly girls who cannot long continue silent without imminent peril of seizure by the dragon Boredom, soon indicates the approach of that monster with a series of undisguisable yawns. Finding it impossible to suppress those yawns by any other process than conversation, she compliments Mrs. Rouncewell on her son, declaring that he positively is one of the finest figures she ever saw, and as soldierly a looking person she should think, as what’s his name, her favourite Life Guardsman—the man she dotes on—the darest of creatures—who was killed at Waterloo.

From the description in this passage, Volumnia seems:
- a. thoughtful.
- b. self-centered.
- c. serious.
- d. understanding.
... the two lads fell in love, and that with the same lady. Mr. Ebenezer, who was the admired and the beloved, and the spoiled one, made, no doubt, mighty certain of the victory; and when he found he had deceived himself, screamed like a peacock. The whole country heard of it; now he lay sick at home, with his silly family standing round the bed in tears; now he rode from public-house to public-house and shouted his sorrows into the lug of Tom, Dick, and Harry. Your father, Mr. David, was a kind gentleman; he was weak, dolefully weak; took all this folly with a long countenance; and one day—by your leave!—resigned the lady. She was no such fool, however; it's from her you must inherit your excellent good sense; and she refused to be bandied from one to another. Both got upon their knees to her, and the upshot of the matter for that while, was that she showed both of them the door.

This passage is rich with implications that
☐ a. the lady was a poor choice.
☐ b. the lady was more poised than both men.
☐ c. Mr. Ebenezer really didn’t love her.
☐ d. Mr. David didn’t deserve her.

In the meantime, the storm subsided into a brisk gale, that carried us into the warm latitudes, where the weather became intolerable, and the crew very sickly. The doctor left nothing unattempted towards the completion of his vengeance against the Welshman and me. He went among the sick, under pretense of inquiring into their grievances, with a view of picking up complaints to our prejudice.

The speaker indicates that
☐ a. the crew had a deadly disease.
☐ b. the doctor was sick, too.
☐ c. the doctor had a vengeful nature.
☐ d. the speaker wasn’t ill.
APPENDIX I

Instructional Script for Treatment Group
I once heard a joke about a farmer who trained a frog to jump whenever he shined a light in the frog's eyes. One day it occurred to the farmer that the frog might jump higher if it weighed less. So, he decided to conduct an experiment. He'd shine the light in the frog's eyes, and after it jumped, he'd pull a leg off the frog. That decreased the weight of the frog, you see. Pretty soon, though, the frog had no legs and, thus, could not jump. What did the farmer think? He thought that when a frog loses all its legs, it goes blind!

Somehow the farmer failed to understand what everyone else realizes from this story. Without legs, no animal can jump. The farmer made an invalid inference.

Inferences are the topic we're going to study for the next few days. Inferences are conclusions you make based on information you know, information you have in your memory, and information found in a text. Making inferences is a little like being the jury in a trial. Both require you to weigh the facts carefully. Both ask you to consider what
you know about the world and what you've learned about a particular situation before making decisions.

The joke about the farmer and his frog should help you realize it's not always easy to make a correct inference. Why? Inferences are often based on information that's not stated in the text; it may be only hinted or implied. Sometimes making inferences is easy. Sometimes it is not. The farmer weighed the facts but made the wrong inference. You avoid doing this by using the information you know about the world when making inferences.

For the next few days, we are going to study a reading strategy called semantic mapping. Semantic mapping is also called concept mapping because a concept map helps you connect the information about a topic you have in your memory with that found in a text. Concept maps are similar to road maps in that they help you see where your reading is taking you and what you're likely to see along the way. They help you recognize and associate important concepts, or ideas, about a topic. This, in turn, helps you remember information and increases the number of valid inferences you make during reading. You strengthen your understanding and memory of what you've read this way.

What do you think when you hear the word "Football?"

<Write "FOOTBALL" in the center of the transparency>
with your black pen. Draw a circle around it. Continue using the black pen until directed to use the red one.>

I think about the stadium, players, referees, coaches, popcorn, cokes, seats, uniforms, peanuts, Tigers, SEC, opponents, goal posts, touchdowns, field goals, Mike the Tiger, Alabama, and Ole' Miss.

<list these on the far side of the transparency as you say them.>

These are the places, events, people, and ideas indicate the concepts I associate with football.

The words you thought of might be the same, or they might be different. That's because each of us has different ideas about the same topic. Just like no two people look exactly alike, no two of our concepts of a topic are identical. Even if the words we use to describe the topic are the same, the mental images, pictures we have in our minds, will be different. This is one reason we sometimes have trouble understanding what we read. The author thinks one thing, and we think another.

One way to reduce the chances of such misunderstandings is by organizing concepts and recognizing the way concepts
relate to each other. You organize a list of concepts by clustering together items from your list that are alike.

After grouping these words together, you write above them a word that identifies what these items have in common. This word is a general, broad concept. The concepts you list under it are lesser and more specific ones.

Look at the list of concepts under "FOOTBALL."

Players, referees, coaches, opponents, and Mike the Tiger are people you'd find at a football game. They are listed together and labelled PEOPLE. Labels need to look different from the concepts under them, so you can easily see the groups you've identified. Let's put a box around them to show they're different. Popcorn, cokes, and peanuts are the food you might eat at a football game. They are placed together on the map and labelled FOOD. Touchdowns
and field goals are how teams score points, so we'll list them together and label them to WAYS TO SCORE POINTS. The stadium, goalposts, and seats have to do with the physical setting of the game. We'll write these on the map and call them SETTING.

When drawing a map, it is important to leave plenty of room between ideas. Later, you'll need this space to add to your map.

Recognizing that these categories all relate to football is important,

<Draw lines from "FOOTBALL" to each general category.>

but it is also important to recognize any relationships between the general categories. Since SEC, Ole' Miss, and Alabama are our opponents, they relate to a concept already on the map as well as to the topic "FOOTBALL." Since opponents is already on the map, we'll list SEC, Ole' Miss, and Alabama under the word. Then, we'll indicate the relationship between opponents and our new group with a line.
Since our new group is connected to "FOOTBALL" through its relationship with opponents, we do not have to draw another line connecting it.

What you see here is a concept map of the topic "FOOTBALL." Concept maps show what a person knows about a topic. As that knowledge changes or increases, the map does also. Listen to the following passage about football, written by a man who played at the University of Texas.

What new concepts come to your mind? I thought of such ideas as band, fans, purple and gold, parades, pep rallies, stadium cushions, pennants, funny hats, winning, cheerleaders, losing, sportsmanship.

List these with your red marker on the far right side of the transparency. Keep the first list covered. Continue using the red marker until the beginning of the WALT DISNEY passage.
How do these fit with the information we first drew on our concept map?

<Draw map as you speak.>

Fans and the band are people who attend games. We'll add them to our list under PEOPLE.

<List each of these as you speak.>

Purple and gold, cheerleaders, parades, pep rallies, pennants, and funny hats all deal with spirit. Since they affect PEOPLE, we'll write them near this category and label them SPIRIT.

Because stadium cushions relate to stadium seats, we'll write stadium cushions under it.

Winning, losing, and sportsmanship all relate to OUTCOMES of the game, so we'll group them together and label them as such. Because they relate to both WAYS TO SCORE POINTS and SPIRIT, we'll write them between the two.

Once again, we need to indicate relationships between the new categories, the topic, and the information we originally mapped.

<Draw lines as you speak.>
Once again, we need lines between our topic "FOOTBALL" and each new general category of concepts. In addition, we need to indicate the relationship between PEOPLE and SPIRIT, SPIRIT and OUTCOMES, and PEOPLE and OUTCOMES with lines. A line also needs to show the relationship between STADIUM SEATS and STADIUM CUSHIONS.

<Cover your list of words on the right of the transparency with paper.>

What we've done so far is to create a concept map of a topic, read a passage about that topic, and change our map to reflect the information we gained about the topic after reading, either from memory or from the passage itself. By looking at what we wrote first in black ink and what we added in red ink, we can see how information grew during reading.

While you may not always construct a concept map on paper before you read, you need to always consider what you know about a topic and how the concepts you know relate to each other and the topic before you begin to read. During and after your reading, you need to update your ideas with the new information you acquire either from the text, your memory, or your connections between the two.
Let's construct another concept map for the topic "WALT DISNEY."

<With black marker write "WALT DISNEY" in the center of a fresh transparency. Draw a circle around it. Continue using the black marker until directed to use the red one.>

This time you tell me what to information to map. What places, events, people, and ideas do you associate with Walt Disney?

<List these on the far left of the transparency as they answer.>

How can we organize these concepts? What concepts can be grouped together?

<List to the top, bottom, right, and left of "WALT DISNEY" the categories formed by the class.>

What concept do the items in each category have in common? What broad, general concept can be used to label this category? Remember that labels need to look different; to make them, we draw a box around them.
<Add labels to map. Remember to draw boxes around labels.>

How do these relate to each other and to Walt Disney?

<Add lines as students indicate.>

Now read this passage about Walt Disney.

<Distribute passages.>

When you are finished reading, list on the back of the last page any concepts you think we need to add to our map. Once everyone is finished reading, we'll discuss these and alter our map.

<After everyone has had time to read, say:>

What new concepts came to your mind after reading?

<List on the right side of transparency in red ink. Continue using red ink for the duration of this session. Discuss with the group each of the following questions as you deem appropriate. Construct the map as the discussion takes place.>
How can we categorize these concepts? Does this information relate to any of the categories we've already mapped? What can we label the categories?

<Draw lines to indicate relationships they identify. When you have completed the map, say:>

This is your concept map of "WALT DISNEY." By looking at it, you can see what you knew about Disney before you read the passage, written in black, and what you knew after you read the passage, written in both black and red. The information you gained from your memory and from the text increased the information you have at your disposal about Disney.

Let me summarize what we've talked about and done today. We have created concept maps of two topics, read a passage about those topics, and added and associated information gained from the passages and our memories to what we originally thought about the topic. Once again, any time you read, this same sort of process needs to take place. While you may not always draw a concept map, it's essential that you consider what you know about a topic before, during, and after reading and how the concepts you know relate to the topic and to each other. Tomorrow, you'll have a chance to practice mapping independently.
Yesterday we discussed concept maps and their value in helping us understand and associate the information contained in a text. Let's review what we did.

First, we listed important places, events, people, and ideas--concepts,--you knew about Walt Disney. We organized that information by identifying general categories and sub-categories and found how they related to the topic and to each other. The map represented all we initially thought of about Walt Disney. Then we read a passage about him and added what we learned to our map. This process is one that should take place any time you read. While you may not always construct a concept map on paper, you need to consider what you know about a topic before you begin reading. After your reading, you need to alter your concept map with the new information you acquire from the text.

Today, I'd like you to practice mapping. I'll walk around the room as you do so to answer any questions or provide you with any assistance you need.
I have given you a packet containing a set of directions and the passage you'll be reading. Read the directions silently as I read them aloud. "DIRECTIONS: Please write your name and student identification number on the top of this sheet. Draw with your regular pencil a concept map of all you know about the topic listed in the middle on the page. Then, read the passage. When you are through reading, raise your hand and your instructor will collect the passage. Then, use your red pencil to add whatever new concepts you know about the topic to your map. When you have completed your map for the second time, turn your map over. They will be collected when everyone has finished." Are there any questions?

The first topic you are considering today is "BASKETBALL." On the first page of your packet, list the concepts you associate with basketball, organize and label them, and draw a concept map of your initial associations with basketball. When you are through, turn the page and read the passage. Once you are finished reading, raise your hand, and I'll collect your passage. Then, turn back to your map and use your red pencil to make any additions or adjustments you feel necessary.

Again, please be sure to ask me for help if you need it.

<After everyone has completed revising their maps, collect all papers.
During the last two days we have discussed concept maps and their value in helping you understand and associate information contained in the text. Let's review what you've done. First, you listed important places, events, people, and ideas—concepts—you knew about a topic. You organized that information by identifying general categories and sub-categories and found how those categories related to the topic and to each other. The map represented all you initially thought of about the topic. Then you read a passage about the topic and added what you learned to your map. This process is one that should take place any time you read. While you may not always construct a concept map on paper, you need to consider what you know about a topic before you begin reading. During and after you read, you need to alter your concept map with the new information you acquired from the text.

Today, I'd like you to practice mapping on your own.

PASS OUT PACKETS

I have given you a set of packet of materials like the one you used yesterday. This packet contains a set of directions and the passage you'll be reading. Read the directions silently as I read them aloud. "DIRECTIONS: Please write your name and student identification number on
the top of this sheet. Draw with your regular pencil a concept map of all you know about the topic listed in the middle on the page. Then, read the passage. When you are through reading, raise your hand and your instructor will collect the passage. Then, use your red pencil to add whatever new concepts you know about the topic to your map. When you have completed your map for the second time, turn your map over. They will be collected when everyone has finished." Are there any questions? The second topic today is "ELVIS PRESLEY."

Please begin.

<After students have completed the first map and you have collected all papers, say:>

Here is your second packet of materials. Please write your name and student identification number on the front page and note again the directions on this page. You are to draw a concept map, read the passage, turn the passage into me, and then alter the map using your red pencil. When you have finished, turn your map over, and I'll collect them when everyone is finished. Any questions?

Your second topic is "ABRAHAM LINCOLN." Please begin.

<Collect materials and dismiss group when everyone is completed the work.>
Day 4 consists of giving students the target passage and the posttest.

<Distribute computer sheets to each student and say:>

Turn your answer sheets on their sides so that the Name Block appears on the left-hand side of the sheet. Beginning with your last name and skipping a space between each one, write your last name, first name, and middle initial in the Name Block.

<Pause.>

Now darken the letters in the circles below each letter of your name.

<Pause.>

In the identification block, put your student ID number and darken the corresponding circles.

<Pause.>
Under Special Codes, write ___ (1 for Group 1 in Allen 31; 2 for Group 2 in Allen 29) and darken this number.

Today you are going to read a passage and answer some questions about what you have read. You will not be able to refer to the passage when answering questions. I am going to distribute the passages now. Take as long as you like to read them. When you have finished reading, raise your hand, and I'll give you a set of questions to answer. Code your answers on your computer sheets. Instructions for answering the passage questions appear on the test packet.

Any questions?
APPENDIX J

Instructional Script for Control Group
I once heard a joke about a farmer who trained a frog to jump whenever he shined a light in the frog's eyes. One day it occurred to the farmer that the frog might jump higher if it weighed less. So, he decided to conduct an experiment. He'd shine the light in the frog's eyes, and after it jumped, he'd pull a leg off the frog. That decreased the weight of the frog, you see. Pretty soon, though, the frog had no legs and, thus, could not jump. What did the farmer think? He thought that when a frog loses all its legs, it goes blind!

Somehow the farmer failed to understand what everyone else realizes from this story. Without legs, no animal can jump. The farmer made an invalid inference.

Inferences are the topic we're going to study for the next few days. Inferences are conclusions you make based on information you know, information you have in your memory, and information found in a text. Making inferences is a little like being the jury in a trial. Both require you to weigh the facts carefully. Both ask you to consider what
you know about the world and what you've learned about a particular situation before making decisions.

The joke about the farmer and his frog should help you realize it's not always easy to make a correct inference. Why? Inferences are often based on information that's not stated in the text. It may be only hinted or implied.

Sometimes making inferences is easy. Sometimes it is not. The farmer weighed the facts but made the wrong inference. You avoid doing this by using the information you know about the world when making inferences. During the next few days, we'll be discussing inferences and practicing making them.

One reason people have difficulty making inferences is they're never seen anyone demonstrate the process. Compare how difficult it is to tell someone how to find your house with how easy it is to show them how to get there. Because showing is sometimes clearer than telling, today I am going to show you how I make inferences. Then, we're going to work as a group to make them.

Let's look at this first passage and the question under it.

<Put transparency #1 on overhead.>

The first thing I need to do, of course, is read the passage and question.
The next thing to do is examine each of the alternatives and, like that jury we talked about, determine which is the best one.

<Read the question again and examine each of the four alternatives. As you work through each alternative, use your pen to circle or underline key words and phrases in the passage. These are underlined in the following discussion. When you refer to them the second, third, etc. time, point to these phrases in the passage with your pen.>

a. "The passage definitely indicates that the Hartsells were close friends of the speaker." Let's see. Another way of asking this same question is "Were the Hartsells close friends of the speaker?" How would I know that? Is there information in the passage that tells me this or makes me think this? If so, what is it? The fact that the speaker was willing to apologize means if he is friends with them, they've all had a big fight or misunderstanding. If they left for Orlando without telling him (it says he heard it), they probably aren't friends. NO, the Hartsells aren't friends of the speaker. What's my next choice?
b. "The passage definitely indicates that the Hartsells lived in Orlando." I'll reword this question to be "Did the Hartsells live in Orlando?" How would I know that? Is there information in the passage that tells me this or leads me to believe this? If so, what is it? If the Hartsells leave for Orlando to visit relatives there, the Hartsells do not live in Orlando. So, the answer to this alternative is also NO.

c. "The passage definitely indicates that the Hartsells were not liked by the speaker." I can change this to ask "Were the Hartsells not liked by the speaker?" How would I know that? Is there information in the passage that tells me this or leads me to believe this? If so, what is it? The fact that the speaker was willing to apologize means he's had some sort of quarrel with the Hartsells. When they saw him in the park, they didn't stop to talk—they just nodded at him. And, they left for Orlando without telling the speaker anything about their plans. From what the speaker says, it doesn't seem he was too unhappy about not talking to them or their leaving town. YES, I'd say the Hartsells were not by liked the speaker, and it sounds like they probably didn't like him either. This may be the correct answer to the question, but I'd better look at the other alternatives just to be sure.

d. "The passage definitely indicates that the Hartsells would accept an apology." I'll change this to ask
"Would the Hartsells accept an apology?" How would I know that? Is there information in the passage that tells me this or leads me to believe this? If so, what is it? I think the answer is NO to this question. After all, if they were willing to let the speaker apologize, they would have done more than just nodded to him in the park. They'd have stopped and talked to him. That they left town without any word to him probably indicates they don't plan to accept any apologies from him—not in the near future, anyway.

Which alternative most accurately answers the question?

C does. That's the answer I pick.

Let me summarize the steps I went through in answering my inference question. First, I read the passage and question carefully. Second, I reread the question and the alternatives to help me focus on what was being asked. Third, I examined each alternative separately. When I examined the alternatives I reworded them into questions that made more sense to me. Then, I looked for evidence that pointed toward an answer to my question. Sometimes I underlined or circled information that seemed important to me. Some of that evidence depended on me making an inference—like deciding that if the Hartsells were going to
accept the speaker's apology, they'd have stopped and talked to him. That inference depended on my knowing how people behave when they want to compromise or settle a quarrel. It depended on my having information in my memory and my combining that with the text. That's what you have to do when you read to be able to understand a passage fully.

Next, even when I found what I thought was the correct answer, I continued to examine the alternatives. I did that because sometimes two answers may be correct, but one answer is more correct than the other. I wanted to be sure my answer was the best possible one. Finally, I made my choice and answered the question.

<Remove the transparency with this question and put the second transparency on the overhead.>

Let me demonstrate one more time how I make inferences.

<Read the passage and question aloud. Pause. Then read the question again and examine each of the four alternatives. As you work through each alternative, use your pen to circle or underline key words and phrases in the passage. These are underlined in the following discussion. When you refer to them the second, third, etc. time, point to these phrases in the passage with your pen.>
a. "One might suppose, from the above passage, that Tom didn't feel well." Is Tom sick? Is there information in the passage that tells me this or makes me think this? If so, what is it? He's **impatient** and **restless**. He's **tossing** and **fidgeting** and his **nerves** are upset. He's in **despair**. I'd say he's nervous about something, but he's not sick. The answer is NO.

b. "One might suppose, from the above passage, that Tom had plans for the morning." Does Tom have plans for the morning? Is there information in the passage that tells me this or makes me think this? If so, what is it? He's **impatient** and **restless**, waiting for **daylight**. He's **tossing** and **fidgeting** and his **nerves** are bothering him. He can't believe it's only ten o'clock at night. YES, I'd say he has something planned for the next day. This may be the right answer, but I'll still look at C and D.

c. "One might suppose, from the above passage, that Tom was nervous." Is Tom nervous? Is there information in the passage that tells me this or makes me think this? If so, what is it? He's **tossing** and **fidgeting** and his **nerves** are bothering him. The passage says he's **restless** and in a state of **despair**. I'd say he's nervous about something. YES, this answer seems correct, too. What about D?

d. "One might suppose, from the above passage, that Tom was annoyed with Sid." Is Tom mad with Sid? Is there information in the passage that tells me this or makes we
think this? If so, what is it? No, he doesn't do anything in the passage to make me think that. If he was, he'd probably want to wake Sid up, just to bother Sid.

Now, what do I do? Both answers B and C seem to be correct. I'll have to decide which is the best one. Let me look at them again and think. B asks "Does Tom have plans for the morning?" Every indication leads me to conclude that he does. C asks "Is Tom nervous?" Well, the passage says he is. This has to be correct, too. Let me look at the question again. <Read first part of question again.>
Oh, I see. Since the question asks what a person might suppose from the passage, not what the passage says, the answer I'm looking for is answer B. Supposing information is the same as concluding information. Other verbs like infer and imply also mean the same as conclude. The best answer for this question is B.

<Remove this transparency.>

Now, let's examine some of these passages together.

<Put third transparency on the overhead and read the passage. Pause. Then reread the question. Ask students to reword the alternatives into questions. Once they have done this, say:>

Is there information in the passage that tells you this or makes you think this? If so, what is it?

<When they respond, underline or circle important information in the passage. Then, when it is referred to again, point to it. Once the group has examined all the alternatives, ask:>

Which answer is the best one?

<Reach a group decision--take a vote, if there's dissent. Continue this procedure for the fourth and fifth transparency.>
Yesterday we discussed inferencing. Inferences are conclusions you make based on information you know, information you have from prior knowledge and experiences, information you have in your memory, and information found in a text. Remember that making inferences is a little like being the jury in a trial. You weigh facts carefully. You consider what you know about the world and what you've learned about a particular situation before making decisions.

Let me summarize the steps I went through in making inferences to answer questions. First, I read the passage and question carefully. Second, I reread the question and the alternatives to help me focus on what was being asked. Third, I examined each alternative separately. When I examined the alternatives I reworded them into questions that made more sense to me. Then, I looked for evidence that pointed toward an answer to my question. Sometimes I underlined or circled information that seemed important to me. Some of that evidence was depended on me drawing conclusions between information in my memory and information contained in the text. That's what you have to do when you read to be able to understand a passage fully. Next, even when I found what I thought was the correct answer, I continued to examine the alternatives. I did that because
sometimes two answers may be correct, but one answer is more
correct than the other. I wanted to be sure my answer was
the best possible one. Finally, I made my choice and
answered the question.

Today, I'd like you to practice making inferences.
I'll walk around the room as you do so to answer any
questions or provide you with any assistance you need.

<Pass out first set of packets.>

I have given you a packet containing a set of
directions and the passages you'll be reading. Read the
directions silently as I read them aloud. "DIRECTIONS: Read
each of the exercises on the following pages, select the
best answer. Then write your choice on the appropriate
blank below." Please write your name and ID number on the
answer sheet. You may tear your answer sheet from the set
of passages. When you have completed the first set, raise
your hand and I'll give you a second set to complete. When
you have completed the second set, turn your papers over.
When everyone has finished the work, I'll collect them.
Again, please be sure to ask me for help if you need it.

<Move around the group, asking them if they need help and
working with them to find answers. When everyone has
completed the second set, pick up all papers and dismiss the
group.>
For the last two days we have discussed and practiced inferencing. Inferences are conclusions you make based on information you know, information you have about the world stored in your memory, and information found in a text. Every time you read a book, a magazine article, a chapter in your textbook, every time you read, you need to connect what you know about a subject with what the text says. This helps you fully understand the information you read.

Once again, I want to summarize the steps I went through in making inferences to answer questions. First, I read the passage and question carefully. Second, I reread the question and the alternatives to help me focus on what was being asked. Third, I examined each alternative. When I did this, I reworded the alternatives into questions that made sense to me. Then, I looked for information that pointed toward an answer to my question. Sometimes I underlined or circled information that seemed important to me. Some of that information depended on me drawing conclusions between information in my memory and information contained in the text. Even when I found what I thought was the correct answer, I continued to look at the alternatives. I did that because even when two answers seem, one answer is more correct than the other. I wanted to be sure my answer
was the best possible one. Finally, I made my choice and answered the question.

Today, I want you to practice answering inference questions on your own. I cannot help you with them as I did yesterday.

<Pass out first set of packets.>

I have given you a packet containing a set of directions and the passages you'll be reading. Read the directions silently as I read them aloud. "DIRECTIONS: For each of the exercises on the following pages, select the best answer. Then write your choice on the appropriate blank below." Please write your name and ID number on the answer sheet. You may tear your answer sheet from the set of passages. When you have completed the first set, raise your hand, and I'll give you a second set to complete. When you have completed the second set, turn your papers over. When everyone has finished the work, I'll collect them.

<When everyone has completed the second set, pick up all papers and dismiss the group.>
Day 4

Day 4 consists of giving students the target passage and the posttest.

>Distribute computer sheets to each student and say:>

Turn your answer sheets on their sides so that the Name Block appears on the left-hand side of the sheet. Beginning with your last name and skipping a space between each one, write your last name, first name, and middle initial in the Name Block.

>Pause.

Now darken the letters in the circles below each letter of your name.

>Pause.

In the identification block, put your student ID number and darken the corresponding circles.

>Pause.>
Under Special Codes, write ____ (1 for Group 1 in
Allen 31; 2 for Group 2 in Allen 29) and darken this number.

Today you are going to read a passage and answer some
questions about what you have read. You will not be able to
refer to the passage when answering questions. I am going
to distribute the passages now. Take as long as you like to
read them. When you have finished reading, raise your hand,
and I'll give you a set of questions to answer. Code your
answers on your computer sheets. Instructions for answering
the passage questions appear on the test packet.

Any questions?
APPENDIX K

Copies of Instructional Transparencies Used in Experimental Group
APPENDIX L

Copies of Instructional Transparencies Used in Control
We seen the Hartsells the next day in the Park and I was willing to apologize, but they just nodded to us. And a couple of days later we heard they had left for Orlando, where they have got relatives.

I wish they had went there in the first place.

The passage definitely indicates that the Hartsells
☐ a. were close friends of the speaker.
☐ b. lived in Orlando.
☒ c. were not liked by the speaker.
☐ d. would accept an apology.
At half past nine, that night, Tom and Sid were sent to bed, as usual. They said their prayers, and Sid was soon asleep. Tom lay awake and waited, in restless impatience. When it seemed to him that it must be nearly daylight, he heard the clock strike ten! This was despair. He would have tossed and fidgeted, as his nerves demanded, but he was afraid he might wake Sid. So he lay still, and stared up into the dark.

One might suppose, from the above passage, that Tom
☐ a. didn’t feel well.
☒ b. had plans for the morning.
☐ c. was nervous.
☐ d. was annoyed with Sid.
A jay hasn't got any more principle than a Congressman. A jay will lie, a jay will steal, a jay will deceive, a jay will betray; and four times out of five, a jay will go back on his solemnest promise. The sacredness of an obligation is a thing which you can't cram into no bluejay's head. Now, on top of all this, there's another thing; a jay can outswear any gentleman in the mines . . . . Yes sir, a jay is everything a man is!

From this description, we may infer that the author is

- □ a. bitter, to an extreme.
- ✔ □ b. critically humorous.
- □ c. informed about birds in general.
- □ d. an unhappy person.
Now they stretched themselves out on their elbows and began to puff, charily, and with slender confidence. The smoke had an unpleasant taste, and they gagged a little, but Tom said:

“Why, it’s just as easy! If I’d a knowed this was all, I’d a learnt long ago.”

One may determine from this passage that

☐ a. the boys enjoyed smoking.

☒ b. Tom was putting up a good front.

☐ c. all boys try smoking.

☐ d. they would never smoke again.
Oh, no; we had no conveniences for keeping him here. He is at a livery stable in the Rue Dubourg, just by. You can get him in the morning. Of course you are prepared to identify the property?

We may infer that the speaker is one who is

- a. unhappy about the situation.
- b. a thoughtless individual.
- c. not careful in his work.
- d. just doing his job.
Ricardo nodded, satisfied. Both these white men looked on native life as a mere play of shadows. A play of shadows the dominant race could walk through unaffected and disregarded in the pursuit of its incomprehensible aims and needs. No. Native craft did not count of course. It was an empty, solitary part of the sea, Schomberg expounded further.

These words imply a feeling of white

☐ a. compassion.
☐ b. understanding.
☐ c. superiority.
☐ d. appreciation.
APPENDIX M

Samples of Maps Drawn by Experimental Subjects
“DIRECTIONS: Please write your name and student identification number on the top of this sheet. Draw with your regular pencil a concept map of all you know about the topic listed in the middle on the page. Then, read the passage. When you are through reading, raise your hand and your instructor will collect the passage. Then, use your red pencil to add whatever new concepts you know about the topic to your map. When you have completed your map for the second time, turn your map over. They will be collected when everyone has finished.”
"DIRECTIONS: Please write your name and student identification number on the top of this sheet. Draw with your regular pencil a concept map of all you know about the topic listed in the middle on the page. Then, read the passage. When you are through reading, raise your hand and your instructor will collect the passage. Then, use your red pencil to add whatever new concepts you know about the topic to your map. When you have completed your map for the second time, turn your map over. They will be collected when everyone has finished."
"DIRECTIONS: Please write your name and student identification number on the top of this sheet. Draw with your regular pencil a concept map of all you know about the topic listed in the middle on the page. Then, read the passage. When you are through reading, raise your hand and your instructor will collect the passage. Then, use your red pencil to add whatever new concepts you know about the topic to your map. When you have completed your map for the second time, turn your map over. They will be collected when everyone has finished."

Beach
Songs
Movies
Music
Drum
Guitar
Speakers
Practise
Limosines
Graceland
Grac
Death
Big houses
Diamonds
Rings
Money
Drugs
Karat
Band members
Memphis
Records
Studios
Army
Radio
Twin Brother Died
Daughter
Percilla Presley (wife)

**ELVIS PRESLEY**

**Instruments**
- Drums
- Guitar
- Speakers
- Sticks
- Bass

**Places**
- Hawaii
- Memphis
- Beach
- Graceland
- Las Vegas

**Entertainment**
- Million dollar records
- Studios
- Beach park
- Movies
- Piano
- Airplane
- Sport cars
- Practice
- Drugs
- Studies
- Radio

**Songs**
- Jail house
- Love me tender
- Blue Suede shoes
- Betcha man

**Personnel**
- Army
- Death
- Mother
- Twin brother
- Percilla Presley
- Karat
- Graceland
- Drugs

**Grafette**
- T-shirts
- Buttons
- Hats
- Jackets
- Jail house rock
- Love me tender
- Piano
- Airplane
- Sport cars
Editor
Jamestown Publishers
P. O. Box 6743
Providence, RI 02940

Dear Sir:

I am a doctoral student and a developmental reading instructor at Louisiana State University. I am writing to ask your permission to use twenty of the passages contained in A Skill at a Time Series:

June 30, 1987

In our opinion you should be able to use the passages under the Fair Use provisions of the copyright law.

Good luck with your studies.

— DP
April 1, 1987

Ms. Carol Christiansen  
Permissions  
Doubleday and Company  
245 Park Avenue  
New York, NY 10167

Dear Ms. Christiansen:

I am a doctoral student at Louisiana State University in Baton Rouge, LA, pursuing a degree in reading education. I am writing to ask your permission to use a selection from The Matlock Papers by Robert Ludlum (1973) as part of an instructional study of the efficacy of concept mapping with college remedial readers.

Enclosed is a xerox of the pages I plan to use with the pertinent passage marked. Please note that part of the passage will be omitted; this omission will be indicated with an ellipsis.

I have also enclosed a stamped, self-addressed envelope to aid you in replying to me.

Thank you very much for your help.

Sincerely,

Debbie Guice Longman

Enclosures

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Nancy Beinaschino
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June 25, 1987

Ms. Debbie Longman  
Special Services, Junior Division  
Louisiana State University  
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Baton Rouge La.  70803

Dear Ms. Longman:

Thank you for your letter of April 30th.

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Sincerely yours,

Judy DeGrottole  
Permissions Editor
VITA

DEBBIE G. LONGMAN

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PERSONAL DATA

Date of Birth: October 11, 1955
Place of Birth: Natchez, Mississippi
Marital Status: Married (No children)

EDUCATIONAL BACKGROUND

Degree Date Awarded Institution
Bachelor of Science May 14, 1976 Louisiana State
University Major: English Education Baton Rouge, LA

Masters of Education August 4, 1978 Louisiana State
University Major: Guidance & Counseling Baton Rouge, LA
Minor: Psychology

Masters of Education May 18, 1984 Louisiana State
University Major: Reading Baton Rouge, LA

PROFESSIONAL EXPERIENCE

Date Position Employer
1981-Present Instructor Louisiana State
Developmental University Reading Lab
Reading) Baton Rouge, LA 70803

Summer months, 1985 Instructor Louisiana State
(Speed reading for University
Jr. and Sr. High) Continuing Education
Baton Rouge, LA 70803

Summer months, 1981-1983 Counselor Louisiana State
(Pre-enrollment) University
Baton Rouge, LA 70803

1978-1981 Teacher (English Bossier Parish School
in grades 9-11) Board
Benton, LA 71111

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PROFESSIONAL ORGANIZATIONS

Phi Delta Kappa

International Reading Association (IRA)

International Reading Association: College Reading Improvement

College Reading Association

Louisiana Association of Developmental Educators (LADE)

National Association of Developmental Educators (NADE)

Western College Reading Learning Association (WCRLA)

PRESENTATIONS

Presenter: National Association of Developmental Educators; New Orleans, LA; March 4-7, 1987; with Rhonda Atkinson; "From Conception to Publication: Writing and Publishing Texts for Developmental Students."

Presenter: College Reading Association; Knoxville, TN; October, 1986; with Kaylene Gebert; "Networking for a Positive, Professional Image"

Presenter: Western College Reading Learning Association; Los Angeles, CA; March 20-23, 1986; with Kaylene Gebert and Rhonda Atkinson; "Developmental Education: Too Expensive to Survive?"

Presenter: Western College Reading Learning Association; Los Angeles, CA; March 20-23, 1986; with Rhonda Atkinson; "Facing the Future: Accomodating Student Diversity through Peer Tutoring."

Presenter: National Association of Developmental Educators; Chicago, IL; March 12-15, 1986; with Kaylene Gebert and Rhonda Atkinson; "Designing a Dollars and Cents Rationale for Developmental Education."

Presenter: National Association of Developmental Educators; Chicago, IL; March 12-15, 1986; with Rhonda Atkinson; "Peer Tutoring: Accomodating Student Diversity in Post-secondary Institutions"
Presenter: Louisiana Association of Developmental Educators Conference; Baton Rouge, LA; October, 1985; with Dr. Kaylene Gebert and Rhonda Atkinson; "Studying Cost-Effectiveness of Developmental Programs."

Presenter: College Reading Association; Pittsburg, PA; October, 1985; with Rhonda Atkinson; "Using the Entertainment Schemata of College Developmental Readers to Make Predictions about Recreational Reading Materials."

Presenter: College Reading Special Interest Group of the International Reading Association; New Orleans, LA; May, 1985; with Rhonda Atkinson; "High Admission Standards: New Era for Developmental Education."

Presenter: International Reading Association; New Orleans, LA; May, 1985; with Rhonda Atkinson; "Improving Recreational Reading Habits: Using Entertainment Schemata to Make Predictions about Text."

Presenter: National Association of Developmental Educators; St. Louis, MO; March 7-9, 1985; with Rhonda Atkinson; "Quest for Quality: Will Higher Admission Standards Affect Developmental Education?"

Presenter: Ninth Annual American Reading Conference; Lake Buena Vista, FL; December, 1984; with Rhonda Atkinson; "Schema Theory, Text/Reader Interaction, and Metacognition: Overview and Educational Implications."

Presenter: Louisiana Association of Developmental Educators Conference; Lafayette, LA; October, 1984; with Rhonda Atkinson; "Higher Admission Standards: The End of Developmental Education?"

Presenter: Texas Reading Conference; Corpus Christi, TX; March, 1984; with Rhonda Atkinson and Tim Parrish; "Questioning Techniques for Postsecondary Readers: Modeling Metacognitive Behaviors."
Presenter: By special request to Alabama College Teachers of Reading; Ninth Southeastern Conference IRA; Birmingham, AL; October, 1983; with Rhonda Atkinson; "More than Just Asking Questions: Suggestions for Teaching Comprehension."

Presenter: Ninth Southeastern Conference IRA; Birmingham, AL; October, 1983; with Rhonda Atkinson and Tim Farrish; "More than Just Asking Questions: Suggestions for Teaching Comprehension."

Presenter: Eighth Southeastern Regional IRA Conference; Biloxi, MS; November, 1982; with Rhonda Atkinson; "Training Peer Tutors for Developmental Students."

Presenter: Louisiana Association of Developmental Educators Conference; Baton Rouge, LA; October, 1982; with Rhonda Atkinson; "Training Peer Tutors for the College Reading Program."

PUBLICATIONS


PROFESSIONAL SERVICE

Co-editor: with Carol Bader; 1982-84; News and Views; Louisiana Association of Developmental Educators newsletter.

Participant: Louisiana State University/Southern University, Baton Rouge, LA, Faculty Exchange; Fall, 1984.

Award: 1985 Louisiana State University Developmental Educator of the Year; named by the Louisiana Association of Developmental Educators; Fourth Annual Meeting; October, 1985; Baton Rouge, LA.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Debbie G. Longman

Major Field: Curriculum & Instruction (Reading)


Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

July 1, 1987