The Effects of Anticipatory and Retrospective Questioning on the Story Comprehension of Fourth Graders

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ABSTRACT

THE EFFECTS OF ANTICIPATORY AND RETROSPECTIVE QUESTIONING ON THE STORY COMPREHENSION OF FOURTH GRADERS

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The current study examined the effect of facilitating the use of story grammar with anticipatory and retrospective questioning on fourth graders. Approximately one-third of participants were assigned to each of three reading conditions. In one reading condition, called "anticipatory", participants predicted the course of action for the protagonists at critical points in two stories and provided rationale for each of their predictions. In the second reading condition, called "retrospective", participants justified the course of action chosen by the protagonists at critical points in the stories. In the third reading condition, called "no questions", participants simply read the stories without predicting or justifying the protagonists' choices. Participants were given two tests for each story immediately after presentation of the stories and again one week later. One test measured comprehension of story ideas and the other test measured memory for explicit details from the story. The results did not indicate any effects for condition. However, participants performed better on comprehension tests in comparison to explicit details. Additionally,

the decline in number of correct responses from the immediate to delayed testing sessions was lower for comprehension tests in comparison to explicit details tests for high-ability participants, but not low-ability participants. The decline in comprehension test scores from the immediate to delayed testing sessions was significantly different from the increase in explicit details test scores across the two testing sessions for one of the stories. Finally, comparisons with Fitzpatrick's (1985) results were made.

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CHAPTER I

INTRODUCTION

Understanding the basic cognitive processes underlying story comprehension provides both psychologists and teachers with a basis for guiding and improving the comprehension skills of developing children. The present study was designed to contribute to this understanding by examining the effects of two types of questioning on the story comprehension of fourth graders. In order to provide support for the present study, story comprehension will be described and inference-making and story recall will be discussed as two critical processes underlying story comprehension. Furthermore, schema theory will be discussed as a framework for understanding story comprehension. Finally, previous research concerning the effects of questioning on story comprehension and the rationale for the present study will be discussed.

Story Comprehension

School-aged children are frequently engaged in story comprehension through reading required passages assigned by their teachers and by pursuing personal interests through leisure reading. In most cases, their goal is to derive meaning from stories, rather than to recall them verbatim (Sachs, 1967; Small, 1990). In explaining how meaning is derived from stories, comprehension can be characterized as a constructive process.

Constructive processes involve interactions between the individual and environment, which lead to qualitative reorganizations within the cognitive system as a whole and reflect progress in the individual's attempts to derive meaning (Kuhn, 1992). More specifically, in story comprehension meaning is constructed through the interaction of bottom-up and top-down processes. Bottom-up processing occurs when the reader processes information from its simplest level to a more complex level. In bottom-up processing, comprehension proceeds from activities such as the detection of letter features and the recognition of letters and words to the retrieval of their meaning. Top-down processing occurs when the reading material activates some cognitive conceptual mechanism in the reader. In top-down processing, comprehension proceeds from the reader's initial deduction of textual information to the reader's search for information within the text to support or reject hypotheses formed. This type of processing consists of activities such as identifying and organizing important ideas and integrating those ideas with prior knowledge (Kintsch & van Dijk, 1978).

Adhering to the view of story comprehension as a constructive process, Bransford and Johnson (1972) state that "prior knowledge of a situation does not guarantee its usefulness for comprehension. In order for prior knowledge to aid comprehension, it must become an activated semantic context" (p. 724). Indeed, Rayner and Pollatsek (1989) state that the meaning of text involves more than the sum of the meaning of individual sentences. Similarly, Small (1990) states that story comprehension requires the semantic integration of sentence information. That is, to construct meaning and establish coherence from stories, readers must expand upon the information provided by individual sentences

and draw inferences about implicit information that links explicit statements (Small, 1990). Rayner and Pollatsek provide an example of this process with the following pair of sentences. "John went into the jewelry store. Mary enjoyed the present" (Rayner & Pollatsek, 1989, p. 263). The sentences appear straightforward; however, readers must "fill in" the information that John bought a present and gave it to Mary to connect the ideas.

Inferential Processes

Rayner and Pollatsek (1989) indicate that much of the research on inferential processes has been concerned with the issue of when readers construct an inference. They indicate that readers, in general, appear cautious in making inferences. Readers seem to wait until they have to make an inference before doing so. Furthermore, it appears as if readers make inferences at many junctures in a passage. Schallert (1982) notes that indicators of this phenomenon include the distortions and intrusions added in free recall and the type of responses given to multiple-choice questions and judgment ratings. Schallert concludes that inferences are not separable products of an isolated process, but are the natural, ordinary, and pervasive consequence of comprehension.

There are many kinds of inferences that individuals might make when reading text. The current study concentrates on causal inferences. Rayner and Pollatsek (1989) provide another example for such causal inferences. Consider the following passage: "John was eating in the dining car of a train. The waiter brought him a bowl of soup. Suddenly the train screeched to a halt. The soup spilled in John's lap" (Rayner & Pollatsek, 1989, p. 282). An obvious causal link exists between the sudden halting of the train and the soup

spilling. However, Rayner and Pollatsek propose an important question that is relevant to the current study: "Before they get to the last sentence, do readers infer that the soup will spill in John's lap?" (p. 282). The nature of this type of inference is considered to be probabalistic, rather than logical. The soup may not spill if the bowl is not very full, and it would only spill in John's lap if he were sitting down. However, the event of the soup spilling seems probable and the narrative appears to indicate this outcome (Rayner & Pollatsek, 1989).

In order to describe how such causal links might be drawn, Duffy (1986) suggests three processes: backward inference, specific expectation, and focusing. Considering the passage cited above, a backward inference occurs when the reader waits until he/she reads the fourth sentence before searching the text for the cause or explanation of the event. Specific expectation occurs when the reader generates the prediction from the first three sentences that the soup is going to spill, which is confirmed by the fourth sentence. Finally, focusing occurs when specific aspects of the text indicate that additional information will follow. Therefore, when an unprecedented event occurs, readers assume that items in memory comprise the appropriate places to find the rationale for what follows. The current study focuses on backward inference and specific expectation as possibilities for establishing causal inferences.

Story Recall

Research indicates that it is the meaning of stories that is more likely to be remembered, rather than their verbatim form (Anderson, 1974; Begg, 1971; Grossman & Eagle, 1970; Jarvella, 1970; Johnson-Laird, 1974; Kintsch, 1970; Sachs, 1967, 1974).

However, Anderson (1974), Jarvella (1970), and Sachs (1967, 1974) provided evidence for verbatim memory of stories, if testing occurs shortly after acquisition. Verbatim form decays rapidly, however, while memory for the "gist" (Fillenbaum, 1966) of a passage is much more durable.

The evidence cited above adheres to the theoretical framework provided by Bartlett's (1932) description of memory as a reconstructive process. A basic assumption behind this view maintains that a person's knowledge of the world interacts with incoming information to produce a memory representation that expands upon the information actually presented (Schallert, 1982). For example, Bartlett (1932) showed that, as time passes, memory for narratives is characterized by deletions that are primarily omissions of details that do not alter the meaning of the passage, and additions that are clarifications and elaborations of the meaning (Small, 1990). Thus, the inferential process is implicated in memory studies (Goetz, 1977; Harris & Monaco, 1978). Support for the constructive memory hypothesis comes from numerous studies (Barclay, 1973; Bransford, Barclay, & Franks, 1972; Bransford & Franks, 1971; Bransford & Johnson, 1972, 1973; Cofer, 1973; Fillenbaum, 1971; James, Thompson, & Baldwin, 1973; Pompi & Lachman, 1967).

Several theories have attempted to explain story comprehension, the inferential process, and memory for stories. The preceding discussion indicates that story comprehension involves more than understanding the literal relations between objects and the temporal sequence of events. Indeed, Rayner and Pollatsek (1989) suggest that story comprehension requires the utilization of real-world knowledge, which includes plans, intentions, and causation.

The current study focuses on schema theory as a framework for understanding story comprehension, inferential processes, and story recall. Schema theory explains these processes in terms of long-term memory structures for knowledge that are called schemata. According to this view, all information can be understood in terms of filling information into schemata. Furthermore, at the time of recall, readers construct memories from what they remember of original material and from the schemata that were activated at the time of comprehension (Small, 1990). The following sections describe schema theory and various types of schemata in greater detail.

Schema Theory

The previous discussion indicates that the nature and extent of the personal experience and knowledge that a child brings to a reading task influences how he/she will interpret a particular passage (Langer, 1984). Schema theory attempts to explain how such personal experience and knowledge is represented in the mind and later used for recall. Generally, the theory proposes that one's existing knowledge directly influences the content and structure of new knowledge. More specifically, schema theory attempts to explain the underlying mechanisms by which comprehension and knowledge acquisition occur (Schallert, 1982).

Cognitive theorists and researchers have revealed several propositions that describe the nature of schema theory and its components. Bartlett (1932) argued that knowledge is represented as schemata, which he defined as general and organized knowledge structures about the invariants of past experience. Schemata are meant to represent all kinds of knowledge, such as objects, events, facts, academic topics, social

situations, routine series of actions (as in scripts), and how information is typically presented (as in story schemata). Schallert (1982) states that a particular schema is embedded in other schemata and contains subschemata. For example, as Rumelhart and Ortony (1977) point out, the schema for a face is composed of subschemata for eyes, a nose, and a mouth, and each of these, in turn, has subschemata such as the lips, teeth, tongue, and palate of the mouth. Thus, schemata are described as hierarchies or tree structures with subsuming information.

Schema theory also proposes that the configuration of the schemata composing one's knowledge is considered to be dynamic, rather than static, and changes from moment to moment in response to comprehension process demands. All possible schemata that one can construct are viewed as interconnected and cross-referenced within one another (Schallert, 1982). Thus, schemata are considered to be organized, but their components (subschemata) that influence a particular pattern at one moment of comprehension do not necessarily maintain the same relationship to one another. Furthermore, schemata develop and become more elaborate and specific with experience. In other words, one's schemata acquire more variables and more levels of variables as one encounters situations, events, and information in the world. Indeed, children's schemata demonstrate movement towards greater specificity and greater elaboration (Schallert, 1982).

The nature of schemata has been addressed; however, it is important to discuss how such schemata or knowledge structures affect story comprehension, the inferential process, and retrieval. Schallert (1982) suggests that comprehension proceeds as values for the variables of a schema are determined. Values for variables are determined as a

result of the interaction of bottom-up and top-down processes. "Bottom-up" and "top-down" processing are described by Rumelhart and Ortony (1977) as follows:

> "Bottom-up processing occurs when aspects of the input directly suggest and activate schemata which correspond to them and when these schemata themselves activate or suggest dominating schemata of which they are constituents...Top-down processing, on the other hand, arises from schemata activating their constituent subschemata.... These processes are called 'top-down' because they lead from conceptual expectations towards the data in the input where the satisfaction of these expectations might be found" (p. 128).

Thus, comprehension is viewed as a problem-solving activity that involves generating hypotheses that are consistent with expectations and information provided in the story and searching for confirming evidence.

An advantage of a schema theoretic view of knowledge acquisition and utilization is its potent explanation of the inferential process. As stated earlier, comprehension proceeds as the reader makes predictions about what a message will be and searches for confirming evidence that the construction he/she has built is valid. The result of the interaction of bottom-up and top-down processes described above is a particularized representation or schema with its variables specifically defined, or what Anderson refers to as an instantiation (Anderson & McGaw, 1973; Anderson & Ortony, 1975; Anderson, Pichert, Goetz, Schallert, Stevens, & Trollip, 1976, Schallert, 1982). More specifically, once a schema is invoked, either directly by explicit story information or by a process that has accessed a superordinate or subordinate schema, its variables become available for instantiation. For example, in most passages it is unusual to find explicit statements of information to fit every important variable of a schema. Instantiation can be described as

the process where the reader identifies explicit information in a passage and/or fills in missing information with default values. When the comprehender encounters missing information and fills the unmentioned variables with default values, he/she is making an inference. These default values take the form of what the reader understands to be the most typical values for variables within the constraints placed on the passage by the schema (Schallert, 1982).

Finally, schema theory offers several explanations for retrieval processes. First, schemata provide a retrieval plan that guides memory search. In proceeding through the categories subsumed by the schema, the reader is likely to access information related to important variables. Thus, readers are more likely to remember information that represents a typical value of a variable in an activated schema than information that does not fit well. Secondly, schemata may influence the response criterion a reader accepts for information. Task demands may lead the reader to disregard seemingly unimportant details (Schallert, 1982).

The schema-based theory of knowledge acquisition presented above and empirical research designed to investigate its propositions explicitly take into account text and reader contributions. For example, Spiro and Tirre (1979) have provided evidence that readers demonstrate individual differences in processing styles that emphasize either bottom-up or top-down processing. Furthermore, Chi (1978) demonstrated that children with strongly developed schemata recall, predict, and monitor more like older students than their age mates with less developed knowledge representations. Gagne, Bell, Weidemann, & Yarbrough (1980) measured recall rather than comprehension and found

that more familiar passages were learned faster and remembered better than less familiar passages. The researchers concluded that more extensive knowledge permits readers to elaborate content on their own.

Other researchers have demonstrated that recall is better for organized material (Hudson & Nelson, 1983; Mandler & DeForest, 1979; Poulsen, Kintsch, Kintsch, & Premack, 1979). That is, a well-structured schema-conforming story appears to be much easier to remember than an unstructured, schema-nonconforming story. Additionally, Dooling and Lachman (1977) and Bransford and Johnson (1972) presented readers with vague passages and found that providing participants with a title, theme statement, or explanatory picture primed the utilization of knowledge structures. Such priming permitted ambiguous sentences to become instantiated variables within relevant schemata. Furthermore, research indicates that schematic knowledge will lead to errors in recall that reflect this knowledge and, over time, such errors are more likely (Landis, 1982). Thus, as readers forget the details of a passage, they rely on schematic knowledge to reconstruct the passage. This line of research indicates that children's story comprehension and recall is facilitated by qualities of the child (prior knowledge) and qualities of the story (schema conformity).

Scripts

Several types of schemata have been presented in the literature. One kind of schema is a "script," defined by Sachs (1984) as a cognitive representation of a standard sequence of events compiled from experience. The generalized structure of scripts contains places or slots for information about the actions, actors, and props of an event

(Small, 1990). These slots are filled by generic rather than specific representations of experiences. For example, the script for visiting a doctor's office contains slots for actions such as checking in, waiting, and sitting on the examination table, for actors such as a receptionist, a nurse, and the doctor, and for props such as a stethoscope and a thermometer. Such scripts are often used to predict the order of necessary and optional acts that can be expected to occur when an event is encountered or referenced.

An individual's scripts comprise a particular type of background knowledge that influences reading comprehension. Meadowcroft and Reeves (1989) suggest that, as story content is instantiated, predictions about subsequent information are formed and that these predictions are based on a script, the individual's past experience, and stimulus information already instantiated. That is, if an important event is not explicit or is absent, the "missing information" is encoded in the appropriate slot of the script. Furthermore, Thorndyke and Yekovich (1979) suggest that the ability to make these predictions facilitates readers in developing efficient strategies for directing attention and helps them fill in missing story content.

Other researchers have provided empirical evidence for the effects of prior knowledge on comprehension. For example, Taft & Leslie (1985) examined the performance of average third grade readers on comprehension tests after reading an expository passage orally. Their results revealed that participants with high prior knowledge correctly answered more textually explicit, textually implicit, and comprehension questions that are implicit according to a script than subjects with low prior knowledge. Additionally, Pearson, Hansen, and Gordon (1979) found that

comprehension was significantly affected by strength of prior knowledge, but the effects were more pronounced on questions that are implicit according to a script rather than textually explicit questions.

Story Schemata

The research cited above suggests that the activation of schemata and scripts facilitates story comprehension. Thus, it seems important to examine what aspects of stories facilitate this activation. Another kind of schema is a "story schema," defined by Mandler and Johnson (1977) as an idealized representation of the constituents of a typical story, the relationships among those constituents, and the variations on them. In other words, as a result of hearing and reading hundreds of stories, people have abstracted a constant set of constituents of a prototypical story--including setting, characters, episodes, and a resolution--that are structured to make a coherent whole and which guide a readers' interpretation of a given story (Bower, 1976). For example, a story schema requires that the story's climax must occur sometime after the beginning. Violations of story schemata often result in confusion and lack of story comprehension.

Research concerning story schemata indicates that most children between the ages of 5- and 7-years-old demonstrate that they have acquired the general form of stories (Schallert, 1982). Although the complexity of stories they tell increases with age, children as young as 4-years-old tell remarkably well-formed stories (Stein & Glenn, 1978). A related finding indicates that presenting the structural elements of a story in a scrambled order as opposed to a prototypical order disrupts children's recall and leads to attempts to reorganize the stories so that they conform more closely to a logical order (Mandler,

1978, 1984; Baker & Stein, 1979).

Story Grammar

Cognitive researchers and theorists have developed story grammars in order to provide an analytic tool that formalizes the structural consistencies observed in many simple stories. Specifically, story grammars can be defined as sets of rules that prescribe how stories can be divided into units and how these units relate to one another (Eckler & Weininger, 1989).

It is necessary to distinguish between a story grammar and a story schema. A story grammar is a formal rule system used by psychologists to describe consistencies in story structure. A story schema is a mental structure that reflects those consistencies (Mandler & Goodman, 1982). In other words, story grammars are rules that specify the parts or elements of a story and their temporal and causal relations (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1979; Thorndyke, 1977). The story schema is a set of expectations about how stories are structured that guides a child's interpretation of a given story (Small, 1990).

The prominent story grammar used in story comprehension research was designed by Johnson and Mandler (1980) and is presented in Figure 1. The story grammar assumes a hierarchical organization of its constituents (or nodes), which are abstract categories of story information. Each node connects to other nodes in a tree structure, expressing part-whole relations and sequential relations that are either causal or temporal.

The major constituents of a story are setting and episode. The first basic node, the setting, introduces the characters, sets the time and location of the story, and describes

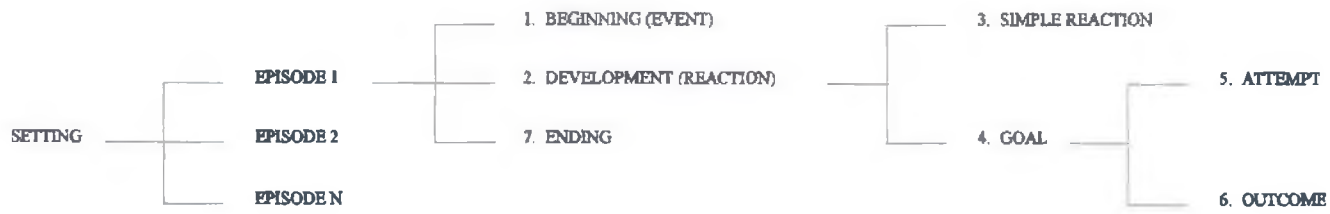

Figure 1. Tree Structure of Node System of Mandler and Johnson (1977) Model for Comprehension of Text.

personal states. The setting is followed by one or more episodes. Episodes are separable events that compose the story. An episode is further divided into subcomponents that may contain other embedded episodes. The first node of an episode is the beginning, which consists of any event that indicates a shift away from the setting into a particular frame of the first episode. At this point in the story, a complication for the protagonist is introduced. The completion of the first beginning leads the reader to the node of development. At this point, a shift to a reaction of a character occurs, that is, the character reacts to the beginning (event). Mandler and Johnson (1977) contend that the reaction is central to the formation of an episode and consists of two parts: 1) a simple reaction, which is the protagonist's emotional response to the beginning event and 2) a goal, which is a plan the protagonist develops to confront any problems created by the beginning.

A goal path is necessary for the completion of the development. The goal path consists of an attempt to reach the goal and the outcome of that attempt. The attempt involves the protagonist performing actions in order to satisfy goals or desires which are either implied or explicitly stated in the story. It is important to note that the constituents of story grammars, such as a goal or attempt, are abstract semantic categories, and many of the sequential relations between constituents are causal. Therefore, a particular action can only be identified as an 'attempt' if a child knows how that action could lead to the desired goal (Johnson, 1983). The successfulness of the attempt is stated in the outcome node. Since goal paths are recursive, if the outcome is not successful, another goal path is created and another attempt is made to achieve the goal. If the outcome is successful, the

ending node for that episode is entered. The ending may conclude the story or it may initiate a new episode and begin the process again.

Mandler, Scribner, Cole, and DeForest (1980) provided empirical evidence for Mandler and Johnson's (1977) story grammar in their study that compared the story recall of schooled and unschooled children and adults from Liberia and America. Their results indicated that all participating populations had the same pattern of story recall for the five major constituents of the Mandler and Johnson (1977) story grammar. Thus, despite differences in age and schooling, there is a consistent pattern of story recall. This research suggests that the same schematic knowledge underlies children's and adults' story comprehension.

The hierarchical organization of story grammar implies that story information is clustered in memory, based on its importance to the story. Central information (story grammar elements) is stored at the top of the memory hierarchy and relatively unimportant information (elaboration or incidental content) is stored at the bottom (Meadowcroft & Reeves, 1989). This view indicates that there are specific cues within the text that signal the reader to the level that a particular sentence occupies in the story structure.

Research also indicates that different parts of a story have differential recall. That is, some parts of stories are recalled better than other parts of stories. For example, readers appear to recall the setting, beginnings, and outcomes of stories better than other parts (Mandler & Johnson, 1977; Stein & Glenn, 1979). Additionally, Brown and French (1976) concluded that young children are primarily interested in the outcomes of actions and emphasize the concluding events in a story.

Finally, Fitzpatrick (1985) examined the effects of inducing the use of story grammar on the story comprehension of fourth and sixth grade children. In this study, children who participated in the treatment condition made choices for the protagonists at critical points in two stories and were asked to provide a rationale for each of their choices. Children who participated in the control condition simply read the stories without an opportunity to make choices or generate rationale. Participants completed two tests, comprehension and details, immediately after reading and one week later. The comprehension tests detected the participants' ability to draw inferences from information presented in the stories. The details tests measured the participants' ability to recognize details from the stories.

Fitzpatrick's (1985) results indicated that participants who made choices for the protagonists and generated rationale for these choices performed better on the comprehension and details tests than control participants. Also, sixth graders performed better on the comprehension and details tests than fourth graders. However, a Grade X Reading Condition interaction revealed that the opportunity to make choices and provide rationale facilitated fourth graders' performance on the comprehension tests more than sixth graders'. A Grade X Session interaction that approached significance suggested that fourth graders' performance on the comprehension tests improved from the immediate test to the test one week later as sixth graders' declined. Participants performed better on the immediate details tests in comparison to the details tests completed one week later. Additionally, participants identified as high-ability scored better on the comprehension tests than those identified as low-ability. The opportunity to make choices and generate

rationale provided the greatest benefit on the comprehension tests for low-ability fourth graders, provided a minimal effect for high-ability fourth and sixth graders, and had no effect upon the performance of low-ability sixth graders. High-ability students who participated in the treatment condition performed better on the details tests than those who participated in the control condition. Low-ability participants had no condition differences on the details tests. A Grade X Ability X Session interaction revealed that the performance of all groups on the details tests declined from the immediate session to the session conducted one week later. Low-ability fourth graders demonstrated only a slight decline. Both high-ability fourth and sixth graders demonstrated similar declines from the immediate session to the session conducted one week later. Finally, low-ability sixth graders showed the largest decline.

Rationale and Nature of the Present Study

Small (1990) states that it is generally assumed that schematic knowledge can influence the formulation of hypotheses or expectations for future information and facilitate understanding, as well as memory for discourse. Indeed, Johnson (1983) states that

> "during comprehension of a story ...the schema provides a basis for predicting what sort of information is likely to come next, for relating new information to what has gone before, and for consolidating information when a given type of unit is complete. During retrieval, the schema guides access to stored information and provides a basis for reconstruction when specific information is no longer accessible" (p. 19).

The present study was designed to examine further the propositions discussed above. Justification for the procedure is provided by several theorists and researchers.

For example, Fitzpatrick (1985) indicated that his effects may have been due to the participants' generation of rationale for choices rather than making decisions for the protagonist. Indeed, Shapiro (1984) suggests that externally generated questions during reading may stimulate the reader to search for new information from the text or from related prior knowledge, to review or elaborate upon previously read material, or to monitor comprehension by assessing or evaluating knowledge that has been gained from reading.

In the current study, readers who participated in treatment conditions were asked to predict the future actions of the protagonists or to reflect upon previously stated information during the reading of two stories. According to the Mandler and Johnson (1977) story grammar, at the point where the protagonist encounters a complication, children who participated in the anticipatory condition (Condition A) were asked to predict the future actions of the characters. Children who participated in the retrospective condition (Condition R) were asked to justify the prior actions of the protagonist after a decision regarding the complication was revealed. Rationale for the two conditions is provided by Duffy's (1986) description of specific expectations (Condition A) and backward inferences (Condition R). A control group of participants simply read the stories without engaging in activities during reading.

In order to measure the effects of the conditions on story comprehension, participants completed comprehension and explicit details tests immediately after reading and one week later. Comprehension tests assessed the readers' ability to draw inferences from information presented in the stories. Details tests assessed memory for specific

details from the stories. It is expected that Conditions A and R promote greater opportunities for the readers to construct a well-organized story schema. Furthermore, elaboration of the complication may be induced and processing of the goal path may be facilitated. By creating a well-structured and organized story schema, through elaboration of the complication and facilitated processing of the goal path, children who participated in Conditions A and R should demonstrate better story comprehension than readers who participated in a 'no questions' condition (Condition NQ). Additionally, the current study was designed to assess the relative effectiveness of Condition A versus Condition R in order to determine whether or not one method of questioning facilitates comprehension and memory for explicit details better than the other. It is expected that Condition A will facilitate these processes to a greater extent than Condition R because predicting the outcome of a complication may induce greater processing by affectively engaging the reader.

Additionally, all participants' performance on the explicit details tests is expected to decline from the immediate tests to the delayed tests administered one week later. Finally, to the extent that Condition A and R questions induce greater use of a story schema, thereby increasing memory organization, it is expected that the superiority of Conditions A and R participants over Condition NQ participants on the comprehension tests will increase on the delayed tests.

To summarize, the current study was designed to investigate the following hypotheses: 1) Condition A participants should perform better than Condition R participants on tests for comprehension and; 2)Condition R participants should perform

better than Condition NQ participants on tests for comprehension and explicit details; 3) the decline in explicit details test scores from the immediate to delayed tests will be greater than the corresponding decline in comprehension test scores; and 4) the superiority of Conditions A and R participants on the comprehension tests will increase on the delayed tests.

CHAPTER II

METHOD

Subjects

The participants were 47 children (20 males and 27 females) from two local elementary schools in Beavercreek, Ohio and Trotwood, Ohio. All 35 participants from the school in Beavercreek, Ohio are Caucasian and primarily come from a middle-class background. Six participants from the school in Trotwood, Ohio are Caucasian and 6 are African-American. Trotwood, Ohio is located near the inner-city of Dayton, Ohio. All participants were children from fourth grade classes and their mean age was 10 years and 3 months. The experiment included three conditions, called "anticipatory" (A), "retrospective" (R), and "no questions" (NQ). Sixteen children (7 males and 9 females) participated in Condition A, 17 children (7 males and 10 females) participated in Condition R, and 14 children (6 males and 8 females) participated in Condition NQ.

Design

The design is a 3 (Condition) X 2 (Ability) X 2 (Story) X 2 (Session) X 2 (Test) mixed factor design. The 3 reading conditions, A, R, and NQ, and the 2 ability levels, low and high, are the between-subjects factors. The two stories, Robinson Crusoe and 20,000 Leagues Under the Sea, and the two testing sessions, immediate and delayed, are the

within-subjects factors. The delayed test session was conducted approximately one week after the immediate test session. The dependent measures are the number of correct responses for two tests, comprehension and explicit details.

Stimulus Materials

Two classic stories, Daniel Defoe's Robinson Crusoe and Jules Vernes' 20,000 Leagues Under the Sea, were modified and condensed for use in this experiment and are presented in Appendix A. Robinson Crusoe contained 87 sentences and 20,000 Leagues Under the Sea contained 82 sentences. Sentence length for both stories varied from 9 to 19 words.

Each story was divided into 4 episodes that were presented to the participants on separate pages. At a predetermined location, depending upon the condition, children who participated in Conditions A and R responded to an anticipatory or a retrospective question, respectively. These questions were placed at critical points in the story line, following the presentation of a complication for the protagonists where they were confronted with two alternatives (Condition A) or following the revelation of the protagonists' decisions (Condition R). Based on the information previously presented, the questions asked the children to predict the course of action that the protagonists would choose (Condition A) or to justify a course of action that the protagonists pursued (Condition R). Figures 2 and 3 illustrate the structure of Robinson Crusoe and 20,000 Leagues Under the Sea, respectively.

Appendix B presents the questions for the treatment conditions for both stories. Each version contained 4 questions that corresponded to the 4 episodes in each story.

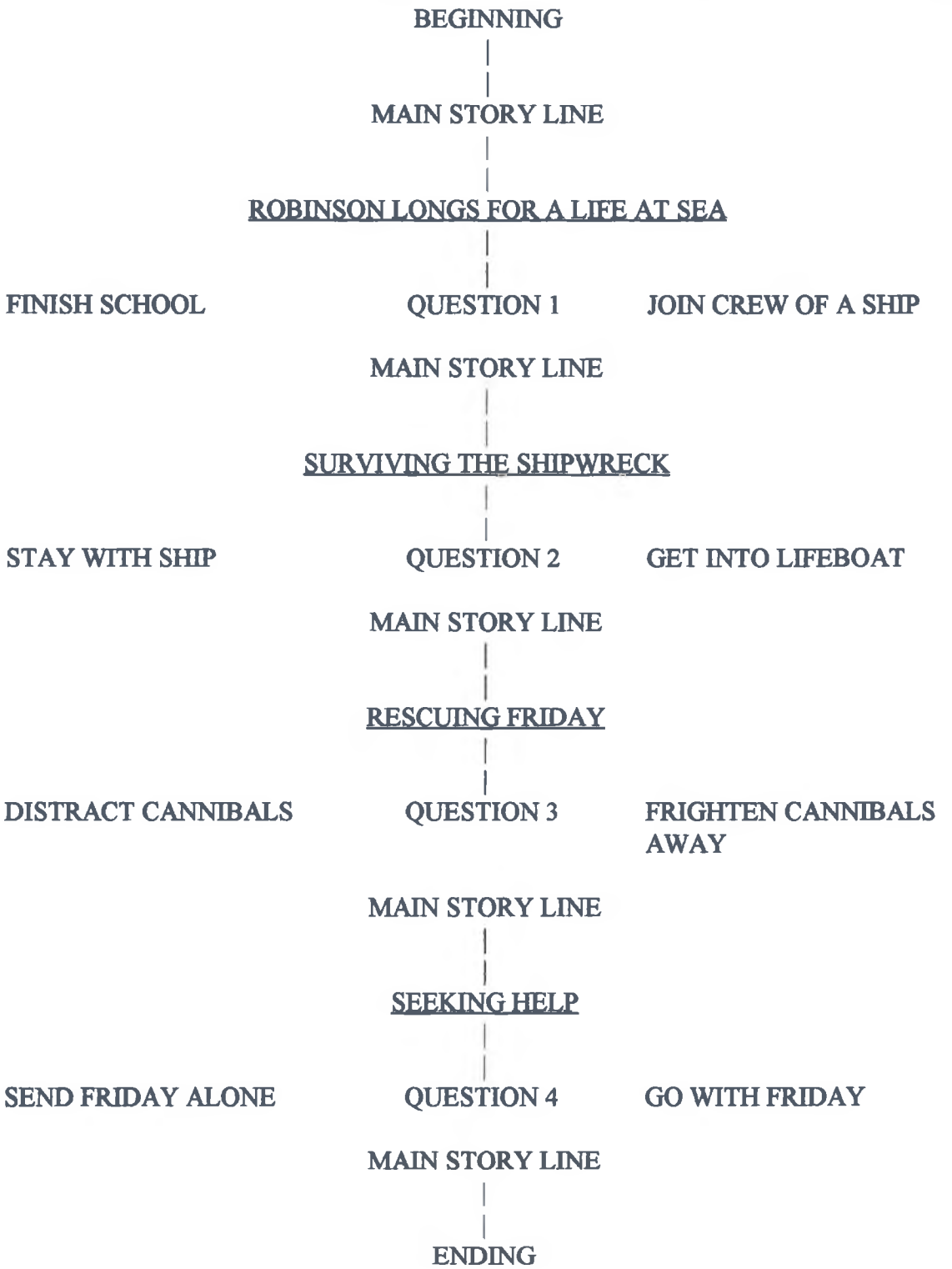

Figure 2. Structure of Robinson Crusoe

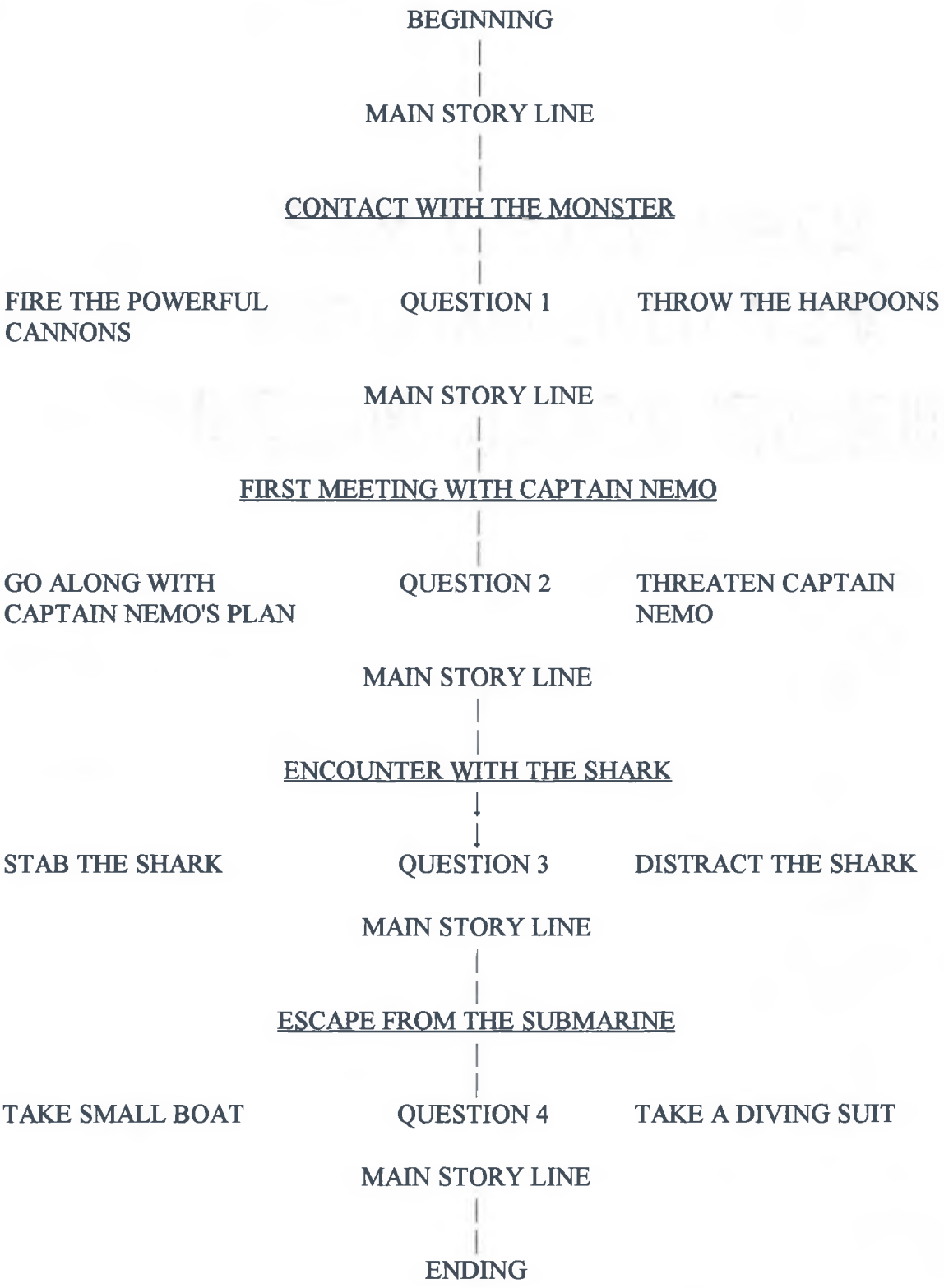

Figure 3. Structure of 20,000 Leagues Under the Sea

Condition A had one question for each episode because it involved a prediction between the protagonists' two alternatives before the decisions were revealed. For Condition R, 2 questions, labelled "a" and "b", were developed for each episode. The two questions addressed the protagonists' two alternatives after the decisions were revealed. Each child who participated in Condition R was yoked with a child who participated in Condition A and a child who participated in Condition NQ. The alternatives predicted by the children in Condition A determined the questions answered by the children in Condition R in order to ensure that an equal number of participants considered the same alternatives. For example, considering question 1 for Robinson Crusoe, if a student who participated in Condition A predicted that Robinson would refuse the captain's offer, then the student who participated in Condition R was asked question "1b", which required the child to explain why Robinson didn't refuse the captain's offer. Conversely, if the student who participated in Condition A predicted that Robinson would accept the captain's offer, then the student who participated in Condition R was asked question "1a", which required the child to explain why Robinson accepted the captain's offer. The students who participated in Condition NQ did not answer any questions.

Testing Materials

Comprehension tests. Appendix C presents the comprehension tests for each story. The comprehension questions were designed to test the participants' ability to recognize valid causal inferences and reject invalid or faulty causal inferences based on information presented in the stories. Each test contained 16 true/false statements that addressed various parts of the story. Eight "true" statements in each test represented valid

inferences. A valid inference was based on information that was not directly presented, but was implied by information provided in the stories. Eight "false" statements represented invalid inferences. An invalid inference was a statement that conflicted with information in the stories or was unlikely to occur according to information given in the stories.

Two versions of the comprehension tests were developed for the administration of an immediate test and a delayed test, which occurred approximately one week after the immediate test. Half of the participants responded to version 1 for the immediate test and version 2 for the delayed test and half of the participants responded to version 2 for the immediate test and version 1 for the delayed test. "True" statements on version 1 (for example, "Robinson spent less than half of his life on the island") were modified so that they were "false" on version 2 (for example, "Robinson spent more than half of his life on the island"). Likewise, statements that were "false" on version 1 were modified so that they were "true" on version 2. The same number of words occurred in each true/false pair across the two versions. Additionally, statements that appeared in the first half of version 1 were presented in the second half of version 2. Likewise, statements that appeared in the second half of version 1 were presented in the first half of version 2. Each half of the tests contained 4 "true" and 4 "false" statements. Figures 4 and 5 illustrate the distribution of valid inferences for each story.

Explicit details tests. Appendix D presents the explicit details tests for each story. The multiple choice questions were designed to test the participants' memory for explicit details throughout the story. Each test contained 18 original sentences from the stories,

- Robinson's parents hoped that he would not risk his life by becoming a sailor.

DILEMMA 1

- All Robinson knew about sailing was from what he read in books.
- Robinson Crusoe believed that some things about sailing could not be learned by just reading books.

DILEMMA 2

- The terrible storm caused all of the others to drown in the sea.
- After the storm, Robinson Crusoe's ship did not sink to the ocean's floor.
- There were supplies left on the ship of some value to Robinson.
- Robinson's life on the island was not very difficult because he had enough food to eat and enough clothes to wear.
- Robinson did not explore the entire island soon after he landed.

DILEMMA 3

- If Robinson had not acted quickly, the cannibals would probably have killed and eaten Friday.
- Before he met Friday, Robinson was very unhappy on the island because he was all alone.
- Before Friday had become a prisoner, he lived on another island.
- Robinson believed that his chances of being rescued were better if he could travel to Friday's island.
- Both Robinson and Friday were afraid that the cannibals would return to the island.
- The small boat that Robinson Crusoe and Friday built was not large enough to hold both of them and their food.

DILEMMA 4

- Because Robinson Crusoe rescued the ship's captain, he promised to take Robinson and Friday to England.
- Robinson spent more than half of his life on the island.

Figure 4. Distribution of Valid Inferences for Robinson Crusoe

- One year, ships from many countries were attacked as they tried to cross the ocean.
- The President of the United States knew that a large monster was attacking and destroying ships.
- The President of the United States felt that Ned could find and destroy the monster because he had sailed to many parts of the world.

DILEMMA 1

- The shots fired by all of the ship's cannons missed the monster because it was swimming too fast.
- Ned knew that when the submarine crew captured him, they had saved him from drowning at sea.
- Even though the submarine had many beautiful rooms and lots of food, Ned still wanted to return home.
- Captain Nemo's submarine was mistaken for a mysterious monster that was roaming the ocean and destroying ships.
- The submarine was well equipped so that it did not need to return to land for supplies.

DILEMMA 2

- Ned knew that Captain Nemo could never be talked into surrendering his submarine.
- Ned did not threaten Captain Nemo because he thought that it would make him angry.
- Ned believed that even if he gained Nemo's trust, he would never be allowed to go home.
- The rare objects that Nemo showed Ned were obtained from treasure found on the ocean's floor.

DILEMMA 3

- Even though Captain Nemo was thankful that Ned Land had saved his life, he did not want to take Ned home.
- Ned knew that his best chance to escape would be while the submarine was on the surface of the water near the coast of Spain.

DILEMMA 4

- Ned was relieved when a fishing boat rescued him from drowning at sea.
- Captain Nemo did not know that Ned was rescued by a fishing boat.

Figure 5. Distribution of Valid Inferences for 20,000 Leagues Under the Sea

with the final word or phrase left incomplete. The participants were presented with 4 alternatives and instructed to choose the correct word or phrase that would make the sentence the same as it appeared in the story.

Two versions of the explicit details tests were also developed. Half of the participants responded to version 1 for the immediate test and version 2 for the delayed test and half of the participants responded to version 2 for the immediate test and version 1 for the delayed test. The two versions for each story contained the same questions. However, statements that appeared in the first half of version 1 were presented in the second half of version 2. Likewise, statements that appeared in the second half of version 1 were presented in the first half of version 2. The order of the 4 alternatives for the questions were varied across the 2 versions for each story. Additionally, approximately the same number of each alternative (a, b, c, or d) was correct on each version of the tests. Figures 6 and 7 illustrate the distribution of explicit details questions for each story.

Procedure

Prior to the collection of data, the experimenter arranged for parental consent forms to be sent home to the participants' parents. The consent form is presented in Appendix E. After consent forms were returned, the experimenter collected data from the children who received parental permission to participate in the study.

Within each class, the teacher rated each child according to their reading comprehension ability prior to the experiment. From these ratings, the experimenter constructed a rank order of the students according to their abilities. Based on these rankings, the participants were grouped with similar children in their class. For example,

- Robinson Crusoe grew up in a small English coastal town of _____.
- Ever since he could remember, his dream was to become a _____.
- One day, Robinson met the captain of a ship while he was walking along the _____.
- The captain told him that he needed another sailor for a _____.

DILEMMA 1

- Robinson's ship began exploring a little known area at the South _____.
- One day a huge wind began to blow, and the sea became very _____.
- As the waves grew larger many men were washed overboard into the _____.

DILEMMA 2

- Robinson looked around and, fortunately, was able to grab and hang onto a floating _____.
- However, Robinson wished he had a friend, because he had been alone on the island for _____.
- Suddenly, Robinson became very frightened when, from a nearby beach, he heard the sounds of _____.
- Robinson carefully approached the area and hid behind some _____.

DILEMMA 3

- Robinson gave Friday food, clothes, and a place to stay in the _____.
- Robinson taught Friday to speak English and they told each other about their _____.
- The boat could not be too large, or they would not be able to _____.
- Robinson and Friday finally finished building the boat after working on it for several _____.
- If they were to reach Friday's island, Robinson would have to decide upon another _____.

DILEMMA 4

- The pirates tied up their prisoners and left them while they _____.
- Robinson Crusoe finally returned home after being on the island for over _____.

Figure 6. Distribution of Explicit Details Questions for Robinson Crusoe

- Then, they returned to their home countries filled with needed _____.
- Ned was made a commander and was provided with cannons and harpoons to equip his _____.
- One day, they spotted a large, dark creature that looked bigger than a _____.
- As the ship turned to chase it, the monster headed in its _____.

DILEMMA 1

- The force of the crash threw Ned and many of the crew into the _____.
- However, the crippled ship was heading away, and Ned knew he could not _____.
- Suddenly, a hatch opened and Ned was taken prisoner by _____.
- Then, the sailors locked the door securely, opening it only to bring Ned his _____.
- Then Captain Nemo showed Ned many beautiful rooms, each filled with rare objects, containing precious _____.

DILEMMA 2

- Each time a sunken ship was located, the crew put on diving suits that Captain Nemo had _____.
- Then, if treasure was found they would load it _____.
- As they began to lift the treasure chest, a large, dark shadow _____.
- The crew became terrified when they realized that the creature swimming toward them was a huge _____.

DILEMMA 3

- Captain Nemo had read about a sunken city that contained large deposits of _____.
- When night came, the submarine would surface to obtain air for only _____.

DILEMMA 4

- He struggled to keep his distance from the submarine as it began to _____.
- The submarine slowly disappeared as the whirlpool _____.
- Ned Land's adventure was now ending after he had traveled _____.

Figure 7. Distribution of Explicit Details Questions for 20.000 Leagues Under the Sea

students ranked as first, second, and third in their class on reading comprehension were grouped together. Within each group, each child was randomly assigned to one of the three conditions.

Each child was individually tested in a separate room provided by the school. In order to familiarize each class with the experimenter, she introduced herself and explained the purpose of the study to the class as a whole. To simplify the explanation of the study, the classes were told that they would read two short stories and they would answer some questions to find out what they think about each story and what they remember about them. The participants were told that their answers to the questions would help the experimenter to determine ways to improve reading.

The participants were individually greeted and taken to the experimental room. The participants were instructed to read the first episode of the first story and to stop after they have finished reading the page(s). At this point, children participating in Condition A answered question 1. Then, the experimenter presented the protagonist's choice to the alternative. Children participating in Condition R answered question 1 after the protagonist's choice was presented. After each child responded to the question, participants continued in this manner until the first story was finished. Children participating in Condition NQ read the story without answering questions between episodes. Then, the same procedure was repeated for the second story. Story order was counterbalanced across all conditions. Standardized reading instructions for the treatment and control groups are presented in Appendix F.

Next, each child responded to the comprehension and explicit details tests for the first story followed by the comprehension and explicit details tests for the second story. Tests for the two stories were administered after the children read both stories, rather than after each story. This procedure was designed to ensure that participants did not know the formats of the tests before reading the second story. If the participants had known the formats of the tests before reading the second story, they may have attended to the events and explicit details of that story more closely. This first session of the experiment lasted approximately 45 minutes for each participant. Each child was asked not to discuss the stories with classmates until everyone had participated. Approximately one week later, alternative versions of the comprehension and explicit details tests were administered to the participants in the same manner. This second session of the experiment lasted approximately 15 minutes for each participant. Test version number was counterbalanced across all conditions. Instructions for the comprehension tests are presented in Appendix G and instructions for the explicit details tests are presented in Appendix H.

CHAPTER III

RESULTS

A median split was performed on story comprehension ability according to teacher rankings on each class. The top students from each class were grouped into a "high-ability" group, which consisted of 24 participants. A "low-ability" group was formed from the 23 students who ranked the lowest in story comprehension ability.

Tables 1 and 2 present the mean number of correct responses and standard deviations for the comprehension and explicit details tests, respectively, for Robinson Crusoe according to Condition, Ability, Test, and Session. Likewise, Tables 3 and 4 present the mean number of correct responses and standard deviations for the comprehension and explicit details tests, respectively, for 20,000 Leagues Under the Sea according to Condition, Ability, Test, and Session. A mean of 8.0 would reflect chance performance on comprehension tests. A mean of 4.5 would reflect chance performance on explicit details tests.

In order to examine differences in test performance across the two reading sessions for low- and high-ability participants of each condition, a 3 (Condition) X 2 (Ability) X 2 (Story) X 2 (Session) X 2 (Test) mixed factor analysis of variance (ANOVA) was performed on number of correct responses. Significant results from the ANOVA are

Table 1

Correct Comprehension Test Responses for Robinson Crusoe

		Ability				
		Low		High		
Condition	n	Immediate	Delayed	Immediate	Delayed	Marginal
Anticipatory	16	(n = 8)		(n = 8)		
M		11.00	10.13	12.50	11.75	11.35
SD		2.14	1.55	1.77	2.37	1.96
Retrospective	17	(n = 9)		(n = 8)		
M		10.44	10.11	11.50	10.87	10.73
SD		1.94	1.90	2.07	1.81	1.93
No Questions	14	(n = 6)		(n = 8)		
M		11.17	10.83	11.75	12.00	11.44
SD		1.72	2.64	1.75	2.51	2.15
Marginal	47	(n = 23)		(n = 24)		
M		10.87	10.36	11.92	11.54	11.17
SD		1.93	2.03	1.86	2.23	2.01

Table 2

Correct Explicit Details Responses for Robinson Crusoe

		Ability				
		Low		High		
Condition	n	Immediate	Delayed	Immediate	Delayed	Marginal
Anticipatory	16	(n = 8)		(n = 8)		
M		8.37	7.75	10.87	8.50	8.87
SD		2.61	2.82	3.18	3.82	3.11
Retrospective	17	(n = 9)		(n = 8)		
M		7.11	8.22	11.50	7.12	8.49
SD		3.02	2.17	2.98	3.60	2.94
No Questions	14	(n = 6)		(n = 8)		
M		8.33	8.67	12.63	8.38	9.50
SD		1.75	5.35	2.61	2.77	3.12
Marginal	47	(n = 23)		(n = 24)		
M		7.94	8.21	11.67	8.00	8.95
SD		2.46	3.45	2.92	3.40	3.06

Table 3

Correct Comprehension Responses for 20,000 Leagues Under the Sea

		Ability				
		Low		High		
Condition	n	Immediate	Delayed	Immediate	Delayed	Marginal
Anticipatory	16	(n = 8)		(n = 8)		
M		10.37	9.75	12.25	11.50	10.97
SD		2.33	2.71	1.91	1.60	2.14
Retrospective	17	(n = 9)		(n = 8)		
M		9.78	11.33	12.75	11.75	11.40
SD		2.44	1.73	1.58	1.58	1.83
No Questions	14	(n = 6)		(n = 8)		
M		9.83	11.33	13.37	12.13	11.67
SD		3.19	1.03	1.06	2.64	1.98
Marginal	47	(n = 23)		(n = 24)		
M		9.99	10.80	12.79	11.79	11.35
SD		2.65	1.82	1.52	1.94	1.98

Table 4

Correct Explicit Details Responses for 20,000 Leagues Under the Sea

		Ability				
		Low		High		
Condition	n	Immediate	Delayed	Immediate	Delayed	Marginal
Anticipatory	16	(n = 8)		(n = 8)		
M		4.50	7.50	8.75	5.87	6.65
SD		2.14	3.82	3.88	3.27	3.28
Retrospective	17	(n = 9)		(n = 8)		
M		4.22	8.00	8.62	7.12	6.99
SD		3.15	2.24	3.62	3.00	3.00
No Questions	14	(n = 6)		(n = 8)		
M		5.17	8.00	10.37	6.62	7.54
SD		4.88	3.35	3.89	3.74	3.97
Marginal	47	(n = 23)		(n = 24)		
M		4.63	7.83	9.25	6.54	7.06
SD		3.39	3.14	3.80	3.34	3.42

presented in Table 5. Condition and Ability were analyzed as between-subjects factors. Story, Session, and Test were analyzed as within-subjects factors. The analysis of variance did not indicate any significant effects for Condition. Thus, hypotheses 1, 2, and 4 were not supported by this analysis.

The analysis of variance revealed other significant main effects that do not correspond directly to hypotheses. A significant main effect was found for Ability. High-ability participants performed better on the tests in comparison to low-ability participants (M=10.43 and 8.83, respectively, F (1,41)=22.28, p<.001). A significant main effect was also found for Story. Participants performed better on tests for Robinson Crusoe in comparison to 20,000 Leagues Under the Sea (M=10.06 and 9.21, respectively, F (1,41)=19.84, p<.001). Additionally, a significant main effect for Test was found. Participants performed better on comprehension tests in comparison to explicit details tests (M=11.26 and 8.01, respectively, F (1,41)=232.11, p<.001).

Several interactions were also found that do not directly correspond to hypotheses. The Ability X Session interaction was significant (F (1,41)=13.55, p<.001). The calculation of simple effects of ability within each session showed that high-ability participants performed better than low-ability participants on the immediate test (M=11.41 and 8.36, respectively, t (44)=5.89, p<.001). There was not a significant difference between high- and low-ability participants for the delayed test.

The Story X Test interaction was also significant (F (1,41)=30.28, p<.001). The calculation of simple effects of story within each test revealed that participants performed better on the explicit details tests for Robinson Crusoe in comparison to 20,000 Leagues

Table 5

Significant Effects from the Analysis of Variance

	SS	df	MS	F
Ability	239.08	1	239.08	22.28**
Story	68.18	1	68.18	19.84**
Test	977.44	1	977.44	232.11**
Ability by Session	192.06	1	192.06	13.55**
Story by Test	98.78	1	98.78	30.28**
Story by Session	30.45	1	30.45	6.18*
Ability by Story by Session	22.24	1	22.24	4.51*
Ability by Test by Session	96.80	1	96.80	6.08*
Story by Test by Session	14.72	1	14.72	4.49*

*$p<.05$. **$p<.001$.

Under the Sea (M=8.95 and 7.06, t (46)=7.11, p<.001). There was not a significant difference between the two stories for comprehension tests.

A significant Story X Session interaction was also found (F (1, 41)=6.18, p<.05). A calculation of simple effects of story within each session revealed that participants performed better on the immediate tests for Robinson Crusoe in comparison to 20,000 Leagues Under the Sea (M=10.60 and 9.17, respectively, t (46)=3.17, p<.01). There was no significant difference between the delayed tests for Robinson Crusoe and 20,000 Leagues Under the Sea.

The Ability X Story X Session interaction was significant (F (1,41)=4.51, p<.05). High-ability participants performed better on the immediate tests for Robinson Crusoe in comparison to the delayed tests (M=11.79 and 9.77, respectively, t (23)=4.47, p<.001). Additionally, high-ability participants performed better on the immediate tests for 20,000 Leagues Under the Sea in comparison to the delayed tests (M=11.02 and 9.17, respectively, t (23)=2.37, p<.05). Low-ability participants performed better on the delayed tests for 20,000 Leagues Under the Sea in comparison to the immediate tests (M=9.31 and 7.31, respectively, t (22)=-2.86, p<.01). There were no significant differences for the low ability participants for 20,000 Leagues Under the Sea across the two sessions.

A significant Ability X Session X Test interaction was found that relates to hypothesis 3 (F (1,41)=6.08, p<.05). High-ability participants performed better on the immediate tests for comprehension in comparison to the delayed tests for comprehension (M=12.35 and 11.67, respectively, t (23)=2.10, p<.05). Additionally, they performed

better on immediate tests for explicit details in comparison to the delayed tests for explicit details (M=10.46 and 7.27, respectively, t (23)=3.03, p<.01). The decline in number of correct responses across the two sessions was lower for comprehension tests in comparison to explicit details tests for high-ability participants (M=0.87 and 5.02, respectively, t (23)=-2.33, p<.05). There were no significant differences for the low-ability participants for immediate tests for comprehension in comparison to the delayed tests for comprehension (M=10.43 and 10.58, respectively). Additionally, there were no significant differences for the low-ability participants for immediate tests for explicit details in comparison to the delayed tests (M=6.29 and 8.02, respectively). Thus, hypothesis 3 was supported for high-ability participants, but not low-ability participants.

A significant Story X Session X Test interaction was also found that relates to hypothesis 3 (F (1, 41)=4.49, p<.05). The calculation of simple effects of story within each session and type of test did not indicate any significant differences. However, as the means for Tables 1 through 4 demonstrate, it appears as if the greatest decline in scores from the immediate to the delayed session occurred for the explicit details tests for Robinson Crusoe (M=9.81 and 8.11, respectively). Surprisingly, there was a slight increase in explicit detail test scores from the immediate to delayed sessions for 20,000 Leagues Under the Sea (M=6.94 and 7.19, respectively). An additional comparison revealed that the decline in comprehension test scores across the sessions was significantly different from the increase in explicit details test scores across the two sessions for 20,000 Leagues Under the Sea (M=4.25 and -0.21, respectively, t (46)=7.90, p<.001). Thus, these analyses do not support hypothesis 3.

Correlations Between Test Scores

In order to further examine the effects of condition on test performance, correlations were computed between the number of correct responses on the comprehension tests and the explicit details tests. Tables 6 and 7 present these correlations according to Condition, Ability, and Session for Robinson Crusoe and 20,000 Leagues Under the Sea, respectively. These analyses were conducted in order to detect possible trends for condition. More specifically, these analyses were conducted to examine possible declines in the correlations from the immediate session to the delayed session. Although speculative, it may be possible that lower correlations between the two types of tests on the delayed session indicate that memory for comprehension is more durable over time in comparison to memory for explicit details. Additionally, it may be true that possible declines in correlations from the immediate to delayed session are greater for Conditions A and R in comparison to Condition NQ.

Robinson Crusoe. For Robinson Crusoe, the correlations for Condition A participants, high- and low-ability, on the immediate tests were low (r (N = 8)=0.09, p>.05 and r (N = 8)=0.15, p>.05, respectively). However, the correlations for the delayed tests revealed a moderate, inverse relationship between comprehension and explicit details test scores for high- and low-ability Condition A participants (r (N = 8)=-0.41, p>.05 and r (N = 8)=-0.38, p>.05, respectively).

The correlations for Condition R participants, high- and low-ability, for the immediate tests indicated a low, positive relationship between comprehension and explicit details test scores (r (N = 8)=.21, p>.05 and r (N = 9)=0.16, p>.05). However, the

Table 6

Correlations Between Comprehension and Explicit Details Scores for Robinson Crusoe

		Ability			
		Low		High	
		(n = 23)		(n = 24)	
Condition	n	Immediate	Delayed	Immediate	Delayed
Anticipatory	16	(n = 8)		(n = 8)	
		0.15	-0.38	0.09	-0.41
Retrospective	17	(n = 9)		(n = 8)	
		0.16	0.45	0.21	-0.19
No Questions	14	(n = 6)		(n = 8)	
		0.57	0.31	-0.05	0.21

Table 7

Correlations Between Comprehension and Explicit Details Scores for 20,000 Leagues Under the Sea

		Ability			
		Low (n = 23)		High (n = 24)	
Condition	n	Immediate	Delayed	Immediate	Delayed
Anticipatory	16	(n = 8)		(n = 8)	
		-0.04	0.25	0.74*	-0.31
Retrospective	17	(n = 9)		(n = 8)	
		-0.04	0.48	0.13	-0.26
No Questions	14	(n = 6)		(n = 8)	
		-0.19	0.69	0.55	0.54

*= $p < .05$.

correlations for the high-ability Condition R participants for the delayed tests revealed a low, inverse relationship between comprehension and explicit details test scores (r (N =8) =-0.19, p>.05). The correlations for low-ability Condition R participants increased to a moderate level for the delayed tests (r (N = 9)=0.45, p>.05).

For high-ability Condition NQ participants the correlation revealed an inverse, low relationship between comprehension and explicit details test scores for the immediate tests (r (N = 8)=-0.05, p>.05). The correlation for these participants increased for the delayed tests (r (N = 8)=0.21, p>.05). For low-ability Condition NQ participants, the correlation was moderate for the immediate and delayed tests (r (N = 6)=0.57, p>.05 and r (N = 6)=0.31, p>.05, respectively).

20,000 Leagues Under the Sea. For 20,000 Leagues Under the Sea, the correlation for high-ability Condition A participants on the immediate tests indicated that children who performed well on the comprehension tests, also performed well on the explicit details tests (r (N = 8)=.74, p<.05). The correlation for these participants for the delayed tests revealed a moderate, inverse relationship between the comprehension and explicit details tests (r (N = 8)=-0.31, p>.05). The correlation for low-ability Condition A participants on the immediate tests revealed a low, inverse relationship between comprehension and explicit details test scores (r (N = 8)=-0.04, p>.05). The correlation for these participants increased for the delayed tests (r (N = 8)=0.25, p>.05).

The correlation for high-ability Condition R participants for the immediate tests indicated a low, positive relationship between comprehension and explicit details test scores (r (N = 8)=0.13, p>.05). However, the correlation for the same participants

revealed a low, inverse relationship for the delayed tests (r (N = 8)=-0.26, p>.05). The correlation for low-ability Condition R participants for immediate tests revealed a low, inverse relationship between the two test types (r (N = 9)=-0.04, p>.05). The correlation for these participants increased to a positive, moderate value for the delayed tests (r (N = 9)=0.48, p>.05).

The correlations for high-ability Condition NQ participants for the immediate and delayed tests were moderate (r (N = 8)=0.55, p>.05 and r (N = 8)=0.54, p>.05, respectively). For low-ability Condition NQ participants, the correlation for the immediate tests revealed a low, inverse relationship between the two test types (r (N = 6)=-0.19, p>.05). The correlation for these participants increased to a moderate, positive value for the delayed tests (r (N = 6)=0.69, p>.05).

Finally, tests of differences between correlations for the delayed tests for Condition A in comparison to Condition NQ did not reveal a significant difference. Additionally, there were no significant differences between the correlations for the delayed tests for Condition R in comparison to Condition NQ. Thus, hypotheses 1, 2, and 4 were not supported by these analyses.

CHAPTER IV

DISCUSSION

The present findings do not indicate a facilitating effect for anticipatory or retrospective questioning upon story comprehension (hypotheses 1, 2, and 4). However, the present results provide support for the hypothesis that the decline in explicit details test scores from the immediate to delayed tests would be greater than the corresponding decline in comprehension test scores for high-ability participants, but not for low-ability participants.

There are several possible explanations for the lack of a condition effect (hypotheses 1, 2, and 4) in the current study. First, the participants may have generated spontaneous inferences while reading the stories, regardless of condition. In order, to further examine this possibility, the percentages of correct responses for comprehension and explicit details from the current study were compared by condition with those of fourth graders from Fitzpatrick's (1985) study, where condition was found to be significant. The tests from the two studies were nearly identical.

Fitzpatrick's (1985) fourth grade "choices" participants provided correct responses to 75% of the comprehension questions and 56% of the explicit details questions. His fourth grade "no choices" participants provided correct responses to 60% of the

comprehension questions and 44% of the explicit details questions. Condition A and Condition R participants from the current study provided correct responses to 70% of the comprehension questions and 43% of the explicit details questions. Condition NQ participants from the current study provided correct responses to 72% of the comprehension questions and 47% of the explicit details tests questions. When compared with Fitzpatrick's (1985) fourth grade "no choices" participants, the participants from Condition NQ in the current study appeared to respond correctly to more test questions. Thus, there is some indication that the students in the current study might have been higher in ability than those in Fitzpatrick's (1985) study.

A second possibility for the absence of a condition effect may involve the procedure that was utilized for the administration of the tests. In the current study, participants read the two stories and responded to the tests for the first story, followed by the tests for the second story. As stated earlier, according to schema theory, readers construct memories from what they remember of original material and from the schemata that were activated at the time of comprehension (Small, 1990). Because the two stories have similar themes (sea adventures), the participants may have activated similar schemata for them. At the time of testing, when the readers were constructing memories, they may have confused aspects of the two stories. Additionally, the delay between the stories and the tests may have promoted a decline in performance. Alternative procedures that may increase the separation between the stories would involve using stories with different themes and/or having the participants read the first story and take the corresponding tests, followed by the same procedure for the second story.

A final possibility for the absence of a condition effect is that it may be attributed to differences in race and socio-economic status between the two schools. As stated earlier, all of the students tested at the school in Beavercreek, Ohio are Caucasian and primarily from come from middle-class backgrounds. On the other hand, of the participants tested at the school in Trotwood, Ohio, 6 are Caucasian and 6 are African-American. Additionally, Trotwood, Ohio is located near the inner-city of Dayton, Ohio. The differences in race and socio-economic status between these two schools may have contributed to high levels of variability, which may have masked possible condition effects.

Relationships Between Test Scores

The correlations between correct responses on the comprehension tests and the explicit details tests were calculated to further examine the effects of Condition and Session. In the current study it was hypothesized that, when story questions are asked, the reader would experience greater retention of implied information (hypotheses 1, 2 and 4). Thus, comprehension scores for Conditions A and R were expected to decline less over time in comparison to explicit detail test scores. If this were the case, it may be possible that the correlations between the comprehension and explicit details tests for Conditions A and R would decline from the immediate test to the delayed test in comparison to Condition NQ.

The average decline in Condition A correlations from the immediate tests to the delayed tests was 0.51 for Robinson Crusoe and 0.39 for 20,000 Leagues Under the Sea. The average change for Condition R correlations was a 0.06 decline for Robinson Crusoe and a 0.06 improvement for 20,000 Leagues Under the Sea. Condition NQ correlations

appeared to increase from the immediate to the delayed tests. The average increase for Robinson Crusoe was 0.01 and the average increase for 20,000 Leagues Under the Sea was 0.43. Thus, there may be a possible Condition effect that was masked by variability. However, although these analyses are suggestive, they are highly speculative and require further examination before firm conclusions can be made. The correlational trends for condition may be due to other factors, such as variability or chance.

Comparison with Fitzpatrick (1985)

Fitzpatrick's (1985) results indicated that participants who made choices for the protagonists and generated rationale for these choices performed better on the comprehension and details tests than control participants. However, he suggests that his effects may have been due to the participants' generation of rationale for choices rather than making decisions for the protagonist. Furthermore, Shapiro (1984) suggests that externally generated questions during reading may stimulate the reader to search for new information from the text, to review or elaborate upon previously read material, or to monitor comprehension by assessing or evaluating knowledge that has been gained from reading.

The current study was designed so that the opportunity to make choices for the protagonists and to determine the path of story was removed. Thus, in the current study Condition A and R participants were asked to generate rationale for the protagonists' decisions and Condition NQ participants were not. Results from the current study suggest that it is the opportunity to make decisions for the protagonist and to determine the path of the story that provides facilitated comprehension rather than providing rationale. The

participants in Fitzpatrick's (1985) study may have experienced a deeper level of involvement as a result of their knowing that they had the opportunity to determine the path of the story. It appears as if generating rationale did not induce differential processing to the extent that occurred when there was opportunity to make choices.

The current study offers several suggestions for future research. First, Fitzpatrick (1985) obtained his results by using a within-subjects design for condition. A within-subjects design may demonstrate effects for anticipatory and retrospective questioning because between-subjects variability would be reduced for condition. Additionally, as mentioned previously, the tests for each story might be administered immediately after each story is read, in order to prevent interference and a decline in performance due to a test delay. Finally, use of a larger, more homogeneous sample of children may reduce variability.

The results of the current study do not necessarily rule out the possible facilitating effects on story comprehension of anticipatory or retrospective questioning at critical points in the story grammar. Clearly, these techniques deserve attention in future research. Perhaps future research that addresses the issues mentioned above will shed light on the validity of the hypotheses set forth in the current study and on our understanding of children's story comprehension.

APPENDIX A

Robinson Crusoe

Robinson Crusoe grew up in a small English coastal town of Hampton by the sea. Ever since he could remember, his dream was to become a sailor. While still in high school, Robinson asked his parents if he could join the crew of a ship. However, his parents were against this idea because they knew that there was danger at sea. One day, Robinson met the captain of a ship while he was walking along the harbor. The captain told him that he needed another sailor for a trip to the South Seas. Robinson knew this was an answer to his childhood dreams. Robinson now had a difficult choice that he had to make. He could refuse the captain's offer and stay home to finish school. However, he could accept the captain's offer and join the crew of the ship.

Anticipatory Question 1

[Read Aloud] "*Robinson decided to join the crew of the ship headed for the South Seas.*"

Retrospective Question 1 a or b

He knew that there would never be another chance like this to become a sailor. Robinson felt that he could always finish school when he returned from his voyage. Although Robinson had read many books about sailing, he knew that experience was the best teacher. Robinson was very excited that this ship would be taking him all over the world. Robinson visited many foreign countries, and he heard many new languages. Robinson's ship began exploring a little known area at the South Seas that contained many islands. One day a huge wind began to blow, and the sea became very rough. Robinson knew from his reading that very few sailors survived tropical storms. Now he was in the middle of a storm that was worse than anything he had imagined. As the waves grew larger many men were washed overboard into the sea. At this moment, Robinson had to decide what to do to survive this storm. He could stay with the ship, and try to bail out the water. However, he could climb into a lifeboat and try to row it to safety.

Anticipatory Question 2

[Read Aloud] "*Robinson decided to stay with the ship and try to bail out the water.*"

Retrospective Question 2 a or b

However, as hard as he and his shipmates tried, the water kept filling the ship. Suddenly, a gigantic wave covered the ship, washing everyone overboard. Robinson looked around and, fortunately, was able to grab and hang onto a floating board. Robinson became exhausted, and he felt that he could not hang on any longer. Just as he was about to give up, his feet touched something solid. The waves had washed Robinson onto the shore of a deserted island. He slowly crawled out of the water and, immediately, fell asleep. When he woke up the next day, Robinson was sad to discover that no one else had survived. Robinson saw his battered ship a short distance from the shore. He swam to the ship and gathered all the remaining supplies that were left. He returned to the island and built his home in a cave on top of a hill. Robinson learned many skills that provided him with many different types of food. He soon became an excellent hunter and, also, learned to plant corn. He also learned to make clothes and build furniture to help make his life comfortable. However, Robinson wished he had a friend, because he had been alone on the island for twelve years. He began to wonder if someone else lived on the other side of the island. One day Robinson decided to explore parts of the island he had never seen. Suddenly, Robinson became very frightened when, from a nearby beach, he heard the sounds of chanting. Robinson knew that there were cannibals in this part of the world. He also knew that if the cannibals caught him, they would kill him and eat him. Robinson carefully approached the area and hid behind some bushes. He saw a group of cannibals with two men as prisoners. Robinson saw the cannibals kill one of the prisoners while the other man screamed for help. He felt very sorry for this man and decided to save him. Next, Robinson had to decide what to do to save the prisoner. He could build a fire to

distract the cannibals away from the prisoner. However, he could fire his rifle to frighten them away from their prisoner.

Anticipatory Question 3

[Read Aloud] "*He decided to fire his rifle to frighten the cannibals away.*"

Retrospective Question 3 a or b

They had never heard such a loud noise before and thought it was a warning from the gods. They became terrified and ran back to their boats. Meanwhile, Robinson approached the man and cut his ropes to set him free. The man fell to his knees because he was grateful to Robinson for saving his life. Robinson named the young man Friday because that was the day he had found him and saved him. Robinson gave Friday food, clothes and a place to stay in the cave. They worked well together and became very good friends. Robinson taught Friday to speak English and they told each other about their homes. Friday remembered seeing a trading ship sail past his island many years ago. Friday's island was nearby and could be reached by boat. They immediately began to build a boat for the trip. It was very difficult work to build the right boat. The boat could not be too large, or they would not be able to move it. It could not be too small, or it would not carry both of them as well as food. Robinson and Friday finally finished the boat after working on it for several months. In preparation for the trip, they loaded the boat full of food. As they climbed into the boat, Robinson realized that there was too much weight for the boat. If they were to reach Friday's island, Robinson would have to decide upon another plan. He could send Friday, alone, with plenty of food to comfortably make the trip. However, they could both travel and take only enough food to barely keep them alive.

Anticipatory Question 4

[Read Aloud] "*He decided to send Friday alone with plenty of food to comfortably make the trip.*"

Retrospective Question 4 a or b

He knew that Friday could be trusted to come back for him. After Friday left, Robinson spent each day looking out at the sea. He hoped to spot a boat carrying Friday and his friends. One day, however, he spotted a sailing ship approaching the island. Unfortunately, the ship had been captured by pirates, who made prisoners of the captain and crew. Robinson watched as some pirates brought prisoners to the island. To his surprise, one of the prisoners was Friday. The pirates tied up their prisoners and left them while they explored the island. When the pirates were out of sight, Robinson released the prisoners. Then, the captain led Robinson, Friday, and the crew back to the ship. He invited Robinson and Friday to join the crew of the ship. Robinson and Friday were thankful to be able to return to England as guests of the captain. Robinson Crusoe finally returned home after being on the island for over twenty-eight years.

20,000 Leagues Under the Sea

The nineteenth century was a period in which many nations engaged in trade. Many ships containing precious cargo set off to sea. Then, they returned to their home countries filled with needed goods. One year, however, many ships failed to return home. There was a mysterious monster that was roaming the oceans and destroying ships. While this monster was roaming the ocean, all of the ships that tried to cross were in danger. The President of the United States knew that this monster had to be destroyed. Therefore, he asked the world famous explorer, Ned Land, to help destroy this monster. Ned was made a commander and was provided with cannons and harpoons to equip his warship. Ned and the crew traveled half way around the world looking for this monster. One day, they spotted a large, dark creature that looked bigger than a whale. As the ship turned to chase it, the monster headed in its direction. As it approached, Ned Land had a difficult decision to make. He could fire the powerful cannons, hoping to hit it immediately. However, he could wait until it got closer and throw harpoons at it.

Anticipatory Question 1

[Read Aloud] "*Ned decided to fire the cannons, hoping to destroy the monster.*"

Retrospective Question 1 a or b

He believed that the monster was too large and strong to kill by using harpoons. As soon as it was in range, all of the ship's five cannons fired at the monster. Unfortunately, it was swimming too fast and all of the shots missed. Before the cannons could be reloaded, the monster crashed into the side of the ship. The force of the crash threw Ned and many of the crew into the sea. Ned struggled against the waves as he tried to swim to the ship. However, the wind was blowing the crippled ship away. Just when Ned thought all was lost, he felt something underneath him. To his surprise it was not a monster but a large submarine, shaped like a giant whale. Suddenly, a hatch opened and Ned was taken prisoner by four sailors. Although the sailors seemed friendly, they did not speak a word to Ned. He was led to a small room and was given dry clothes and food. Then, the sailors locked the door securely, opening it only to bring Ned his meals. After spending several days alone, Ned was finally visited by a man named Captain Nemo. Captain Nemo told Ned that he would no longer be locked up in the small room. Ned would be free to go anywhere on the submarine. Then Captain Nemo showed Ned many beautiful rooms, each filled with rare objects, containing precious emeralds. Captain Nemo explained that his submarine was built so that it would remain at sea forever. They obtained all of their food and other supplies from the ocean. He also told Ned that no one on the submarine would ever return home. Ned did not want to spend the rest of his life on the submarine. Therefore, in this very difficult situation Ned had to make an important decision. He could agree to remain on the submarine but, secretly, wait for a chance to escape. However, he could threaten Captain Nemo and demand to be returned to land immediately.

Anticipatory Question 2

[Read Aloud] *"Ned agreed to remain on the submarine but, secretly wait for a chance to escape."*

Retrospective Question 2 a or b

He did not want to make Captain Nemo angry at this time. Ned was afraid Captain Nemo would, again, lock him up in a small room. Ned also believed that Captain Nemo would not allow anyone who entered the submarine to leave. Therefore, Ned knew that he would have to wait and, later, come up with a clever plan to escape. For now, however, all plans to escape would have to wait. In the next few weeks, Ned saw many beautiful things on the ocean's floor. As they explored ocean reefs, they sometimes discovered sunken ships. Each time a sunken ship was located, the crew put on diving suits that Captain Nemo had designed. Then, if treasure was found they would load it onto their backs and carry it back to the submarine. One day, a very large treasure chest was discovered. It was so heavy that the entire crew had to help carry it back to the submarine. Captain Nemo invited Ned to go along with the rest of the crew. As they began to lift the treasure chest, a large, dark shadow approached. The crew became terrified when they realized that the creature swimming toward them was a huge tiger shark. Suddenly, it attacked Captain Nemo, grabbing his air tank and ripping his diving suit. Ned realized that Captain Nemo's life was in danger and that he had to make a decision. He could try to kill the shark by stabbing it with a knife that he was carrying. However, he could try to distract the shark, giving Captain Nemo enough time to get away.

Anticipatory Question 3

[Read Aloud] "*Ned decided to distract the shark, giving Captain Nemo enough time to get away.*"

Retrospective Question 3 a or b

He thought that the shark would become even more angry if he stabbed it. Instead, he grabbed its tail, causing the shark to spin and thrash. Meanwhile, Captain Nemo recovered his air tank and, then, killed the shark with a spear. Captain Nemo was thankful that Ned had saved his life. However, after they returned to the submarine, Captain Nemo mentioned nothing about letting Ned return home. After several months had passed, the submarine traveled to the coast of Spain. Captain Nemo had read about a sunken city that contained large deposits of gold. Ned knew that they would never be this close to land again. Therefore, Ned decided to escape that night while the submarine was on the surface to refill its air supply. When night came, the submarine would surface to obtain air for only two hours. Ned knew that he would have to make another important decision. He could take a small boat that was stored inside the submarine. However, he could take a diving suit and try to swim to shore.

Anticipatory Question 4

[Read Aloud] "*Ned decided to take a diving suit and swim to shore.*"

Retrospective Question 4 a or b

He felt that there was little chance that someone would discover the missing diving suit. After Ned entered the water, he swam away from the submarine with all of his strength. Suddenly, Ned was surprised to find a strong current pulling him back toward the submarine. He struggled to keep his distance from the submarine as it began to swirl around in a whirlpool. The submarine slowly disappeared as the whirlpool swallowed it. Fortunately, a fishing boat was nearby, and it stopped to pick up Ned. As Ned climbed into the boat, he wondered if Captain Nemo and his submarine had survived the whirlpool. Ned Land's adventure was now ending after he had traveled 20,000 leagues, or 60,000 miles under the sea.

APPENDIX B

Anticipatory Questions: Robinson Crusoe

1. Robinson could refuse or accept the captain's offer. What do you think he will do? Why do you think he will do that?

2. Robinson could stay with the ship or climb into a lifeboat. What do you think he will do? Why do you think he will do that?

3. Robinson could build a fire or fire his rifle. What do you think he will do? Why do you think he will do that?

4. Robinson could send Friday alone or they could both travel in the boat. What do you think he will do? Why do you think he will do that?

Retrospective Questions: Robinson Crusoe

1. Robinson could have refused or he could have accepted the captain's offer.
   a. Why did he accept the captain's offer?
   b. Why didn't he refuse the captain's offer?

2. Robinson could have stayed with the ship or he could have climbed into a lifeboat.
   a. Why did he stay with the ship?
   b. Why didn't he climb into a lifeboat?

3. Robinson could have built a fire or he could have fired his rifle.
   a. Why did he fire his rifle?
   b. Why didn't he build a fire?

4. Robinson could have sent Friday alone or they could have both traveled in the boat.
   a. Why did he send Friday alone?
   b. Why didn't they both travel in the boat?

Anticipatory Questions: 20,000 Leagues Under the Sea

1. Ned could fire the powerful cannons or throw harpoons at the monster. What do you think he will do? Why do you think he will do that?

2. Ned could agree to remain on the submarine or threaten Captain Nemo. What do you think he will do? Why do you think he will do that?

3. Ned could try to kill the shark or distract it. What do you think he will do? Why do you think he will do that?

4. Ned could take a small boat or a diving suit? What do you think he will do? Why do you think he will do that?

Retrospective Questions: 20,000 Leagues Under the Sea

1. Ned could have fired the powerful cannons or he could have thrown harpoons at the monster.
   a. Why did he fire the cannons?
   b. Why didn't he throw harpoons at the monster?

2. Ned could have agreed to remain on the submarine or he could have threatened Captain Nemo.
   a. Why did he agree to remain on the submarine?
   b. Why didn't he threaten Captain Nemo?

3. Ned could have tried to kill the shark or he could have distracted it.
   a. Why did he decide to distract the shark?
   b. Why didn't he try to kill the shark?

4. Ned could have taken a small boat or a diving suit?
   a. Why did he take the diving suit?
   b. Why didn't he take the small boat?

APPENDIX C

Comprehension Test: Robinson Crusoe

Version 1

1. Regardless of what Robinson Crusoe decided, the cannibals would not have killed and eaten Friday. (F)

2. Robinson spent less than half of his life on the island. (F)

3. The terrible storm caused all of the others to drown in the sea. (T)

4. Robinson's life on the island was very difficult because he never had enough food to eat or enough clothes to wear. (F)

5. Both Robinson and Friday were afraid that the cannibals would return to the island. (T)

6. Robinson believed he had learned all there was to know about sailing just by reading books. (F)

7. After the storm, Robinson Crusoe's ship did not sink to the ocean's floor. (T)

8. There were supplies left on the ship of some value to Robinson. (T)

9. Because Robinson rescued the ship's captain, he promised to take Robinson and Friday to Friday's island. (F)

10. Before he met Friday, Robinson was very unhappy on the island because he was all alone. (T)

11. Robinson believed that his chances of being rescued were better if he could travel to Friday's island. (T)

12. All Robinson knew about sailing was from what his parents told him. (F)

13. Robinson's parents hoped that he would not risk his life by becoming a sailor. (T)

14. Robinson curiously explored the entire island soon after he first landed. (F)

15. Before Robinson bravely rescued Friday, they lived on the same island. (F)

16. The small boat that Robinson Crusoe and Friday built was not large enough to hold both of them and their food. (T)

Comprehension Test: Robinson Crusoe

Version 2

1. Robinson Crusoe believed that his chances of being rescued were better if he stayed on his island. (F)

2. Before Friday had become a prisoner, he lived on another island. (T)

3. Robinson's parents hoped that he would accept the captain's offer to become a sailor. (F)

4. Before he met Friday, Robinson was very happy on the island because he was all alone. (F)

5. All Robinson knew about sailing was from what he read in books. (T)

6. The boat that Robinson and Friday built was large enough to hold them and the supplies that they wanted to take. (F)

7. Robinson did not explore the entire island soon after he landed. (T)

8. Because Robinson Crusoe rescued the ship's captain, he promised to take Robinson and Friday to England. (T)

9. Robinson's life on the island was not very difficult because he had enough food to eat and enough clothes to wear. (T)

10. After the storm, Robinson's ship sank to the bottom of the ocean's floor. (F)

11. Neither Robinson nor Friday was afraid that the cannibals would return to the island. (F)

12. Despite the terrible tropical storm, some of Robinson Crusoe's fellow ship mates survived. (F)

13. If Robinson had not acted quickly, the cannibals would probably have killed and eaten Friday. (T)

14. There was nothing left on the ship of any value to Robinson. (F)

15. Robinson Crusoe believed that some things about sailing could not be learned by just reading books. (T)

16. Robinson spent more than half of his life on the island. (T)

Comprehension Test: 20,000 Leagues Under the Sea

Version 1

1. The shots fired by all of the ship's cannons missed the monster because it was swimming too fast. (T)

2. Because the submarine had many beautiful rooms and lots of food, Ned did not want to return home. (F)

3. The President of the United States felt that Ned could find and destroy the monster because he was a famous trader who owned many ships. (F)

4. Ned was relieved when a fishing boat rescued him from drowning at sea. (T)

5. Because Captain Nemo was thankful that Ned had saved his life, he wanted to take Ned home to the United States. (F)

6. The President of the United States knew that a large submarine was attacking and destroying ships. (F)

7. Captain Nemo's submarine was mistaken for a mysterious monster that was roaming the ocean and destroying ships. (T)

8. Ned knew that his best chance to escape would be while the submarine was on the surface of the water near the coast of Spain. (T)

9. The rare objects that Captain Nemo showed Ned were purchased when the submarine visited coastal cities. (F)

10. Ned knew that Captain Nemo could never be talked into surrendering his submarine. (T)

11. Captain Nemo did not know that Ned was rescued by a fishing boat. (T)

12. Ned felt that if he had not been captured, he could have swam back to his ship. (F)

13. Ned believed that even if he gained Nemo's trust, he would never be allowed to go home. (T)

14. Captain Nemo's submarine was not well equipped so that it needed to return to land for supplies. (F)

15. One year, ships from all countries were safe as they tried to cross the ocean. (F)

16. Ned did not threaten Captain Nemo because he thought that it would make him angry. (T)

Comprehension Test: 20,000 Leagues Under the Sea

Version 2

1. Ned knew that when the submarine crew captured him, they had saved him from drowning at sea. (T)

2. The rare objects that Nemo showed Ned were obtained from treasure found on the ocean's floor. (T)

3. Ned did not threaten Captain Nemo because he liked him and they were becoming friends. (F)

4. Ned knew that Captain Nemo could somehow be talked into surrendering his submarine. (F)

5. Ned Land believed that if he gained Captain Nemo's trust, he would be allowed to go home. (F)

6. One year, ships from many countries were attacked as they tried to cross the ocean. (T)

7. Captain Nemo was happy that Ned had been rescued by a fishing boat. (F)

8. The submarine was well equipped so that it did not need to return to land for supplies. (T)

9. The President of the United States felt that Ned could find and destroy the monster because he had sailed to many parts of the world. (T)

10. Even though Captain Nemo was thankful that Ned Land had saved his life, he did not want to take Ned home. (T)

11. Ned knew that his worst chance to escape would be while the submarine was on the surface of the water near the coast of Spain. (F)

12. The President of the United States knew that a large monster was attacking and destroying ships. (T)

13. Ned was frightened that he would become a prisoner in the fishing boat. (F)

14. Even though the submarine had many beautiful rooms and lots of food, Ned still wanted to return home. (T)

15. Captain Nemo's large submarine was not the mysterious monster that was roaming the ocean and destroying ships. (F)

16. The shots fired by all of the ship's cannons missed the monster because it was out of range. (F)

APPENDIX D

Explicit Details Test: Robinson Crusoe

Version 1

1. Robinson taught Friday to speak English and they told each other about their _____. (a)
(a)homes b)families c)children d)parents

2. Robinson's ship began exploring a little known area at the South _____. (a)
a)Seas b)Pacific c)Atlantic d)Ocean

3. Robinson carefully approached the area and hid behind some _____. (d)
a)rocks b)trees c)shrubs d)bushes

4. As the waves grew larger many men were washed overboard into the _____. (b)
a)water b)sea c)waves d)ocean

5. Robinson looked around and, fortunately, was able to grab and hang onto a floating _____. (c)
a)plank b)life jacket c)board d)mast

6. Robinson Crusoe grew up in a small English coastal town of _____. (c)
a)Liverpool b)Newport c)Hampton d)Glasgow

7. One day a huge wind began to blow, and the sea became very _____. (b)
a)uneven b)rough c)rugged d)chopping

8. Ever since he could remember, his dream was to become a _____. (a)
a)sailor b)seaman c)captain d)crew member

9. The pirates tied up their prisoners and left them while they _____. (d)
a)fished b)looked around c)hunted d)explored

10. Robinson gave Friday food, clothes and a place to stay in the _____. (d)
a)shelter b)hut c)house d)cave

11. However, Robinson wished he had a friend, because he had been alone on the island for _____. (b)
a)7 years b)12 years c)17 years d)6 years

12. The boat could not be too large, or they would not be able to _____. (c)
a)push it b)drag it c)move it d)pull it

13. The captain told him that he needed another sailor for a _____. (a)
a)trip b)crew c)voyage d)journey

14. One day, Robinson met the captain of a ship while he was walking along the _____. (c)
a)dock b)pier c)harbor d)wharf

15. If they were to reach Friday's island, Robinson would have to decide upon another _____. (b)
a)way b)plan c)method d)idea

16. Suddenly, Robinson became very frightened when, from a nearby beach, he heard the sounds of _____. (a)
a)chanting b)yelling c)drums d)screaming

17. Robinson and Friday finally finished the boat after working on it for several _____. (d)
a)days b)years c)weeks d)months

18. Robinson Crusoe finally returned home after being on the island for over _____. (c)
a)26 years b)27 years c)28 years d)29 years

Explicit Details Test: Robinson Crusoe

Version 2

1. However, Robinson wished he had a friend, because he had been alone on the island for ____. (c)
a)6 years b)17 years c)12 years d)7 years

2. The captain told him that he needed another sailor for a ____. (c)
a)voyage b)journey c)trip d)crew

3. Robinson gave Friday food, clothes and a place to stay in the ____. (a)
a)cave b)house c)hut d)shelter

4. If they were to reach Friday's island, Robinson would have to decide upon another ____. (d)
a)idea b)method c)way d)plan

5. The boat could not be too large, or they would not be able to ____. (a)
a)move it b)pull it c)push it d)drag it

6. Robinson Crusoe finally returned home after being on the island for over ____. (b)
a)29 years b)28 years c)27 years d)26 years

7. Suddenly, Robinson became very frightened when, from a nearby beach, he heard the sounds of ____. (d)
a)screaming b)drums c)yelling d)chanting

8. One day, Robinson met the captain of a ship while he was walking along the ____. (d)
a)pier b)dock c)wharf d)harbor

9. Robinson and Friday finally finished the boat after working on it for several ____. (b)
a)years b)months c)days d)weeks

10. Robinson looked around and, fortunately, was able to grab and hang onto a floating ____. (a)
a)board b)plank c)mast d)life jacket

11. Robinson taught Friday to speak English and they told each other about their _____. (c)
a)children b)parents c)homes d)families

12. Robinson carefully approached the area and hid behind some _____. (a)
a)bushes b)rocks c)trees d)shrubs

13. One day a huge wind began to blow, and the sea became very _____. (c)
a)chopping b)uneven c)rough d)rugged

14. The pirates tied up their prisoners and left them while they _____. (b)
a)looked around b)explored c)fished d)hunted

15. As the waves grew larger many men were washed overboard into the _____. (d)
a)waves b)ocean c)water d)sea

16. Robinson Crusoe grew up in a small English coastal town of_____. (b)
a)Glasgow b)Hampton c)Newport d)Liverpool

17. Ever since he could remember, his dream was to become a _____. (b)
a)seaman b)sailor c)crew member d)captain

18. Robinson's ship began exploring a little known area at the South _____. (d)
a)Ocean b)Atlantic c)Pacific d)Seas

Explicit Details Test: 20,000 Leagues Under the Sea

Version 1

1. Then, the sailors locked the door securely, opening it only to bring Ned his _____. (c)
a)dinners b)food c)meals d)suppers

2. Ned was made a commander and was provided with cannons and harpoons to equip his _____. (c)
a)battleship b)gunboat c)warship d)battle cruiser

3. He struggled to keep his distance from the submarine as it began to _____. (a)
a)swirl b)twist c)spin d)sink

4. Then, if treasure was found they would load it _____. (b)
a)onto their shoulders b)onto their backs c)in baskets d)in nets

5. When night came, the submarine would surface to obtain air for only _____. (d)
a)1 hour b)3 hours c)1/2 hour d)2 hours

6. The crew became terrified when they realized that the creature swimming toward them was a huge _____. (b)
a)killer shark b)tiger shark c)gray whale d)killer whale

7. As they began to lift the treasure chest, a large, dark shadow _____. (a)
a)approached b)moved nearer c)appeared d)came closer

8. Captain Nemo had read about a sunken city that contained large deposits of _____. (d)
a)treasure b)silver c)jewels d)gold

9. Suddenly, a hatch opened and Ned was taken prisoner by _____. (b)
a)3 sailors b)4 sailors c)5 sailors d)6 sailors

10. One day, they spotted a large, dark creature that looked bigger than a _____. (c)
a)house b)dragon c)whale d)ship

11. As the ship turned to chase it, the monster headed in its _____. (c)
a)way b)path c)direction d)course

12. Then Captain Nemo showed Ned many beautiful rooms, each filled with rare objects, containing precious ____. (b)
a)pearls b)emeralds c)rubies d)diamonds

13. The submarine slowly disappeared as the whirlpool ____. (a)
a)swallowed it b)sank it c)covered it d)crushed it

14. Ned Land's adventure was now ending after he had traveled ____. (d)
a)80,000 miles b)40,000 miles c)20,000 miles d)60,000 miles

15. Each time a sunken ship was located, the crew put on diving suits that Captain Nemo had ____. (c)
a)constructed b)invented c)designed d)built

16. The force of the crash threw Ned and many of the crew into the ____. (a)
a)sea b)waves c)ocean d)water

17. However, the crippled ship was heading away, and Ned knew he could not ____. (c)
a)reach it b)signal it c)swim to it d)catch it

18. Then, they returned to their home countries filled with needed ____. (a)
a)goods b)treasure c)food d)supplies

Explicit Details Test: 20,000 Leagues Under the Sea

Version 2

1. Each time a sunken ship was located, the crew put on diving suits that Captain Nemo had ____. (a)
a)designed b)constructed c)built d)invented

2. One day, they spotted a large, dark creature that looked bigger than a ____. (b)
a)ship b)whale c)house d)dragon

3. Then Captain Nemo showed Ned many beautiful rooms, each filled with rare objects, containing precious ____. (d)
a)diamonds b)rubies c)pearls d)emeralds

4. The force of the crash threw Ned and many of the crew into the ____. (c)
a)ocean b)water c)sea d)waves

5. The submarine slowly disappeared as the whirlpool ____. (c)
a)sank it b)covered it c)swallowed it d)crushed it

6. As the ship turned to chase it, the monster headed in its ____. (d)
a)path b)course c)way d)direction

7. However, the crippled ship was heading away, and Ned knew he could not ____. (d)
a)signal it b)catch it c)reach it d)swim to it

8. Ned Land's adventure was now ending after he had traveled ____. (a)
a)60,000 miles b)80,000 miles c)40,000 miles d)20,000 miles

9. Then, they returned to their home countries filled with needed ____. (d)
a)treasure b)food c)supplies d)goods

10. When night came, the submarine would surface to obtain air for only ____. (b)
a)3 hours b)2 hours c)1 hour d)1/2 hour

11. As they began to lift the treasure chest, a large, dark shadow ____. (d)
a)moved nearer b)appeared c)came closer d)approached

12. Ned was made a commander and was provided with cannons and harpoons to equip his ____. (a)
a)warship b)battleship c)battle cruiser d)gunboat

13. Suddenly, a hatch opened and Ned was taken prisoner by _____. (c)
a)6 sailors b)5 sailors c)4 sailors d)3 sailors

14. Then, if treasure was found they would load it _____. (c)
a)in baskets b)onto their shoulders c)onto their backs d)in nets

15. Captain Nemo had read about a sunken city that contained large deposits of _____. (a)
a)gold b)jewels c)treasure d)silver

16. The crew became terrified when they realized that the creature swimming toward them was a huge _____. (d)
a)gray whale b)killer whale c)killer shark d)tiger shark

17. He struggled to keep his distance from the submarine as it began to _____. (b)
a)twist b)swirl c)sink d)spin

18. Then, the sailors locked the door securely, opening it only to bring Ned his _____. (b)
a)suppers b)meals c)dinners d)food

APPENDIX E

Informed Consent

Dear Parent(s),

We would like to have your permission to allow your child to participate in a project that we are conducting in local elementary schools. We are studying how young children develop an understanding of stories.

First, each child will be seen by a trained assistant for one period of about 40 minutes. During this time, two children's stories will be read. During the reading, questions will be asked that highlight important aspects of the stories. These questions were designed to increase children's understanding of the stories. Following the reading, additional questions will be asked to determine how much was understood and remembered. Second, each child will be seen by the same trained assistant for another period of about 15 minutes one week later. During this time, additional questions will be asked to determine how much was understood and remembered. These interactions will be tape recorded for scoring purposes.

This brief description omits some details, but hopefully it will give you an idea about the project's general purpose and procedures. Children find the experience enjoyable and rewarding.

If you have any questions about the project, please call Rhonda Douglas at 298-8153. We would appreciate your returning the form at the bottom of the page to your child's teacher as soon as possible. There is a great deal that we do not yet know about children's reading. Therefore, we look forward to working with your child and furthering our understanding of this vital process.

Sincerely,

Rhonda Douglas (298-8153)
University of Dayton
Department of Psychology

Ronald M. Katsuyama, Ph.D. (229-2167)
University of Dayton
Department of Psychology

_____ I give my child permission to participate in the project.

_____ I would not like my child to participate in the project.

_____ _____

Child's Name Child's Birthday

_____ _____

Parent's Signature Date

APPENDIX F

Reading Instructions: Treatment Groups

First Story:

I have a story for you to read. It is called Robinson Crusoe (20,000 Leagues Under the Sea). I am interested in what you think about this story and what you remember about it. Please read the story to yourself, taking whatever time you need to understand it.

At certain points in the story, the main character will have to make an important decision. At these points, I will ask you some questions. Remember when you answer the questions that there is no right or wrong answer.

Later on, you will answer questions so that I can find out what you think about the story and how much you remember about it. Do you have any questions now? Let's begin.

Second Story:

Okay, now you will begin reading the second story. It is called 20,000 Leagues Under the Sea (Robinson Crusoe). Remember to take whatever time you need to understand the story. Do you have any questions now? Let's begin.

Reading Instructions: Control Group

First Story:

I have a story for you to read. It is called Robinson Crusoe (20,000 Leagues Under the Sea). I am interested in what you think about this story and what you remember about it. Please read the story to yourself, taking whatever time you need to understand it.

Later on, you will answer questions so that I can find out what you think about the story and how much you remember about it. Do you have any questions now? Let's begin.

Second Story:

Okay, now you will begin reading the second story. It is called 20,000 Leagues Under the Sea (Robinson Crusoe). Remember to take whatever time you need to understand the story. Do you have any questions now? Let's begin.

APPENDIX G

Comprehension Tests Instructions

First Story:

Now I am going to read you some sentences about the first story that you read, Robinson Crusoe (20,000 Leagues Under the Sea). Some of the sentences are true and some are false according to the story. A sentence is true if it actually occurred in the story or if it agrees with information in the story. A sentence is false if it is impossible or unlikely according to the story. After I read each sentence, answer "true" if it agrees with the story and "false" if it does not agree with the story. Do you have any questions now? Let's begin.

Second Story:

Okay, now I will read you some sentences from the second story that you read, 20,000 Leagues Under the Sea (Robinson Crusoe). Remember to answer "true" if the sentence agrees with the story and "false" if it does not agree with the story. Do you have any questions now? Let's begin.

Comprehension Tests Instructions: Delayed Test

First Story:

I am going to read you some sentences about the first story that you read last week, Robinson Crusoe (20,000 Leagues Under the Sea). Some of the sentences are true and some are false according to the story. A sentence is true if it actually occurred in the story or if it agrees with information in the story. A sentence is false if it is impossible or unlikely according to the story. After I read each sentence, answer "true" if it agrees with the story and "false" if it does not agree with the story. Do you have any questions now? Let's begin.

Second Story:

Okay, now I will read you some sentences from the second story that you read last week, 20,000 Leagues Under the Sea (Robinson Crusoe). Remember to answer "true" if the sentence agrees with the story and "false" if it does not agree with the story. Do you have any questions now? Let's begin.

APPENDIX H

Explicit Details Tests Instructions

First Story:

Now I am going to read you some sentences from the first story that you read, Robinson Crusoe (20,000 Leagues Under the Sea). The sentences are exactly the same as you read in the story, but the last word of each sentence has been left out. I will read you four choices. Then, you decide which is the correct word that will make the sentence the same as the one read in the story. Do you have any questions now? Let's begin.

Second Story:

Okay, now I will read you some sentences from the second story that you read, 20,000 Leagues Under the Sea (Robinson Crusoe). You decide which is the correct word that will make the sentence the same as the one read in the story. Do you have any questions now? Let's begin.

Explicit Details Test Instructions: Delayed Test

First Story:

I am going to read you some sentences from the first story that you read last week, Robinson Crusoe (20,000 Leagues Under the Sea). The sentences are exactly the same as you read in the story, but the last word of each sentence has been left out. I will read you four choices. Then, you decide which is the correct word that will make the sentence the same as the one read in the story. Do you have any questions now? Let's begin.

Second Story:

Okay, now I will read you some sentences from the second story that you read last week, 20,000 Leagues Under the Sea (Robinson Crusoe). You decide which is the correct word that will make the sentence the same as the one read in the story. Do you have any questions now? Let's begin.

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