COMPREHENSION MONITORING: AN EXAMINATION OF THE STRATEGIES USED BY SELECTED PROFICIENT READERS AT THE GRADE THREE LEVEL

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Comprehension Monitoring: An Examination of the Strategies Used by Selected Proficient Readers at the Grade Three Level

by

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ABSTRACT

This study was an investigation into the process of reading comprehension. Its purpose was to identify the comprehension monitoring strategies used by a select group of proficient grade three readers and to determine similarities or differences in strategy use among such readers. The study employed a methodology which combined the active processing measure of oral reading, the think-aloud measure of verbal reporting and the product measure of free recalls.

The sample consisted of a group of twenty proficient grade three readers from three schools within the Roman Catholic School Board for Conception Bay Center. The readers were assigned the task of reading a selected passage aloud and stopping at designated points to vocalize their thoughts. After completion the readers were required to retell the passage in their own words. Each session with individual readers was audiotaped. Transcriptions of these sessions provided the data for the study.

Three comprehension monitoring strategies were identified in the oral reading protocols, and five were identified in the think-aloud protocols. Although no new strategies were identified in the free recall protocols, support for some of the previously identified strategies was found. The free recalls also provided an adequate assessment of reading comprehension for the readers. It was found that readers in general utilized all eight strategies but did so to varying extents and in varying circumstances. Readers' free recalls in general proved to be very similar in both type and extent of information and indicated adequate comprehension. It was concluded that despite the individual differences in the utilization of

strategies, readers had similar end results of adequate comprehension.

Conclusions regarding the relevance of this research for pedagogical practice and recommendations for further research were made in the final chapter of this study.

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Chapter I

INTRODUCTION

Reading comprehension has been examined and studied in the past from many different angles and perspectives. In recent years the relatively new field of cognitive psychology has had great input into the advancement of reading comprehension theories. Various theories of reading comprehension have been developed, including information-processing theory (Samuels, 1977), psycholinguistic theory (Goodman, 1973), schema theory (Rystrom, 1977) and metacognitive theory (Brown, 1980), the latter being a newer and still evolving cognitive perspective. Cognitive psychologists have adopted reading as one of their main objects of study because of its strong links with metacognition, cognitive monitoring and comprehension monitoring. The present study examined the process of reading comprehension from the perspective of metacognitive theory. It specifically examined the process of comprehension monitoring in an attempt to identify the monitoring strategies that proficient readers use to ensure that comprehension occurs. The investigator believed that such a study would contribute to a more thorough understanding of the reading comprehension process.

Children's performance in reading comprehension is a widespread concern of educators at all levels today. According to Pearson (1985), "more than ever before, we are devoting much intellectual and emotional energy to helping students better understand the texts we require them to read in our schools" (p. 724). In order to help students develop their reading comprehension ability, teachers need a sound theoretical base from which to teach.

Background of the Study

According to Baker and Brown (1984a) comprehension monitoring "entails keeping track of one's ongoing comprehension success, ensuring the process continues effectively, and taking remedial steps when necessary" (p. 22). Although researchers in the past like Huey (1908) and Thorndike (1917) suggested the importance of checking and regulating in reading it is only recently, with the development of research in metacognition, that comprehension monitoring has been recognized as a vital component of reading comprehension. The literature strongly suggests that in order to adequately understand text, readers must, among other things, be able to monitor their comprehension effectively. Effective readers keep track of their comprehension processes, checking and regulating constantly as they progress. Although there is not enough evidence up to the present time to conclude that poor comprehension monitoring is a causal factor of inadequate comprehension, the evidence is clear that the two variables are certainly related (Baker and Brown, 1984a). Proficient readers tend to monitor their comprehension much more than do less proficient readers.

Occasionally, in both classroom and clinic, we find disabled readers who are expert "word callers" but are poor comprehenders. Such readers are labelled less proficient readers because they score relatively low on comprehension assessment. Assuming that the text to be read is well structured and well organized, and that it is somewhat familiar and interesting to readers, then it can be supposed that the problem is not the text. Assuming that readers possess adequate world knowledge, linguistic knowledge and knowledge of word

meanings, then readers do not lack the background knowledge necessary for facilitating comprehension. The components for comprehension, suitable text and adequate reader background knowledge, are thus present in the reading situation; it is the integrating of the components, the actual process of comprehension which appears to be posing a problem. Readers are unable to take the text, relate their background knowledge to it and derive meaning. Although there are other possible explanations for this problem, one plausible explanation may be that readers are not monitoring for comprehension. If readers are not monitoring, would it be useful for teachers to show them how to monitor? What type of instruction do such readers require? The present study was motivated by an interest in such questions.

Purpose of the Study

The purpose of the study was to examine the process of comprehension monitoring and to identify the specific comprehension monitoring strategies used by proficient grade three readers as they read narrative text for immediate understanding. The study specifically addressed the following questions.

1. What specific comprehension monitoring strategies do proficient readers use when they read for immediate understanding?
2. Are there similarities and/or differences in strategy use among proficient readers?

Definition of Terms

The following terms are defined with respect to how they are used in the present study:

Comprehension monitoring strategies refer to specific plans or techniques employed by readers in an effort to evaluate or regulate comprehension.

Proficient grade three readers refer to readers who performed at a high grade three level in both word identification and comprehension. The readers in this study were selected on the basis of their overall school performance as assessed by their respective classroom teachers.

Narrative text refers to a narrative selection in which a simple plot is developed. It consists of approximately 130 words and is written at the high second grade readability level as determined by the Fry Readability Formula (Fry, 1977).

Immediate understanding refers to readers' understanding of a selection as it is being read as well as immediately afterwards. In the present study immediate understanding was reflected in readers' oral reading performances, think-aloud reports, free recalls, and aided recalls (where questions were posed). Immediate understanding does not involve understanding for the purpose of remembering information for any extended period of time since comprehension generally occurs at the point of reading.

Significance of the Study

Although research in the area of monitoring is relatively new and undeveloped (Baker, 1979a), a strong positive relationship between comprehension monitoring and the actual comprehension process has been established. Details on the nature of the relationship, however, are still scanty and inconclusive. Researchers generally suggest that much research is needed in order to further our understanding of the concept of comprehension monitoring and to more soundly theorize on its implications for reading instruction.

Based upon the research in comprehension monitoring up to this point, some researchers (Mangano, Palmer and Goetz, 1982; Pitts, 1983) are advocating that comprehension monitoring strategies be taught to students experiencing difficulty in comprehension. What specific strategies must be taught, however, is a concern that has not thoroughly been addressed in the literature, and one which certainly demands attention. As Collins and Smith (1980) contend, researchers must specify in enough detail the tacit processes which underlie reading comprehension before methods can be found to teach students to master these processes. Although some researchers, such as Mangano et al. and Pitts, have hypothesized about which comprehension monitoring strategies should be taught, many generally suggest that more empirical research is needed in order to determine what strategies proficient readers use, and, similarly, what strategies less proficient readers should be taught. The present study hoped to contribute to the growing body of research in this area by identifying some of the comprehension monitoring strategies utilized by a group of proficient readers.

Chapter II

REVIEW OF RELATED LITERATURE

Overview

The notion of comprehension monitoring as an important aspect of reading comprehension is widely accepted among today's reading theorists and researchers. Comprehension monitoring has numerous applications within the area of reading comprehension. The term may refer to readers' processes of being aware of their own comprehension or miscomprehension (Wagner, 1983). In contrast, it may refer to particular strategies that readers use to assist them in remembering text information as they study (Andre and Anderson, 1978-1979). In the past decade a considerable amount of research using a variety of subjects, settings and methodologies has been conducted in the area of comprehension monitoring as it applies to reading. The purpose of this chapter is to review the research which is relevant to the present study.

The aim of this study was to examine and identify the comprehension monitoring strategies that proficient grade three readers used as they read for immediate understanding. First, the current theories on comprehension monitoring were studied and a clear working definition of monitoring was developed. Comprehension monitoring was then examined in terms of its role in the process of reading comprehension. Comprehension monitoring was defined as a component of metacognition and a component of reading comprehension. With this definition as a base, an extensive review of empirical research studies was undertaken.

Defining Comprehension Monitoring

A Component of Metacognition

Comprehension monitoring is presently a very prominent area of investigation in the field of metacognitive research. Although the terms comprehension monitoring, cognitive monitoring and metacognition are often used interchangeably in the literature, for the purposes of this study they are examined as hierarchically related concepts. It is therefore essential to define the concepts of metacognition and cognitive monitoring in order to develop a clear picture of what comprehension monitoring means with respect to the present study.

The term "metacognition" was introduced by developmental psychologists in their study of the development of children's thinking and learning. Vygotsky (1962) was one of the first to distinguish the concept of metacognition from cognition. Cognition was described as "the automatic unconscious acquisition of knowledge" whereas metacognition was described as "the active conscious control of that knowledge." Cognition refers to the process of unconsciously acquiring knowledge. As cognition develops, for example, a young child learns to say certain sounds, like "wa-ta" and "ma-ma", as a result of natural learning in the environment. An individual's cognition can develop without any conscious effort by the individual to control or motivate it. Metacognition, on the other hand, refers to the more advanced process of controlling one's own cognition. For instance, a young child learning to read may learn to pay attention to the beginning letters of words in addition to guessing words that make sense. In this example, the child is consciously directing attention to particular letters in words; such conscious control of one's cognition falls into the realm of metacognition.

Flavell (1976), a prominent developmental psychologist, elaborates on the definition given by Vygotsky without changing the overall gist of it:

> Metacognition refers to one's *knowledge* concerning one's own cognitive processes and products or anything related to them, e.g. the learning relevant properties of information or data. For example, I am engaging in metacognition (metamemory, metalearning, metaattention, metalanguage or whatever) if I notice that I am having more trouble learning A than B; if it strikes me that I should double-check C before accepting it as a fact; if it occurs to me that I had better scrutinize each and every alternative in any multiple-choice type task situation before deciding which is the best one; if I sense that I had better make a note of D because I may forget it; if I think to ask someone about E to see if I have it right... Metacognition refers, among other things, to the *active* monitoring and consequent *regulation* and *orchestration* [italics added] of these processes in relation to the cognitive objects or data on which they bear, usually in the service of some concrete goal or objective. (Flavell, 1976, p. 232)

According to Flavell metacognition refers to, among other things, one's knowledge and one's active "regulation and orchestration" of one's own cognitive processes. Baker and Brown (1984b) interpret Flavell's statement of metacognition to include two not necessarily independent clusters of activities, knowledge about cognition and regulation of cognition. Brown and DeLoache (1978) similarly refer to metacognition as "the thinker's knowledge, control, and coordination of his own cognitions" (p. 30). Brown and DeLoache, as well as Baker and Brown, have attempted to refine the original definitions proposed by Vygotsky and Flavell without interfering with the general gist of them:

There appears to be a consensus among theorists and researchers that metacognition involves at least two components, "knowledge" and "regulation". Baker and Brown (1984a) describe these two components respectively as:

> (1) an awareness of what skills, strategies, and resources are needed to perform a task effectively.

> (2) the ability to use self-regulatory mechanisms to ensure the successful completion of the task, such as *checking* the outcome of any attempt to solve the problem; *planning* one's next move, *evaluating* the effectiveness of any attempted action, *testing* and *revising* one's strategies for learning, and *remediating* any difficulties encountered by using compensatory strategies. (Baker and Brown, 1984a, p. 22)

Baker and Brown have very clearly delineated the two major components of metacognition. For the purpose of this study, their definition of metacognition was adopted. The two components of metacognition, knowledge and regulation, will now be examined respectively in terms of how each applies to the process of reading comprehension.

The first component of metacognition which has been identified is "an awareness of what skills, strategies, and resources are needed to perform a task effectively" (Baker and Brown, 1984a). This component is what Flavell (1981) refers to as metacognitive knowledge. According to Flavell, metacognitive knowledge includes knowledge about the self, the task and the strategies that are known to influence performance, and that can be called up from long-term memory on repeated occasions in a rather purposeful way.

Metacognitive knowledge of the self includes knowing one's relative ability to perform certain types of tasks and knowing one's feelings and ideas about particular tasks. In reading, this would include one's concept of self as a reader. Does one think one is a good reader? Does one know what one can and cannot read?

Metacognitive knowledge of the task includes knowing the demands of particular tasks and knowing, for example, that certain tasks will be more difficult than others. With respect to reading, this would involve the reader's concept of the reading process, and of particular reading tasks. Does the reader

perceive oral reading as being more difficult than silent reading? Is reading considered an exact word recognition process or a meaning-getting process?

Metacognitive knowledge of strategies refers to what the child knows about means or strategies which are likely to achieve particular cognitive goals. It includes, for example, knowing that there are strategies of differential utility for solving different tasks. In reading, knowledge of strategies would include among other things the reader's knowledge that slowing down one's rate of reading might improve one's ability to understand difficult text.

Many studies in metacognition and reading have focused on the knowledge component of metacognition, especially the knowledge of task component. Winograd and Johnston (1982) label such reading research as inquiry about what readers know about the task of reading. Most studies in this area have involved conducting interviews and questioning readers about real or hypothetical reading situations (Myers and Paris, 1978; Canney and Winograd, 1979). In many instances the metacognitive knowledge of good and poor readers has been compared. The general finding of such research has been that poor readers differ from good readers in their knowledge of the reading process (Garner and Kraus, 1981-82). Poor readers tend to emphasize the importance of exact word recognition rather than of understanding what has been read.

The second component of metacognition which has been identified by Baker and Brown is "the ability to use self-regulatory mechanisms to ensure the successful completion of the task." This component is what Flavell (1981) refers to as cognitive monitoring. The skills of cognitive monitoring (checking, planning, evaluating, testing, revising, and remediating) are, according to Brown and DeLoache (1978), the basic characteristics of efficient thought. Such

skills are necessary for all "deliberate learning and problem-solving situations" (Brown, 1978). It is thus suggested that monitoring one's cognition or one's thinking is essential in order to successfully solve problems, to remember and to learn. Since reading is associated with problem-solving, remembering, and learning, then it follows that cognitive monitoring occurs in the process of effective reading.

Prior to being recognized as an important aspect of reading, monitoring was studied for years by cognitive and developmental psychologists. Cognitive monitoring was perceived as a fundamental process in the study of thinking and learning; and later, in the study of memory, language development, and problem-solving. Recently, with the emphasis on reading as an interactive comprehension process, reading theorists and researchers have begun to investigate the role that cognitive monitoring plays in the reading process. They want to find out if, and how, readers regulate and monitor ongoing processes in reading. Monitoring plays a very significant role in all cognitive processes, and the cognitive processes involved in reading appear to be no exception. Most of the cognitive activities involved in reading have as their goal adequate comprehension; a large part of cognitive monitoring in reading can thus more specifically be called "comprehension monitoring."

The hierarchial relationship among the concepts of metacognition, cognitive monitoring, and comprehension monitoring is illustrated in Figure I. As indicated, metacognition can be defined in terms of its two components which have been identified in the literature as metacognitive knowledge and cognitive monitoring. Metacognitive knowledge includes knowledge about the self, the task and strategies, each of which may influence one's performance on a particular task. Cognitive monitoring involves the ability to regulate

one's cognitive process in tasks involving memory, language, thinking, and comprehension. Cognitive monitoring as it applies to comprehension has been differentiated from monitoring as it applies to memory, language and thinking for the purpose of clarifying the concept of comprehension monitoring. It is not meant to imply that the process of comprehension is to be treated as a separate entity from memory, language and thinking. The four processes are indeed very closely interrelated.

METACOGNITION

METACOGNITIVE KNOWLEDGE	COGNITIVE MONITORING
Self	Memory
Task	Language
Strategies	Thinking
	Comprehension

Figure I

Hierarchy of metacognitive concepts

Comprehension monitoring has been described as a metacognitive process and as a particular type of cognitive monitoring. Baker (1979a) defines comprehension monitoring in this manner:

> Comprehension monitoring involves the evaluation and regulation of one's own ongoing comprehension processes. To evaluate is to keep track of the success with which comprehension is proceeding, and to regulate is to ensure that the process continues smoothly, including taking remedial action when comprehension fails. (Baker, 1979a, p. 365)

The comprehension monitoring that Baker (1979a) refers to could occur in many situations. In conversing casually with another person, for example, one ensures understanding of the other's message by interrupting when the message is unclear, questioning, repeating, and paraphrasing until satisfied with one's comprehension of the message. The procedures of interrupting, questioning, repeating, and paraphrasing are examples of the comprehension monitoring strategies used in an informal conversation.

Comprehension monitoring also occurs when one participates in a debate, listens to a lecture, listens to a poem, or reads a book. The extent of the comprehension monitoring and the strategies used undoubtedly vary from one situation to another, depending on the reader's or listener's purpose as well as the material to be comprehended. Listening to a very simple poem for sheer enjoyment would certainly not require the same type or amount of monitoring as would reading a research article in preparation to discuss it with a colleague. Undoubtedly there would be some overlap.

Although the term "comprehension monitoring" has been narrowed down from the definitions of metacognition and cognitive monitoring, it is evident that comprehension monitoring is still a very broad term. It covers comprehension as it occurs in various modes of communication, including listening, speaking, reading, and writing. For the purpose of this study, however, comprehension monitoring was examined solely with respect to reading comprehension. Comprehension monitoring in this study refers to the process of monitoring one's own comprehension as one reads connected discourse in print. It refers specifically to readers' processes of "evaluating" and "regulating" their own reading comprehension. To investigate readers' processes of evaluating their own comprehension is to question whether readers are aware of when they

do or do not understand. To investigate readers' processes of regulating their own comprehension is to question whether readers know how to facilitate understanding and whether they can remediate problems which occur.

The processes of evaluating and regulating comprehension require the use of comprehension monitoring strategies by the reader. For the purpose of this study, the term "comprehension monitoring strategy" refers to any plan or technique employed by the reader in an effort to evaluate or regulate comprehension. Specifically, the term refers to any plan or technique employed by the reader in an effort to do one or all of the following:

(1) recognize a lack of understanding,

(2) facilitate understanding,

(3) remediate problems in understanding.

The purpose of utilizing any comprehension monitoring strategy is to lead to more adequate comprehension. Utilization of a strategy, however, does not necessarily imply that this goal has been achieved. The use of strategies can be either effective or ineffective in leading to more adequate comprehension.

It has been suggested that comprehension monitoring is a vital component of reading comprehension (Baker, 1979a; Baker and Brown, 1984a; Baker and Brown, 1984b). It is thus necessary to examine why and how it is so vital, which is the objective of the following section.

A Component of Reading Comprehension

The ultimate goal of reading is to achieve understanding of text. As Fry (1977) suggests, "Getting the meaning, or comprehending, is the process of reading. Without getting meaning you can't really call it reading" (p. 90). In order to get meaning from text, readers must interact with it, process and reconstruct it until it makes sense to them. In the process of reconstructing,

readers must make inferences, and become involved in "transforming, extending, and relating information" (Markman, 1981, p. 65). In so doing, it is necessary for readers to keep track of or to monitor their comprehension. Otherwise, they may not be able to make the appropriate inferences and connections necessary for "making sense."

Often readers are comprehending but are unaware of doing so. On such occasions, readers are unconsciously monitoring their comprehension. Skilled readers whose processing skills are very fluent "can proceed merrily on automatic pilot, until a triggering event alerts them to a comprehension failure" (Brown, 1980, p. 455). As soon as comprehension failures or problems are detected, readers become more aware of their comprehension, and monitoring becomes more of a conscious process. The construction of meaning which was so rapid and automatic slows down considerably. Readers must become active in applying appropriate monitoring strategies, which Brown (1980) refers to as "debugging devices and strategies." More processing time and effort are required for the employment of such strategies. Readers thus become more conscious of what they are doing.

"Triggering events" which alert readers to comprehension failures may vary. A reader may realize that an expectation that has been entertained about the text is not to be confirmed, or that it has been changed. A reader may realize that a previous interpretation of a phrase was incorrect and must be reinterpreted. Whatever the event, the reader reacts to it by slowing down the rate of reading and by engaging in more processing. An effort is made to clarify the comprehension problem, and if necessary, to remediate the failure which had occurred. When a reader enters this strategic state, there is an active involvement in the comprehension process and an effort is being

made to make sense of the text. Because readers become more conscious of their processing, the process seems to become more observable.

The literature suggests that the process of comprehension monitoring in reading becomes more apparent when readers experience some difficulty or problem in comprehending. Comprehension monitoring strategies are then required for getting the comprehension process back on track. The study of comprehension monitoring has thus largely focused upon the detection and remediation of problems in reading, without attending to the presence of comprehension monitoring in smooth non-problematic reading. The definition of comprehension monitoring suggested by Wagner (1983) illustrates this point:

> "Knowing about comprehending" by definition must be a conscious process, and appears to involve some kind of triggering mechanism or recognition by the reader of failure to understand the text message... A second aspect of comprehension monitoring, "knowing how to comprehend", involves fix-up strategies which the reader may employ once the failure to comprehend has been recognized and which may vary according to the level at which the failure to comprehend has occurred. (Wagoner, 1983, p. 330)

Much research has been devoted to problem detection and remediation, and much has been written on "fix-up" and corrective strategies. This line of research relies heavily on the error detection paradigm (Winograd and Johnston, 1982) which will be discussed in more detail in a later section. In such research, information about comprehension monitoring strategies is based upon strategies that readers use to detect errors or inconsistencies which have been imposed upon the text. Such strategies, however, may not necessarily be representative of the monitoring strategies used in comprehending unaltered text, as in a natural reading situation. The present study will investigate the comprehension monitoring strategies involved in facilitating comprehension,

as it proceeds smoothly, without problems, as well as the strategies utilized when problems or difficulties are recognized by the readers.

Fitzgerald (1983) suggests that comprehension monitoring involves "readers' awareness and self-control of their understanding and of strategies that facilitate comprehension" (p. 249). The two aspects of comprehension monitoring which were delineated in the previous section, evaluation and regulation thus become apparent. First, we must consider the reader's ability to evaluate, or to recognize when one does or does not comprehend; and second, we must consider the reader's ability to regulate, or use appropriate strategies to facilitate comprehension and/or remediate problems which may occur. The present study is concerned with both aspects of comprehension monitoring and it focuses directly on the comprehension monitoring strategies used in both evaluation and regulation processes.

The following section will review actual research studies which are relevant to the present study. The studies have been categorized under two headings, oral communication and listening studies, and reading studies. Although comprehension monitoring in oral communication and listening is not the actual focus of the present study, research in the area has many implications for comprehension monitoring in reading.

Research in Comprehension Monitoring

Oral Communication and Listening Studies

Readers who monitor their comprehension of text are likely to know when they understand, when they don't understand and when they partially understand (Baker, 1979a). Research in comprehension monitoring originates with this aspect of comprehension monitoring, the "evaluation" aspect, and it

really began with studies in oral communication. Such studies have used a communication task to assess monitoring. They typically have not involved planned connected discourse in the same sense as in written discourse or even as in listening-to-written-discourse studies (Wagoner, 1983).

Robinson and Robinson conducted four studies in which they investigated young children's understanding of communication and communication failure. In these so-called "referential communication" studies, the subject of investigation was children's awareness that an inadequate message could cause a communication failure. In two 1976 studies, children were asked to identify pictures after listening to oral instructions. Each child played the role of both speaker and listener in a communication game with the experimenter. Failures in communication were made to occur, and the child was asked to judge whose fault these were and why. Almost all of the five and six year-olds blamed the self as a message-receiver rather than the message itself for the communication failure. The older children (seven and eight year-olds), however, generally recognized the message as inadequate rather than blaming themselves for the failure in comprehending. In a third experiment, (1977a) the same "whose fault" technique was used with six year-olds, this time using an extremely inadequate message. Again, children did not recognize the inadequacy of the message, lending support to the previous findings.

These studies by Robinson and Robinson indicated that in referential communication tasks involving picture identification, young children generally do not recognize when they do not adequately understand; their ability to recognize inadequacies, however, seems to improve with age. In a subsequent study, Robinson and Robinson (1977b) used the same "whose fault" task using oral discourse without picture identification. Again, the same developmental trends

were observed. Children seemed to gradually develop the ability to recognize inadequacies in messages, and in effect, to recognize when they did not adequately comprehend.

Markman (1977), in two studies similar to those of the Robinsons, examined children's ability to evaluate their understanding of oral messages. In Markman's first study, children in first and third grades listened to simple instructions on how to play a game or perform a magic trick. Instructions were made obviously incomprehensible by deleting information needed to understand how to perform the task. In a second study, Markman used the same procedure but used visual demonstrations to accompany the instructions. In both studies, Markman found that first-grade students were unable to perceive the inadequacy of the directions until they actually attempted to perform the task themselves. Since enactments reduce the necessity for mental processing, Markman suggested that young children's initial insensitivity to their own comprehension failure is due to a relative lack of constructive processing. The second and third grade children were better able to recognize the need for more information before attempting the task. Results again indicated a developmental trend in children's ability to evaluate their understanding of oral discourse and to recognize when they do not adequately understand.

The referential communication studies by the Robinsons and by Markman strongly suggest that children's ability to identify problems and/or failure in comprehension of oral communication tasks is developmental. Is the ability to identify problems and/or failures in listening to text likewise developmental? What factors, other than age, may affect this ability? Most studies addressing comprehension monitoring in listening to text as well as in reading text, as

will be discussed later, are based on the "error detection paradigm" (Winograd and Johnston, 1982). Inconsistencies or problems are introduced into written discourse in anticipation that older, experienced readers will readily detect the inconsistencies whereas younger, inexperienced readers will not.

Markman (1979), as an extension of her earlier work in oral communication, conducted a series of three studies investigating elementary school children's awareness of their own comprehension failure while listening to text containing inconsistencies. In the first study, Markman read short essays containing either explicit or implicit informational inconsistencies to third, fifth, and sixth grade students. The students were asked to question and to evaluate the essays indicating their awareness of the inconsistencies. Results showed no grade differences but that all children were more likely to notice explicit rather than implicit inconsistencies. Explicit inconsistencies, however, were not detected as easily as might be expected. Even the sixth graders (twelve year-olds) judged as comprehensible a sizable proportion of essays with seemingly very explicit inconsistencies. It was concluded that the children had good probed recall of the information, had the logical capacity to draw the inferences, and were generally not reluctant to question the experimenter, yet they failed to notice implicit as well as some explicit inconsistencies. In essence, the children were genuinely unaware that they had failed to comprehend. Markman's subsequent studies attempted to explore some possible explanations for this inability to detect comprehension problems.

In her second listening study, Markman hypothesized that despite their good probed recall of the essays, children may have overlooked the explicit inconsistencies mainly because they failed to connect the critical sentences. This time she presented third and sixth graders with either whole passages

or pairs of sentences at a time and asked students to repeat what they had heard. The idea of having children repeat sentences rather than whole essays was to ensure that the two inconsistent propositions were concurrently activated in working memory. Although Markman (1979) expected that the two-sentence repetition condition would help children detect inconsistencies, she found that this was not the case. Developmental differences, however, were evidenced for the explicit conditions. Sixth graders out-performed third graders in their ability to detect explicit inconsistencies in listening to text regardless of whether the two-sentence repetition condition was used or not. Markman suggested that although the sentences may have been activated in memory, young children (third graders) may still have failed to compare them whereas sixth graders spontaneously initiated the appropriate comparisons. There were no developmental differences in the implicit conditions. Sixth graders did not discover more of the implicit problems than did third graders.

In her third study, Markman hypothesized that children may be more capable of detecting inconsistencies in listening to text if they are informed that there may be a problem. Such an instructional set, suggests Markman, should promote more careful evaluation on the part of the listener. In this study, the control group received the standard instructions to question and to evaluate as "consultants", just like in the first study, whereas the experimental group received set instructions to find a problem in each essay. As predicted, Markman found that children receiving the set instructions performed better than children in the standard instructional setting. This indicates that informing children of the presence of a problem in the text improves their ability to detect and identify it. Providing such information sets the listener's purpose

as listening to detect a problem rather than listening to get the meaning of the text as would be the purpose in a natural listening-to-reading situation. Results of this study suggest that children have the ability to evaluate their comprehension, but probably not the natural disposition to do so. They evaluate their comprehension only when directed externally. In this third study by Markman, no developmental differences were found within the standard instructional group which lends support for the findings of the first study. Developmental differences were found only in the group receiving set instructions which seems to suggest that children's modified expectations play an important role in problem-detection. The finding of developmental differences in performance on one skill but not on the other was interpreted to suggest that comprehension monitoring is a multidimensional process. Markman concluded that monitoring of comprehension is not a single unified act, but is composed of a variety of sub-processes which may be learned and utilized separately, according to individual or developmental expertise.

As a follow-up to the third listening study by Markman, Markman and Gorin (1981) investigated the effectiveness of children being instructed as to the kind of problem they might find. In this study, a criterion for the evaluation of comprehension was established. Children were directed to evaluate their comprehension of passages in terms of their noticing one of the following inconsistencies:

(1) internal consistencies, referring to inconsistencies across sentences which raised questions of logic, and

(2) external consistencies, referring to inconsistencies between text information and reader background knowledge, which raised questions of truth.

Eight and ten year-olds were instructed to find problems with either logic or truth, and were read a series of short essays containing the specified problem. The ten year-olds detected more problems than the eight year-olds when they were presented with the criteria for evaluating comprehension. Developmental trends were observed and evidence was found for a positive effect of established criteria on comprehension monitoring.

The oral communication and listening studies reviewed indicate that young school children generally are poor at analyzing oral messages for clarity, completeness and consistency (Markman, 1981). It must not be concluded that young children fail to monitor their comprehension. What can be concluded from this research is that comprehension monitoring in listening is a developmental process. With age and maturity, children tend to improve their ability to evaluate and to regulate ongoing processes as they listen to oral messages or text. Other factors found to influence readers' performance in comprehension monitoring while listening were verbal ability and memory capacity (Baker and Brown, 1984a), and the establishment of explicit criteria (Markman and Gorin, 1981).

Although the comprehension processes used in listening to text are similar to those used in reading text, the two processes are not identical. Research in listening comprehension can give valuable insights into reading comprehension but cannot be generalized completely to reading comprehension. Despite the lack of empirical evidence, Baker and Brown (1984b) suggest that the listening and reading situations may differ in the following way:

> It may well be that the *evaluation* component of comprehension monitoring is similar in the two situations, that is, both listeners and readers may use the same standards or criteria to evaluate their state of

> understanding. What may differ is the *regulation* [italics added] component, that is, once a problem has been identified, listeners and readers may deal with it in different ways... for example, listeners can request clarification from the speaker; readers can reread or look ahead in the text. (Baker and Brown, 1984b, p. 378)

Research on comprehension monitoring in oral communication and listening is certainly relevant and valuable to comprehension monitoring research in reading. Since there are some difficulties with generalizing between the two situations, it is necessary at this point to examine the research that has been conducted on comprehension monitoring in reading.

Reading Studies

When comprehension monitoring was defined for this study, the two components of evaluation and regulation were identified. The foregoing review of oral communication and listening studies focused on the evaluation component of comprehension monitoring. It addressed the issue of whether readers recognize when they do or do not comprehend and it explored possible influencing factors. This issue will again be addressed in some of the reading studies in this section. In addition, the reading studies will focus upon the regulation component of comprehension monitoring, exploring how readers facilitate comprehension and/or remediate problems in comprehension. Attention will also be given to the actual strategies that readers possibly use in the processes of facilitating and remediating.

Comprehension monitoring in reading has been examined in a number of ways using a variety of representative reading tasks. For the purpose of this study the reading studies are presented under two categories, problem detection in text, and strategy use in comprehending text. The former deals with the

evaluation component of comprehension monitoring whereas the latter deals mainly with the regulation component.

Problem Detection in Text. Results of problem detection studies in listening indicate that comprehension monitoring ability, although highly dependent upon knowledge and expertise (Baker, 1979a), tends to develop with age, or maturity. Can it then be assumed that mature readers will usually demonstrate good comprehension monitoring during reading? Baker (1979b) attempted to answer this question in a study that she conducted with a group of college students. It was found that even though college students monitor their comprehension, they do so imperfectly and they often fail to defect inconsistencies. There appears then to be other factors besides developmental level which influence one's ability to detect problems in comprehension.

In many reading studies, reading proficiency level has been identified as a related factor in comprehension monitoring ability. Several studies have been conducted in which children of various reading proficiency levels are presented with text containing inconsistencies, with the prediction that proficient readers will notice the inconsistencies whereas poorer readers will not. In a study by Canney and Winograd (1979), good and poor readers in grades two, four, six, and eight were presented with reading passages which were either intact or drastically altered. Children were asked to judge the passages as either readable or not, and to explain their answers. Results indicated that most good readers detected problems whereas poorer readers did not.

Garner (1980) similarly conducted a study in which she directed junior high school students to process two expository passages as editors. Each

passage had been divided into four segments and in two of the four segments of one passage, material had been altered to introduce inconsistency with the overall message. The students rated each passage for comprehensibility. Proficient readers seemed to notice the disruptive effect of the altered material and less proficient readers did not. This was interpreted to indicate that proficient readers monitor better than less proficient readers.

Other research studies have found supporting evidence of reading proficiency differences in comprehension monitoring (Owings, Petersen, Bransford, Morris, and Stein, 1980; Winograd and Johnston, 1982). One simple explanation for this finding might be that less proficient readers, as a result of decoding problems, cannot read fluently enough to understand the passage. How about readers who are less proficient in the sense that they are poor comprehenders but good decoders? Garner (1981) offers what she calls a "piecemeal processing explanation" (p. 159). She suggests that good decoders who are poor comprehenders can be characterized as readers who manage written language as bits and pieces, not as textual wholes. As a result of their "piecemeal processing", poor comprehenders experience difficulty in detecting informational inconsistencies across sentences in a passage. In an experimental study of poor comprehenders from grades five and six, Garner found that poor comprehenders focused on long words within sentences, rather than on inconsistent information across sentences, lending support for the hypothesis that poor comprehenders process print in a piecemeal fashion.

In a subsequent study, Garner and Kraus (1981-82) investigated the ability of good and poor comprehenders in seventh grade to detect errors in narrative passages. Poor comprehenders were found to be unsuccessful at demonstrating error detection. Good comprehenders were somewhat successful

with between-sentence error detection and very successful with within-sentence detections. Again, results indicated reading proficiency differences in comprehension monitoring as well as support for Garner's "piecemeal explanation."

Garner and Taylor (1982) directed good and poor comprehenders from grades four, six and eight to process as editors, narrative passages containing intra-sentential inconsistencies. Two sets of probing questions and specific assistance designed to aid subjects in noting inconsistencies were presented. Few readers, either good or poor, demonstrated that they were spontaneously aware of the inconsistencies in the text. The good readers and the oldest poor comprehenders, however, were able to detect inconsistencies once they were directed to watch for them. Expected developmental and reading proficiency differences were thus obtained. Again, the influence of established criteria for evaluation on comprehension monitoring was made evident.

Wagoner (1983) suggested that it is possible, based upon the listening and reading detection studies, to hypothesize a developmental sequence which occurs in this aspect of comprehension monitoring in reading. Initially, at a very early age, problems seem either not noticed, or as Robinson and Robinson (1977b) noted, are thought to be the hearer's (or reader's?) own fault. Once the comprehender grasps that the problem can be in the text rather than within the person comprehending, a next stage in monitoring is to test the text content against reality. Finally, the reader is able to monitor for consistency within the text itself.

In reviewing studies on problem detection in reading, Baker and Brown (1984b) warn that researchers must be careful in interpreting results. In such studies, a variety of text disruptions such as contradictions, nonsense words

and irrelevant text can be found. Detection of different types of text disruptions, according to Baker and Brown, requires that the reader use different standards or criteria for evaluating understanding. This means a reader may fail to notice one particular type of problem but succeed in noticing another. It also means a reader may notice a particular problem which has been imposed upon the text but, may still not be aware of miscomprehension in a natural reading situation. Conclusions must not be drawn about comprehension monitoring in general based upon reader's detection of a particular type of problem. Comprehension monitoring is not a unitary construct, it is rather a very complex construct which involves various skills and processes (Baker and Brown, 1984b). The text disruption methodology is limited in that it usually examines comprehension monitoring in terms of a single skill or process.

As indicated previously, problem detection studies deal with the evaluation component of comprehension monitoring only. The evaluation of comprehension necessarily precedes the regulation of it. If one is to ensure that comprehension occurs one must regulate it, remediating problems as they occur. One must first, however, be able to detect the failure to comprehend. According to Markman (1981), there are at least four signals which readers can use to detect failure to comprehend. Sternberg and Powell (1983) interpret Markman's signals in the following manner:

> One signal is perceived absence of structure. If one finds it difficult or impossible to impose a structure on verbal materials, then this failure should serve as a signal that the information is not well understood. A second signal is multiple perceived structures. In the sentences "John and Bill went to the store. He bought some bread," at least two possible structures can be imposed, signalling the difficulty one has in understanding the message the writer intended to communicate. A third signal is the discovery of inconsistencies, which has been the topic of Markman's recent research (e.g. Markman, 1977, 1979). Inconsistencies may indicate mis-structuring

> of information comprehended earlier, so that the imposed structure does not work for information that is comprehended later. A fourth signal is inability to use structure to formulate expectations. Except in the case of highly novel materials, if one cannot formulate plausible expectations about what is to come next on the basis of what has come already, this failure may indicate a lack of comprehension of the text. (Sternberg and Powell, 1983, p. 888)

Effective readers, according to Markman (1981), are generally aware of and responsive to the signals of comprehension failure outlined above. What strategies readers use in response to these signals, that is, to regulate comprehension, is an area of research that will be addressed next.

Strategy Use in Comprehending Text. Problem detection, or the recognition of failure to comprehend, is prerequisite to using strategies to overcome a comprehension block (Sanacore, 1984). Although many studies have specifically investigated problem detection, few studies in comparison have attempted to examine strategy use. According to Garner and Kraus (1981-1982), we have little evidence about reader's facility at developing corrective strategies or about readers using strategies routinely in reading situations. Of the strategy studies conducted, a few have attempted to identify differences in strategy use between good and poor readers in high school (Olshavsky, 1976-1977, 1978; Hare, 1981).

Olshavsky (1976-1977), using a protocol analysis paradigm, attempted to identify the types of strategies readers employ to comprehend an author's message. Tenth-grade good and poor readers were asked to read passages silently, stopping to think aloud at frequent predetermined and cued points as they tried to comprehend the passages. An analysis of the protocols revealed two types of strategies used by readers, problem identification strategies and problem solving strategies. The strategies identified by Olshavsky are broadly defined and are not considered strategies with respect to the definition of

comprehension monitoring strategies used in the present study. Most of her so-called "strategies" were not stated as strategies, and others only vaguely so. Nevertheless, the Olshavsky study is a seminal piece of research because it was one of the first to attempt to identify comprehension monitoring strategies. In the Olshavsky study two problem identification strategies were noted:

(1) stated failure to understand a word, and

(2) stated failure to understand a clause.

Eight problem solving strategies were also noted:

(1) use of context,

(2) synonym substitution,

(3) re-reading,

(4) inference,

(5) addition of information,

(6) personal identification,

(7) hypothesis, and

(8) use of information about the story.

It was found that although all subjects used the same ten strategies, readers with high interest, readers with abstract style material, and proficient readers used certain strategies significantly more often than less proficient readers. Results showed that all readers do indeed use strategies. The types of strategies identified, such as hypothesizing, for example, were interpreted as support for a theoretical position that reading is a problem solving process.

In a second study, Olshavsky (1978) used the same procedure but varied the difficulty of the passages. Contrary to her predictions, strategy use decreased rather than increased with passage difficulty for both good and

poor readers. Olshavsky attributed her unexpected results to the fact that students simply gave up trying to understand the difficult passages. Strategy differences between good and poor readers, although minimal, were again found.

Hare (1981) used Olshavsky's methodology to compare good and poor comprehenders' problem identifications and problem-solving strategies in passages of high and low prior knowledge. She found that the ability to discuss reading problems and strategies, the quantity of comprehension monitoring comments, and the number and kinds of strategies used were all associated with reading proficiency. In general, there was evidence of a greater use of strategies in the passages of high prior knowledge than in the ones of low prior knowledge.

In a study designed to investigate the strategies used by readers to generate inferences, Phillips (1985) used an adaptation of Olshavsky's methodology. A group of very proficient sixth graders and a group of less proficient sixth graders were asked to read sections of a passage, stopping at particular points to report their thoughts aloud. Phillips identified ten strategies that were being utilized by both groups of readers. These strategies were classified under the following headings:

1. Most Productive Strategies
   - (a) Shifting of Focus
   - (b) Analyzing Alternatives
   - (c) Confirming an Immediate Prior Interpretation
   - (d) Empathizing from Experience
2. Productive Strategies
   - (a) Rebinding

(b) Questioning a Default Interpretation and/or a Direct or Indirect Conflict

(c) Confirming a Non-Immediate Prior Interpretation

3. Counterproductive Strategies

(a) Assigning an Alternative Case

(b) Assuming a Default Interpretation and Transforming Information

(c) Neglecting to Respond or Reiterating Information (Phillips, 1985, p. 12-27)

The classification of strategies used by Phillips suggests that some strategies may be effective, or very productive, in leading to more adequate understanding while others may indeed be ineffective, or counterproductive.

The studies by Olshavsky and Hare examined problem identification as well as problem solving strategies. The study by Phillips examined strategies that readers use to make inferences, which are not necessarily problem-solving strategies. Several studies have been conducted which focus primarily on reader's use of compensatory comprehension strategies with the assumption that the use of such strategies is necessarily preceded by the reader's realization that a problem exists, in such studies the researcher has usually identified the problem for which strategies will be examined.

DiVesta, Hayward, and Orlando (1979) used a cloze task with good and poor readers at the junior high and senior high school levels. Two sets of paragraphs were used, one omitting five key words near the beginning of each paragraph and another omitting five key words near the end of each paragraph. Reading the entire paragraphs was necessary for full comprehension. Strategies elicited were defined as the use of running text and the use of subsequent text, with the use of subsequent text judged as a more mature

strategy. All readers used running text somewhat more effectively than subsequent text but better and older readers used subsequent text nearly as well as running text. The ability to use subsequent text as well as running text thus seemed to be influenced by maturity level as well as reader proficiency level.

Garner and Reis (1981) developed a segmented story task in which the reader would be unable to answer certain questions without looking back at earlier segments of the story. Non-verbal monitoring behaviour such as hesitations and facial contortions were observed. Findings indicated that good comprehenders in sixth, seventh and eighth grades all demonstrated monitoring behaviour but that only the oldest group used the look back strategy successfully even though all students had been instructed to look back as needed. Poor comprehenders neither demonstrated monitoring behaviour nor used look-backs. The ability to use look-backs effectively also seemed to be influenced by maturity level and reader proficiency level.

With the exception of the studies by Olshavsky, Hare, and Phillips, much research which has been reviewed on strategy use has involved compensatory strategies, or strategies that readers use to solve problems which have been detected, usually problems imposed by the text (DiVesta et al, 1979; Garner and Reis, 1981). It is suggested by Mangano, Palmer, and Goetz (1982) that readers must have a repertoire of strategies for dealing with comprehension failures once they are detected. They refer to the work of Collins and Smith in suggesting the following strategies for remediating comprehension failures.

(1) Readers can ignore a word or passage if it is not

necessary for the understanding of the text and continue reading.

(2) Readers can suspend judgment about a word or passage if they think that these unknown segments of the text will be clarified later in the selection.

(3) Readers can guess what the word is or means through use of context and read on to determine if they hypothesized correctly.

(4) Readers can re-read the current sentence or sentences while searching for a revised interpretation of the material.

(5) Readers can re-read previous sentences while searching for a revised interpretation of the material.

(6) Readers can go to an expert source such as the teacher or reference book for further clarification. (Mangano, Palmer, and Goetz, 1982, p. 368)

The strategies outlined by Mangano, Palmer and Goetz are strictly compensatory strategies, that is, they are used only after a problem has been detected in the text. In addition to these compensatory strategies, the present study examined strategies readers used when problems were not incurred. As was explained previously, comprehension monitoring is believed to occur in smooth, non-problematic reading as well as in reading where problems occur. Research in comprehension monitoring at this point generally overlooks the notion that such strategies exist.

The purpose of the present study was to examine strategies which readers use to make sense of readable unaltered text as well as strategies

they use to solve individual problems that are experienced in their efforts to make sense. Although the study took into account strategies which are used when problems are detected, it focused heavily on monitoring strategies which occurred in smooth non-problematic reading.

Summary

For the purpose of the present study, comprehension monitoring in reading refers to readers' processes of evaluating and regulating their own reading comprehension. To evaluate is to know when one does or does not comprehend. To regulate is to do what one must in order to facilitate comprehension, including remediating problems which occur. Both aspects of comprehension monitoring have been recognized in the literature as vital processes in reading comprehension.

Research findings generally indicate that both the evaluation and the regulation components of comprehension monitoring are influenced by the reader's developmental level and reading proficiency level, among other things. Older and more proficient readers generally tend to monitor their comprehension more efficiently and effectively than younger and less proficient readers.

Relevant research studies were reviewed in the areas of oral communication, listening and reading. In each area, there was a noticeable concentration of studies directed towards the evaluation component of comprehension monitoring. Investigating listeners' and readers' ability to detect problems in comprehension, using some version of the error detection paradigm, was a popular subject of inquiry. A smaller proportion of research has been conducted investigating actual strategies that readers use to recognize lack of understanding, to

facilitate understanding and to remediate problems in understanding. Need for such research has been recognized and such research has been highly encouraged. The present study is considered one response to this expression of needed research.

Chapter III

THEORETICAL FRAMEWORK AND METHODOLOGY

Introduction

The purpose of the present study was to examine the process of comprehension monitoring in reading and to identify the specific strategies used by a select group of proficient readers. The theoretical framework for the study has been partially provided in the preceding chapter, where the construct of comprehension monitoring was defined, and its role in reading comprehension was discussed. In this chapter, the theoretical framework for the study is integrated. Methodologies commonly used in comprehension monitoring, up to this point in time, are reviewed and evaluated. A rationale for choosing the methodology for the present study is presented. Finally the chosen methodology is described in detail, and the sample, materials and procedures are outlined.

Levels of Monitoring

Comprehension monitoring has been defined as a multi-dimensional process. It is composed of a variety of subprocesses which may be learned and utilized separately or concurrently, according to individual and developmental expertise (Markman, 1979). Comprehension monitoring may refer to a very simple skill, such as using previous context to identify an unknown word in text. It may, on the other hand, refer to a complex skill such as recognizing that a particular sentence is contradictory in some respect to an idea which

was expressed in earlier text. According to Baker there are at least three different levels at which comprehension can be monitored in reading:

> The simplest level involves making sure that the individual words are understood. Most readers are likely to know when a word comprehension failure occurs, and they know how to remedy this problem: consult a dictionary, ask someone the meaning of the word, or try to figure out the meaning from the context of the passage in which the word occurs. A more complex level of monitoring involves checking that the ideas expressed in the text make sense and are consistent with one another. This process requires that readers consider the meanings not only of individual sentences but also the relationships among sentences within the text. An even more complex level of monitoring involves a consideration of how the ideas expressed in the text relate to what the reader already knows. All three levels of comprehension monitoring are critical components of comprehension, and the proficient reader should be able to monitor effectively at all levels. (Baker, 1979a, p. 3-4)

The present study took into account all three levels of comprehension monitoring as outlined by Baker. Since the subjects for the study were proficient readers it was expected that there would be evidence of monitoring at the word level, across sentences or ideas, and in relating text to background knowledge. It was anticipated that there would be specific monitoring strategies utilized by readers at each of the three levels of monitoring and, in some instances, the strategies would overlap within levels. Baker's three levels of monitoring served as a framework for the identification of monitoring strategies undertaken in the study.

Comprehension Monitoring Methodology

Comprehension monitoring in reading, being the covert process that it is, is extremely difficult to assess overtly. According to Phifer and Glover (1982) a variety of methods of studying metacognition have been attempted,

each with its own limitations and problems. They suggest that the most common methods of studying the metacognitive processes that a reader uses include the following:

(1) asking readers how they would perform a hypothetical reading task;

(2) asking readers to report what they are doing during an actual reading task; and

(3) using a performance measure such as oral reading miscues, or eye movements to infer reader's techniques and strategies. (p. 195)

From the first two methods mentioned above, one might discover readers' awareness of what they are doing or should be doing during the reading process. Information gathered through such verbal reporting is limited by readers' verbal ability and their ability to remember. In young children this problem is even more salient, and very often their verbal reports do not coincide with their actual processing (Phifer and Glover, 1982). The third method mentioned above is limited in that some type of verification system must be implemented in order to discover the techniques and strategies that actually are employed and the degree of success of this application. It is thus suggested that using some performance measure such as self-correcting of miscues to measure comprehension monitoring activity is insufficient. The performance measure must be accompanied by an assessment of actual comprehension in order to evaluate the effectiveness of strategies used.

Baker and Brown (1984a) reviewed a number of techniques or methods by which researchers have attempted to investigate comprehension

monitoring. These included the ones outlined by Phifer and Glover, with four additional ones:

(1) Eliciting Verbal Reports. Readers are questioned on their knowledge about various aspects of reading in an interview technique (Myers and Paris, 1978; Canney and Winograd, 1979). They may also be asked to comment on their thoughts and behaviours while they are reading. Such self-reports are sometimes collected as running commentaries, or think-aloud protocols, (Olshavsky, 1976-77) or they may be retrospective reports provided after a reader has finished reading (Collins, Brown, and Larkin, 1980).

(2) Using On-Line Processing Measures. Readers are observed as they are processing text and the number of times they use external study aids may be recorded. Such behaviours may be videotaped. Measures such as eye movements, eye-voice span (EVS), and reading times may be used as on-line processing measures (Baker and Brown, 1984b). An analysis of oral reading errors can also be considered a source of evidence for ongoing comprehension monitoring (Beebe, 1980).

(3) Asking Comprehension Questions. Readers are questioned on the information of the text after the reading has been completed. Researchers then make inferences about comprehension monitoring based on student responses (Baker, 1979a). Memory places major limitations on this technique.

(4) Measuring Felt Understanding. Readers are asked to note their certainty that they have answered a comprehension question correctly or incorrectly. Readers are considered good comprehension monitors if they indicate that they are sure that their answers are correct when in fact they are, or if they indicate that their answers are wrong when they are incorrect (Forrest and Waller, 1979). The criticism of this technique is that it tests one's

ability to judge the correctness of an answer given after reading rather than assessing one's feelings of understanding, or misunderstanding during reading.

(5) Using Cloze Techniques. Readers are presented with passages containing word deletions and are asked to supply the missing words. This technique assesses a reader's ability to make effective use of context (DiVesta, Hayward, and Orlando, 1979). Such a procedure is criticized because it is so removed from a natural reading situation that strategies used may not be generalizable to natural reading.

(6) Using Text Disruption Techniques. Readers are tested on their ability to detect and/or identify inconsistencies, or problems, in text. This technique is based on variations of the error detection paradigm referred to previously. In one variation of this method, readers are presented with a passage containing inconsistent information and are not told in advance that a problem is present. After they have finished reading the passage they are asked to indicate whether the passage made sense and was comprehensible. The ability to report the intended problem is taken as evidence of comprehension monitoring (Baker, 1979b; Garner, 1980).

A major limitation of the text disruption technique is that failure to report message inadequacies may be due to factors other than poor comprehension monitoring (Baker, 1979a; Winograd and Johnston, 1982). These factors are explained by Baker and Brown (1984b):

> Perhaps the children believed they understood the message (i.e. they evaluated their understanding and found it adequate), but their interpretation did not match the author's interpretation. It is also possible that the children made inferences to resolve the potential sources of confusion and were unable for reasons of verbal ability or memory, to convey this when questioned. The children may also have been unwilling to point out problems in the messages or to say they didn't understand,

> despite efforts to make them feel comfortable doing so. (p. 361)

One other criticism of the text disruption technique is that it lacks "ecological validity". Readers do not typically encounter confusing elements in their reading material.

Although each methodology presented above has its strengths and limitations, some of the methodologies have received overwhelming criticism. Use of the error detection paradigm, as well as use of the cloze technique, for examples, have recently been denigrated by many as inadequate means of investigating comprehension monitoring because of the non-naturalistic settings used. Wagoner, after reviewing comprehension monitoring research up until 1983, emphasized the importance of a natural setting when she wrote that "the research task needs to be undertaken in as naturalistic a setting as possible".

Much research in reading comprehension, and especially in comprehension monitoring, is also criticized for its reliance on product measures. Process measures, such as eye movements and other on-going behaviours during reading are extremely difficult to obtain and must always be supplemented by some product measure which confirms that comprehension occurred. Phifer and Glover (1982) suggest that researchers can combine the process approach with a product that can be analyzed, thus obtaining a more adequate measure of comprehension monitoring. For purposes of this study, a combination approach using product and process measures was deemed appropriate.

Methodology of the Present Study

Research studies utilizing each methodology, or combination of methodologies from the selection previously outlined were thoroughly examined. Limitations and strengths of the various methodologies were assessed in an effort to formulate some guidelines for selecting the methodology to be used in this study. Three specific criteria guided this selection. First, a process measure should be used in conjunction with a product measure in identifying comprehension monitoring strategies. Second, reading comprehension should be assessed in order to verify the effectiveness of such strategies. Third, as natural a reading situation as possible should be utilized in studying the process of comprehension monitoring.

In order to meet the three criteria for selection, a combination of techniques was required. The process measure of oral reading performance and the product measures of think aloud reports and free recalls were used in the identification of monitoring strategies. Free recalls were used also to provide an assessment of the process of comprehension. Comprehension questions were used in conjunction with free recalls in comprehension assessment. The passage used was unaltered in any way and the reading task was representative of a natural reading situation.

Each measure of comprehension monitoring, oral reading performance, think-aloud reports, and free recalls are examined separately.

Oral Reading Performance

As a passage is read orally there are many accompanying overt behaviours which may indicate a reader's attempt to monitor comprehension. Readers

may look puzzled or confused, they may hesitate before saying particular words, or they may repeat particular words or phrases. Sometimes readers respond in a manner which differs from the expected response to the written text. In the literature such responses are usually referred to as miscues. Frequently, readers correct miscues that are made as they read. Sometimes corrections that readers attempt are in fact correct; at other times they may be close to correct or acceptable in terms of syntax and semantics. In both instances of correcting, readers experience successful comprehension monitoring, since comprehension is very likely to be facilitated. When attempted corrections are still incorrect or unacceptable, comprehension is not facilitated and readers' attempts to monitor comprehension may be considered unsuccessful in terms of facilitating comprehension. Analysis of miscues, especially the analysis of corrections, can provide some indication of comprehension monitoring. Correcting miscues with syntactically and semantically acceptable responses may be considered an overt sign of effective comprehension monitoring.

Although corrections appear to be the most frequently observed indicator of spontaneous comprehension monitoring, there may be others. In a study investigating the overt monitoring behaviours of low reading achievers in grades two and four, Fagan (1985) hypothesized that the indicators of overt monitoring included (a) corrected miscues, (b) repetitions of phrase, word and word part, and (c) hesitations at beginning and within sentence positions. Such behaviours may be considered indicators of spontaneous comprehension monitoring, and may occur at the word, phrase, or sentence level. By closely examining such behaviours it is possible to obtain information about the monitoring strategies utilized by readers.

Think-Aloud Reports

The measure of oral reading performance identifies strategies only from patterns of readers' miscues and from observed behaviours. Readers may identify problems or apply strategies that are not reflected in oral performance which may be reflected via verbalizations about their behaviour (Olshavsky, 1976-77). For example, when readers pause they may be rereading a section of the text, they may be reflecting on previous text information, or they may be hypothesizing about subsequent text information. In these instances, noting the pause or hesitation gives little, if any, indication of what the reader is actually doing and any conclusions drawn are highly inferential on the part of the researcher. Readers' verbalization of what they were actually thinking as they were reading, however, is a fairly strong indication of what strategies may have been used in the process. Such verbalizations or reports are recorded as think-aloud protocols.

The validity of using verbal reports as data has been questioned in the literature. According to Nisbett and Wilson (1977), much evidence exists suggesting that people are unable to observe directly their own cognitive processes, thereby making it likely that they cannot report accurately about them. Furthermore, Ericsson and Simon (1980) explain that under a variety of circumstances subjects may omit information in their verbal reports or they may provide information which is inconsistent with their actual performance. An example of such an inconsistency might be where a reader reports using text information to answer a question when it is evident from the response that the reader relied mainly upon background knowledge. When verbal reports are collected with other records of behaviour, however, Ericsson and Simon suggest that it becomes possible to actually check for consistency,

thus providing more valid data. They contend that "verbal reports, elicited with care and interpreted with full understanding of the circumstances under which they were obtained, are a valuable and thoroughly reliable source of information about cognitive processes" (p. 247). Afflerbach and Johnston (1984) similarly recognize the advantage of verbal reports as an access to the reasoning processes underlying higher level cognitive ability.

Think-aloud reports have been found useful in a variety of contexts investigating various aspects of cognition and metacognition. Norris (1985) found that studies of thinking processes using think-aloud reports (in conjunction with probes) were useful in the construct validation of ability tests. Think-aloud protocols enabled Olshavsky (1976-1977) to identify some of the strategies that readers use in comprehending text, and Phillips (1985) used them in identifying strategies that young readers use to generate inferences as they attempt to comprehend. According to Phillips, "it is only through using verbal reports that it becomes possible for researchers to come close to the child's reality".

An analysis of think-aloud protocols reflects readers' developed thoughts during reading. It reveals to some extent how the text was processed. In the present study the protocol analysis of the think-aloud reports was used to identify the specific strategies that readers used in monitoring across sentences or ideas. Attempts to monitor the text in relation to background knowledge were also revealed. Sometimes, readers responded in a manner which differed from the expected response to the written text. In the literature such responses are usually referred to as miscues.

Since the identification of strategies in the think-aloud protocols was highly subjective on the part of the researcher, it was necessary to introduce

a measure of reliability. The supervisor for this study, who is an expert in the area of reading research, was given a random sample of 25% of the total protocols. She was given the list of strategies identified, which she assigned to idea units. Interrater reliability for the assignment of strategies to idea units was found to be acceptable at 88% agreement.

Free Recalls

According to Wagoner (1983), a great deal of monitoring research has been conducted without emphasis on actual comprehension. It is suggested that more research is needed which will assess conventional comprehension in conjunction with monitoring. If readers demonstrate through oral reading performance and through think-aloud verbalizations that they are utilizing good monitoring strategies, it is often assumed that the passage was adequately understood. This assumption, however, must not be made without assessing comprehension, since it is indeed possible for readers to use good monitoring strategies and still not adequately understand the passage. A free recall served to assess comprehension in the present study. In addition to assessing comprehension, free recalls were used to give some indication of the comprehension monitoring strategies that readers used as they processed the passage. Often, the free recalls served to provide support for strategies identified via the think-aloud reports and/or the oral reading performance measures.

A considerable body of research indicates that insights into children's processing operations during reading can be explored through analyzing their free recalls. Tierney, Bridge and Cera (1979) claim that by analyzing a passage and by comparing a reader's verbal recall of the text to the structure of the passage itself, the nature of the reader's processing procedures can be

assessed. Verbal recalls, they suggest, should be analyzed according to the following criteria:

(1) the extent or amount of information recalled, and

(2) the type of information recalled.

The type of information recalled can be categorized as either explicit or inferred information. Essentially, an analysis of verbal recalls according to Tierney, Bridge and Cera, involves examining the extent and nature of both explicit and inferred information.

Beebe and Malicky (1982) support the position of Tierney, Bridge, and Cera (1979) regarding verbal recalls. They further hypothesize that if readers' recalls of passages are analyzed to try to determine what kind of information they selected from the text to rearrange and organize into a summary, as well as how they rearranged and organized this information, it might give an indication of what readers actually do as they process text for immediate understanding. The free recalls in the present study were therefore analyzed for two purposes:

(1) to assess the readers' comprehension, and

(2) to indicate the types of comprehension monitoring strategies used by readers.

Fagan (1981) has suggested a method of assessing the reader's comprehension and, at the same time, of obtaining an indication of how the reader has processed the text. He has developed a system which provides a structure to assess the degree of comprehension as indicated by a recall protocol. Such an assessment is achieved in four stages, the second of which has been modified to suit the needs of the present study. The four stages in the assessment of comprehension, as outlined by Fagan are described below.

Stage 1: Eliminating Irrelevant Data

The first step is to isolate that information which will be analyzed. In order to do this it is necessary to eliminate two categories of data, which are (1) mazes, or pauses, and (2) recall conventions, for example, "It says that ...". Such data plays a significant role in the natural speech flow but contains no significant information relating to actual text processing.

Stage 2: Choosing a Unit for Analysis

The protocol must be divided into idea units. Fagan suggests that the idea unit be a t-unit, defined as a single main clause together with any subordinate clauses that may be grammatically related to it. Since the present study focused upon meaning within and across sentences, it was decided to modify Fagan's t-unit, which is syntactically-based, to a clausal unit, which is more meaning-based. A clausal unit is defined as a clause which, within itself, carries a meaningful idea.

Stage 3: Comprehension Categories

Each clausal unit will be categorized according to the following:

A. Text Exact. This category includes information recalled from the text in its exact form or with minimal variations.

B. Text Specific. In this category is placed information recalled that has specific references in the text.

C. Text Entailed. The information retrieved is (a) a paraphrase of, or synonymous with the information input, but the unit of recall includes information from more than one unit of input, or (b) a superordinate statement subsuming information from more than one text unit.

D. Text Experiential. This information is added by the reader to fill in gaps in the text data. The reader constructs information based on prior knowledge.

E. Text Erroneous. This category involves the use of text information which the reader has processed incorrectly either at the time of comprehending, or during the time of producing the recall. (Fagan, 1981, p. 6-11)

Stage 4. Weighting

A weight (in points) will be assigned to each clausal unit. The kind and number of categories evident in the reader's recall must be noted. This will indicate whether the reader was very dependent on the text, was very dependent on background of experience, or was using both fairly evenly. Recalls containing high levels of C and D categories are deemed indicators of adequate comprehension because they suggest a balanced interaction between the text and the reader's experiential background.

Although Fagan's comprehension categories (1981) were developed primarily to assess comprehension, it was possible from the recall protocol analysis to identify particular strategies that readers may have used during the actual reading. Support for strategies evidenced in the think-aloud protocols and the oral reading protocols was also found in the recall analysis.

The importance of assessing comprehension in comprehension monitoring research has previously been addressed. In the present study, the measure of free recall accommodated this concern to the degree that the reader's memory and verbal skills allowed. When a reader's memory and verbal ability inhibited a reader's recall it was necessary to provide structured questions which revealed what the reader had comprehended but had been unable to recall

from memory. Comprehension questions were used in the present study when free recalls were deemed to be inadequate, that is, when recalls did not relate the general gist of the passage and/or did not provide most of the supporting details.

Since comprehension questions were used in conjunction with the free recall protocols and for the same purposes, they were similarly analyzed using Fagan's comprehension categories (1981). The nature of the information recalled, rather than the extent of it, was of primary concern.

Summary of Methodology

Based upon an assessment of the existing methodologies used in comprehension research, the following criteria for selection of a methodology for the present study were established. The methodology should provide the following:

(1) a process measure and a product measure;

(2) an assessment of reading comprehension; and

(3) a natural reading situation.

In order to meet the criteria, a methodology consisting of three separate but related measures of comprehension monitoring was used. Comprehension monitoring strategies were examined using data collected from oral reading performances, think-aloud reports, and free recalls.

Sample

The sample for the study consisted of twenty proficient readers at the grade three level. The readers were determined to be proficient on the basis of overall performance as judged by their respective classroom teachers, supported by their general progress for the school year. The sample was selected from three elementary schools within a suburban school district outside St. John's. The schools had enrollments of between 200 and 450 students, with either one or two classes at each grade level. In general, facilities were satisfactory and teachers were well qualified. For the total sample of twenty readers, six were selected from one school and seven from two others. Teachers were requested to select the six (or seven) most proficient readers in their classes. The sample consisted of five boys and fifteen girls.

Materials

The reading passage for the study was adapted from one of several that were used by August, Flavell and Clift (1984) in their study of comprehension monitoring in skilled and less skilled readers. The original passage was approximately 130 words in length and was written at the second-grade readability level according to the Burmeister scale used by August, Flavell and Clift. Two versions of the passage were used, one with a male character and the other with a female character. The reason for using the two versions was to provide a female character to whom the female readers could relate and a male character to whom the male readers could relate. Each version of the original passage is contained in Appendix A. Although August, Flavell, and Clift (1984) did not use a title for the passage, the title Quick Thinking was chosen for the purpose of this study to provide motivation and purpose

for the students involved. The passage was divided into seven sections or episodes, namely setting, initiating event, internal response, attempt, obstacle, solution, and reaction (See Appendix A).

A pilot study was conducted with five proficient readers from another school in the same school district. The purpose of the pilot study was to determine the suitability of the passage in terms of reading level, vocabulary, and interest. The most suitable format for presentation of the passage was also determined. In order to determine the most suitable format for presenting the passage, three formats were experimented with. The passage was presented as a whole with a small space between each section. Two sections of the passage were presented at a time with a larger space between each section, and each section of the passage was presented individually in a booklet form.

Results of the pilot study indicated that the narrative passage selected, with its cumulative plot was appropriate in terms of encouraging the utilization of monitoring strategies by readers. The format which proved to be most effective in getting readers to vocalize their thoughts as they read was the individual presentation of sections in booklet form. It was found that when two or more sections of the passage were presented at a time, readers tended to be anxious to read on, not allowing sufficient time to vocalize their thoughts thoroughly. The passage was found to be suitable in terms of interest to the readers, but unsuitable in terms of reading level and vocabulary. The reading level was found to be too low and the vocabulary not challenging. The passage was therefore revised, using more advanced vocabulary and increasing the reading level to a high second grade level, according to the Fry Readability Formula (Fry, 1977). The revised versions of the passage which were used in the present study are found in Appendix B.

Procedure

After the pilot study had been conducted, the passage had been revised, and other practical concerns had been addressed, the main study was undertaken. Each group of readers within a school (either six or seven students) met with the researcher in the assigned room. Introductions took place and an effort was made to establish a comfortable, relaxing setting. The purpose of the study was explained to the students. They were told that they were not being tested and that their answers and responses would not be rated as right or wrong. They were told that all of their responses would be of benefit to the research study. A sample passage, another from the ones used by August et al. (1984), was used to demonstrate the procedure to be followed. Each section of the text was read aloud by individual students who vocalized their thoughts immediately afterwards. The students were informed that they would be audiotaped and that they were welcome to ask questions or make comments at any time as long as they were relevant to the study. Before the individual sessions started, the students were asked if they wanted to participate in the study. None of the students refused to participate.

The twenty readers involved in the study each met individually with the researcher for approximately twenty minutes. During the sessions, the readers discussed the passage title with the researcher, read the passage sections, reported their thoughts after each section, retold the passage, and answered any questions posed.

The individual sessions were conducted in the following manner.

(1) Readers were reminded that their thoughts as they read were of great importance. They were encouraged to tell

whatever they could about them. They were informed that they were required to retell the story in its entirety when the oral reading was completed.

(2) The title, Quick Thinking, was discussed until it was evident that the readers had some idea of what it meant.

(3) Each section was read and thoughts were vocalized immediately. Questions were asked at the researcher's discretion. The questions in Appendix C guided the researcher's questioning.

(4) The passage was retold by readers. Questions were posed if readers failed to relate the general gist of the passage, and/or failed to provide supporting details. Guideline questions are found in Appendix D.

(5) Readers were asked whether or not there were any questions, or concerns about the story. Such concerns were clarified before the student left the room.

Analysis of Data

Each of the student sessions was transcribed from the audiotapes to provide the data for the study. The data for each of the three measures of comprehension monitoring namely, oral reading performances, think-aloud reports, and free recalls, were analyzed consecutively. Afterwards, the entire data collection was analyzed as a whole. A thorough discussion of the data analysis is presented in the following chapter.

Chapter IV

FINDINGS AND DISCUSSION

Introduction

The present study was designed to examine the comprehension monitoring strategies used by proficient grade three readers when reading for immediate understanding. In this chapter an attempt will be made to answer the questions which guided this study.

1. What specific comprehension monitoring strategies do proficient readers use when they read for immediate understanding?
2. Are there similarities and/or differences in strategy use among proficient readers?

The transcriptions of the student sessions provided the total data for the study. Each transcription consisted of three separate but related sets of data. There was a set of data for each of the three measures of comprehension monitoring, namely, oral reading protocols, think-aloud protocols and free recall protocols. Each set of data was analyzed separately. Then the data from all three measures was analyzed as a whole, significant trends were noted, and an overall view of the process of comprehension monitoring emerged. Case examples are used throughout this report in an effort to illustrate particular findings of the study.

Findings from Protocols

The findings from the oral reading protocols, the think-aloud protocols and the free recall protocols are presented separately. The protocols were analyzed with respect to the two questions posed at the outset of the present study. The analysis of the oral reading protocols and the think-aloud protocols addressed both questions. The analysis of the free recalls added support for findings from the oral reading and think-aloud protocols.

Oral Reading Protocols

The oral reading protocols were studied closely and all miscues, that is, responses other than the expected exact words of the text, were noted. Repetitions, hesitations, corrections, and attempts to correct were abstracted for analysis. Such behaviours were considered evidence of comprehension monitoring. These behaviours were indicative of a reader's awareness that comprehension was being interrupted and that something must be done to remedy the problem.

Miscues for which no attempts were made to correct, and which were unacceptable in terms of syntax and/or semantics, were excluded from the analysis. For example, a miscue such as the following was not analyzed because the reader appeared to be oblivious to the lack of understanding and to the incorrect response:

Text: Fortunately, the engineer saw the light.

Protocol: (Pause) Frontedly, the engineer saw the light.

In this example, the reader did not acknowledge the error and possibly was unaware of miscomprehension. The reader read on as if no error was made.

Such miscues comprised ~~only~~ 9% of the total miscues noted in the study and were excluded from the analysis because they were not considered evidence of comprehension monitoring. The other 91% of total miscues were analyzed and the following strategies were identified. For purposes of clarification, the code OR (Oral Reading), is used with the number of each strategy to indicate that it is a strategy identified from an oral reading analysis.

1. *Strategy OR-1* Focusing on a problem word. The reader hesitates at an unknown word and uses a word identification strategy to successfully identify it. Word identification strategies used may be any of phonics, structural analysis, sight, or context, used individually, or in combination. Also, once a problem word has already been identified, the reader may repeat it in an attempt to test whether or not it is actually a word.

Example:

Text: Kate's father was employed by the railroad company.

Protocol: "Kate's father was (hesitates) 'em-pleed', 'em-plo,' employed by the railroad company."

In this example, the reader was successfully monitoring at the word level. Upon hesitating, the reader realized her inability to identify the word 'employed'. Word identification strategies were utilized immediately until successful identification occurred.

2. *Strategy OR-2* Focusing on a phrase or sentence containing a problem word. The reader hesitates at a problem word, then rereads the previous text, or omits the word and reads subsequent text in order to successfully

identify the unknown word. Also, once a problem word has been correctly identified, the reader may repeat the phrase or sentence in which it was found in order to verify that it is the correct response.

Example:

Text: Kate's father was employed by the railroad company.

Protocol: "Kate's father was (hesitates, then rereads) Kate's father was (hesitates, says 'blank', reads on) by the railroad company (pause) employed by the railroad company."

In this example, the reader was successfully monitoring at the sentence level. Upon hesitating before the word 'employed' the reader recognized the inability to identify the word so reread the beginning of the sentence in an effort to get the word from the context of the sentence.

3. *Strategy OR-3* Focusing on a problem word and/or a sentence (or phrase) containing the problem word. The reader hesitates at a problem word but gives no verbal evidence of attempting to use word identification strategies, of rereading, or of reading ahead. The reader may be utilizing one or any number of the strategies. The reader, however, indicates an awareness of a comprehension problem which must be cleared, if possible, before continuing on.

Example:

Text: Kate's father was employed by the railroad company.

Protocol: "Kate's father was (hesitates for about 10 seconds) employed by the railroad company."

In this example, the reader was either uncertain of the word 'employed' or was unable to immediately identify it. Some strategy was utilized in order to correctly identify it, but the reader gives no evidence as to what the strategy may have been. The reader may have been monitoring at the word level or at the sentence (phrase) level, or both.

The analysis of the oral reading protocols suggests that the readers in the study were monitoring their comprehension process most of the time, that is, 91% of the time. It was evident that readers were using three particular comprehension monitoring strategies at times when they experienced problems with word identification. The actual frequency and percentage of use for each strategy identified in the oral reading protocols are indicated in Table 1.

Table 1

Summary of strategies identified in oral reading protocols

Strategy	Frequency of Use	Percentage of Use
Strategy OR-1	55	41%
Strategy OR-2	35	26%
Strategy OR-3	44	33%
TOTAL	134	100%

N = 20 (Number of Readers)

All of the oral reading strategies were utilized frequently. According to the table, Strategy OR-1, focusing on a problem word, was used most frequently.

Strategy OR-3, focusing on a problem word and/or sentence containing the problem word, was the second most frequently used strategy. Because the utilization of Strategy OR-3 indicates the utilization of either Strategy OR-1 or Strategy OR-2, or the utilization of both, it is impossible to determine from the data which strategy was actually utilized most frequently. There are no significantly outstanding frequencies so it may be reasonable to conclude only that the three strategies were used with nearly equal frequency.

Although readers were generally successful in identifying problem words by utilizing the three strategies outlined, they were not always successful. In the examples used to demonstrate each of the oral reading strategies, readers were successful in identifying problem words. Of the total 134 instances of strategy use, 25% resulted in readers being unsuccessful in identifying problem words. In such instances, readers indicated that they were monitoring, and were utilizing particular strategies, but were unable to identify the problem words. For the purpose of this study, evidence of utilizing a particular strategy, regardless of the ultimate effectiveness was considered to be evidence of comprehension monitoring. The following example demonstrates how readers can sometimes utilize a monitoring strategy but be unsuccessful in identifying the problem word or words.

Example:

Text: She was approximately four hundred meters away from the railroad tracks.

Protocol: "She was 'ap-prox-i-mat-med-ate-ly' four hundred meters away from the railroad tracks."

In this example, the reader was aware of a problem so utilized the strategy of focusing on the problem word (Strategy OR-1) in an effort to identify it.

The utilization of the strategy was ineffective in facilitating the identification of the problem word. The reader's skill with phonics and structural analysis was not developed to the point where such a long word could be analyzed and synthesized successfully. The reader possibly realized that the word was not absolutely essential for overall comprehension, so ignored the miscue and read on.

In instances similar to the example above, when using Strategy OR-1 was ineffective, some readers utilized Strategy OR-2 immediately, and met with success. The following example is such an instance.

> Text: Kevin's father was employed by the railroad company.
>
> Protocol: "Kevin's father was empty-loaded (pause) empty-loaded by the railroad company, employed by the railroad company."

In this example, the reader's utilization of Strategy OR-1 was ineffective in identifying the problem word 'employed'. Once the sentence was completed, the reader immediately identified the word. The reader monitored at the word level at first but was unsuccessful. When he monitored at the sentence level, utilizing Strategy OR-2, he met with success. The reader thus used a combination of Strategy OR-1 and Strategy OR-2.

For approximately 18% of the total oral reading miscues, a combination of strategies was utilized. Two combinations were noted, Strategy OR-1 with Strategy OR-2, and Strategy OR-3 with Strategy OR-2. Strategy OR-2 appeared to be a strategy sometimes used when the other two had been ineffective.

In analyzing the effectiveness of the utilization of strategies in facilitating word identification, it was noted that some strategies appeared to be effective

more frequently than others. Table 2 indicates the percentage of effective and ineffective use for each of the three strategies when used independently as well as when used in combination. In the table, Strategy OR-1/OR-3 -> OR-2 refers to the combined use of either Strategy OR-1, or Strategy OR-3, with Strategy OR-2.

Table 2

Summary of effective and ineffective strategy use

Strategy	Percentage of Effective Use	Percentage of Ineffective Use
Strategy OR-1	69%	31%
Strategy OR-2	86%	14%
Strategy OR-3	73%	27%
Strategy OR-1/OR-3 -> OR-2	80%	20%

N = 20 (Number of Readers)

In general, the utilization of strategies was effective in facilitating word identification. This was especially evident for Strategy OR-2, focusing on a phrase or sentence containing a problem word, and for Strategy Or-1/OR-3 -> OR-2, using Strategy OR-1 or Strategy OR-3 in combination with Strategy OR-2. This was interpreted to suggest that the utilization of Strategy OR-2, either independently or in combination with other strategies, was more likely to be effective for readers in successfully identifying problem words.

Because 20% of the readers had very few problems with the oral reading, they had less than three miscues. Consequently, they had few, if any, opportunities to utilize strategies. It is unknown what strategies they would

likely use if more problems had occurred. The oral reading protocols, although helpful in indicating strategies that readers use when problems are experienced, were of no use in indicating strategies that readers used when no problems were experienced. Such strategies were more evident in the think-aloud protocols.

Think-Aloud Protocols

Before any analysis of data was undertaken, the think-aloud protocols were first closely examined to determine what information would be used as evidence of comprehension monitoring strategies. All think-aloud reports volunteered by the readers were included in the data. A great deal of researcher-questioning and reader-answering was incorporated into the think-aloud reporting, but not all of it was included as data to be analyzed. Questioning was used in the think-aloud reporting for two purposes. One purpose was to encourage and to probe readers who did not readily vocalize their thoughts by using questions from those provided in Appendix C. Since the purpose of such questioning was to aid readers in expressing their thoughts, answers were included as data to be analyzed. Another purpose for questioning throughout the reporting was to give readers opportunities to clarify their thoughts and to elaborate on them so that it was clear to the researcher why they had responded in a particular manner. Responses to such questioning were often explanatory in nature. Because these responses were used to assist the researcher in understanding readers' thought processes, they were not used as data to be analyzed. These responses were not deemed to be indicative of readers' immediate thoughts while reading.

Once the data to be analyzed was abstracted the protocols were divided into idea units. The procedures followed were those developed by Kintsch and van

Dijk (1978) and utilized by Phillips (1985). An idea unit was defined as a proposition containing at least one relational concept and at least one argument. The idea unit is the simplest independent unit which may be used to convey meaning. For example, "It was a big flood" and "Kevin must be worried" are idea units. Often sentences consist of two or more idea units. For example, the sentence "There was an unexpected storm and it knocked down the railroad bridge by Kate's house" consists of three idea units: \There was an unexpected storm,\ \it knocked down the railroad bridge\ and \the railroad bridge [was] by Kate's house.\

Each idea unit in the protocols was compared with the text information which initiated it and a subjective opinion of how the reader was processing was recorded. The ten inference strategies identified by Phillips (1985) were used as a guide in defining the strategies that were being noted. After 25% of the protocols were completed, the following five strategies were identified as regularly occurring strategies. There was evidence of the same strategies throughout the remaining 75% of the protocols. In the presentation of the strategies identified from the think-aloud protocols the code TA (Think-Aloud) is used with the numbers of the strategies to distinguish them from the strategies identified in the oral reading protocol.

1. *Strategy TA-1* Visualizing a scene or event predominantly on the basis of text information. During the process of reading, the reader activates appropriate schemata and readily forms a mental image of the scene or event being portrayed in the text. This visualization, while based on the text information, reflects the reader's perception of the information.

Example:

Text: Kate lived with her parents in a house located by the railroad tracks.

Protocol: "I see Kate's house right now - ah - right by the railroad tracks."

In this example, the reader perceived the phrase "located by the railroad tracks" as meaning "right by the railroad tracks." The reader was possibly thinking in terms of a few meters from the tracks when it could indeed have meant several meters away from the tracks. The reader's thoughts closely resembled the ideas of the text.

2. *Strategy TA-2* Visualizing a scene or event predominantly on the basis of text information, with elaborations which reflect inferred information. During the process of reading, the reader activates appropriate schemata and readily forms a mental image of the scene or event, adding information based on background knowledge or experience.

Example:

Text: One day an unexpected storm caused a flood. The flood washed away the wooden train bridge near Kate's house.

Protocol: "The flood was very rough. And if the tracks went down the trains wouldn't be able to come and they always stopped their engine there."

In this example, the reader clearly was visualizing the flood scene with the washed-out bridge as portrayed in the text, but added information about what the flood was like (very rough) and about the trains not being able to come. Both additions were inferred from the text and were plausible assumptions.

3. *Strategy TA-3* Visualizing a scene or event predominantly on the basis of background knowledge and/or experience. During the process of reading, the reader activates schemata which are related to the text information but which are more related to the reader's experiential background. The reader thus creates a mental image of a scene or event which may not necessarily reflect exactly what the text had intended to convey, but is a reasonable possibility.

Example:

Text: Kevin lived with his parents in a house located by the railroad tracks.

Protocol: "Early in the morning a train comes by and wakes him up every morning and he don't like it and then he's there, 'ah, is the train gone yet?' and he falls back to sleep again."

In this example, the reader had created a mental image of the boy sleeping and being awakened by the train early in the morning. Although this image was triggered by the text information, it was not necessarily implied by it. The reader understood the section and embellished the information by placing himself in Kevin's place, and by reflecting on how it might feel to live close to railroad tracks.

4. *Strategy TA-4* Questioning subsequent events and/or information, based on previous text information and/or background knowledge. During the process of reading, the reader thinks ahead in an effort to predict subsequent events and/or information. Sometimes the reader may merely question,

yet at other times the reader may hypothesize about subsequent events and/or information, developing one or more hypotheses.

Example A:

Text: She was approximately four hundred meters away from the railroad tracks. Then she fell down hard. She injured her left leg.

Protocol: "I'm wondering now if the train will see her or not."

In Example A, the reader was questioning about subsequent events, based on the information that had already been provided in the text. It was a logical question, and there was a good possibility that an answer would emerge in subsequent text. It is likely that the reader was looking for the answer as he read on.

Example B:

Text: She was approximately four hundred meters away from the railroad tracks. Then she fell down hard. She injured her left leg.

Protocol: "Well she probably won't be able to run to get the train now - her leg is hurt."

In Example B, the reader was hypothesizing about subsequent events, based on the information that had already been provided as well as on background knowledge. Since she has hurt her leg, Kate will probably not be able to catch the train. This hypothesis was logical, and could possibly be confirmed by subsequent text information.

5. *Strategy TA-5* Keeping foregoing information (and hypotheses made by the reader) in short-term memory. During the process of reading, the reader stores significant pieces of information

in short-term memory and relates it to subsequent text as reading continues. As a result, the reader may integrate foregoing information with subsequent text information. The reader may also confirm or disconfirm previous hypotheses once additional information has been gathered.

Example A:

Text: Kevin grabbed a flashlight. He hurried towards the tracks.

Protocol: "He's running fast to get to the tracks so that he won't be too late for to signal the train to stop."

In Example A, the reader relates present information, Kevin hurrying towards the tracks, to foregoing information, regarding the need for someone to signal the train to stop before it got to the bridge. The foregoing information had been immediately recalled from short-term memory and integrated with subsequent information in order to make sense to the reader.

Example B:

Text: Kevin was very glad that he had helped. The railroad company gave him a medal for preventing a serious train accident.

Protocol: (Reader smiled.) "I said that back there, that he was glad that he stopped the train."

In Example B, the reader recalled a previous hypothesis and confirmed it using evidence from subsequent text.

Example C:

Text: Kevin knew that someone would have to signal the train

to stop before it got to the bridge. He decided to run to the tracks to warn the engineer.

Protocol: (Reader had previously predicted that Kevin's house gets destroyed in the flood.) "I think that his house could be wrecked but now I don't think it is, because he had to be in his house to run out of it, and he wouldn't run out if there was a flood."

In Example C, the reader recalled a previous hypothesis and disconfirmed it on the basis of information which was gathered in subsequent text. The reader summarized the information up to this point and inferred that, since Kevin was leaving his house to warn the engineer about the bridge, his house must have been intact. Otherwise, he thinks something in the text would have indicated that Kevin's house was wrecked.

The five strategies identified above accounted for all strategies which were directly observable in the think-aloud protocols. Sometimes strategies were utilized simultaneously such that a particular idea unit was assigned two or more strategies. For example, a reader may hypothesize, utilizing Strategy TA-4, and simultaneously visualize a scene, utilizing one of Strategies TA-1, TA-2, or TA-3. In such cases, all strategies were recorded in the analysis. The actual frequency and percentage of use for each strategy identified is indicated in Table 3. Unlike the strategies identified in the oral reading protocols, these five strategies were not necessarily utilized when a problem surfaced. These strategies were utilized when comprehension was progressing smoothly as well as when problems were experienced.

Table 3

Summary of strategies identified in think-aloud protocols

Strategy	Frequency of Use	Percentage of Use
Strategy TA-1	128	20%
Strategy TA-2	123	19.5%
Strategy TA-3	179	28%
Strategy TA-4	158	25%
Strategy TA-5	47	7.5%
TOTAL	635	100%

N = 20 (Number of Readers)

The most frequently used strategies were Strategies TA-1, TA-2, TA-3, and TA-4, all of which were used with similar frequency. Strategy TA-5, keeping foregoing information in short-term memory, was evidenced only about one third as often as the others. Since Strategy TA-5 involved keeping previous information in mind, and could be used simultaneously with the other strategies, it is possible that it was used at times when readers didn't really indicate via vocalizations. It is possible that this strategy was actually utilized just as often as the others but readers did not give evidence of it in think-aloud reporting.

All of the strategies identified may be referred to as productive strategies because readers' utilization of them usually resulted in facilitating overall comprehension of the passage. At times when the utilization of such strategies did not actually facilitate comprehension, it did not interfere with it either. For example, by utilizing Strategy TA-4, questioning subsequent events and/or

information, readers may have questioned ideas which were addressed in subsequent text. Hence, comprehension was likely facilitated. On the other hand, readers may have questioned ideas which were irrelevant to overall text understanding and which were not addressed in subsequent text. In such instances, readers had been wise to have questioned, but such questioning turned out to be not as important in this story as it might have been in others. At the same time, however, students' questioning had not interfered with their overall comprehension of the passage.

One strategy which differed, in a way, from the others was Strategy TA-3, visualizing a scene or event predominantly on the basis of background knowledge and/or experience. Strategy TA-3, unlike the other strategies, had the potential to be counterproductive if overused. The utilization of this strategy in moderation usually facilitated overall comprehension. If, however, it was utilized quite often throughout the passage by a reader, it interfered greatly with comprehension and usually led to misinterpretation of the passage. Use of Strategy TA-3 thus could enhance comprehension or interfere with comprehension, depending on the degree to which it was used.

The case example to follow will demonstrate how one reader in the present study used Strategy TA-3 excessively, and partially misinterpreted the passage. While working through the example, Appendix B should be referred to for the text of the entire passage. Questions posed throughout the think-aloud reports are in parentheses.

> Case Example: Reader 3 was a fairly fluent reader. She made ten miscues in the oral reading which was more than the average number of miscues in the study ($\overline{X}$ = 7 miscues). All except two miscues were corrected successfully. In terms of

accuracy in oral reading, then, Reader 3 performed in the average range.

While reading the first three sections of the passage, Reader 3 utilized various strategies effectively. She was visualizing the scenes of men working at the railroad tracks, of the flood washing away the railroad bridge, and of Kate running to the track to warn the engineer to stop. She appeared to be monitoring her comprehension, utilizing Strategies TA-1, TA-2, TA-3, and TA-4, with about the same frequency. Comprehension was being facilitated along the way. In text Section 4, however, the reader started to overuse Strategy TA-3, and continued to do so throughout the remainder of the sections, letting her background experience override the text, thus leading to a biased interpretation of the passage.

Text Section 4: Kate grabbed a flashlight. She hurried towards the tracks.

Reader 3: "So she must have told them in the night if she had her flashlight. Probably a train was broke down and like they couldn't see where they were to and she went over to the tracks. (Do you think the flashlight will help?) A little bit, help the people get off, cause when we were going down to Carbonear we went on the train down in Carbonear and, like, it was in the evening and we didn't get back until in the night and this train was broke down and buddy brang them over a flashlight and all the people got off and went on another train."

Text Section 5: She was approximately four hundred meters away from the railroad tracks. Then she fell down hard. She injured her left leg.

Reader 3: "So if she injured her left leg and was almost there probably she'd have to try and get up herself and wouldn't be able to. And she could have screamed and someone might have helped her. (What about the train? Why is she running down there?) Because probably they were broke down that time when she was running. She was running down to get the man out of it. Probably there was another train coming and going to bang into it and she was trying to get the man that was driving off the train. Probably he was trying to get the train going, probably she ran down to help him and then couldn't get there 'cause she fell down."

Text Section 6: Kate reached for the flashlight and began to blink danger. Fortunately the engineer saw the light. The train stopped safely before the bridge.

Reader 3: "Probably the train was coming and probably stopped before it got to the bridge because he probably saw the other train there. Kate put the flashlight over to the train that was coming behind and turned it on and off to show them that there was danger there. (Do you think that was a good idea?) Yes. Cause it could help him to stop so it wouldn't bang into the other train."

Text Section 7: Kate was very glad that she had helped. The railroad company gave her a medal for preventing a serious train accident.

Reader 3: "Probably the train, she slipped out of gear, the train that was behind, and banged into it and had an accident.

I'm wondering if any of the people that were on the other train were dead or anything, got killed, cause they did have an accident."

While reading Text Section 4 of the passage, the reader hypothesized that the train may have been broken down, just like the train in her memory which broke down on its way to Carbonear. She hypothesized that the flashlight was used to help people see how to get off the train, just as it had been used in her train experience. Up to this point Reader 3 was effectively utilizing strategies, including Strategy TA-3, which had the potential of facilitating comprehension. It is only later, when she utilized Strategy TA-3 to the point where it contradicted information in the text, that she ran into problems with comprehension. In Text Section 5, Reader 3 changed her mind about why Kate was running to catch the train. Earlier, in Text Section 3, she had talked about the importance of someone warning the train driver about the broken bridge, which was text-based information. Later, in Text Section 5, she talked about warning the train driver about another train that may be coming behind the first train, and which might collide with the first train, pushing it into the hole in the bridge. The reader was again focusing on memories of her Carbonear trip. Even though the information she was recalling did not jive with the text, she continued to believe that it did. This resulted in a misinterpretation of the text.

In Text Section 6, the reader continued to fit the text information into her interpretation, rather than to change her interpretation so that it was more parallel with the text. Thus, the train referred to in this section was interpreted by the reader to be a second train, which was being signalled to stop so it wouldn't collide into the first train. The reader continued building upon her interpretation in Text Section 7, and was so convinced of her own interpretation

by this time, that she ignored the details in the text. The reader had read the text accurately, with the exception of one miscue ('serious' was pronounced 'service'). Even though she had read that Kate had been awarded a medal for preventing a train accident, the reader thought that there had been a collision and one train had collided with the other, causing an accident. This seemed to be what she had been thinking would happen all along, so she confirmed her hypothesis regardless of the information which was provided by the text.

The case example of Reader 3 which was discussed above is an exceptional case in the study. Overriding all the evidence of strategy use by Reader 3 is the possibility that Reader 3 had interpreted the task of thinking-aloud to mean saying everything that's in one's imagination. It would be interesting to find out how Reader 3 would have interpreted the passage in the absence of the think-aloud reporting. This points to an inevitable drawback in research such as this.

In analyzing the responses of Reader 3 it was noted that she varied greatly from most readers in the type of strategies she frequently used, and in the nature of the interpretation she developed. Although there were no other such exceptional cases as the one presented, a close look at all of the other protocols revealed great individual differences in the use of comprehension monitoring strategies. With the exception of Strategy TA-5, all readers used each strategy to a certain extent. Strategies were used simultaneously, or consecutively. Readers, however, varied in the extent to which they used particular strategies and when they used strategies for particular sections of the passage. Table 4 indicates the frequency of use of individual strategies as well as total use for each reader. It is thus suggested that the use of comprehension monitoring strategies varies among individual proficient grade three readers. To adequately

comprehend, proficient readers use varied combinations of the five strategies identified.

Table 4

Strategy use for individual readers

		Number of Strategies Evidenced					
		TA-1	TA-2	TA-3	TA-4	TA-5	Total
Reader	# 1	8	3	3	13	1	28
	2	7	7	2	13	6	35
	3	6	10	29	12	0	57
	4	9	6	6	1	3	25
	5	7	3	4	5	0	19
	6	5	2	11	11	2	31
	7	2	6	10	10	3	31
	8	8	2	1	2	1	14
	9	1	5	7	10	2	25
	10	6	3	2	2	3	16
	11	12	2	0	1	3	18
	12	1	7	14	18	7	47
	13	8	9	7	22	5	51
	14	8	6	5	6	3	28
	15	4	11	17	6	0	38
	16	10	3	4	2	0	19
	17	6	13	11	4	1	35
	18	6	8	16	5	1	36
	19	2	7	12	5	2	28
	20	12	10	18	10	4	54

Outstanding use of Strategy TA-3, over and above the use of the other strategies, appears to interfere with comprehension. Table 4 indicates that the total number of strategies used is not a feature of adequate comprehension. The relative use of types of strategies is a more sound indication of adequate comprehension.

Free Recall Protocols

The free recall protocols were analyzed for two purposes, to assess comprehension and to identify comprehension monitoring strategies which may or may not have

been evidenced in the two previous analyses. The protocols were analyzed according to the following criteria:

1. the extent or amount of information recalled, and
2. the type of information recalled, either explicit or inferred.

The four stages involved in using the category system outlined by Fagan (1981) were followed. For each free recall protocol, irrelevant data was eliminated, clausal units were delineated, comprehension categories were identified, and points were assigned to the categories. Each protocol was analyzed in terms of the number of clausal units recalled in each category, the total number of clausal units recalled, and the adequacy of the recalls. A summary of this information for each reader is provided in Table 5.

The number of clausal units per category for each reader was recorded. The amount of recall refers to the total number of units recalled in all categories. The adequacy of recall refers to a subjective rating of the adequacy of comprehension, which is categorized as either adequate or inadequate. Recalls which related the general gist of the passage and provided most of the supporting details were rated as adequate. Those which did not relate the general gist of the passage and/or did not provide the supporting details were rated as inadequate. There are two separate ratings given for each reader in the table. The first rating is based solely on the free recall, as volunteered information provided by the reader. For readers demonstrating inadequate comprehension in this rating, a second rating was made using the answer to the structure questions from Appendix D, in addition to the voluntary free recall. This second rating was completed in order to control for limitations which readers may have experienced in the areas of memory and verbal ability.

Table 5

Summary of the type, amount and adequacy of recalls for individual readers

Reader Number	Type of Recall					Amount of Recall (Total No. of Units)	Adequacy of Recall (Free Recall Only)	Adequacy of Recall (Free Recall and Questioning)
	A	B	C	D	E			
1	1	4	4	6	1	16	Adequate	Adequate
2	1	2	4	4	3	14	Adequate	Adequate
3	0	0	1	1	4	6	Inadequate	Inadequate
4	2	6	7	2	0	17	Adequate	Adequate
5	2	1	5	1	2	11	Adequate	Adequate
6	1	1	2	3	1	8	Inadequate	Adequate
7	4	1	3	6	0	14	Adequate	Adequate
8	0	4	4	1	3	12	Adequate	Adequate
9	0	2	4	4	0	10	Adequate	Adequate
10	2	2	2	3	1	10	Adequate	Adequate
11	3	1	6	6	0	17	Adequate	Adequate
12	0	0	10	11	1	22	Adequate	Adequate
13	0	2	8	2	0	14	Adequate	Adequate
14	0	2	4	0	1	8	Inadequate	Adequate
15	0	0	8	6	6	20	Inadequate	Inadequate
16	0	2	7	2	1	13	Adequate	Adequate
17	0	0	4	11	0	15	Adequate	Adequate
18	1	6	5	1	1	14	Adequate	Adequate
19	0	1	7	5	0	13	Adequate	Adequate
20	0	1	11	3	0	15	Adequate	Adequate
Total	17	18	106	78	25	269		
Average	.8	2	5	4	1	13.5	Adequate	Adequate

N = 20 readers

Key to the mnemonics:

A	=	Text Exact
B	=	Text Specific
C	=	Text Entailed
D	=	Text Experiential
E	=	Text Erroneous

Although no additional comprehension monitoring strategies were identified through the free recall analysis, some support was found for findings in the think-aloud analysis. In Table 5, there was a significant concentration of units classified under the C and D categories, for the readers in general. The total scores of 106 and 78 for categories C and D respectively, were at least double the scores under the other three categories. This trend was interpreted to suggest that readers tended to recall more inferred information than explicit information. It supports the findings reported in Table 3, which indicates a noticeably higher frequency of use for Strategy TA-3, which is a strategy based highly on experiential background resulting in interpretations of text which are largely inferred, and are reflective of readers' background experiences.

The average amount of information recalled by the readers was 13.5 clausal units. Considering that the actual passage consisted of 18 clausal units, readers in general gave quite extensive recalls. In terms of adequacy of comprehension as measured via the free recalls, 90% of the readers indicated adequate comprehension whereas 10% of the readers indicated inadequate comprehension. The majority of readers demonstrated that they had adequately understood the passage. This finding regarding extent of information recalled is further supported by the previous finding of high concentration of recalled units categorized under C (Text Entailed) and D (Text Experiential). Fagan has suggested that such concentration indicates adequate comprehension resulting from readers' balanced interaction between text and experiential background.

Although the majority of readers demonstrated adequate understanding of the passage, there were two readers who, even when their answers to the structure questions were analyzed, demonstrated inadequate comprehension. They were Readers 3 and Reader 15. These two readers varied greatly in the amount of

information they recalled. The recall provided by Reader 3 was very scanty whereas that provided by Reader 15 was relatively extensive. A close look at the profiles of the two readers reveals similarities in the type of information that they recalled. Neither reader recalled any specific text information nor have points in Category A (Text Exact) and Category B (Text Specific). Both readers have an outstanding proportion of total points in category E (Text Erroneous), indicating that much of the information recalled was either questionable or false. It is thus suggested that the two readers focused so heavily on their own experiential backgrounds while reading that they misinterpreted the actual text information. Evidence for this suggestion was found in Table 4, which indicates that Readers 3 and 15 utilized Strategy TA-3 on an outstanding number of occasions, as compared with other readers. The previous case example of the think-aloud reporting provided by Reader 3 further illustrates the processing that occurred which led to a partially misconstrued recall. Such a recall was indicative of how experiential background tended to override text information, resulting in inadequate comprehension of the passage.

One explanation for the behaviours of the two readers who misinterpreted the passage may be the nature of the task that the readers were asked to perform. In their efforts to express their thoughts aloud as they read, these readers may have tried to impress by having lots to say. They possibly tried to think of things which were related in any way to the text, but in so doing, strayed from the actual story line. This may suggest a possible limitation in using the think-aloud reporting method with young children. Some children appear to interpret the task inappropriately which may interfere with the quality of their performance.

In general, the readers in the study had similar recalls, both in type (generally inferred information) and in amount (generally extensive information). Most readers related the general gist of the passage in their free recall, and also provided most of the supporting details either independently or via questioning. In general, the readers demonstrated adequate comprehension of the passage.

Summary of Findings

The analysis of the data provided by the oral reading protocols, the think-aloud protocols, and the free recall protocols indicated that the proficient readers in the study used comprehension monitoring strategies as they read for immediate understanding. Eight specific comprehension monitoring strategies were identified, three from the oral reading protocols and five from the think-aloud protocols. Although the strategies were identified separately, it was demonstrated throughout the discussion that they were related strategies which worked together to facilitate comprehension. Often strategies operated simultaneously. It was indicated that all readers tended to use the same strategies, but readers varied in the extent to which they used particular strategies, and in the situations in which they used particular strategies. In the latter sense, then, strategy use varied among individual readers. Total frequency of strategy use was shown to be less significant than the relative frequency of use of types of strategies in facilitating comprehension. It was a matter of what strategies were being used, relatively how often, rather than how many strategies were being used all together, which indicated the adequacy of reading comprehension.

Despite the individual differences in the use of comprehension monitoring strategies, the analysis of the free recalls indicated a similarity in readers' end product of comprehension. The free recalls tended to be similar in the extent

and type of information recalled, and readers generally demonstrated adequate understanding.

Chapter V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, a summary of the research study will be presented. It will be followed by conclusions drawn from the study, implications for instruction, and recommendations for future research.

Summary

Comprehension monitoring was defined as a metacognitive process which plays a vital role in the process of reading comprehension. Within this context, comprehension monitoring and its related strategies have been examined in a number of different settings with subjects varying in age from preschool to adult. Research methodologies have also varied, but most research has been designed around the error detection paradigm. The research review for this study indicated a need for more empirical research in the area of comprehension monitoring using methodologies which would overcome some of the limitations associated with the error detection paradigm.

The purpose of the present study was to identify the comprehension monitoring strategies used by a select group of proficient grade three readers and to determine any similarities and/or differences in strategy use among these readers. The twenty readers in the study were asked to read sections of an unaltered passage, stopping at designated points to vocalize their thoughts. After completion, the readers were asked to retell in their own words the storyline of the passage. The data for the study consisted of the protocols of the reading sessions which were transcriptions from audiotapes. Three sets of data, namely the oral reading protocols, the think-aloud protocols and the free

recall protocols provided three distinct, yet related, measures of comprehension monitoring.

From the data analysis, eight comprehension monitoring strategies were identified. Three strategies were identified from the oral reading protocols. These were strategies generally used when a reader experienced problems with identifying words, which in essence meant problems with comprehension. Five strategies were identified from the think-aloud protocols. These were strategies generally used as reading progressed. Such strategies reflected what readers were doing as they attempted to make sense of the on-going text. Although no additional strategies were identified from the free recall protocols, support was found for some of the others already identified in the oral reading and think-aloud protocol analyses. In addition to providing support for particular strategies, the free recalls provided a measure of overall comprehension assessment.

It was found that readers generally utilized all eight strategies identified. Thus, the readers were similar in the types of strategies they used. However, readers differed in the extent to which they used these strategies and in the circumstances in which they used particular strategies. Results indicated that despite individual differences in the utilization of strategies, readers' free recalls were generally similar in type and extent of information. Readers tended to recall extensive information which was mostly inferred and was indicative of adequate comprehension.

Conclusions

Because of the abstract nature of the process of comprehension monitoring, caution must be exercised in interpreting the findings of this study. Several conclusions were drawn on the basis of the findings and must be interpreted in the context of the present study. The conclusions of the study are as follows.

1. There are at least eight strategies which proficient grade three readers utilize in reading for immediate understanding.
2. Proficient readers utilize strategies when problems are experienced in reading as well as in smooth non-problematic reading.
3. Proficient readers usually, but not always, utilize monitoring strategies which are effective in facilitating comprehension.
4. Proficient readers differ in the extent and nature of their utilization of comprehension monitoring strategies. Processing styles of various readers tend to be highly individualized.
5. There appears to be no one particular processing style or style of strategy use which results in adequate comprehension of a reading passage.
6. Comprehension monitoring and the utilization of comprehension monitoring strategies is positively related to reading comprehension.

Implications for Instruction

The findings and conclusions of this study have some general implications for reading instruction. The implications which follow correspond directly to the conclusions in the previous section.

1. The reading process involves, among other things, the utilization of specific identifiable strategies which facilitates understanding. Reading teachers should be aware of such strategies, and should integrate such knowledge into their theoretical bases for teaching. Readers at all proficiency levels should be encouraged, for example, to visualize and to hypothesize as they read, and to monitor at the word, sentence, and passage levels if they are to become thinkers rather than mere word-callers.
2. Readers should learn strategies which facilitate comprehension when problems are experienced as well as when no problems are incurred. Reading teachers should therefore not function on the assumption that strategies are utilized mainly when problems are incurred, but rather on the assumption that strategies are also utilized extensively when no problems are incurred.
3. Proficient readers are usually, but not always, characterized as effective comprehension monitors. Reading teachers should never assume that highly proficient readers will effectively monitor their comprehension while reading for immediate understanding. Although it is most likely that they will monitor effectively, it is possible that they will not.
4. The processing styles of readers appear to be highly individualized. This implies that attempting to specify characteristics of the successful comprehension monitor is not the approach that should be taken. There is no single most

effective monitoring style. Rather, there appears to be many different effective monitoring styles.

5. Comprehension monitoring strategies which are effective for some readers may not necessarily be effective for others. Readers may be taught various monitoring strategies but, whether they utilize them, and where and when they do so, will vary with individual readers.
6. Readers who think, monitor, and utilize their individually chosen strategies as they read are likely to adequately understand what they read.

Recommendations for Further Research

Based upon the findings and limitations of this study, recommendations are proposed for further research. The present study examined the comprehension monitoring strategies utilized by a sample of twenty proficient grade three readers. Similar studies using proficient readers at the grade three level and using other texts would make the findings more generalizable. Studies examining readers at different grade levels and proficiency levels would offer more insight into the comprehension monitoring process.

The present study examined comprehension monitoring by employing a methodology which involved the task of thinking aloud during the reading of a piece of narrative text. Experimentation with other types of reading material such as expository or descriptive text might reveal additional strategies. While the same or additional strategies might be found, they may be used more or less with different types of reading materials. Such information would be useful to know.

The present study attempted to utilize as natural a setting as possible in examining comprehension monitoring. The passage itself was natural in the sense

that it was not altered in any way as was often the case in comprehension monitoring studies, especially those based upon the error detection paradigm. The fact that readers were withdrawn individually to a designated room and were asked to read to and talk with an adult whom they had just met, however, indicates that the setting was still far from natural. More research should be conducted in natural environments for young children in order to come even closer to the classroom reality in which children read.

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APPENDICES

APPENDIX A

ORIGINAL READING PASSAGES

Appendix A.

Original Passage #1

Quick Thinking

Text Section 1:	Kevin lived with his parents in a house by the railroad tracks. Kevin's father worked for the railroad.	Setting
Text Section 2:	One day a terrible storm caused a flood. The flood washed away the wooden train bridge near Kevin's house.	Initiating Event
Text Section 3:	Kevin knew that someone would have to stop the train before it got to the bridge. He decided to run to the tracks to warn the engineer.	Internal Response
Text Section 4:	Kevin grabbed a flashlight. He ran toward the tracks.	Attempt
Text Section 5:	He was about four hundred meters away from the railroad tracks. Then he fell down hard. He hurt his left leg.	Obstacle
Text Section 6:	Kevin grabbed the flashlight and he began to blink danger. The engineer saw the light. The train stopped safely before the bridge.	Solution
Text Section 7:	Kevin was very glad that he had helped. The railroad gave him a medal for saving the train.	Reaction

Appendix A

Original Passage #2

Quick Thinking

Text Section 1:	Kate lived with her parents in a house by the railroad tracks. Kate's father worked for the railroad.	Setting
Text Section 2:	One day a terrible storm caused a flood. The flood washed away the wooden train bridge near Kate's house.	Initiating Event
Text Section 3:	Kate knew that someone would have to stop the train before it got to the bridge. She decided to run to the tracks to warn the engineer.	Internal Response
Text Section 4:	Kate grabbed a flashlight. She ran toward the tracks.	Attempt
Text Section 5:	She was about four hundred meters away from the railroad tracks. Then she fell down hard. She hurt her left leg.	Obstacle
Text Section 6:	Kate grabbed the flashlight and she began to blink danger. The engineer saw the light. The train stopped safely before the bridge.	Solution
Text Section 7:	Kate was very glad that she had helped. The railroad gave her a medal for saving the train.	Reaction

APPENDIX B

REVISED READING PASSAGES

Appendix B

Revised Passage #1

Quick Thinking

Text Section 1: — Setting

Kevin lived with his parents in a house located by the railroad tracks. Kevin's father was employed by the railroad company.

Text Section 2: — Initiating Event

One day an unexpected storm caused a flood. The flood washed away the wooden train bridge near Kevin's house.

Text Section 3: — Internal Response

Kevin knew that someone would have to signal the train to stop before it got to the bridge. He decided to run to the tracks to warn the engineer.

Text Section 4: — Attempt

Kevin grabbed a flashlight. He hurried towards the tracks.

Text Section 5: — Obstacle

He was approximately four hundred meters away from the railroad tracks. Then he fell down hard. He injured his left leg.

Text Section 6: — Solution

Kevin reached for the flashlight and began to blink danger. Fortunately, the engineer saw the light. The train stopped safely before the bridge.

Text Section 7: — Reaction

Kevin was very glad that he had helped. The railroad company gave him a medal for preventing a serious train accident.

Appendix B

Revised Passage #2

Quick Thinking

Text Section 1: — Setting

Kate lived with his parents in a house located by the railroad tracks. Kate's father was employed by the railroad company.

Text Section 2: — Initiating Event

One day an unexpected storm caused a flood. The flood washed away the wooden train bridge near Kate's house.

Text Section 3: — Internal Response

Kate knew that someone would have to signal the train to stop before it got to the bridge. She decided to run to the tracks to warn the engineer.

Text Section 4: — Attempt

Kate grabbed a flashlight. She hurried towards the tracks.

Text Section 5: — Obstacle

She was approximately four hundred meters away from the railroad tracks. Then she fell down hard. She injured her left leg.

Text Section 6: — Solution

Kate reached for the flashlight and began to blink danger. Fortunately, the engineer saw the light. The train stopped safely before the bridge.

Text Section 7: — Reaction

Kate was very glad that she had helped. The railroad company gave her a medal for preventing a serious train accident.

APPENDIX C

QUESTIONS USED WITH THINK-ALOUD REPORTS

Appendix C

Questions Used With Think-Aloud Reports

1. Do you have any questions?
2. Did you read anything over again?
3. Did you concentrate on any particular part of the story?
4. Did you imagine (picture) the story in your mind?
5. Is there anything that is not clear to you?
6. Is there anything you had to think about a lot?

APPENDIX D

QUESTIONS FOLLOWING FREE RECALLS

Appendix D

Questions Following Free Recalls

1. Why was it so important to stop the train? What might have happened?
2. What exactly did the engineer do when he saw the blinking light?
3. How did the railroad company find out about what Kate (Kevin) did?
4. Why was the story called "Quick Thinking"?
5. Did everything in the story make sense?