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EXPLORING THE COMPREHENSION MONITORING OF SIX LEARNING

DISABLED STUDENTS

BY

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# ABSTRACT

This research study examined six learning disabled students' ability to monitor their understanding of written discourse through participation in several reading-like activities. Students completed Paris and Jacob's metacognitive questionnaire, the <u>Index of Reading Awareness</u>. Evaluative, planning, conditional and regulative strategy knowledge awareness was examined on the questionnaire. Data was also collected and analyzed from the students' performance on four other tasks: analysis of miscues, comments about miscues, think aloud comments and error detection comments/highlighting. To allow for in depth exploration of each student's comprehension monitoring, the results were examined quantitatively and qualitatively.

Six learning disabled students from a school within the Edmonton Public School Board participated in the study. Students were selected for participation in the study if they were above a grade two or higher reading level and were from ten to twelve years of age. Background information about each student's academic history was collected as well.

Findings revealed that learning disabled students engage in comprehension monitoring. The students in this study were aware when loss of understanding occurred and accordingly, tried to restore understanding through regulative strategies. In fact, all students demonstrated awareness of regulative and evaluative knowledge.

The results also illustrated that similarities and

differences in comprehension monitoring emerged between the students. For example, the students appeared to experience difficulty knowing when to use particular strategies and seemed unsure which strategies were more effective as they appeared somewhat lacking in conditional or planning knowledge awareness. Nevertheless, individual differences also emerged within the data illustrating the complex nature of comprehension monitoring or metacognitive processing.

The information gleaned from this exploratory examination of comprehension monitoring demonstrates that the six learning disabled students in this study were able to monitor their comprehension. The findings emphasize that educators and researchers acknowledge the unique ways in which individual students monitor their understanding of written discourse.

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CHAPTER ONE


INTRODUCTION


Being able to read and write, being literate, is one of
the demands of our society. Schools as societal agents are
expected to produce students who are able to read
effectively and thus, compete in today's rapidly changing
society. In order to be competent readers, children must be
able to construct meaning from written materials. The
ability to construct meaning from written discourse is
referred to as comprehension, the core of reading.
Successful reading comprehension is critical "since,
performance in reading affects other curriculum areas. [and]
school success is determined to a large degree by students'
success in reading comprehension and their ability to
effectively apply reading processes" (Shapka, 1990, 2).
Hence, understanding how readers comprehend information is
of utmost interest to both educators and researchers.

Reading comprehension is an extremely complex process
to examine because individuals construct meaning in highly
unique ways as they orchestrate different strategies in
their reading repertoire. There appear to be three distinct
theories of how people read and these same theories relate
to how readers comprehend information. Across models, the
role of the reader in the reading process varies. The three
distinct views of the reading process are: 1) text-based or

bottom up, 2) knowledge-based or top down, and 3) theories which draw from both of these positions--the interactionist view.

Advocates of text-based or bottom up views believe that the page or text brings more information to the reader than the reader brings to the text. Advocates of the knowledge-based or top down approach view the role of prior knowledge as being crucial to the total comprehension process as the reader brings more information to the text than the text to the reader. In the knowledge-based or top down view of reading, the comprehension process is deemed as occurring first and the identification of words as occurring second.

At present, much of the literature reflects an interactionist perspective, a model that draws from both the text-based/bottom up and knowledge-based/top down perspectives. The interactive model is based on a computerized language processing model where there are no fixed steps or stages through which a reader has to progress. Many researchers (i.e., Dole et al., 1991; Fagan, 1987; Pearson et al., 1990) see the interactive model as the model of choice because children are acknowledged as being active participants in the reading process. Lipson and Wixson (1991) concur and emphasize that the student's knowledge and control of the reading process itself is fundamental to reading in general. Much of the current research on reading comprehension is being conducted from an

interactive perspective where the child's cognitive involvement is considered to be a critical component of the reading process. At the same time, instructional emphasis has shifted from a skills-based approach to one where the processes involved in reading are viewed as important and worthy of study. The comments of Pearson et al. (1990) sum up the current direction of reading research and instruction:

> This new understanding has led to a different view of comprehension and an accompanying shift in our views how to teach it. We no longer think of reading comprehension as a series of discrete skills that can be summed up to achieve comprehension ability. Instead we see comprehension as a complex process involving interactions between readers and texts in various contexts for various purposes. (p. 2)

The students' awareness of the reading process as well as the strategies or processes proficient readers use to construct and monitor meaning is the focus of much of the research. Today many researchers interested in improving reading comprehension instruction and children's ability to comprehend written discourse are focusing on cognitive processes as a way to achieve these goals (i.e., Baker and Brown 1984; Jacobs and Paris, 1987). Two particular areas that tend to dominate much of the current reading comprehension research is "the work done by developmental

psychologists with children in the area of metacognition, and the work done by information-processing cognitive psychologists with adults in the area of executive control" (Garner, 1987, p.15). Thus, cognitive research is viewed as the "new domain of inquiry" as researchers draw upon the interactive perspective to study the cognitive processes of skilled and poor readers (Baker and Anderson, 1982, p. 282).

Yussen (1985) defines metacognition as "that body of knowledge and understanding that reflects on cognition itself. Put another way, metacognition is the mental activity for which other mental states or processes become the object of reflection" (p. 253). From this perspective, metacognition refers to a person's awareness of his/her own cognitive processes as well as the ability to reflect on the results or purpose of the thinking act itself. According to Flavell (1978, cited in Yussen, 1985) the learners act on the basis of their own understanding of the reading process, an understanding, gleaned from past instructional experiences and their own development. Basically, metacognition refers to the learner's knowledge about his/her thinking processes and learning experiences.

The second area of focus, executive control processes, is drawn from a computer processing model where the ability to solve problems and manipulate the amount of information stored and retrieved is emphasized. Garner (1987) reports that "Whereas researchers in metacognition emphasize the

knowledge learners bring or fail to bring to learning situations, researchers of executive control emphasize the control learners bring or do not bring, the success or failure at 'orchestrating' (Cavanaugh and Perlmutter, 1982), knowledge" (Garner, 1987, p. 24).

Even though the two lines of research, metacognition and executive processes, have different ancestry and use different terms to explain similar functions, there is a great deal of overlap between the two areas. Both emphasize the role of the active learner or cognitive awareness and both acknowledge the presence of "production deficiencies, that is, children's failures to use strategies spontaneously when appropriate, but ability to use them effectively when explicitly directed to do so" (Garner, 1987, p. 24).

Comprehension monitoring, a critical component of reading, is directly related to both metacognition and executive processes research. Myers (1991) believes that comprehension monitoring is vital to reading in general because "most of the cognitive activities involved in reading have as their primary objective successful comprehension, [and] a large part of cognitive monitoring in reading is virtually comprehension monitoring, or metacomprehension" (p. 259). Thus, comprehension monitoring is the ability to metacognitively oversee the reading process to determine if comprehension is occurring; as well, comprehension monitoring encompasses the incorporation of

possible fix-up strategies, executive processes, used solely
to restore meaning loss.

Much of the research on comprehension monitoring has
discovered that good readers monitor their information
processing and are metacognitively aware of the reading
process in general (i.e., Baker and Brown, 1984; Garner,
1980). On the other hand, poor readers and learning
disabled readers are often believed to suffer from a
production deficit because the students' "psychological
processes are intact, while their passive approach to
learning impedes their ability to execute the appropriate
strategies" (Thomas, 1984, p.2). As well, research has
shown that poor readers and learning disabled readers
experience difficulty monitoring their comprehension and are
often unaware of the reading process itself (ie., Chan and
Cole, 1986; Johns, 1980). Hence, poor readers and learning
disabled readers may be unaware that meaning loss has
occurred; consequently, they are unable to activate
corrective strategies because they have not yet realized a
problem has occurred. On the other hand, research by Boss
and Filip (1984) indicates that learning disabled students
are capable of engaging in comprehension monitoring if they
are provided with instruction on strategy use. As well,
Wong (1985, cited in Forrest-Pressley, MacKinnon and Waller)
found that "brief training on using a task-appropriate
strategy in aid of learning typically resulted in

substantially improved performance improvements in LD
children" (p. 155).

## Purpose of the Study

The purpose of this research was to investigate
elementary learning disabled students' comprehension
monitoring as they participated in oral and silent reading
activities. The children were interviewed and observed as
they engaged in reading activities that required them to
monitor and regulate their understanding of written
discourse. The questions which were addressed are as
follows:

1.  What do learning disabled children know about
    their comprehension monitoring?

2.  How do learning disabled children monitor their
    oral reading miscues when reading material at
    their instructional level?

3.  What do learning disabled readers do to help
    maintain understanding when they are faced with a
    problem in silent reading comprehension?

## Definition of Terms

Definitions of terms most important to this study are
as follows:

Reading Comprehension. Reading comprehension refers to the reader's ability to effectively understand written discourse. Basically, comprehension is considered to be the goal of all communication.

Metacognition. Metacognition has been defined by many, but still remains a rather fuzzy concept to define. Nevertheless, all definitions emphasize that metacognition involves "thinking about thinking", awareness of what one is thinking, and monitoring or regulating thinking to restore and maintain meaning (Babbs and Moe, 1983, p. 423).

Comprehension Monitoring. Bos and Filip (1984) define comprehension monitoring as "the evaluation and regulation of one's ongoing comprehension process" (p. 229).

Executive Control Processes. Executive control processes are believed to be self-control mechanisms that the reader uses to regulate/control the reading activity. "They involve the application of knowledge into actions and include evaluating the effectiveness of the individual's own comprehension, selecting appropriate strategies, regulating the effectiveness of these strategies and repeating these strategies as necessary when reading" (McGuire, 1991, p. 9).

Miscues. Any divergence that a reader makes from the text when engaged in oral reading is deemed as a miscue.

Learning Disabled. There are many definitions of learning disabilities, but the one used in this study is that adopted by Edmonton Public Schools. Edmonton Public Schools

considers students to be learning disabled if they
demonstrate:

> severe delays in academic functioning and are expected
> to be successful after two years of programming in a
> district learning disabilities class. Eligibility for
> this categories [sic] includes average or above average
> intellectual ability (I. Q. 100 +) and a delay of two
> or more years (or **below the 10th percentile**) in more
> than one of: reading comprehension, reading decoding,
> written language, spelling, mathematics concepts or
> applications. There must be evidence that the
> academic delay is not due to lack of schooling,
> behaviour disorder, sensory or physical handicap,
> English as a second language, cultural deprivation, or
> instruction in more than one language (Edmonton Public
> Schools 1992-1993 Criteria, p. 58).

## Assumptions

1. Student's oral reading miscues will help to provide
   information about each student's monitoring abilities.
2. Think aloud reports will provide clues about how
   learning disabled students' monitor their understanding
   of written discourse when engaged in silent reading.
3. By synthesizing oral and silent reading data, a more
   complete picture of each learning disabled student's

metacognitive awareness and comprehension monitoring can be achieved.

## Delimitations

1. The Edmonton Public Schools criteria for learning disabilities classification was used as the basis for selecting students to participate in the study. Students in year one or two of the learning disabilities program were considered for inclusion.

2. Students in the study were from a district class, aged ten to twelve and had at least a grade two reading level.

3. Only narrative passages were employed in this study.

## Significance of the Study

The study examined the comprehension ability of learning disabled students in both oral/ silent modes and added a preliminary understanding to the literature of how some learning disabled students monitor their comprehension across different tasks. As prior studies (ie. Beebe, 1980; Daniluk, 1991; Thomas, 1984) only addressed one mode of reading, it was anticipated that an examination of both reading modes would provide a more complete u: derstanding of learning disabled children's comprehension monitoring. Garner and Anderson (1982) share this view as they

recommended that assessing comprehension through varied tasks, across different modes, helps to provide a better understanding of the reading process.

Determining how the participants monitor their comprehension also provides the classroom teacher with more precise information, which may lead to more effective remedial program planning. Research by Wittrock (1987) has stressed that assessment measures which focus on processes rather than products are more successful when examining how children comprehend information. Work by Paris and Jacobs (1984) also emphasizes that assessment measures must be in line with the task at hand as they discovered that traditional reading tests were inadequate for assessing metacognitive processes.

The current study uses a descriptive and holistic approach to provide fellow teachers with more insight into the comprehension processes of learning disabled students. Even though "comprehension monitoring is no panacea for reading difficulties, it may offer new ways of thinking about or presenting comprehension techniques to students" (Pitts, 1983, p. 522). The results of this study, therefore, add to the current literature on learning disabled students' comprehension monitoring.

The individual assessment measures or combinations of measures used in this study may reveal new insights into comprehension processes assessment. In addition,

modifications to the monitoring measures used in this study may help facilitate the development of other measures to use in process assessment.

## Overview of the Thesis

Chapter one, the present chapter, contains the introduction and purpose of the study, definition of terms and the research questions that guide the study. The assumptions, delimitations and significance of the study are also presented.

A review of the related literature and research is presented in chapter two. The review is divided into four sections and begins with an overview of theoretical models of reading. Second, an introduction to some of the work of three prominent researchers in the field will be presented. The third section reviews the research techniques used in prior studies which addressed similar problems. The last section examines some of the research on metacognitive awareness, comprehension monitoring/regulating and teacher training studies.

In chapter three, the research design utilized in the study is discussed. This chapter also includes information on an earlier pilot study, the sample selection, research instruments and the general procedures used in the study. As well, detailed information on the methods used to analyze and code the students' responses for the <u>Index of Reading</u>

<u>Awareness</u>, the miscue analysis/oral reading, the think aloud task and the error detection task are provided.

Chapter four contains the findings of the study. Results are presented in the form of six individual case studies for each of the learning disabled students. A comparison of the students' comprehension monitoring and strategy awareness across the different tasks, in relation to the research questions posed follows.

A brief summary is presented in the final chapter, chapter five. As well, the major findings, limitations, implications of the study and recommendations for future research are proposed.

CHAPTER TWO

REVIEW OF THE LITERATURE

In this chapter, a brief review of reading models is
ir ded to provide a theoretical framework for the study.
T. eview of the related literature will then include three
theorist's views on the construct of metacognition and
reading, followed by a selective review of studies which
incorporate a variety of investigation techniques, such as
the use of interviews, miscue analysis, an error detection
paradigm, and a think aloud technique, in the investigation
of metacognition and comprehension monitoring. Next, a
discussion of some of the major studies will be presented.
The latter section will be sub-divided into the following
three subsections: studies with primarily a metacognitive
focus, studies which emphasize comprehension
monitoring/regulation and lastly, studies which focus on the
teacher variable in metacognitive awareness or comprehension
monitoring.

Reading Comprehension Theories

Text-Based or Bottom Up View of Reading

Advocates of the text-based or bottom up view of
reading believe that the page or text brings more
information to the reader than the reader brings to the

text. LaBerge and Samuels (1974, cited in Duffy and Roehler, 1989), advocates of the text-based or bottom up view, stress that the reader selectively attends to specific details which are actually components of four stages connected by a feedback loop. Visual memory, the first stage of information processing, requires the eye to act as a receiver. This receiver, the eye, transmits information to the brain where it is processed for use in word recognition or alphabet recognition. The second stage involves the use of phonologic memory where sounds are mapped according to acoustic and articulatory features. Next, semantic memory functions to help the subject assimilate meaning acquired from the two previous stages of development. Episodic memory is last. This memory is considered optional as it serves as an extra feature which can be accessed if there is difficulty in any of the other stages. In their view (Laberge and Samuels, 1974, cited in Duffy and Roehler, 1989), reading is considered to be "a serial acquisition of skills that are testable, sequential, and teachable" (p. 121). They emphasize as do other bottom up theorists that "meaning" is found in the text.

Lipson and Wixson (1991) report that all bottom up or text based models of reading contain the following elements:

- reading is primarily a perceptual process;
- meaning resides in the text;
- processing proceeds from part to whole (i.e.,

smallest to largest units of processing); and

- model is consistent with skills-based approaches to instruction. (p. 8)

Basically, the reader approaches the task sequentially and brings very little of his/her own information to the text.

## Knowledge-Based or Top Down View of Reading

Advocates of the knowledge-based or top down approach view the role of prior knowledge as being crucial to the total comprehension process as the reader brings more information to the text then the text to the reader. The comprehension process is viewed as occurring first and the identification of words as occurring second. Advocates of this view stress that words can't be articulated until they are understood in context. Smith (1978, cited in Duffy and Roehler, 1989), emphasizes the role of past experiences when he reports that "nonvisual information" or a previous familiarity with the manner in which words connect to form meaning" helps the reader to comprehend information more readily (p. 123). Hence, material which contains words and content familiar to the reader will be comprehended faster.

Lipson and Wixson (1991) outline the important characteristics of top down or knowledge-based reading models as follows:

- reading is a language process;
- meaning resides in reader;

- processing proceeds from whole to part (i.e., from the largest to the smallest units); and

- model is consistent with whole language approaches to instruction. (p. 10)

From the top down or knowledge-based view of reading comprehension, meaning resides in the minds of the readers as they draw upon background knowledge to construct meaning.

## Interactive View of Reading

The interactive theory of reading is based on a computerized language processing model where there are no fixed steps or stages that a reader has to progress through. Rumelhart (1978) visualizes the reader as a message center being inundated with incoming information from various sources. The information is synthesized simultaneously causing the reader to "generate hypotheses or expectations about what is being read" (Duffy and Roehler, 1989, p. 121). Hypotheses are constantly being made and revised as new information from the various sources change as it is added to the central message center. That is precisely why the interactive approach is seen as involving both top-down and bottom-up processes. This model allows readers to enter at any point and simultaneously draw information from text and prior experiences.

The interactionist view of reading is cognitive because it maintains that readers are mentally aware as they

construct meaning in the reading process. Dole et al. (1991) reports that "whereas traditional views conceptualized reading as a set of discrete skills to be mastered, cognitively based views suggest a more holistic view of reading" (p. 244). Basically, when looking at the reading process from an interactive perspective, the construction of meaning occurs when the reader combines his/her own knowledge with that of the text. Myers (1991) concurs that the construction of meaning is an interactive process as she reports that "researchers define comprehension as a constructive process during which the reader creates meaning from a transaction/interaction among selected information, the context of the information and the reader's existing knowledge schemata" (p. 258).

The critical features of the interactive reading model have also been identified by Lipson and Wixson (1991) and are listed as follows:

- reading is a cognitive process;
- meaning results from the interaction of the reader and text;
- processing proceeds from part to whole and whole to part; and
- different emphasises in instruction are appropriate at different times. (p. 12)

At this time, the interactive model is considered to be the model of choice by most teachers and researchers because

reading is viewed as being a dynamic cognitive interplay between the reader, the text and the context in which the reading is occurring (Lipson and Wixson, 1991). Because the interactive model is cognitive in orientation much of the current research in reading focuses on cognitive monitoring or metacognition.

## Metacognition

Metacognition is a term often used to describe the knowledge or awareness children have about their own learning or thinking. Complete agreement on the nature of metacognition has yet to be achieved. At this time, metacognition is considered to be an open construct for the following reasons: 1) it is extremely difficult to define and 2) clear boundaries that succinctly outline what is included and what is excluded have yet to be resolved. Flavell, Paris and Jacobs and Brown, Armbruster and Baker's views about the construct of metacognition will be explored to help provide a framework for understanding the nature of metacognition in reading comprehension.

## Flavell's View

Flavell (1979 and 1981) broke down metacognition into four central components: metacognitive knowledge, metacognitive experience, cognitive goals, and cognitive

actions. He defined metacognitive knowledge as "the part of one's acquired world knowledge that has to do with cognitive (or perhaps better, psychological) matters" (Flavell, 1979, 1981, cited in Weinert and Kluwe, 1987, p. 21). Metacognitive knowledge was divided into three separate components: person variables, task variables and strategy variables. McGuire (1991) defined the three elements of metacognitive knowledge as follows:

> Person variables or the knowledge of learner characteristics involves the awareness or knowledge of the individual's own ability, the individual's familiarity with the material and the ways in which characteristics affect learning.

> Task variables include awareness and consideration of the specific features of the reading passage that influence comprehension as well as an awareness of the purposes of reading.

> Strategy variables include the awareness of strategies and thinking processes that readers engage in to understand the text. (p. 16)

Metacognitive experiences are defined as "conscious experiences that are cognitive and affective" (Flavell, 1979, 1989, cited in Weinert and Kluwe, 1987, p. 24). As well, Flavell (1979) believes that metacognitive experiences

play a significant role in everyday life and are basically part of our intellectual life. In his view, even young children can have metacognitive experiences; however, they may have difficulty interpreting them well.

Cognitive goals refer to those implicit and explicit goals that serve to direct the reading process. The kinds of goals vary with each reading activity as they can have "no apparent goal (e.g., daydreaming) to a less clearly defined goal (e.g., reading for pleasure) to an explicitly defined goal (e.g., reading for the main idea in preparation for an exam)" (Flavell, 1981 cited in Shapka, p. 20, 1990).

Metacognitive strategies or actions refer to the implementation of specific cognitive strategies or behaviours to achieve the desired goal or task. Flavell (1976 cited in Weinert and Kluwe, 1987) provides an example of cognitive and metacognitive strategies as he states: "Asking yourself questions about the chapter might function either to improve your knowledge (a cognitive function) or to monitor it (a metacognitive function)" (p. 66). Another helpful example presented by Flavell (1981 cited in Weinert and Kluwe, 1987) follows: "sometimes one reads things slowly simply to learn the content (cognitive strategy); other times ones reads through things quickly to get an idea of how difficult or easy it is going to be to learn the content (metacognitive strategy)" (p. 23).

## Paris and Jacob's View

Paris and Jacobs have conducted a great deal of research in the area of metacognition. They believe that metacognition is characterized by two broad categories: "self-appraisal of cognition" and "self-management of thinking" (Jacobs and Paris, 1987, p. 258). Self-appraisal can be broken down further into three knowledge components-- declarative, procedural and conditional knowledge. These components allow the readers to appraise the task and consider which strategies should be used to reach their goal or task. Jacobs and Paris (1987) define the three knowledge elements as follows:

> Declarative knowledge refers to what is known in a propositional manner. For example, a student might know that topic familiarity and prior knowledge influence reading speed and comprehension or that rereading facilitates memory.

> Conditional knowledge refers to an awareness of the conditions that influence learning such as **why** strategies are effective, **when** they should be applied and **when** they are appropriate. For example, students can become aware of the value of periodic paraphrasing as a means of monitoring comprehension, yet they also need to realize that paraphrasing is a strategy used selectively for some purposes with some kinds of texts.

Procedural knowledge refers to an awareness of

processes of thinking. For example, a student could

know how to skim, how to use context, how to underline,

how to summarize, or how to find the main idea while

reading. (p. 259)

Self-management of thinking is viewed as being a self-

regulated component which exerts executive control of

behaviour. This component blends both knowledge or

awareness with action in order to achieve task completion.

The self-management of thinking or regulation component is

made up of the following: planning, evaluation, and

regulation. Jacobs and Paris (1987) define the three self-

management components as follows:

Planning refers to the selective coordination of a

cognitive means to a cognitive goal. For example,

proficient readers adjust their rate of reading and

standards of comprehension.


Evaluation is the second dimension of self management.

For example, readers can evaluate their own

understanding as they pause, paraphrase, answer

questions or summarize information in text.


Regulation is the third aspect of self management.

Self-managed thinking requires an individual to monitor

progress and then revise or modify plans and strategies

depending on how well they are working. (p. 259)

After examining the work of Paris and Jacobs it appears

that, in their view, metacognition should not be assumed or

inferred, but rather should be observable and overt.


## Brown, Armbruster and Baker's Views

Ann Brown has contributed much to defining and

describing metacognition more explicitly. Working together

with her colleagues, a definition of metacognition in

reading has been formed:

> Metacognition in reading refers to one's understanding
>
> of the reading process. This understanding is revealed
>
> in two ways. First, understanding involves the
>
> reader's knowledge of the nature of reading: the
>
> purposes and goals of reading; the various factors that
>
> influence reading; and the what, how, when, and why of
>
> strategy usage in reading. Second, readers'
>
> understanding is reflected in the control they have of
>
> their actions while reading for different purposes.
>
> Active readers monitor their own state of learning,
>
> plan strategies, adjust efforts appropriately, and
>
> evaluate the success of their ongoing efforts to
>
> understand. (Brown, Armbruster and Baker, 1986, cited
>
> in Lipson and Wixson, 1991, p. 16)

From their definition, it is apparent that metacognition can
actually be broken down into two components, the knowledge
the reader has about cognition and the ability of the reader
to regulate or control cognitions. Ann Brown refers to
these two components as being either static or strategic
metacognitive knowledge. Static knowledge is the knowledge
the reader has about cognition, the verbal comments that
people make about their own cognition. Strategic knowledge
refers to the procedures or the ability of the reader to
effectively regulate or restore cognitive activity while
engaged in the reading act. It is apparent to Brown that
there are many strategies involved in reading as all
students try to resolve difficulties in unique ways.
Nevertheless, Brown (1984) feels that the following
metacognitive skills or strategies are very important in
reading:

> (a) clarifying the purposes of reading, that is,
> understanding both the explicit and implicit task
> demands; (b) identifying the important aspects of a
> message; (c) focusing attention on the major content
> rather than trivia; (d) monitoring ongoing activities
> to determine whether comprehension is occurring; (e)
> engaging in self-questioning to determine whether goals
> are being achieved; and (f) taking corrective action
> when failures in comprehension are detected. (Brown,
> 1980 cited in Baker and Brown, 1984, p. 354)

These metacognitive skills or strategies are believed to be executive processes.

## Summary

By examining some of the key concepts in metacognitive definitions, several common areas of focus emerge. First, students' awareness of their own cognitions plays a part in reading. Flavell's metacognitive knowledge, Paris and Jacob's conscious awareness of cognitive states and Brown, Baker and Armbruster's understanding of the reading process all illustrate this point. Second, it appears that the reader's ability to cognitively monitor his/her own reading basically refers to the reader's ability to monitor his/her understanding of written discourse. Hence, when cognitive monitoring is associated with reading activities it is referred to as comprehension monitoring or metacomprehension. It is this ability to keep track of the success or failure of one's mental processes and consequent shifting of gears when meaning is lost, that is of interest. Thus, comprehension monitoring, a crucial component of metacognition, will be examined next.

## Comprehension Monitoring

Comprehension monitoring is believed to be the ability to metacognitively oversee the reading process to determine

if comprehension is occurring. Bos and Filip (1984) define comprehension monitoring as "the evaluation and regulation of one's ongoing comprehension process" (p. 229). In addition, Wagoner's (1983) definition helps to illustrate the interrelatedness between metacognition, executive processes and comprehension:

> Comprehension monitoring is defined as a metacognitive process which is affected by person, strategy and task variables. It is viewed as an executive function, essential for component reading, which directs the reader's cognitive process as he/she strives to make sense of incoming textual information. (p.328)

By examining the two definitions, it appears that comprehension monitoring focuses on the following: 1) awareness of mental processes, 2) the ability to monitor one's reading to determine if meaning loss has occurred, 3) the ability to monitor one's reading to determine if meaning construction is occurring and 4) the execution of mental processes, in the form of remedial strategies, to restore any occurrences of meaning loss.

## Assessment Techniques Used in Metacognition and Comprehension Monitoring Research

Several assessment techniques have been used to gather information about the different components of comprehension monitoring. Miscue analysis, interviews and the error

detection paradigm are just a few of the techniques referred to in the literature. The techniques used to study students' comprehension monitoring and the results obtained will be briefly examined next.

## Miscue Analysis

Miscue analysis, a term used to refer to oral reading errors, was originally brought into focus by Kenneth and Yetta Goodman. Kenneth Goodman (1977, cited in Wixson and Lipson 1991), states that miscues serve as a "window on the reading process" as they provide clues to how readers use the graphophonic, syntactic and semantic language systems to process information (p.188).

Like Goodman (1970), Beebe (1980), Clay (1979) and Paris and Meyers (1981) also studied children's comprehension monitoring through the a. .ysis of oral reading miscues. Beebe (1980) discovered that "corrections and acceptable miscues were important common predictors of reading comprehension and retelling ability" (p. 324); as well, she concluded that oral reading miscues were an "effective way of inferring what kinds of miscues may occur during silent reading" (p. 335).

Clay (1979) developed the concept of running records to assess children's oral reading miscues. She found that by keeping a written account of children's errors during reading much could be learned. Like Clay (1979) and Beebe

(1980), Devine (1986) concurred that miscue analysis provides crucial information on how readers process information and demonstrate strategy usage during oral reading.

Paris and Meyers (1981) examined the ability of good and poor readers to correct reading errors spontaneously and through a more direct approach. They reported that the "intent to monitor was present yet poor readers did not evaluate the comprehensibility of the stories as accuratly as good readers" (p. 12). They concluded that poor readers may have encountered difficulties because they appeared to direct their attention towards decoding rather than constructing meaning. Similar results were reported by Di Vesta, Hayward and Orlando (1979) as they found that "growth in comprehension may be a function of the way the pupil processes text"; hence, students' views about the reading process itself influences how meaning is constructed from the text (p. 103).

Lipson and Wixson (1991) report that there have been criticisms raised against miscue analysis and acknowledge that results achieved through miscue analysis should be interpreted with caution. The following comments found in Lipson and Wixson (1991) illustrate some of the concerns:

Miscues should be interpreted with caution, however, because there is evidence that patterns vary as a result of the complex interaction among factors such as

the instructional method; the readers background,
skills and purpose for reading; and the specific nature
of the written material. As with any test, miscue
analysis provides a sample of behaviour that may or may
not be representative of the way a student interacts
with different types of texts under different reading
conditions. (p. 190)

As well, Lipson and Wixson (1991) and Devine (1986)
recognize that the primary concern with miscue analysis is
that the procedure itself is very complex and time
consuming. However, they both concur that when miscue
analysis is used properly it can provide useful information
in regards to how students process information.


## Oral Report Measures


Studies which rely primarily on oral reporting methods
like introspection, retrospection and oral interviews will
be examined under the heading oral report measures.
Olshavsky's (1976-1977) study on the investigation of
reading strategies is referred to often in the oral report
literature as she used three techniques--introspection,
retrospection and protocol analysis--to examine students'
mental processes in silent reading. Olshavsky (1976-1977)
concluded that identifying strategies "on the basis of what
the subject can verbalize about his behaviour" can reveal
strategies that could not be uncovered through miscue

analysis as "miscue analysis identifies strategies only from patterns of reader's miscues" (p. 673). Alverman (1984), Bereiter and Bird (1985) and Wade (1990) all acknowledged Olshavsky's (1976-1977) assessment techniques as noteworthy. In fact, Wade (1990) devised an assessment measure, similar to the technique used by Olshavsky's (1976-1977), to meet the demands of present day process assessment.

Another variation of the oral report measures was suggested by Garner (1982) and Hare and Smith (1982). They found that a retrospective approach can be used to effectively uncover information on cognitive processes with some measure of success and does not interrupt the ongoing reading process.

Meyers and Paris (1978) and Paris and Jacobs (1984) used oral interviews as a method of obtaining information about the ongoing reading process. They discovered that "beginning readers have a limited understanding of reading as a cognitive activity and certainly could profit from instruction regarding the means, goals, and parameters of proficient reading" (p. 690). Work by Wixson, Bosky, Yachum and Alverman (1984) also produced similar findings.

Oral reporting measures have been criticised as being unreliable data sources (Garner, 1987; Pace et. al., 1985) because it is difficult to determine if what a student says he/she does is what actually occurs. In addition, for those students "who are less capable of thinking about their own

thinking and reporting on it, the think aloud may underestimate their knowledge and abilities" (Garner, 1987, cited in Wade, 1990, p. 450).

## The Error Detection Paradigm

The error detection technique consists of embedding errors within written or spoken discourse for students to detect. Those students who are unsuccessful in detecting errors are usually provided with a succession of cues to help them, which in turn, provides the researcher with information as to why the student was unable to detect the errors in the first case.

Markman's (1979) research investigated third, fifth and sixth grade students' ability to detect explicit or implicit informational inconsistencies in short essays that were read to them. Half of the students in the study were warned that the information contained some confusing or tricky problems, in order to determine if alerting the students to difficulties prior to the researcher reading the material would enable them to detect inconsistencies more effectively. Results demonstrated that few third grade students could detect the inconsistencies, but most sixth grade students who were informed that there were possible errors within the text were able to locate the problems. Therefore, the results indicated that there were developmental differences in comprehension processing

between younger and older students. Furthermore, informing sixth grade students about the possibility of errors within the text improved their ability to monitor their comprehension.

Baker (1979) had college students read several passages containing errors and informed the students directly after they had completed reading the passage that inconsistencies were present in the passages. Then the students were asked to indicate which segments of the text contained a problem. The results demonstrated that "failure to report a confusion is not in itself a sensitive index of comprehension monitoring because subjects often made inferences to resolve the confusions without realizing they had done so" (Baker, 1979, p. 19). Therefore, simply determining whether a student has located an error or not in a given passage is not sufficient; more information must be obtained about the student's understanding of the error itself (Baker, 1979).

Garner (1980) conducted several studies which made use of the error detection paradigm. She discovered that good readers noticed inconsistencies within text, but poor readers did not. She concluded that poor readers may not have an adequate schematic basis to interpret the text. In a later study, Garner (1981) proposed that poor comprehenders processed information in a piecemeal fashion which resulted in deficient meaning construction as their

focus was directed primarily to word identification rather than comprehension.

Later studies tended to incorporate the use of prompts or probes to determine if readers could be cued to demonstrate monitoring behaviour. Gambrell and Bales (1984) used induced imagery as a means of helping students uncover inconsistencies in text with success. They discovered that when poor readers experienced difficulty, they did not spontaneously use mental imagery to facilitate comprehension monitoring. However, when poor readers were "specifically directed to induce mental imagery, the majority of the poor readers (70%) reported that they did so, and they performed significantly better at the comprehension-monitoring task than did the control group" (Gambrell and Bales, 1986, p. 461). Bos and Filip's (1984) results were similar to those of Gambrell and Bales (1984) as they reported that "when the LD students were specifically cued to look for text inconsistencies, i.e., directed to use comprehension monitoring strategies, they were able to activate these strategies and detect the confusion" (p. 231). The work of Chan, Cole and Barfett (1987) also supports that of Bos and Filip (1984) and Gambrell and Bales (1984), as they reported that providing students with explicit instruction and training in detecting textual inconsistencies is a successful manner in which to teach children how to monitor their comprehension.

Nevertheless, Winograd and Johnson (1979) outlined several criticisms against the use of the error detection paradigm in monitoring research. In their view, the error detection paradigm falls short in the following areas:

1. Determining why subjects do not overtly respond to the presence of errors in the text.

2. Determining which criteria for comprehension subjects have chosen to apply.

3. Adequately specifying the kind, magnitude, and placement of the target errors.

4. Over relying on the use of probes as the dependent measure.

5. Determining the accuracy of subjects' verbal reports about their own cognitive processes.

   (p. 73)

Other researchers (McLain, 1991; Garner, 1987) have raised similar concerns. However, McLain (1991) points out that, in general, the over-riding concern is to work towards better assessment instruments for measuring cognitive processes. Paris, Wasik and Turner (1991, cited in Barr et al., 1991) concur and recommend that one way to get over the assessment hurdle, in the examination of cognitive processes, is to use a "rich variety of formal and informal assessment techniques...that are aligned with a revised curriculum and new instructional objectives" (p. 634).

## Summary of Monitoring Assessment Measures

From the literature review of data collection methods, it is evident that researchers have focused their data collection on two key areas: 1) gathering information about students' understanding of the reading process and 2) gathering information about students' ability to monitor or regulate their understanding of written discourse. It appears that one must be aware that there is more than one method for data collection when examining comprehension monitoring. Therefore, the researcher should try to observe the child as he/she is actively engaged in monitoring/regulating or meaning making while reading. In addition, seeking information from the child about his/her processing may also help the researcher to understand how the child perceives and monitors his/her understanding of the reading process. Basically, if one is to obtain an accurate understanding of the comprehension monitoring process, a variety of assessment measures must be used.

## Review of Metacognitive Awareness and Comprehension Monitoring Studies

In the next section of the literature review, several studies are reviewed to help highlight some of the key issues dealt with in the metacognitive and comprehension monitoring research. The studies have been divided into

three categories: studies which focus primarily on metacognitive awareness, studies which address comprehension monitoring or regulation, and lastly, studies which focus on the teacher variable in metacognitive awareness or comprehension monitoring.

## Studies Which Focus on Metacognitive Awareness

Myers and Paris (1978) presented twenty second and sixth grade students with a set of eight standardized interview questions which addressed the person, task and strategy variables involved in reading. They discovered that there were significant differences between the second and sixth grade students. The second grade children differed from sixth graders in the following ways: 1) they were unable to recognize that particular tasks or materials require specific strategies, 2) they were unfamiliar with the characteristics of effective readers, 3) they did not actively engage in comprehension monitoring and lastly, 4) they were not attuned to "specific semantic features such as sequencing or common topics" (Meyers and Paris, 1978, p. 688). On the other hand, the sixth grade students were more aware of the structural cues related to meaning found in paragraphs and recognized that different strategies could be used to maintain their understanding of the text. As well, Myers and Paris (1978) indicated that the actual teaching of reading skills can be "embedded in a cognitive framework and

be directly related to children's developing appreciation of a variety of metacognitive knowledge" (Meyers and Paris, 1978, p. 689).

Pace (1980) examined kindergartners' and second graders' ability to recognize and regulate comprehension errors by their ability to correct comprehension errors spontaneously or make requests to hear the story again (use of a relistening strategy). Both sets of students were read a story about a topic that they were unfamiliar with and then were required to answer a set of questions. The questions themselves ' ther assessed information contained within a single sentr· . required the referent of a word, or depended on the in. .tion of information across sentences" (Pace, 1980, p. 3). Pace (1980) discovered that simply being aware of a regulation strategy did not appear to offer advantages to younger students as those kindergarten children who requested that the passage be read again still "performed no better than the others" who had not requested that a passage be reread to them (Pace, 1980, p. 10). Overall, performance appeared to be affected by the type of questions that were asked as fewer than one fourth of the kindergarten children were able to correctly answer questions that required them to integrate information across sentences. In fact, it appeared that the younger students found questions that focused on the "correct referent of a word, either a pronoun ("it") or synonymous noun", easier to

understand (Pace, 1980, p. 11). On the other hand, second grade students demonstrated greater success with questions which required the integration of information across sentences. Pace (1980) concluded, like Meyers and Paris (1978), that it was possible that student's awareness levels may have been related to development or schooling itself.

Johns' (1980) investigated children's concepts about print by using Clay's Concepts About Print test to examine students at different reading levels who had completed a year of reading instruction. Sixty students were selected for the study. The students were then divided into three groups upon the basis of their achievement on three tests-- the Metropolitan Reading Survey Test, the Metropolitan Achievement Test or the Gates MacGinitie test and a basal reader placement test. Johns (1980) results ("above-average readers have a greater understanding of print-related concepts than below average readers") (p. 547) were similar to those of Meyers and Paris (1978) who discovered that older students were more aware of the different reading strategies used to increase understanding of written discourse.

Garner (1980), like Johns (1980), focused on comparing good readers and poor readers. She investigated monitoring skill differences of good and poor readers by asking fifteen good readers and fifteen poor readers to read passages that contained informational inconsistencies and passages that

were informationally consistent. Students were required to check one of the following choices after they had completed reading the passages:

☐ This part was very easy to understand.

☐ This part was ok.

☐ This part was difficult to understand (Garner, 1980, p. 58).

Next, the students were required to explain why they had checked a particular answer. The results indicated that good readers were more aware when the passages contained inconsistent information or when passages were easy to understand. Poor readers, in contrast, "made little rating distinction across the segments containing material intended to be either consistent or inconsistent with passage gist" (Garner, 1980, p. 61). Garner (1980) felt that the reason poor students were more aware of the "structure and referential meaning within the sentence" rather than across sentences was because the students directed their focus towards individual sentences rather than integrating information from several sentences (p. 62).

Paris and Jacobs (1984) examined the relationship between "children's reported awareness and their actual reading achievement"; as well, training children to use and understand strategies was also explored (p. 2085). Ninety-one third graders and ninety-two fifth graders participated in the study. Several measures, including a scripted

interview, the <u>Gates MacGinitie Comprehension Test</u>, a cloze task and a task requiring students to detect problems (incomprehensibility) in grade appropriate passages, were presented in the fall and spring. An instructional program designed to increase students' awareness about reading, through the presentation of a series of lessons focusing on reading comprehension strategies, was implemented. The results indicated that "children's levels of awareness were highly related to performance on all three reading tasks" (Paris and Jacobs, 1984, p. 2091). Like Pace (1980), Paris and Jacobs (1984) discovered that children's age was often directly related to their awareness and understanding of written discourse as ten year olds demonstrated greater reading awareness and understanding of written discourse than eight year olds. In addition, Paris and Jacobs (1984) also discovered that "children at all levels of awareness benefit from direct instruction about reading awareness" (p. 2091).

Paris, Cross and Lipson (1984) conducted a study where third and fifth grade students were presented with the experimental curriculum, "Informed Strategies For Learning (ISL)". The ISL "instructional paradigm was designed to teach children how, when, and why to use various comprehension strategies so that they could become self-directed, independent readers" (Paris, Cross and Lipson, 1986, p. 1241). As well, the ISL curriculum was designed to

help increase students' awareness of declarative, procedural and conditional knowledge. Strategy instruction was carried out for four months by using three modes to present information, namely, classroom lessons, bulletin board displays and suggestions and guidance for classroom teachers in how to teach children to use the different strategies. The results indicated that "children in the experimental classes generally had greater knowledge about reading strategies than children in control classes" and "children who had the highest reading awareness scores achieved the highest scores on all four comprehension measures reported in this article "(Paris, Cross and Lipson, 1984, p. 1248). As well, the researchers concluded that standardized tests may not necessarily be the best measure for activities which focus on the use of cognitive skills. They also reported that group instruction can be used to teach students directly about cognitive strategies.

## Summary

The review of studies by Meyers and Paris (1978), Pace (1980), Johns (1980), Paris and Jacobs (1984) and Paris, Cross and Lipson (1984) provided an understanding of some of the key issues surrounding findings from metacognitive awareness research. Much of the work involved good reader and poor reader comparisons where it was found that good readers were 1) more aware when passages contained

inconsistent information, 2) cognizant when passages were easy to understand, 3) able to actively engage in comprehension monitoring, 4) aware that different strategies could be used and 5) aware that specific strategies can be applied to particular tasks.

As well, age differences have also been identified. Good readers or older students are more aware about reading in general and are able to expand their focus across sentences whereas poor readers and younger students tend to direct their focus primarily towards a word or sentence level. In addition, all children tended to benefit from instruction that focused on increasing their level of reading awareness regardless of whether they were instructed individually, in a small group or in a large group.

## Studies Which Focus on Comprehension Monitoring/Regulation

Paris and Meyers (1981) investigated grade four students comprehension and monitoring skills in two separate experiments. In their first experiment, the examination of differences in comprehension monitoring of good and poor readers in an oral reading task, Paris and Meyers (1981) used two indices to measure comprehension monitoring. First, they asked students to read stories which contained anomalous information and they recorded hesitations, repetitions and self-corrections made as the children read. Next, they presented the students with another set of

passages which contained anomalous information and asked the
students to underline any information that did not make
sense as they read. The results indicated that "poor
readers failed to monitor exactly the information that most
required comprehension checking" (Paris and Meyers, 1981,
p.10). Paris and Meyers (1981) concluded that poor readers'
difficulties may have stemmed from two possible causes: 1)
inappropriate reading goals, where the student placed
greater emphasis on decoding rather than meaning
construction, and 2) processing limitations.

Chan and Cole (1986) trained a group of learning
disabled students and a group of regular students different
comprehension monitoring strategies. Training was provided
in small groups of five or six in the school in which the
students were enroled. The two groups were instructed at
different times because combining the two groups may have
been upsetting to the learning disabled children as the
students had been matched by reading age, not chronological
age, and the learning disabled children were generally older
than their reading level matched peers. The following
strategies were taught to both groups of students: 1) self-
questioning only condition, 2) underlining only condition,
3) self-questioning and underlining condition and 4) read-
reread condition. Chan and Cole (1986) found that "training
in the self-questioning and underlining techniques, singly
or in combination, relative to the simple instruction of

requesting students to read the passage a second time, had

not especially benefited the overall comprehension

competence of the regular class subjects"( p. 38). However,

the results indicated that the learning disabled students

who had received instruction in the self-questioning and

underlining techniques performed superior to those learning

disabled students who had just been taught a read-reread

strategy. Overall the learning disabled children did not

appear to differ significantly from the regular students in

recall or comprehension of information; however, they did

appear to differ in skill transfer. The results showed that

the read-reread strategy was the least effective for

comprehension, the underlining strategy was the most

effective for transfer, while no differences were observed

among the four strategies on recall (Chan and Cole, 1986, p.

39). In addition, the results indicated that training

learning disabled students to monitor their comprehension

can effectively increase their understanding of written

discourse. Chan and Cole (1986) felt that the actual

techniques used may not have been the underlying cause of

the improvement, but rather, just the fact that the students

were involved in the reading process may have served to

stimulate cognitive processes. Therefore, Paris and Meyers

(1981) would concur with Chan and Cole (1986) that simply

training students how to direct their focus and develop

effective reading goals may encourage students to take on a more active role in comprehension monitoring.

Miller (1985) examined the effect of self-instructional training on elementary school aged children's ongoing comprehension monitoring through the use of an error detection paradigm. Students were presented with samples of written discourse that contained errors and samples of text that were unaltered. Miller then assigned children from a fourth grade class to various groups according to their achievement on the Stanford Diagnostic Reading Test. The students were divided into several treatment groups in order to test the effectiveness of self-monitoring instruction on reading comprehension. One group of students was presented with self-instructional training, one with general and self-instruction, the third received only didactic instruction (the students received specific self-instruction but were not taught to self-verbalize) and the fourth group listened to the experimenter read the passage once and then read the passage over three times to themselves. The results demonstrated that "the fourth grade average readers who received either general or specific self-instruction were able to identify significantly more embedded text inconsistencies in this study than students who received practise and feedback with the same materials" (Miller, 1985, p. 624). Miller (1985) concluded that the self-verbalization component was an important component in

comprehension monitoring as all students who had received self-instruction training outperformed the students in the didactic group even after three weeks had gone by. Thus, it appears that the self-verbalization component proposed by Miller (1985) may enhance the reader's cognitive involvement in the reading process as students who are more aware of their own cognitions are more successful when faced with comprehension monitoring tasks.

Chan, Cole and Barfett (1987) studied the use of general and specific instruction on student's ability to monitor text for internal consistency. They used a "reading level design" where learning disabled students were matched with younger students on the basis of their reading level. Two conditions were assigned: a general instruction condition and a specific instruction condition. In the general instruction condition, students were not given any explanation as to why particular sentences were inconsistent; as well, the inconsistent sentences were outlined in the text for them (Chan et al., 1987, p. 117). In the specific instruction condition, a demonstration as to how to monitor text for inconsistencies was given; in addition, students were required to monitor their understanding by highlighting the sentences that were inconsistent in relation to the surrounding text. Results indicated that learning disabled students performed "better in the specific instruction setting than the general

instruction condition" (Chan et al., 1987, p. 119). Their results mirrored those of other researcher's in the field, namely, Myers and Paris (1978) and Paris and Jacobs (1984), as learning disabled students can "exhibit production deficits in reading comprehension, but may be trained to use cognitive strategies effectively" (Chan et al., 1987, p. 121).

## Summary

Once again much of the research literature was drawn from studies of good reader and poor reader differences. Results indicated that poor readers failed to monitor key information and tended to direct their focus toward monitoring decoding rather than monitoring passage meaning. However, much of the research involved training studies where students were trained to use a variety of strategies to monitor their understanding of written discourse. Results indicated that training activities which encouraged children to become more cognitively involved in the reading/monitoring process were generally the most successful. For example, it was discovered that learning disabled students could be effectively trained to use monitoring strategies that combined self-questioning with the underlining or highlighting of vital information. One area where good and poor readers differed dramatically was in skill transfer or skill generalization as learning

disabled students could be trained to use particular strategies, but they often did not generalize these strategies to other areas.

## Studies with a Teacher Training Emphasis

Duffy et al. (1987) studied the effectiveness of training a group of teachers "how to explain the mental processing associated with using reading skills as strategies" (p. 347). Twenty third grade teachers and their students participated in the study. Ten teachers were randomly selected to receive instruction in mental processes teaching as well as peer coaching in their own classrooms. Results indicated that "low-group students whose teachers provided explicit explanations of the mental processes involved in using skills strategically became more aware across time of lesson content generally, and of the situational and procedural knowledge presented during lessons particularly" (Duffy et al., 1987, p. 360). In addition, Duffy et al. (1987) concluded that teachers can learn to be explicit in their explanation of mental processes involved in reading.

Book et al. (1985) examined the "relationship between teacher explanation and metacognitive awareness during reading instruction" (p. 29). Twenty-two fifth grade teachers volunteered to participate in their study. Researchers went out to the teacher's classrooms and rated

their management skills to establish a baseline. Then the teachers were divided into groups according to their particular ratings: high, medium and low. Next, teachers were divided into control groups and treatment groups. Teachers in the control group were presented with a workshop on classroom management and teachers in the treatment group were presented with information on the use of an explanation model. The explanation model focused on the following:

(1) an introduction of the skill to be taught (when, how, and why), (2) an explanation of the skill which includes the thinking process modelled aloud by the teacher, (3) teacher interaction with students during which (a) the students are given a chance to practise the skill and to explain their thinking of the process, and (b) the teacher corrects mistakes and tries to get students to think through the use of the skill on their own, (4) practise in using the skill (e.g. worksheets), and (5) application of the skill in connected text (e.g. books). (Book et al., 1985, p. 31)

Results indicated that students of teachers who had been trained to be more explicit in their instruction of mental processes appeared to exhibit greater metacognitive awareness than students of teachers who did not receive training. As well, Book et al. (1985) discovered the following results: 1) teachers who were trained to be more

explicit became more explicit over time, and 2) there was a "significant positive relationship between explicit explanation and metacognitive awareness" (p. 35) Book et al. (1985) concluded that the explanation model could be used to help teachers become more explicit in their instruction of students.

## Summary

From the review of Duffy et al. (1987) and Book et al. (1985) it appears that teaching students in an explicit and direct manner helps to increase students' awareness and understanding of the mental processes involved in reading. As well, the use of an explanation model helps classroom teachers increase their level of direct and explicit instruction to students.

## Chapter 2 Summary

The brief review of the different reading models served to illustrate how the interactive reading model has come to be viewed as the model of choice today. From an interactive view, reading is essentially a cognitive process which actively involves the reader.

The nebulous nature of metacognition and the fact that an exact definition of metacognition has yet to be conceived was discussed. A brief introduction to the work of Flavell,

Paris and Jacobs and Armbruster was presented. In addition, the relationship between metacognition and comprehension monitoring was examined.

A brief review of miscue analysis, oral report measures and the error detection paradigm was presented to help outline the different methods used by researchers in the study of metacognitive processes. It became evident that the most feasible approach to study metacognitive processes was to combine a variety of data collection methods.

Next, a selected review of metacognitive awareness and comprehension monitoring studies was presented. Much of the literature tended to focus on a comparison of good readers and poor readers. Results indicated that older or more skilled readers were more aware of reading processes and younger or poorer readers tended to be unaware that specific strategies could be applied to resolve problems; hence, younger or poorer readers tended to monitor more on a word analysis level rather than a meaning level.

The review demonstrated that children appeared to benefit from explicit instruction in mental processes as their reading awareness levels increased after explicit instruction. The results indicated that interventions that focus on training students to use self-instruction in conjunction with another reading strategy greatly increased students' ability to monitor written discourse. Moreover, rereading, the usual monitoring strategy chosen by the

students, was found to be a less successful comprehension monitoring strategy. In addition, it was emphasized that training teachers to be more explicit in teaching students when, how and why to use a strategy helps to increase students' understanding and awareness of the mental processes involved in comprehension of written discourse.

CHAPTER THREE

DESIGN OF THE STUDY

This chapter contains a disc..·· · n of the research design, the sample selection, the ьpecific instruments, tasks and procedures used in data collection, the criteria used for coding the responses, and the procedures used for data analyses. In addition, the results from a pilot study will also be discussed.

## The Experimental Design

A case study design was chosen by the researcher because the problem chosen was both educational and clinical in nature. A case study approach allowed the researcher to look at the problem in greater depth, use a variety of data collection techniques and basically, understand the problem in relation to the participants in question (Borg and Gall, 1989).

Because the researcher's goal was to obtain a greater understanding of comprehension monitoring processes and students were to be observed as they were engaged in specific reading activities, it was felt that a case study design using both qualitative and quantitative data collection methods would allow the problem to be explored more fully. Merriam's (1988) comments lend support as she states "case study research...is an ideal design for

understanding and interpreting ob.ervations of educational phenomena" (p. 2).

In addition, students' cumulative records were examined to help the researcher obtain a better understanding of each student's reading difficulties. The psychological reports, diagnostic reading reports and informal discussions with the classroom teacher and classroom aide helped to provide the researcher with a brief case history of each participant.

## Sample

Six learning disabled students drawn from a special education class within the Edmonton Public School district took part in the study. The students were from a district class in south Edmonton and had met the Edmonton Public Schools' criteria for placement in a district site for learning disabilities programming. The criteria established by Edmonton Public Schools in the classification of learning disabled students above the age of eight is contained in chapter one.

The learning disabled population was chosen for the following reasons: 1) the researcher was interested in learning disabilities programs within the Edmonton Public Schools district, 2) the researcher had worked with students who were learning disabled and 3) the researcher wanted to investigate the comprehension monitoring of learning disabled students.

In addition, the six candidates met another criterion established by this researcher; namely, students were able to read at a grade two or higher level. This criterion was selected because students who are able to read at grade two or higher level experience greater success reporting their cognitive activities (Paris and Jacobs, 1984). In addition, the investigation of comprehension monitoring addressed both oral and silent reading to help obtain a more holistic view of the reading process. Students who were able to read at a grade two or higher level usually have established an experiential base in both oral and silent reading modes.

As research by Paris and Jacobs (1984) has shown that metacognitive skills are later developing and comprehension monitoring is a component of metacognition (i.e., Meyers, 1991), students who are above the age of eight should be more metacognitively aware of their thinking processes. Therefore, students from the ages of nine through twelve were chosen to participate in the study. Because the study used a case study approach it was not considered necessary for the participants to be the same chronological age.

## Classroom Context

The six learning disabled students chosen for the study were from one classroom for students with learning disabilities. The classroom itself was made up of ten learning disabled students, one teacher, and one full-time

teacher aide. The six girls and four boys in the class, ranged in age from nine to eleven years old.

The classroom was attractive and colourfully decorated with student work. A pleasant atmosphere prevailed and the students were engrossed in their assignments at all times. As well, students were attentive and receptive to suggestions made by the teacher or the classroom aide. Classroom observations revealed that the students spent a considerable amount of time on written composition, both with pen and paper and on the computer. As well, the students' written composition was integrated across subject areas and they completed writing assignments at home as part of their regular homework assignments.

Reading instruction focused on comprehension and incorporated various learning strategies into daily instructional practices in order to meet the needs of individual students. For example, students were given the opportunity to use cloze exercises to facilitate the use of context as an aide to decoding unknown words. In addition, daily cloze messages encouraged further practice of individual letter combinations or phonetic concepts.

Spelling was taught through a cued spelling approach where the students were encouraged to work from their own knowledge base to spell unknown words. The new spelling words were taken home for practise and presented in lessons throughout the week for practise.

In addition, the teacher read novels to the students on a regular basis to help familiarize the students with different authors and expand the students' vocabularies. The students seemed to enjoy listening to stories and participated well in informal discussion about story content.

In general, students appeared to be interested in their daily assignments and were motivated to put forth a good effort. Routines were well established and students behaved responsibly.

Data Collection

The researcher spent several mornings observing the students in class and meeting with the classroom teacher to develop rapport and encourage support for the research project. An information letter was forwarded to the participants' parents and written approval was obtained. In addition, the subjects' parents were contacted by phone to clarify any questions which might arise and thank them, upon study completion, for allowing their children to participate in the study.

Because of the complex nature of comprehension monitoring, several different assessment instruments were used in the study to obtain information on the students' ability to monitor written discourse. A brief summary of each instrument and its role in the study will follow next.

## The Level of Strategy Awareness: Index of Reading Awareness (IRA)

Paris et al. (1984) developed a multiple choice questionnaire, Index of Reading Awareness (IRA), which was based on an earlier interview study (Paris and Jacobs, 1984). The questionnaire measures a student's reading strategy awareness by focusing on the following: "evaluating the task and one's skills, planning for specific goals, monitoring one's reading progress and employing reading strategies to meet specific goals" (Shapka, 1990, p. 58) The questionnaire contains twenty questions with three alternate responses and is divided into four sections-- planning, evaluative, conditional and regulative strategy awareness. The four sections yield four individual sub-scale scores as well as a total score for overall metacognitive awareness.

Planning awareness evaluates a student's ability to select a reading strategy to achieve a specific goal. An example illustrating planning knowledge is as follows: "If you could only read some sentences in the story because you were in a hurry, which ones would you read?" (Paris and Jacob, 1987, p. 269).

The questions on the evaluative scale were designed to assess the students's knowledge of his/her own reading abilities as well as his/her knowledge about reading tasks in particular. An example of an evaluative question from

the IRA is listed as fol .ws: "What would help you become a better reader?" (Paris and Jacobs, 1987, p. 269).

Conditional knowledge evaluates the student's knowledge of or understanding of the purpose of a given strategy as well as the student's ability to understand when a particular strategy should be used. "If you are reading for science or social studies, what would you do to remember the information?" is an example of a question from the IRA that assess a student's conditional knowledge awareness (Paris and Jacobs, 1987, p. 270).

The questions on the regulative scale are designed to measure the student's monitoring skills and awareness of alternate strategies. The following question, taken from the IRA was designed to measure regulation awareness: "What do you do when you come to a word and you don't know what it means?" (Paris and Jacobs, 1987, p. 270).

The questionnaire was read to all participants to minimize any frustration they may have encountered with word identification. Students were also given a copy of the interview questions/question choices, which allowed them to follow along with the examiner. In addition, student suggestions or comments about particular items were taken into account.

The Diagnostic Reading Program (DRP) and Oral Reading Miscues

The Diagnostic Reading Program (Alberta Education, 1986) consists of having students read graded passages silently or orally and then answer comprehension questions. In this study, students were required to answer the comprehension questions following both oral and silent reading tasks, in order, to determine independent, instructional and frustration reading levels. The oral reading of passages was used as both an initial screening device to determine each student's independent and instructional reading level in order to select appropriate levels of material for other study tasks as well as a means of providing a sample of the children's oral reading miscues. Establishing the instructional level was important because it ensured that students were presented with written discourse that was challenging but not frustrating. The assessment sessions were audio taped to ensure accuracy in data recording. In addition, the classroom teacher's input was included in determining the best estimate of each child's instructional reading level.

As each child read orally, the researcher recorded the corrected and uncorrected miscues on a recording sheet. After the child finished reading the entire passage, informal questions were asked about the nature of the corrections or comments made by the child during reading of independent and instructional level passages, e.g., "Why did

you correct this word?", "You were reading this sentence and then you changed this word, "How come?" or "Why did you do that?", "What made you aware that there was a problem?" and "How did correcting the error help you?" The informal question asking was also audio taped, which enabled the researcher to verify the responses written on the recording sheets with those on the tape transcript. Comments made during oral reading were also included in the transcript.

## Qualitative Reading Inventory (QRI) and the Think Aloud Task

The Qualitative Reading Inventory is an "individually administered informal reading inventory designed to provide diagnostic information about conditions under which subjects can decode and comprehend successfully, and 2) conditions which appear to result in unsuccessful decoding and or comprehension" (Leslie and Caldwell, 1992, p. 1). Because the passages from the QRI provide students many opportunities to wonder about the content and encourage them to make predictions as they read, passages from the QRI were selected for the think aloud task. Goal based narratives were selected since they encourage students to think about problem resolution and take an active part in the reading process. Furthermore, the passages from the QRI were longer which allowed the students more time to think about what they were reading whereas the DRP passages, being shorter in

length, tended to encourage students to think about problems or resolution as they read.

Olshavsky's (1977) think aloud approach for silent reading was adapted for use with the reading selections from the QRI. This technique involved having students silently read and then stop and report their thoughts at predetermined stopping places (identified by yellow dots placed in the text). Care was taken to place the stopping places at strategic points in the text where the student needed to construct the meaning of a sentence or group of sentences and form some tentative hypotheses in order to comprehend the information being read.

Prior to participating in the think aloud activity, all students were individually presented with a practise activity where they silently read a passage and then stopped at predetermined points in the text. As well, students were shown how to move a marker as they read to ensure that one line of text was shown at a time to help them remember to stop at the predetermined points. When students came to the stopping points they were required to offer comments in response to the following probes: "What does it make you wonder about? What does it make you think about? Is there anything confusing in what you have just read?" It should be noted that the students had no difficulty responding in the practise sessions, so the probes were only used if the student made no reply. After the students were familiar

with the procedures, each child was presented with instructional level reading selections from the <u>Qualitative Reading Inventory</u>. Student comments from each of the predetermined stops were recorded for analysis. In addition, to ensure accuracy, a written transcript was made from the tape recording of the session. Each student's comments were examined individually to determine if the student appeared to be monitoring the reading selection. By focusing on the probes described above, insight into how the students processed the information was gleaned. The stories for the think aloud passages can be found in the appendix.

## The Error Detection Task

Several researchers have indicated that the placement of certain types of errors within passages can help to determine what components of the text cause problems for individual students (ie., Chan et al., 1987; Garner, 1980; Garner and Reis, 1981; Winograd and Johnston, 1982). The following error categories, taken from Winograd and Johnston (1982), were used to develop the error detection task in the study:

1. Unclear pronominal reference,

2. Anomalous sentences, and

3. Inconsistencies (p. 72).

Unclear pronominal reference involves a confusion in noun agreement. Anomalous sentences involve the inclusion of

sentences which are definitely unrelated to the topic presented in the reading passage. The inconsistencies category included sentences which "make perfectly good intra-sentence sense", but violated [violate] the gist of the larger passage" (Garner, 1980, p. 56). In addition, two other error patterns were included, poor syntactic organization and the insertion of polysyllabic words into the text (Garner, 1980). Examples of the different kinds of errors included in the error detection tasks are as follows:

1. Unclear Pronominal Reference:

The boy was playing and they had fun.

2. Anomalous Sentences:

Bill and David were school friends who lived by a beach. Bill had made a raft from old drums, wood and rope. One day Bill and David pushed the raft out to sea and it floated well. They both jumped on. The boys lay down on the raft. Soon they fell asleep. When they woke up they were a long way out to sea. Bill and David knew they were too far from shore to swim back to safety. They began to worry. The boy swimming from the ship had a rope tied to him so he would be safe (Chan et al., 1987, p. 117).

3. Informationally Inconsistent Information:

The train stopped at Centerville everyday at both one o'clock and at five o'clock. Dr. Jones needed to travel from Centerville to Milltown on business. He

decided to go by train. He packed his bags. He caught a train at five o'clock, and was in Milltown in time for his meeting. This passage was systematically modified to create the informationally inconsistent passage (i.e., "caught a train at seven o' clock" instead of five o' clock") (Garner, 1980, p. 16C).

4. Polysyllabic Words: This refers to the substitution of multisyllable words for one or two syllable words.

The dog ran (scampered) home.

5. Unclear Syntactic Organization: This simply refers to a sentence whose order is confusing such as, "The ran dog fast" instead of "The dog ran fast."

Passages were selected from the Alberta Diagnostic Reading Program and modified to contain the five different kinds of errors. The passages were presented to students, one sentence of text per page. As they read, students were required to highlight the words or sentences that appeared to be confusing. Practice was given before the activity to ensure that the students understood what kinds of errors were made and what the highlighting procedure entailed. Then students were informed that the passages were written by students from another school who wanted other students' help in correcting some of the errors in their writing, in order for them to have their work published in the school journal. The participants were then told that only some of the text contained errors and their job was to 1) find the

errors in the text, and 2) explain how the errors were found. In addition, students were told that there was not an error on every page, there were no spelling errors, and they were free to look back or ahead at any time as they read the children's stories.

To facilitate data collection, the sessions were audio recorded and the examiner took notes to determine the particular segments of text that appeared troublesome to students. Students were first involved in an information session where the different kinds of errors that would be found in the reading samples were presented in an informal discussion. Then the students were given the opportunity to practise highlighting errors in a sample story. After students had highlighted the errors, a discussion followed to help clarify any misunderstanding. Then students were given two reading selections and asked to highlight any information that seemed confusing to them. As well, the students were not told how many errors they were searching for, but rather to search for items in the text that were confusing. At the end of the session the examiner asked the student to point out the errors they had highlighted and explain why they had done so. The informal question data were transcribed to help provide further information on student's monitoring rationale. Informal note taking was also included to note those instances where students

appeared to be aware of an error, even though they did not highlight the error in the text.

## Pilot Study

A pilot study was conducted in April, 1992 to determine if the activities selected for the study adequately measured comprehension monitoring and provided the researcher with useful information. The pilot study was conducted \ ith eight children at a different school from that used in 'he study.

The results confirmed the suitability of the Index of Reading Awareness and the error detection task. A few minor changes were made to some of the error detection passages and the student directions were written in point form to help facilitate a better understanding of the task requirements for the students. From the pilot study it became evident that it was necessary to emphasize two other key points with the students: 1) there was not an error on every page of the text; and 2) all spelling errors had been corrected, so students did not have to direct their attention towards spelling. Once the changes were incorporated into the task explanation, students were able to locate most of the errors and to provide a rationale for their monitoring.

Stories were originally selected from the Diagnostic Reading Program for the Think Aloud activity. However, when

the first set of four students were given the passages to read, they indicated that the passages did not make them wonder as there was nothing confusing or unclear in the stories; therefore, they basically engaged in paragraph summarizing. Consequently, another set of reading passages from the Qualitative Reading Inventory was selected in place of the Diagnostic Reading Program think aloud passages. The goal based narrŕive passages from the Qualitative Reading Inventory were found to be more suitable for the Think Aloud task as they provided the students with more opportunities to reflect on their processing when they came to the designated stopping points. The directions given to the students were also worded in a more direct manner to help students understand the nature of the task. The questions asked previously, "Tell me about what you have just read?" and "What do you think about what you've just read?", appeared to encourage students to provide paragraph summaries. Therefore, the questions were revised as follows: 1) "What does the information you've just read make you wonder about?" and 2) "Does anything you've just read seem unclear or confusing?"

After incorporating the specified changes into the task format the passages were presented with a second set of four students. The students were able to effectively describe what the text made them wonder as well as report anything that was confusing or unclear.

Scoring and Analysis of Data

After the assessment measures had been administered and
the tapes transcribed, the data for each child were analyzed
individually, according to the criteria presented below:

### Index of Reading Awareness

Each questionnaire item was scored individually
according to the metacognitive awareness values assigned by
Paris and Jacobs (1987) for the Index of Reading Awareness.
An individual question score and a total awareness score
were calculated. The items were divided into the four
assigned categories--evaluation, planning, regulation, and
conditional knowledge--and scores were tabulated for each
category as well. The results were then examined to
determine which strategies students were aware of and which
types of strategies presented a difficulty for them. The
results on the IRA served as one means of comparing
students' reported strategy awareness with their actual
monitoring ability.

### Miscue Analysis

Student miscues on passages from the DRP up to and
including that at the instructional level were analyzed
according to the criteria adapted by Malicky (1991) from the
Reading Miscue Inventory (Goodman and Burke, 1972) and the

Diagnostic Reading Program (Alberta Education) (Class notes, Fall, 1991). The categories and criteria used to code miscues follow:

Corrections: Miscues are marked as either being corrected or not.

Graphic Similarity: Each miscue is judged as having high, partial or no visual similarity according to the following criteria (Alberta Education).

a) High. Half or more of the letters in the text are the same as those in the miscue (count the number of letters in the text word and determine how many of these appear in the miscues without regard to where the letters occur in the word).

b) Partial. At least one but fewer than half of the letters in the text word are the same as those in the miscue.

c) None. No letters are the same in the miscue and text word. This also includes all omissions and insertions.

Contextual Acceptability: Each miscue (including substitutions, mispronunciations, omissions and insertions) is examined to determine degree of meaningfulness according to the following criteria:

a) High. The miscue results in the production of a meaningful sentence and is meaningful in relation to prior sentences in the passage as well.

b) <u>Partial</u>. The miscue results in a meaningful
sentence but is not meaningful in relation to
prior sentences in the passage (Partial 1) or the
miscue is meaningful only in relation to the part
of the sentence before or after it, but not both
(Partial 2).

c) <u>None</u>. The miscue is not meaningful. This
includes all nonsense words.

<u>Meaning Change</u>: This category is .s.d 'o determine to
what extent the reader's predicti is ` ,ge the meaning
intended by the       . This is difficult since only
the author knows .  .  aaning was intended (Goodman and
Burke, 1972).

a) <u>None</u>. The miscue is synonymous with the word
used by the author and hence, does not result in
any change in meaning.

b) <u>Partial</u>. A minimal change in meaning is involved
(eg. changes in function words, omission of
descriptive words, etc.).

c) <u>High</u>. The miscue involves an extensive change in
meaning (all nonsense words are included here).

The analyses consisted of examining the data recorded
on a miscue recording sheet to determine:

1. percentage of corrected errors;

2. percentage of errors having high, partial and no
graphic similarity;

3.  percentage of errors having high, partial and no contextual acceptability;

4.  percentage of errors that involved no, partial, or a high change of meaning.

In addition, the nature of the miscues corrected as compared to those which were uncorrected was examined along with the students' responses for the informal questions. By examining the types of miscues made and the students' reported decisions for making those corrections, possible insights into each student's monitoring rationale could be gleaned.

## Think Aloud Task

Responses from the think aloud audio tape were transcribed and then significant trends that emerged from within each student's transcription/observation data were determined. Next, similarities and differences across all of the students were examined.

## Error Detection Task

Data from the audio tape and written record sheet were examined according to the following criteria:

1.  ability to locate errors in the text,

2.  types of errors located, and the

3.  ability to explain how the errors were found.

After the data was analyzed in relation to the established criteria, significant trends for each student were highlighted. Then a comparison between the students' results was made to accentuate the significant similarities and differences that occurred in the error detection tasks.

## Comparison Across Tasks

After completing the individual data analyses for each student, similarities and differences between the students emerged. As the similarities and differences became more apparent, specific categories were used to analyze the data in greater detail.

CHAPTER FOUR

FINDINGS OF THE STUDY: CASE STUDIES OF THE SIX LEARNING
DISABLED STUDENTS

This chapter presents the findings for comprehension
monitoring and metacognitive awareness for each of the
students in the sample. The chapter is sub-divided into two
sections. The first section contains the data obtained from
the following measures: 1) the metacognitive interview
questionnaire, 2) miscues, 3) student's comments about
miscues, 4) the think aloud task and finally, 5) the error
detection task. The information is presented in a case
study format where a brief summary of each student's
background is presented first, the information from each of
the tasks is presented next and this, in turn, is followed
by a brief summary synthesizing all of the data for the
individual student.

The second section in this chapter compares and
contrasts each student's performance with that of the other
students across the different tasks. Where applicable,
tables or figures will be used to highlight similarities and
differences as well as facilitate the data presentation.

Case Study One - David

## Personal and Educational Background Information

David (a pseudonym) was 10 years, 8 months old at the time the study was conducted. He is a quiet child, who reported that he is often ill. He indicated that he thoroughly enjoys reading factual books, mystery books and books about the future. As well, he indicated that he built models in his spare time.

David's school records demonstrated that he had previously experienced difficulty academically and was in a adaptation class before entering the learning disabilities program. At this time, David has been in a class for students with learning disabilities for two years. A reading assessment contained in his cumulative record indicated that David's strengths were his receptive vocabulary, listening comprehension, and cooperative attitude. His last intellectual assessment indicated that he was functioning in the above average to superior range in most areas except visual-motor functioning.

## Metacognitive Interview

Table 1 illustrates the scores David achieved on the different sub-scales of the IRA. David's total score on the Index of Reading Awareness was moderately high and indicated that he was aware of many reading strategies. It appeared

that David's metacognitive awareness was greatest for
planning and evaluation.

On the planning items, David indicated that recalling
story events and reading the words and sentences that tell
the most about the story were important. However, David
indicated that the only prereading planning necessary was to
locate a comfortable place to read.

Table 1

Davi.'s Index of Read:.g Awareness Results

| Scales on IRA | Score on IRA | Percentage Correct |
| --- | --- | --- |
| Total Score | 27/39 | 69% |
| Planning | 8/10 | % |
| Evaluation | 7/9 (10) | 78% |
| Regulation | 5/10 | 50% |
| Conditional | 7/10 | 70% |

He was unaware that thinking about the text before engaging
in reading is an effective planning strategy. David seemed
unaware of the purpose of skimming as he suggested that the
best way to remember the general meaning of a story was to
read the selection over and over again. As well, he seemed
to think that the general meaning of a story could be
discovered by reading information indepth as he indicated
that remembering all of the details and events in the story

was critical in determining the general meaning of the story.

In relation to evaluative knowledge, David was aware that he must check to make sure he understands what he reads if he is to become a better reader. He recognized that the structure of text can provide the reader with valuable information as he indicated that the first sentence often tells what the story is about and the last sentence often tells what happened in the story. However, he was not aware how one should decide which sentences are important as he stated that all of the sentences were important. In addition, David was cognizant of his own reading difficulties as he recommended that another choice should be added to question one, "What is the hardest part of reading for you?". He felt none of the answers applied to him and suggested that keeping one's place should be added to the answer selection as he frequently lost his place when he read. The answer total for the evaluation section was calculated out of nine instead of ten as question one was omitted.

David's metacognitive awareness of conditional knowledge was slightly lower than that of his planning and evaluation knowledge. He was aware that when one is writing a book report, writing the ideas in one's own words is a good strategy to engage in, which in turn, may be related to the fact that book reports were a regular part of his school

assignments. However, some of his responses indicated that he may experience difficulty applying strategies across reading tasks as he seemed to lack an understanding of how to effectively recall science or social information and was unable to elicit appropriate test studying strategies. He suggested that concentrating and trying hard to remember th information, reading the story as many times as possibl d thinking about remembering the story were more worthhile strategies than writing the information in his own words, discussing the story content with someone else, and asking himself questions about the important ideas as he read. Therefore, even though he was cognizant of some strategies, he failed to recognize which strategies would be more effective in particular situations.

David's regulation knowledge was weaker than his planning, evaluation and conditional knowledge. It seemed he was unaware that rereading can be used to increase one's understanding of written discourse as he thought rereading was simply done for practise. He did indicate that he would engage in rereading if he had difficulty understanding a sentence, but failed to recognize that using the surrounding context to resolve the problem is a more effective strategy. It seemed that he might be directing his attention more towards a word level or sentence level rather than focusing his attention on a paragraph level as he indicated that if he encountered a problem word he could use the words around

it to figure it out rather th⁁· indicating that the
sentences before or after the uknown word could be used to
help resolve the problem. As well, he indicated that one
should read every word and seemed unaware that some words,
unimportant to the central thought, can be omitted in
reading. In addition, David failed to recognize that prior
knowledge of a topic, such as having read the story before,
makes it easier for the reader to adjust his/her rate of
reading.

## Miscue Analysis

In order to obtain an understanding of David's
monitoring when reading orally, a detailed analysis of
corrected and uncorrected miscues across the instructional
level reading passages "Rascal is Lost", "Part of the Team",
"Just One More" and the "The Wrong Decision" was conducted.
The percentage of miscues corrected across all of the
instructional level passages was 27%.

Table 2 depicts a summary of the uncorrected and
corrected miscues for graphic similarity, contextual
acceptability and meaning change. For description of the
high, partial and none ratings for graphic similarity,
contextual acceptability and meaning change, please refer to
chapter three.

Graphic similarity refers to the reader's ability to
attend to the print itself. The total percentage of

corrected and uncorrected miscues across all of the

instructional level passages for graphic similarity

indicated that David processed half or more of the letters

in words 57% of the time. When comparing the percentages

for corrected and uncorrected miscues on graphic similarity,

the percentage of miscues with high graphic similarity was

the same; hence, graphic cues did not appear to be a basis

for David's monitoring.

Table 2

Davida's Miscue Data Profile

| Error Type | Error Rating | Graphic Similarity | | Contextual Acceptability | | Meaning Change | |
|---|---|---|---|---|---|---|---|
| Corrected | H | 8 | 57% | 5 | 36% | 9 | 64% |
| | P | 1 | 7% | 6 | 43% | 0 | 0% |
| | N | 5 | 36% | 3 | 21% | 5 | 36% |
| Uncorrected | H | 21 | 57% | 21 | 56% | 17 | 46% |
| | P | 2 | 5% | 8 | 22% | 3 | 8% |
| | N | 14 | 38% | 8 | 22% | 17 | 46% |

Note. H = High, P = Partial, N = None

Even though he corrected some errors with partial or no

graphic similarity, the percentage of errors with no graphic

similarity was similar for corrected and uncorrected

miscues.

Contextual acceptability refers to the reader's ability to make meaningful predictions. The total percentage of uncorrected and corrected miscues that had high contextual acceptability was 51%, which indicated that David had some awareness that context cues play a role in meaning making in reading. A comparison of percentages on corrected and uncorrected miscues for contextual acceptability showed that David tended to correct miscues with partial contextual acceptability. Forty-three percent of the miscues that he corrected were partially contextually acceptable whereas 22% of the errors he left uncorrected were partially contextually acceptable. In addition, 36% of the miscues he corrected had high contextually acceptability and 56% of those left uncorrected made sense in relation to the rest of the passages. This indicates that he was less likely to correct miscues which were meaningful in relation to the rest of the passage.

Meaning change refers to the student's ability to maintain the author's interpretation of written discourse. The total percentage of corrected and uncorrected miscues that had no or partial meaning change was 49% across the passages, indicating that David's miscues preserved the author's meaning less than half of the time. The percentage of corrected miscues having a high meaning change was 64% and for uncorrected miscues it was 46%, which indicated that David tended to monitor miscues which changed the author's

meaning. In addition, 36% of the miscues corrected had no or partial change in the author's meaning whereas 54% of the miscues left uncorrected involved none or only a partial meaning change.

## David's Miscue Comments

David's comments about his oral reading miscues were examined to obtain a better understanding of his comprehension monitoring in Table 3. "During" indicates that David made the comment while he was engaged in oral reading. "After" indicates that the comment was made later in a discussion with the researcher.

Table 3

David's Miscue Comments Data

| Criteria | During/After | Number |
|---|---|---|
| Didn't make sense. | A | 2 |
| Didn't sound right. | A | 2 |
| Hard word, couldn't figure out. | D | 4 |
| Looked back, sounded out, read ahead. | A | 1 |
| I realized it was wrong and I looked back. | A | 1 |
| Looked back, even though "came" fit, it said "come" and because of the "o" and it said "mate", I had read it wrong, so I changed it. | A | 2 |
| I sounded it out and I know what "converge means!" | A | 1 |
| Hard word and it didn't make sense. | A | 1 |
| Total Score | | 14 |

In general, the results from David's miscue comments support the results obtained on the miscue record as David

appeared to monitor his reading for meaning. Like the miscue record, David's miscue comments indicated that graphic similarities were frequently not the basis on which he monitored his reading as there were few comments that pertained to graphic cues. In fact, there were several comments that suggested he may have had difficulty decoding particular words and tended to rely on context to restore his understanding of written discourse.

David's responses could be categorized into either an evaluative or regulative awareness focus. For example, his comments "it didn't sound right", "it didn't make sense" and "it's a hard word, couldn't figure out" illustrated that he was aware of his own problems, which in turn, helped to demonstrate his awareness of evaluative knowledge. His response "didn't sound right" seemed to be a category where meaning was emphasized as he appeared to be focusing on the contextual acceptability of a miscue. For example, when asked why he had corrected his response, "He had been looking for some food but when he", he indicated that it didn't sound right in the story. When asked how he knew it didn't sound right, he stated that it simply didn't make sense. The sentence should have been read as "He had been looking for some food but was trapped".

His use of regulative or fix up strategies such as sounding out unknown words, looking back and reading ahead indicated that David was also concerned with maintaining an

adequate understanding of the story information. He seemed to be trying to coordinate several strategies in order to restore understanding, but frequently relied on a look back strategy to resolve his difficulties. Even though he tried to use more than one strategy, he may not have known which was the most effective strategy to use. As well, David did not include any planning or conditional knowledge comments. This may have been due to the small sample or the fact that the strategies were not reported.

## David's Think Aloud Comments

David was presented with two passages at his instructional level, "Christopher Columbus" and "Margaret Mead". He read the passages silently, and offered comments when he came to the predetermined stopping points. Figure 1 illustrates the comments David made and the categories into which they were placed.

It appeared that David was able to monitor his understanding of written discourse at a word level as he was aware when he did not know the meaning of "anthropology" and recognized when he was unable to identify a word in print such as "merit". As well, he brought his own experiences into his reading to make his encounter with the text more meaningful. For example, he indicated that he had read a different version of the story previously.

| Think Aloud Comments | MIWM | PCT | BI | WIA | MITQ | MUT | MIWI |
|---|---|---|---|---|---|---|---|
| I wonder why he wants to make a route to the east? | | | | | * | | |
| Why does he believe the world is round? | | | | | * | | |
| Can you help me with this word (merit)? Is it murit? | | | | * | | | |
| Makes me wonder why it was so hard to find sailors to join him? | | | | | * | | |
| I wonder why they are so afraid of going on the Sea of Darkness? | | | | | * | | |
| How could the bird and branches have gotten so far away from the island? | | | | | | * | |
| I wonder why he died believing that he had reached Indian (Indies)? | | | | | | | * |
| Is it India or Indians (Indies)? | | | | * | | | |
| What is anthropology? | * | | | | | | |
| I read the story, but a different version in a book. | | | * | | | | |
| Why is Margaret Mead so interested in these people? | | | | | * | | |
| Why did she want to go to Sa Moon (Samoa)? | | | | | | | * |
| Why was it so difficult to live with no electricity? | | | | | * | | |
| Why did she want to live in a house with no walls, no gas, no water and no electricity? | | | | | * | | |
| In the other book it said that she wanted to look out at the people. | | | * | | | | |
| Why was she about to give up living in Samoan? | | | | | | | * |
| Why was she famous? I know because she wrote the book about Samoan (Samoa)! | | * | | | | | |
| Total Scores for Categories | 1 | 1 | 2 | 2 | 7 | 1 | 3 |

**Figure 1.** Results from an analysis of the think aloud data for David.

MIWM:  a request for more information on word meaning
PCT:  a prediction constrained by the text was made
BI:  comment indicated use of background information constrained by the text
WIA:  word identification assistance request
MITQ:  more information requested by using text to pose questions
MUT:  misunderstanding of text
MIWI:  more information requested, but difficulty with word identification evident

The category that had the highest number of responses was MITQ (more information requested by using the text to pose new questions). David's MITQ responses enabled him to

read for a purpose, which may have allowed him to clarify his understanding of the information read. On the other hand, a response classified under MIWJ indicated that David requested more information but had difficulty identifying a specific word within the text. He did not appear to be aware that he had identified a word incorrectly and hence, did not monitor his error. On one occasion he recognized that something was wrong and later requested assistance with word identification (merit); however, he did not appear to be aware that "Indies" and "Samoa" were identified incorrectly. As well, the comment that was classified as MUT, (misunderstanding of text) indicated that he could identify the word in text, but had difficulty interpreting the information. For example, he had some difficulty recognizing the fact that the birds and plant debris were clues that indicated land was near.

## David's Error Detection Comments

David was presented with two passages from the Alberta Diagnostic Reading Program, "The Dark Tent" and "Through the Storm", that had each been altered to contain four examples of implanted errors and one example of a implanted multisyllabic word as indicated in Chapter 3. He was asked to read the passages silently, highlight anything that did not make sense, and then explain why he had highlighted

items.  Figure 2 presents the comments David made and the types of implanted errors he located.

Findings indicated that David was able to detect implanted errors or multisyllabic words 50% of the time. Results indicated that David was able to locate both of the implanted anomalous information errors and one each of the pronominal, word order and informational inconsistency errors.  However, he did not indicate that any of the multisyllabic words implanted in the text were difficult for him and was unable to locate the other pronominal, word order and informational inconsistency errors.  T may be that David resolved some of the errors as he was read, but did not report them because he was unaware he had corrected them.  On the other hand, it is also possible that because he read very quickly, he may have actually missed out key points as he was reading.

Examining the reasons why David made particular monitoring decisions was also beneficial in helping to shed light on his monitoring behaviour.  The category DMS (didn't make sense) appeared several times, which indicated that David tended to monitor on a meaning basis as he was concerned with whether or not the text could be understood.

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| Sentence Highlighted | Implant | DMS | WI | DMSC | WIC | COT |
|---|---|---|---|---|---|---|
| Mother anxiously cradled Becky in his arms. (Pronominal) | Yes | • | | | | |
| Mother anxiously cradled (craddled) Becky in his arms. | No | • | • | | | |
| The crying baby's face was flushed and damp. | No | | | • | | |
| As Tom carried the firewood into the log cabin, he shot a worried glance at his mother and baby sister. | No | | | • | | |
| It's five town to kilometres. (Word Order) | Yes | • | | | | |
| "I'm twelve now, remember?". | No | • | | | | |
| Get your snow shoes Tom, she sighed (sight). | No | | • | | | |
| Tom quickly got his high top sneakers on. (Anomalous Information) | Yes | • | | | | |
| Snowdrifts were beginning to blanket the road as Tom set out. | No | | | • | | |
| He struggled (suggested) against the fierce and blinding (building) snow. | No | | • | | | |
| Shining faintly (finely) below were the lights of the town. | No | | | | • | |
| Tom was relieved, for he knew the doctor would give him a wonderful sleigh ride to the birthday party. (Informational Inconsistency) | Yes | • | | | | |
| After supper they sat around the campfire and tried to scare each other with ghost stories. | No | | | | | • |
| The children enjoyed visiting the library and listening to the librarian read stories. (Anomalous Information) | Yes | • | | | | |
| Total Scores for Categories | | 7 | 3 | 3 | 1 | 1 |

**Figure 2.** Results from an analysis of the error detection data for David.

| | |
|---|---|
| Implant: | "Yes" under implant indicated that the particular error was implanted in the text by the researcher and "No" indicated that the student interpreted it as an error |
| DMS: | indicated that an error was reported because it didn't make sense |
| WI: | reported that a particular word in text was unknown |
| DMSC: | indicated that a word in text had been highlighted because he thought it didn't make sense, but after reading ahead had discovered that it did make sense and wished to change his response |
| WIC: | reported that he did not know a particular word in text but changed his mind after he had read on |
| COT: | indicated that he was checking to determine if the sentence was on topic and had decided that it was not |

The category WI (student indicated that a word in the text was unknown) emerged as David reported that there were several words in the text that were unknown to him,

indicating that he also tended to monitor text information at a word level. The category DMSC (student indicated that a word in text had been highlighted because he thought it didn't make sense, but after reading ahead had discovered that it did make sense and indicated that he wished to change his response) and WIC (student reported that he did not know a particular word in text, but changed his mind after he had read on) helped to demonstrate that David was able to use context to resolve some of his word identification difficulties as he was aware when a loss of understanding occurred as well as when understanding was restored. COT (student indicated that he was checking to determine if highlighted sentence was on topic and then decided that it was not on topic) showed that David monitored on a meaning basis as he indicated that he was checking to see if the sentence was related to the rest of the story.

## Summary of David's Results

By combining the results from the different tasks, a better understanding of David's strengths and weaknesses emerged. For example, results from the IRA indicated the David was aware of many reading strategies, particulary those related to planning and evaluation.

An analysis of David's oral reading miscues indicated that he did not monitor on the basis of graphic cues, but

rather on the basis of contextual acceptability and the author's meaning. In addition, his comments about his miscue analysis errors provided further evidence that he monitored on a meaning basis (evaluative strategies) as he was aware when meaning loss had occurred and tried to resolve problems (regulative strategies).

Results for the think aloud tasks indicated that David was frequently aware of his own comprehension difficulties. He monitored at a word level, and usually indicated when words were difficult to identify or when a word's meaning was unknown. As well, he seemed to read purposefully and brought in his own experiences to help him make sense of the text.

On the error detection task, David demonstrated that he was aware when a loss of understanding occurred about 50% of the time. When he did locate errors, it appeared that he focused on meaning as a basis for monitoring. As well, he indicated that there were several words that were unknown and demonstrated an ability to use context to restore meaning. Furthermore, it appeared that David was concerned with information at a word or sentence level as well as at the larger story level.

Overall, it appeared that David was aware of many reading strategies as he frequently recognized when loss of understanding occurred and monitored his understanding of text on the basis of meaning. As well, David was frequently

able to implement several fix up or regulation strategies to
resolve loss of understanding across different text levels.


Case Study Two - Karen

## Personal and Educational Background Information

Karen was eleven years six months at the time the study
was conducted. She appeared to be a quiet and pleasant
child. She reported that she liked to read mysteries as
well as books by Robert Munsch and Judy Bloome. In
addition, Karen indicated that she enjoyed studying rocks
and playing baseball or volleyball in her free time.

Karen's school records demonstrated that she had
problems coping with the curriculum in grades one and four.
In addition, records indicated that Karen's strengths were
her attentiveness to the task at hand, cooperative attitude,
skill in using context, and immediate auditory memory.
Weaknesses were noted in her knowledge of reading and
spelling, visual perception, visual motor association and
immediate visual memory. At present, Karen has been in a
class for students with learning disabilities for one year.


## Metacognitive Interview

On the Index of Reading Awareness Karen achieved a
total score slightly over 50%, which indicated that she has
some knowledge of strategies vital to reading. Table 4

illustrates the different levels that Karen achieved on the four scales of the IRA.

Table 4

Karen's Index of Reading Awareness Results

| Scales on the IRA | Score on IRA | Percentage Correct |
|---|---|---|
| Total Score | 21/40 | 52% |
| Planning | 5/10 | 50% |
| Evaluation | 5/10 | 50% |
| Regulation | 5/10 | 50% |
| Conditional | 6/10 | 60% |

Her strategy awareness levels were at similar levels on all four areas assessed, with the exception of one, conditional knowledge awareness, which was slightly higher.

From the conditional knowledge results, we can conclude that Karen was aware that people read for different purposes as she was able to distinguish between recreational reading and reading done for test taking. She also recognized that discussing critical information with someone else was a valid test studying strategy and indicated that discussion helps to ensure that the reader has a good understanding of the information presented. However, Karen seemed to be inconsistent in her knowledge of conditional strategies as

she was not aware that asking herself questions about the information read was a more effective strategy than concentrating and trying hard to remember the content. Similar difficulties were noted as she indicated that if she were reading a library book to write a book report, sounding out the words that she didn't know would be more helpful than writing the information down in her own words. Karen's response, "say every word over and over", for the question "Which of these is the best way to remember a story?", also indicated that she failed to see the value of note taking as an aid to information recall.

Karen's knowledge of planning strategies was slightly less well developed than her conditional knowledge. She was aware that reading the words that tell the most about the story was an important strategy but failed to recognize that skimming can be used to construct the general meaning of a story as she indicated that concentrating and trying hard to remember would help to construct the general meaning of a story. She seemed to be unaware that the structure of text itself can provide the reader with valuable information as she indicated that one should read the interesting and exciting sentences rather than the sentences that tell the most about a story. The value of making prereading plans or using planning strategies before one reads was not viewed as being important as Karen indicated that it was not necessary to make plans, but just to start reading.

In relation to evaluation strategies, Karen indicated that she believed improving her ability to check her understanding of information read would help her to become a better reader, that the hardest part of reading was sounding out the hard words, and that the last sentences of a story were important because they tell what the story is about. However, it appeared that she may not be fully cognizant of some aspects of text structure as she believed that the first sentences or two of a story were special because they were the most interesting. In addition, Karen reported that she was unsure how to extract vital information from the text as she felt all of the text sentences were important.

Karen was aware of some regulation strategies as she recognized that it was easier to read text one has encountered previously and that using the words around an unknown word was a useful strategy for figuring out unknown words. However, she believed that the reason for rereading selections was basically for practice and did not seem aware that it is a valuable strategy for restoring ones' understanding of written discourse. She indicated that she tried to read every word and never skipped out information, and was not aware that one may omit unimportant parts of text when searching for the general meaning and still keep the story meaning intact. As well, she appeared to be focusing strongly on words as she indicated that sounding out all of the words was important to the question "What do

you do if you don't know what a sentence means?" rather than suggesting that using the other sentences around the u' 'nown sentence would help resolve the problem.

## Miscue Analysis

An analysis of Karen's miscues across the passages "Rascal is Lost", "Part of the Team", "Just One More", "The Wrong Decision" and "Alone" was conducted. Table 5 presents a summary of the uncorrected and corrected miscues for graphic similarity, contextual acceptability and meaning change. The percentage of miscues corrected across all of the instructional level passages was 27%.

By examining Karen's miscues for graphic similarities, it appeared that she focused heavily on graphic cues to identify words. The total percentage of corrected and uncorrected miscues across all of the instructional level passages with high graphic similarity indicated that Karen processed half or more of the letters in words 76% of the time. However, graphic cues did not appear to be the basis upon which she monitored miscues as there was little difference in the percentage of correcte and uncorrected miscues which had high visual similarity to text words.

Table 5

<u>Karen's Miscue Data Profile</u>

| Error Type | Error Rating | Graphic Similarity | | Contextual Acceptability | | Meaning Change | |
|------------|--------------|--------|------|--------------|------|---------|------|
| Corrected | H | 8 | 80% | 2 | 20% | 8 | 80% |
| | P | 1 | 10% | 5 | 50% | 2 | 20% |
| | N | 1 | 10% | 3 | 30% | 0 | 0% |
| Uncorrected | H | 20 | 74% | 11 | 43% | 19 | 70% |
| | P | 1 | 4% | 3 | 11% | 3 | 11% |
| | N | 6 | 22% | 13 | 46% | 5 | 19% |

<u>Note</u>. H = High, P = Partial and N = None

Indeed, a higher percentage of miscues with no visual similarity to text words were left uncorrected (22%) than were corrected (10%).

The total percentage of corrected and uncorrected miscues with high contextual acceptability was 35%, which indicated that Karen has some awareness that context does play a role in reading. The difference between the percentages of corrected and uncorrected miscues rated as none in contextual acceptability demonstrated that Karen was aware that making sense of what one reads is important; the percentage of errors that had partial contextual acceptability was higher for corrected (50%) than uncorrected miscues (11%). As well, only 20% of the miscues

she corrected had high contextual acceptability, whereas 43%
of those left uncorrected made sense in relation to the rest
of the passage.

Meaning change refers to the student's ability to
maintain the author's interpretation of written discourse.
The total percentage of corrected and uncorrected miscues
that had no or partial meaning change was 27% across the
passages.  The percentage of miscues which involved high
meaning change was 80% for corrected miscues and 70% for
uncorrected miscues.  These figures demonstrated that Karen
was aware that responses that change the author's
interpretation or meaning should be corrected.  The
importance of meaning to Karen's monitoring was also
reflected in the miscues coded as involving no or partial
meaning change.  Only 20% of the miscues with no or partial
change in the author's meaning were corrected whereas 30% of
the miscues left uncorrected involved no or partial meaning
change.

## Karen's Miscue Comments

Karen's comments about her oral reading miscues were
examined to provide more information about her
comprehension monitoring in Table 6.  The results from
Karen's miscue comments, like the results achieved on the
miscue analysis, indicated that she seemed to be monitoring
her miscues largely on a contextual basis.  She appeared to

be quite concerned with meaning at a word level as she indicated that she would look back and reread a sentence in order to determine what a unknown word meant.

Karen's comments indicated that she was aware of graphic cues as there were several instances where she had focused on graphic cues in her comments; as well, she also indicated that longer words and words she had never seen before, posed a problem. However, even though she indicated that she had focused somewhat on graphic cues, she tended to monitor on a meaning basis.

Table 6

Karen's Miscue Comments Data

| Criteria | During/After | Number of Examples |
|---|---|---|
| I knew it wasn't a question. | A | 1 |
| I was reading too fast. | A | 1 |
| There's too many letters. | D | 1 |
| It's a long word I didn't know. | A | 2 |
| That's too short for "crib". | D | 1 |
| There was no " " in that word (" " refers to a individual letter). | A | 2 |
| I've never seen that word before, so I knew there was a problem. | A | 2 |
| I was trying to sound it out. | A | 3 |
| I don't know what that word means. | C | 1 |
| Didn't sound right. | A | 3 |
| Didn't make sense. | A | 9 |
| Does make sense (said after she corrected the miscue). | D | 3 |
| Then I looked back and read the sentence again and had a chance to know what word made sense. | A | 3 |
| Didn't sound right, didn't' make sense. | A | 2 |
| I don't know. | A | 3 |
| Total Number of Examples | | 37 |

Karen's miscue comments indicated that she tended to make statements that were based mainly on evaluative knowledge. She appeared to have some awareness of regulative knowledge strategies, but to a lesser degree. Comments such as: "I knew it wasn't a question", "I was reading too fast", It's a long word that I didn't know", and "I don't know what that word means" were considered to be examples of evaluative knowledge as Karen was aware of her own difficulties with reading. The fact that she tried to "sound it out" and then "looked back and read the sentence again and had a chance to know what word made sense" indicated that she was attempting to engage in fix-up or regulative strategies to restore meaning loss. Her latter comment could also be viewed as a statement reflecting conditional knowledge as she knew that context could be used to help her understand the meaning of an unknown word. It appeared that while Karen was aware of alternate strategies, she was unsure when to use strategies for a specific purpose or problem. Hence, Karen may have had limited conditional strategy awareness or simply did not report her knowledge of these strategies. As well, awareness of planning strategies did not emerge.

## Karen's Think Aloud Comments

Karen was presented with two instructional level passages, "Christopher Columbus" and "Margaret Mead", from

the Qualitative Reading Inventory. Figure 3 illustrates the comments Karen made, the number of times they occurred and the manner in which they were classified.

| Think Aloud Comments | WIA | ES | MIWI | MIWM | MITQ |
|---|---|---|---|---|---|
| Why was he trying to find that? What's that? It says he was determined to find an all water route to the Indies? Why was he trying to find an all water route? | | | | | * |
| Why would people laugh at this idea? | | | | | * |
| Why was it difficult to find sailors who were willing to join him? | | | | | * |
| Why had no one ever sailed out on the Sea of Darkness? | | | | | * |
| Why were there branches and leaves in the water? | | | | | * |
| Why did he believe he reached the Indians (Indies)? | | | | * | |
| Nothing was confusing in the story. | | * | | | |
| What's that word (anthropology)? | * | | | | |
| What are taboos? | | | * | | |
| How could she live in a house like that? | | | | | * |
| Why was she listening to their talks, jokes and gossip? | | | | | * |
| Why does it no longer exist today? | | | | | * |
| Total Score for Categories | 1 | 1 | 1 | 1 | 8 |

**Figure 3.** Results from an analysis of the think aloud data for Karen.

MITQ: more information requested by using text to pose questions
MIWI: more information requested, but difficulty with word identification evident
WIA: word identification assistance request
ES: evaluative statement
MIWM: a request for more information on word meaning

The results from the analysis of the think aloud passages indicated that Karen made two requests for help at a word level, one for identification and the other for word meaning. However, she did not request help with the word "Indies" and seemed unaware that her miscue had significantly changed the author's meaning. She indicated

that nothing was confusing, possibly, because her response
"Indians" made sense within the sentence itself and
"Indians" was a word that had connotations within her realm
of understanding.

The category that had the highest number of responses
was MITQ (more information requested by using the text to
pose new questions). Karen's MITQ responses enabled her to
read for a purpose, which served to guide her reading and
helped her to clarify her understanding of the text.

## Karen's Error Detection Comments

Figure 4 helps to illustrate the errors located by
Karen and the categories in which her error detection
comments were placed. Data from "The Dark Tent" and
"Through the Storm" were combined to facilitate greater
understanding of the implanted errors.

Findings indicated that Karen was able to detect 70% of
the implanted errors and multisyllabic words. She was able
to locate both of the pronominal, word order and anomalous
information errors, but she did not highlight either of the
multisyllable words and missed locating one informational
inconsistency error. It appeared that she was able to
decode most words quite readily as she did not report any
problems identifying the implanted words; however, she did
indicate that she did not know the word "petrified". It is
difficult to ascertain whether it was the meaning of the

word or the identification of the word as she indicated she just "didn't know it". It may be that Karen resolved the multisyllabic implants while she read or had no difficulty with the words and hence, did not deem it necessary to highlight them.

| Error Detection Comment | Implant | DMS | LBN RLS | WME | WSE | DSRS | WI | RDMSS |
|---|---|---|---|---|---|---|---|---|
| Mother anxiously cradled Becky in his arms. (Pronominal) | Yes | * | | | | | | |
| It's five town to kilometres. (Word Order) | Yes | " | | | | | | |
| What could she do? | No | | * | | | | | |
| Tom quickly got his high top sneaker on. (Anomalous Information) | Yes | | * | | | | | |
| He plowed on. | No | | | * | | | | |
| Just as he thought he couldn't take another step, Tom reached the crest of the hill. | No | | | | * | | | |
| As he neared the town, Tom saw that the doctor's sleigh was in place. | No | * | | | | | | |
| Tom was relieved, for he knew the doctor would give a wonderful sleigh ride to the birthday party. (Informational Inconsistency) | Yes | | | | | | | * |
| To his surprise, Mike's mom and dad had brought him a pup tent. | No | | | | | * | | |
| Each boy had tent own his now. (Word Order) | Yes | * | | | | | | |
| As Mike was getting ready for bed, she suddenly realized he'd have to spend the next night alone in a dark tent. (Pronominal) | Yes | * | | | | | | |
| He lay petrified. | No | | | | | | * | |
| The children enjoyed visiting the library and listening to the librarian read stories. (Anomalous Information) | Yes | | | | | | | * |
| | | 5 | 2 | 1 | 1 | 1 | 1 | 2 |

**Figure 4.** Results from an analysis of the error detection data for Karen.

Implant:      "Yes" under implant indicates that the particular error was implanted in the text by the researcher and "No" indicates that the student interpreted it as an error

DMS:          indicated that the error was reported because it didn't make sense

LBNRLS:       looked back and decided that the sentences were not related to the last sentences read

WME:       indicated that the meaning of the word was used incorrectly in the story
WSE:       reported that the word was misspelled as it should have been "rest"
DSRS:      indicated that the word "pup" didn't sound right in the sentence
WI:        reported that she did not know what a particular word was
RDMSS:     recognized that the information didn't make sense in relation to the rest of the
           story

Similarly, the one informational inconsistenc    ror may not

have been reported either because Karen was unaware that it

was an error or she resolved the problem while she read.

Examining the reasons why Karen made particular

monitoring decisions was also beneficial in helping to gain

a better understanding of Karen's monitoring behaviour.

The category DMS (didn't make sense) appeared several times,

which indicated that Karen tended to monitor on a meaning

basis.  As well, the category LBNRLS, demonstrated that she

was again concerned with meaning as she indicated that she

had looked back to verify whether or not a sentence made

sense in relation to the last few sentences she had just

read.  The categories WME (student indicated that she didn't

know the meaning of the word), DSRS (didn't sound right in

the sentence) and RDMSS (didn't make sense in relation to

the rest of the story) also illustrated her strong focus on

meaning as a monitoring criterion.  It seemed that Karen was

able to monitor across many different levels as she was able

to focus on individual words, individual sentences, groups

of sentences and the whole story as well.

## Summary of Karen's Results

Karen's total score on the metacognitive interview demonstrated that she had some strategy awareness knowledge, but all of her scores were from 50 to 60%.

The miscue analysis results demonstrated that Karen was aware of graphic cues, but did not monitor on this basis. Instead, she tended to monitor on the basis of partial contextual acceptability. In fact, Karen's miscue comments indicated that she was aware when she came to an unknown word and recognized when understanding (evaluative strategies) had been lost. As well, she was able to use fix up strategies (regulative) to help her restore understanding of written discourse.

Results on the think aloud task indicated that Karen tended to pose questions that helped her to establish a purpose for reading the selection. However, even though she appeared to be concerned with maintaining the author's meaning, she seemed unaware that word identification errors changed the author's meaning.

The error detection results indicated that Karen was able to locate 70% of the implanted errors. In general, she appeared to monitor on a meaning basis as many of her comments seemed to focus on meaning construction.

Overall, it appeared that Karen had some awareness of reading strategies, was usually aware when loss of understanding occurred and engaged in applying fix-up

strategies to restore her understanding of written discourse. It appeared that Karen was able to monitor across levels as she directed her focus towards individual words, sentences or the story level. As well, she focused strongly on monitoring comprehension on the basis of meaning.

## Case Study Three - Nicole

### Personal and Educational Background Information

Nicole is a pleasant student who cooperated well in all of the activities. Playing baseball and working on math assignments were activities that she indicated she liked. Nicole also reported that she enjoyed listening to stories.

Nicole's school records indicated that she experienced difficulty coping with the curriculum in grade four. However, strengths were noted in her cooperative attitude, strength in verbal competence and mathematics. Organizing for instruction, written composition, writing mechanics, reading comprehension, reading decoding and spelling were identified as being areas of difficulty for Nicole. At present, Nicole has been in a class for students with learning disabilities for one year.

## Metacognitive Interview

Nicole's total score on the Index of Reading Awareness indicated that she had developed an awareness of several strategies involved in reading. Her scores on evaluation, conditional and planning strategies were similar; however, her awareness of regulation strategies was considerably lower. Table 7 illustrates the four scaled scores on the different knowledge awareness sections.

Table 7

Nicole's Index of Reading Awareness Results

| Scales on IRA | Score on IRA | Percentage Correct |
|---------------|--------------|--------------------|
| Total Score   | 27/40        | 67%                |
| Planning      | 6/10         | 60%                |
| Evaluation    | 7/10         | 70%                |
| Regulation    | 4/10         | 40%                |
| Conditional   | 7/10         | 70%                |

One of Nicole's greatest strengths appeared to be her metacognitive awareness of evaluation strategies as she recognized the following: 1) checking for understanding would help her to become a better reader; 2) the first sentence or two of a story often tell what the story is about; 3) the sentences that tell the most about the

characters and what happened in the story are the most important sentences in a story; and 4) sounding out words was the hardest part of reading for her.

From Nicole's responses we can infer that she was aware of some of the structural features found in written discourse. However, she appeared to be unsure what the last sentences in stories represent as she indicated that the last sentences of a story were harder to read.

Conditional knowledge, knowing when and why to apply specific strategies, was another area where Nicole showed strengths. She recognized that people read differently when reading for enjoyment than when studying science and social information. She reported that a study strategy for the retrieval of science and social information was to ask one's self questions about the important ideas. However, she did not appear to have a solid understanding of test studying strategies as she indicated that if she were reading for a test, reading the story as many times as possible would be more helpful than talking about the important information with someone else. As well, Nicole indicated that if she were reading a library book to write a book report, sounding out the words that she didn't know would help her write the report. She failed to recognize that writing the information down in her own words would be more beneficial. Furthermore, her response, "think about remembering it", to the question, "Which is the best way to remember a story?,

indicated that she was not aware that writing information down in her own words was a more effective strategy to use for this particular task.

Nicole's awareness of planning strategies was slightly less well developed than that of the evaluation and conditional knowledge strategies. She seemed aware that story events were important and recognized that some words were vital to the meaning of the story. However, she appeared to be unaware that planning strategies were important strategies to use before commencing reading as she noted her only plan was to choose a comfortable place to read. As well, Nicole seemed unaware that skimming a story to determine the general meaning was a highly effective strategy as she indicated that reading all of the story and trying to remember everything would help her determine the general meaning of a story. Furthermore, she was not aware that selectively choosing to read only the key sentences would provide valuable information about the story and shorten the time spent in determining the general meaning as she indicated that the middle sentences would be the most important to read.

Regulation knowledge, the ability to use alternate strategies and the ability to monitor one's comprehension, appeared to be a weaker area for Nicole. Her responses 1) "go on to the next word" for "What do you do if you come to a word and you don't know what it means?", 2) "sound out

all the words", for "What do you do if you don't know what a whole sentence means?" and 3) "you never skip anything" for "What parts of the story do you skip as you read? indicated that she tended to focus strongly on the text. She recognized that maintaining an understanding of the story was important as she stated that she would go back and reread information if she didn't understand the selection; as well, she recognized that information read before will be read faster the second time.

## Miscue Analysis

An analysis of Nicole's miscues across the passages "Rascal is Lost", "Part of the Team" and "Friendly Advice" is presented in Table 8. The percentage of miscues corrected across all of the instructional level passages was 19%.

By examining Nicole's miscues for graphic similarities, it appears that she was focusing heavily on graphic cues to identify words. The total percentage of corrected and uncorrected miscues across all of the instructional level passages for graphic similarity indicated that Nicole processed half or more of the letters in words 82% of the time. It appeared that graphic cues did not form the basis for Nicole's monitoring as there was little difference between the percentage of corrected and uncorrected miscues which had high visual similarity to text words. In fact, a

higher percentage of miscues with no visual similarity to text words were left uncorrected (19%) than were corrected (7%).

Table 8

Nicole's Miscue Data Profile

| Error Rating | Error Type | Graphic Similarity | | Contextual Acceptability | | Meaning Change | |
|---|---|---|---|---|---|---|---|
| Corrected | H | 13 | 86% | 8 | 53% | 14 | 93% |
| | P | 1 | 7% | 4 | 27% | 0 | 0% |
| | N | 1 | 7% | 3 | 20% | 1 | 7% |
| Uncorrected | H | 50 | 81% | 33 | 53% | 35 | 56% |
| | P | 0 | 0% | 14 | 23% | 6 | 10% |
| | N | 12 | 19% | 15 | 24% | 21 | 34% |

Note:  H = High, P = Partial, N = None

After examining the percentages of corrected and uncorrected miscues that were contextually acceptable, it was evident that Nicole did not appear to be monitoring her written discourse on the basis of contextual acceptability as there was little difference in percentages between corrected and uncorrected miscues.  However, it may have been possible that Nicole was monitoring her reading covertly or that she was able to use the structure of the

story questions to construct the author's meaning as she was able to answer the comprehension questions adequately.

The percentage of corrected miscues involving high meaning change was 93%. This figure demonstrated that Nicole was aware that responses that change the author's meaning should be corrected as a lower percentage of miscues resulting in a significant change in the author's meaning were left uncorrected (56%). As well, it appeared that a higher percentage of no or partial meaning change miscues were left uncorrected (44%) than corrected (7%); this indicated that errors that did not significantly change the meaning intended by the author were frequently not deemed necessary for correction. Hence, Nicole's monitoring was largely based on maintaining an adequate interpretation of the author's intended message.

## Nicole's Miscue Comments

Nicole's comments about her oral reading miscues were examined to provide more information about her comprehension monitoring. Table 9 illustrates the kinds of comments made by Nicole and the number of the times the different types of comments occurred.

Table 9

Nicole's Miscue Comments Data

| Criteria | During/After | Number of Examples |
|---|---|---|
| Because there was no ' in this and (couldn't) has an 't in it and I knew she wanted to get to the phone. | A | 1 |
| Because " " is spelled a different way. | A | 2 |
| Didn't sound right. | A | 1 |
| Doesn't seem right. | D | 2 |
| Didn't make sense. | A | 4 |
| Read on, didn't seem right. | A | 3 |
| Looked back to check if it was right. | A | 3 |
| Not the right word because it meant... | A | 4 |
| I don't know. | D | 2 |
| Total Number of Examples | | 22 |

Her comments "didn't sound right", "didn't seem right" and "didn't make sense" seemed to be all closely related to contextual acceptability or meaning. For example, when Nicole was asked why she had corrected her reading of "Bob had realized that he had forgotten to pick the new life jackets" to "Bob had realized that he had forgotten to pack the new life jackets," she indicated that it didn't seem right" after she had read a few sentences past the miscue and the story indicated that they were going to bring the life jackets on a trip. The results from Nicole's miscue comments, like the results achieved on the miscue analysis indicated that she did not monitor strongly for graphic cues, but rather tended to focus on maintaining meaning. She tended to look back to verify that a response was correct and indicated that several miscues had been

corrected because the response she had originally selected was not the right word and meant something different than the text word.

Nicole's miscue comments seemed to demonstrate that she had some awareness of evaluative strategies as she was aware when meaning loss had occurred and knew when she did not understand information read. This was reflected in comments such as "it didn't seem right", "didn't sound right", "didn't make sense", "I don't know", "not the right word because it meant " "  and " " is spelled a different way".

Her use of fix up strategies, such as sounding out words, looking back and reading on in the text, served to restore an adequate understanding of the written discourse and confirmed that Nicole appeared to have some knowledge of regulative strategies as indicated on the IRA. However, even though she was aware of some regulative strategies, it appeared that she may have had a limited awareness of the many different strategies available to readers. In fact, Nicole did not offer any comments that emphasized planning or conditional knowledge strategies. This may have been because of the task itself, the fact that she did not report on these processes, the fact that the knowledge had become automatic or she may simply have lacked knowledge of planning and conditional knowledge strategies.

## Nicole's Think Aloud Comments

Nicole was presented with two passages at her instructional level, "Christopher Columbus" and "Margaret Mead". Figure 5 illustrates the comments made by Nicole, the number of times they occurred within the think aloud activity and the manner in which the comments were classified.

The highest number of responses recorded was for MITQ (more information requested by using text to pose new questions). This indicated that she appeared to be having little difficulty monitoring her understanding of the text presented. These responses allowed her to read purposely and helped her to maintain her understanding of written discourse.

Nicole appeared to monitor her understanding of written discourse at a word level as she was aware when she was unable to recognize a word and when she did not know the meanings of words. She indicated that she did not recognize "inhabitants" and was unfamiliar with the meaning of "anthropology". However, she was unaware that she had substituted the word "Indians" for "Indies", which made sense in the immediate sentence, but changed the meaning intended by the author.

| Think Aloud Comments | MIWM | WIA | MITO | MIWI | ES |
|---|---|---|---|---|---|
| What's the title (Christopher Columbus) ? | | | * | | |
| Why was he trying to find an all water route to the Last Indians? | | | * | | |
| Why did he believe the world was round? | | | * | | |
| Why did he have to wait seven years before getting any money? | | | * | | |
| Why were sailors scared of getting close to the edge? | | | * | | |
| Why was it called the Sea of Darkness? | | | * | | |
| How much millions in gold did they get? | | | * | | |
| What is that word (inhabitants) ? | | * | | | |
| I don't know that word (Columbus) ? | | * | | | * |
| Why did he still believe that he had reached the Indians (Indies)? | | | | * | |
| I didn't understand "ways of life of people". | * | | | | * |
| I don't know what "anthropology" means. | * | | | | * |
| I was confused by "Margaret realized living with a people is the only effective way to learn about them. (underlined section indicates part that was confusing to her) | * | | | | * |
| I wondered why she had to study language and everything about them? | | | * | | |
| Why did they have no walls, gas, electricity, running water and bathrooms? | | | * | | |
| I wondered why they told her their problems? | | | * | | |
| Why did it say "Coming of Age in Sama (Samoa)? | | | | * | |
| Total Score for Categories | 3 | 2 | 9 | 2 | 4 |

**Figure 5.** Results from an analysis of the think aloud data for Nicole.

WIA:   word identification assistance request
MITO:  more information requested by using text to pose new questions
ES:    evaluative statement
MIWI:  more information requested, but difficulty with word identification evident
MIWM:  a request for information on word meaning

Nicole also indicated that the meanings of phrases found within the text itself ("ways of life of people" and "realized living with a people") were confusing. Hence, she appeared to be monitoring her understanding of the phrases

found in the text. In general, Nicole seemed meaning
oriented as she was aware when she had not understood the
meaning of a word and when she found the text or an unknown
word confusing.


## Nicole's Error Detection Comments

Figure 6 illustrates the comments made by Nicole on the
error detection task and the categories in which the
comments were placed. Data from "The Dark Tent" and
"Through the Storm" were compiled in this table.

From the results, it appeared that Nicole was able to
detect 70% of the implanted errors or multisyllabic words.
She was able to locate both of the implanted pronominal,
word order, and anomalous errors as well as one of the
inconsistent information errors. She did not locate the
multisyllable words and one of the inconsistent information
errors. It is possible that she was able to decode the
multisyllabic words while she read as she did not report any
problems identifying the implanted words. In fact, she may
have been unaware that she had corrected them while reading.
However, there were words which Nicole was unable to
identify through context, for example, she sought assistance
when she came across the word "anxiously".

| Error Detection Comment | Implant | DMS | WC | DNF | DM SC | WI | RDM SS | PE | WIC | WME |
|---|---|---|---|---|---|---|---|---|---|---|
| Mother anxiously cradled Becky in his arms. (Pronominal) | Yes | * | | | | | | | | |
| Mother anxiously cradled Becky in his arms. | No | | | | | * | | | | |
| It's five town to kilometres. (Word Order) | Yes | * | | | | | | | | |
| Tom quickly got his high top sneakers on. (Anomalous Information) | Yes | | | * | | | | | | |
| Snowdrifts were beginning to blanket the road as Tom set out. | No | | * | | | | | | | |
| He struggled against the fierce wind and blinding snow. | No | | | | | * | | | | |
| The daylight was fading. | No | | | | | | | | * | |
| Just as he thought he couldn't take another step,Tom reached the crest of the hill. | No | | | | * | | | | | |
| He plowed on. | No | | | | | | | | | * |
| Tom was relieved, for he knew the doctor would give a wonderful sleigh ride to the birthday party. (Informational Inconsistency) | Yes | | | | | | * | | | |
| Each boy had tent own his now (Word Order) | Yes | * | | | | | | * | | |
| As Mike was getting ready for bed, she suddenly realized he'd have to spend the next night alone in a dark tent. (Pronominal) | Yes | * | | | | | | | | |
| The children enjoyed visiting the library and listening to the librarian read stories. (Anomalous Information) | Yes | | | | | | * | | | |
| | | 4 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |

Figure 6. Results from an analysis of the error detection data for Nicole.

| | |
|---|---|
| Implant: | "Yes" under implant indicated that the particular error was implanted in the text by the researcher and "No" indicates that the student interpreted it as an error |
| DMS: | indicated that the error was reported because it didn't make sense |
| WC: | word change was suggested by the student |
| DNF: | information in text was deemed as not fitting in |
| DMSC: | indicated that she had originally highlighted the error because she had thought that it didn't make sense, but after reading ahead she indicated that she wished to change her mind as it actually did make sense |
| WI: | reported that she did not know what a particular word was |
| RDMSS: | recognized that information didn't make sense in relation to the rest of the story |
| PE: | information was related to personal belief or experience |
| WIC: | a word that was originally deemed as unknown was reclassified as known after student had read on |
| WME: | indicated that the meaning of the word was used incorrectly in the sentence |

The category DMS (didn't make sense) indicated that Nicole monitored her understanding of written discourse. As well, the categories DNF (doesn't fit) and RDMSS (recognized when information did not make sense in relation to the rest of the story) also served to illustrate her strong focus on meaning. In addition, the category WC (word change was suggested by the student) and the category WME (word meaning was suggested as being inappropriate by the student) indicated that Nicole was trying to make sense of information at a word level. She even suggested changes in the story vocabulary which would enable her to construct a better understanding of the text presented.

Nicole was aware when both a loss and restoration of understanding had occurred. For example, in the category DMSC, she had originally highlighted the error because she thought that it didn't make sense, but after reading ahead she indicated that she had changed her mind as the text actually did make sense. As well, Nicole indicated when her own knowledge about a topic was not consistent with that presented in text (PE).

## Summary of Nicole's Results

Results from the metacognitive interview demonstrated that Nicole was aware of planning, evaluation and conditional knowledge strategies. However, her awareness of regulation strategies was considerably less.

Her miscue analysis results indicated that she did not monitor on the basis of graphic cues or contextual acceptability, but that she tried to maintain the author's meaning. In fact, Nicole's comments about her oral reading miscues also revealed that she monitored on the basis of meaning. Her comments reflected awareness of both evaluative and regulative strategies.

Results from the think aloud tasks indicated that Nicole was able to form purposeful questions to guide her reading. She sometimes commented when a word was unknown; however, she still made word identification errors which tended to change the meaning intended by the author.

Nicole's results on the error detection task demonstrated that she was able to locate 70% of the errors and multisyllabic words. She did not offer comments about the multisyllable word implants, even though she sought clarification on other multisyllable words in the text. Overall, results indicated that she monitored on a meaning basis and used context to help resolve difficulties.

## Case Study Four - Brenda

### Personal and Educational Background Information

Brenda was nine years, seven months at the time the study was conducted. She was a friendly and talkative child

who enjoyed writing poetry. As well, she reported that art, physical education and music were her favourite subjects.

Brenda's school records indicated that she was assessed for special needs programming in grade two, but did not meet the criteria because her achievement scores were only one half to one year below grade expectation. Difficulties with reading comprehension and reading decoding were identified in this initial assessment. School records indicated that there was a history of learning disabilities in Brenda's family as her father had experienced similar difficulties in school. Brenda has been in a class for students with learning disabilities for one year.

## Metacognitive Interview

Brenda's total score on the Index of Reading Awareness indicated that she was aware of some strategies. Table 10 illustrates Brenda's scores for the planning, evaluative, conditional and regulative strategy awareness sub-scales on the IRA.

Planning knowledge, the student's ability to selectively choose reading strategies for particular tasks, was a strength for Brenda. She was aware that selectively reading the words and sentences that tell the most about a story were useful strategies to use. Brenda did not choose the most effective strategy for the remaining planning questions. For example, her response "read all of the story

and try to find the main parts" for the question "If your teacher told you to read a story to remember the general meaning, what would you do?", indicated that she was aware that reading the story and remembering information was a necessary part of reading; however, she failed to recognize the value of skimming for the main idea of a story. As well, Brenda seemed to feel that the only plan she should engage in before reading was to select a comfortable place to read rather than recognizing that thinking about the topic and trying to construct a mental framework for the reading selection were more effective planning strategies.

Table 10

Brenda's Index of Reading Awareness Results

| Scales on IRA | Score on IRA | Percentage Correct |
| --- | --- | --- |
| Total Score | 20/40 | 50% |
| Planning | 7/10 | 70% |
| Regulative | 5/10 | 50% |
| Evaluative | 4/10 | 40% |
| Conditional | 4/10 | 40% |

In relation to regulation strategies Brenda appeared to be aware that one can adjust one's reading rate for different tasks and materials. However, her response "ask someone else" to the question "What do you do if you come to

a word and you don't know what it means?" and her response "because it is good practise" for the question "Why do you go back and read things over again?", demonstrate that she may not have been fully aware of the following: 1) the purpose of reading, 2) how to use context to resolve word identification difficulties or 3) what alternative strategies can be used to remediate specific problems. Consequently, she indicated that she relied on teacher intervention to resolve many of her difficulties.

Evaluative knowledge was not one of Brenda strengths. Nevertheless, she was aware that the main goal of reading was to maintain understanding of written discourse as she believed "checking for understanding" would help her become a better reader. In addition, she felt that the hardest part of reading was sounding out unknown words. Therefore, it seemed that Brenda had some knowledge of evaluative strategies because she was aware of the purpose of reading and could recognize an area, decoding words, that was difficult for her. However, Brenda appeared to lack a solid understanding of text structure as she was unable to determine what purpose the first or last sentences of a story serve, and consequently, was unsure which sentences were the most important sentences in a story.

Brenda's conditional knowledge was rather limited. She indicated that "if she were reading a story for fun" she would look at the pictures to get the meaning. Her

responses "concentrate and try hard to remember", read the story as many times as possible" and think about remembering it (story)" indicated that she may have been either unaware of or unfamiliar with more effective strategies for information retrieval. In addition, Brenda indicated that when she came to information that she didn't understand when reading a library book, she just skipped out the parts that she didn't understand rather then take notes to help clarify her understanding of written discourse.

## Miscue Analysis

To obtain an understanding of Brenda's monitoring when reading orally, a detailed analysis of corrected and uncorrected miscues across the reading passages "Baby Deer's Lesson", Magic Boots", "Rascal is Lost" and "Part of the Team" is illustrated in Table 11. The percentage of miscues corrected across all of the instructional level passages was 17%.

By examining Brenda's miscues for graphic similarities, it appeared that she was aware that one should focus on graphic cues when reading. The total percentage of corrected and uncorrected miscues across all of the instructional level passages for graphic similarity indicated that Brenda processed half or more of the letters in words 57% of the time.

Table 11

Brenda's Miscue Data Profile

| Error Type | Error Rating | Graphic Similarity | | Contextual Acceptability | | Meaning Change | |
|---|---|---|---|---|---|---|---|
| Corrected | H | 8 | 61% | 2 | 15% | 9 | 69% |
| | P | 1 | 8% | 9 | 70% | 0 | 0% |
| | N | 4 | 31% | 2 | 15% | 4 | 31% |
| Uncorrected | H | 36 | 57% | 20 | 31% | 36 | 64% |
| | P | 1 | 2% | 28 | 44% | 12 | 10% |
| | N | 26 | 41% | 16 | 25% | 15 | 26% |

Note. H = High, P = Partial, N = None

When comparing the percentages for corrected and uncorrected miscues with high graphic similarity, little difference was evident; thus, graphic cues did not appear to be a basis for Brenda's monitoring.

The total percentage of corrected and uncorrected miscues that were high in contextual acceptability was 28%, which indicated that Brenda had some awareness that context cues play a role in meaning construction. There was some tendency to correct errors that were partially contextually acceptable rather than those which had no or high contextual acceptability. The percentage of corrected errors which had partial contextual acceptability was 70% and the percentage of uncorrected errors which were partially contextually

acceptable was 44%. This indicates that Brenda monitored miscues which made sense in relation to small units of meaning, namely, sentences or parts of sentences. However, there was little difference between uncorrected and corrected miscues in the percentages which had no or high contextual acceptability.

The total percentage of corrected and uncorrected miscues that involved no or partial meaning change was 40% across the passages, which indicated that Brenda was aware to some degree that the author's meaning is important in reading. However, there was little difference between the percentages for corrected and uncorrected miscues rated as high in meaning change, which indicated that Brenda did not appear to base her monitoring on maintaining the author's meaning.

## Brenda's Miscue Comments

Brenda's comments about her oral reading miscues were examined to provide more information about her comprehension monitoring. Table 12 illustrates the comments Brenda made about her oral reading miscues. The information presented focused solely on comments made in discussion with the researcher after the student read the selection.

Table 12

Brenda's Miscue Comments Data

| Criteria | After | Number |
|---|---|---|
| It didn't make sense. | A | 2 |
| It didn't sound right. | A | 2 |
| I read it over, I read every sentence two times when I read. | A | 1 |
| It was hard to read fast and get every word, so I slowed down and read it again. | A | 1 |
| It didn't make sense, so I read it again. | A | 1 |
| I read it over again. | A | 1 |
| I read on and it didn't make sense, so I read backwards. | A | 1 |
| I looked back and I said "Oh, I missed a word, in my brain, so I went and put it back in". | A | 1 |
| I remembered it had a "h" in it and "was" has a "w". | A | 1 |
| I checked it because I knew it had a "o". | A | 1 |
| It was spelled differently. | A | 1 |
| Total Score | | 13 |

The results from Brenda's miscue analysis and miscue comments both indicated that even though she was aware of graphic cues, it seemed that contextual acceptability was the basis on which she monitored her miscues. For example, when she read "Mrs. Bear rescued over and pushed against it as hard as she could with her paws" for "Mrs. Bear rushed over and pushed against it as hard as she could with her paws", she indicated that she had corrected "rescued" for "rushed" because it was spelled differently. However, when asked why she had decided to correct the error, she stated that it didn't make sense so she had changed her mind and read it over again.

It appeared that Brenda's comments could be broken down into mainly evaluative and regulative comments. Examples of comments deemed as having an evaluative focus included "it didn't make sense", "it didn't sound right", and "it was hard to read fast and get every word".

Brenda's use of fix up strategies such as looking back, reading ahead, rereading text and using graphic cues to decode unknown words indicated that she was aware of regulative strategies. It appeared that she was attempting to coordinate her own evaluative knowledge with her knowledge of alternate strategies to restore meaning loss. In addition, it appeared that Brenda had some awareness of conditional knowledge as she indicated that she had changed her reading rate to increase her understanding of specific text words.

Planning strategies did not emerge in the data. Even though she was able to use different regulative strategies, she did not verbally state her intended actions before engaging in a fix up strategy. It is possible that she engaged in the planning strategies covertly, but did not make it known to the researcher.

## Brenda's Think Aloud Comments

Brenda was presented with two passages at her instructional level, "The Surprise" and "Father's New Game", from the Qualitative Reading Inventory. The comments Brenda

made, the number of times they occurred during the think aloud activity and the manner in which they were classified are illustrated in Figure 7.

| Think Aloud Comments | PCT | PPE | ES | MUT | NC |
|---|:---:|:---:|:---:|:---:|:---:|
| What's going to happen, are they going to get kidnapped? | | | | * | |
| Nothing confusing. | | | | | * |
| There's nothing confusing, doesn't make me wonder about anything. | | | | | * |
| I wonder if he's downstairs because they're finding these notes all over the house. Can I read on? | * | | | | |
| I think this is a new game their father is trying to teach them. | * | | | | |
| I think the new game was set up by the dad when the guy was fixing the washer. | * | | | | |
| They might get a pet. | * | | | | |
| Jackie tried on the new coat. She didn't like it, so she returned it and I think one of her friends is going to buy it. | | * | | | |
| I was right. | | | * | | |
| I think it's going to be a puppy, a large one, Airedales they listen better than others. | | * | | | |
| Yes, I was right. | | | * | | |
| I wonder if it's a black dog? | * | | | | |
| I think the sign says "Happy Birthday". | * | | | | |
| I wonder if the dog gets into a lot of trouble? | * | | | | |
| Can I change my prediction to "Happy Birthday" Love Grandma and Mom? | * | | | | |
| Total Score For Categories | 8 | 2 | 2 | 1 | 2 |

**Figure 7.** Results from an analysis of the think aloud data for Brenda.

PCT:      a prediction constrained by the text was made
PPE:      a prediction drawn from personal experiences was made, but indicated a departure from the story meaning
ES:       evaluative statement
NC:       no comment, nothing appeared confusing or made child wonder
MUT:      misunderstanding of text

The results indicated that Brenda made several predictions based on information she had read. In fact, she

appeared to be using her predictions to purposely guide her reading of the written discourse and sometimes brought her own personal experiences into her interpretation of the text. However, if her background experiences were not strongly constrained or related to the actual text, a departure away from the meaning intended by the author occurred.

Brenda indicated that she felt two of her predictions were correct when in fact, they were not consistent with the meaning intended by the author. This same trend was noted in MUT where Brenda's question did not seem to be related to the information read.

## Brenda's Error Detection Comments

Data from "Something New" and "Alone on the Mountain" were combined in Figure 8 to illustrate the comments made by Brenda on the error detection task and the categories in which the comments were placed. It appeared that Brenda was generally able to detect errors and multisyllabic words implanted in the text 80% of the time. She was able to find one pronominal, one multisyllabic and both word order, informational inconsistency and anomalous information errors.

| Error Detection Comments | Implant | WME | RTC | REWT RC | MSNP | WCR | DMS | SWC | CI |
|---|---|---|---|---|---|---|---|---|---|
| Something New | No | | * | | | | | | |
| He had a hammer, saw and some nails. | No | * | | | | | | | |
| The trip to the candy store was fun. (Anomalous Information) | Yes | | | | | | * | | |
| The animal were happy with their new stalls. (Informational Inconsistency) | Yes | | | * | | | | | |
| Farmer Brown is going the pond for us to build around. (Word Order) | Yes | | | | | | * | | |
| Suddenly she saw a butterfly with magnificent bright blue wings. (Multisyllabic) | Yes | | | | * | | | | |
| He stopped to watch it. (Pronominal) | Yes | | | | | | * | | |
| He stopped to watch it. | No | | | | | * | | | |
| The butterfly landed on a rosebush. | No | | | | | | | | * |
| The only sounds Linda could hear were birds chirping, the wind rustling the leaves and people laughing at the birthday party. (Informational Inconsistency) | Yes | | | | | | | | * |
| Linda yelled again, "Mom ! Dad! I'm lost!" | No | | | | | | | * | |
| Finally she heard Dad's voice. | No | | | | | | | * | |
| We are ready to go shopping now, let's all get into the car. (Anomalous Information) | Yes | | | | | | * | | |
| "I was not afraid" said Linda. | No | | | | | | | | * |
| I know you find me would. (Word Order) | Yes | | | | | | * | | |
| Her mother and father looked at each other and smiled. | No | | | | | | | * | |
| Total Number | | 1 | 1 | 1 | 1 | 1 | 5 | 3 | 3 |

**Figure 8.** Results from an analysis of the error detection data for Brenda.

| | |
|---|---|
| Implant: | "Yes" under implant indicates that the particular error was implanted in the text by the researcher and "No" indicates that the student interpreted it as an error |
| WME: | indicated that the meaning of the word was used incorrectly in the sentence |
| RTC: | recommended that the title be changed |
| REWTRC: | recognized the error and explained the error to the researcher by using examples from the text |
| MSNP: | appeared to have no difficulty with the multisyllable word "magnificent" |
| DMS: | indicated that the error was reported because it didn't make sense |
| SWC: | suggested that the writer of the story make changes in the text to improve clarity (make it easier to understand) |
| CI: | suggested that the information in a particular sentence contradicted with that from another part of the story |

The category DMS (doesn't make sense) indicated that Brenda monitored her reading on the basis of when meaning loss occurred. She appeared to monitor her understanding of textual information across levels as she indicated when a word's meaning didn't make sense (WME) and suggested that information from another part of the story contradicted a particular block of text (CI). As well, she was aware when she understood multisyllable words in text and made suggestions for error corrections by using examples from the text (REWTRC).

Brenda also tended to make suggestions for improving the written composition itself as she indicated that the writer of the story could make several changes, including a change in the story title.

## Summary of Brenda's Results

Brenda's total score on the metacognitive interview indicated that she had some strategy awareness. Her strengths appeared to lie in planning and regulative knowledge awareness.

The miscue analysis results demonstrated that Brenda corrected relatively few miscues. Miscues that were corrected tended to make sense in relation to sentences or parts of sentences rather than the whole passage. She did not tend to monitor on the basis of the author's meaning. In addition, the results from the miscue comments indicated

that Brenda tried to use regulative strategies to restore her understanding of written discourse, but at times seemed uncertain when to use particular strategies.

Results from the think aloud task indicated that Brenda made predictions to purposely guide her reading; however, her predictions were often not constrained by the text.

The error detection results indicated that Brenda located 80% of the implanted errors and multisyllabic words. She appeared to monitor on a meaning basis as she was aware when she had lost understanding. As well, she also seemed to be concerned with clarity of expression as she made several comments about how the writer could improve the written composition for the reader.

In general, Brenda's comprehension monitoring seemed to be meaning directed because she was aware of some strategies, recognized when meaning loss occurred and recognized that written discourse can be edited to ensure greater understandability.

## Case Study Five - Sandra

### Personal and Educational Background Information

Sandra was ten years old at the time the study was conducted. She reported that she enjoyed mathematics, soccer, and sharing interesting books she had read. From

the interview, it was apparent that she tried to read daily
and was familiar with a variety of authors.

Sandra's school records indicated that she was placed
in a learning disabilities program directly after grade
three as she had difficulties with writing, reversals of
letters and words, and letter order confusions within words.
The most recent intellectual assessment indicated that
Sandra's strengths were her good vocabulary knowledge,
excellent verbal reasoning, efficient visual learning skills
and well developed social comprehension skills.  Sandra has
been in a class for students with learning disabilities for
one year now.

## Metacognitive Interview

Sandra's total score on the Index of Reading Awareness
indicated that she was aware of some of the strategies
involved in reading.  Table 13 illustrates Sandra's results
on the four sub-scales of the IRA.

She experienced the greatest success on questions which
dealt with regulation strategies; results for planning,
conditional knowledge and evaluation scales, were all lower
and around a similar level.  Sandra's scores on the
regulation knowledge scale indicated that she was aware that
there were alternate strategies for resolving loss of
understanding.

Table 13

Sandra's Index of Reading Awareness Results

| Scales on the IRA | Score On IRA | Percentage Correct |
|---|---|---|
| Total Score | 25/39 | 64% |
| Planning | 5/9 | 55% |
| Evaluation | 6/10 | 60% |
| Regulation | 8/10 | 80% |
| Conditional | 6/10 | 60% |

She demonstrated an awareness of the following regulation strategies: 1) encountering a reading selection more than once will increase one's reading rate, 2) going back and rereading material will increase one's understanding of writter urse, 3) unknown words can be figured out by reading the surrounding text, and 4) if a whole sentence is misunderstood, thinking about the other sentences in the paragraph will help clarify the meaning. She was not aware that skipping out irrelevant story parts still allowed the reader to maintain the meaning the author intended as she indicated that every word should be read.

Sandra's knowledge of planning strategies was somewhat less well developed than her regulation knowledge. Her response, "read all of the story and try to remember everything", indicated that she was not aware that skimming

was a useful strategy for determining the general meaning of a story. It appeared that she was unfamiliar with prereading or planning activities as she indicated that "you don't make any plans, you just start reading". However, she was aware that one should try to be selective and read the words and sentences that tell the most about the story. Sandra found one planning question, "When you tell other people about what you read, what do you tell them?", difficult to answer as she felt that two answers applied: 1) tell what happens in the story, and 2) tell who the characters are. This item was not counted in the total score or the planning strategies score.

In relation to evaluative strategies, Sandra indicated she was aware that checking to maintain her understanding of the story information was an extremely important strategy. In addition, she also recognized that sounding out words was an area of difficulty for her. However, Sandra appeared to have a rather limited awareness of narrative text structure. She was aware that the first sentences often told what the story was about, but believed the last sentences were special because they were exciting-action sentences rather than recognizing the fact that they actually told what happened in the story. She also responded, "all of them are important", when asked "which sentences are the most important ones in a story?".

Sandra's scores on conditional knowledge, knowing when to use strategies, indicated that she had some strategy awareness, particularly with writing. She also felt that writing down information in her own words would help her to write a book report and to remember a story. However, a lack of conditional knowledge awareness was also present as she felt that if she were reading a book for fun the pictures would be the most important element in helping her construct the story meaning. In addition, she seemed to be unsure how to effectively retrieve information when studying for a test or social or science activity as she indicated that concentrating and trying hard to remember and saying the sentences over and over would be the most helpful.

## Miscue Analysis

A detailed analysis of corrected and uncorrected miscues across the instructional level reading passages "Rascal is Lost", "Part of the Team", "The New Horse" and "The Wrong Decision", was conducted. Table 14 presents a summary of the data. The percentage of miscues corrected across all of the instructional level passages was 14%.

From examining Sandra's miscues for graphic similarities, it seemed that she was aware that one should focus upon graphic cues in reading. The total percentage of corrected and uncorrected miscues with high graphic

similarity indicated that Sandra processed half or more of the letters in words 58% of the time.

Table 14

Sandra's Miscue Data Profile

| Error Type | Error Rating | Graphic Similarity | | Contextual Acceptability | | Meaning Change | |
|---|---|---|---|---|---|---|---|
| Corrected | H | 9 | 69% | 6 | 46% | 10 | 77% |
| | P | 0 | 0% | 3 | 23% | 1 | 8% |
| | N | 4 | 31% | 4 | 31% | 2 | 15% |
| Uncorrected | H | 45 | 56% | 42 | 53% | 49 | 61% |
| | P | 5 | 6% | 10 | 12% | 12 | 15% |
| | N | 30 | 38% | 28 | 35% | 19 | 24% |

Note. H = High, P = Partial, N = None

When comparing corrected and uncorrected miscues, the percentage of miscues with high graphic similarity was slightly higher for corrected than for uncorrected errors, indicating that graphic cues did not appear to be a basis for Sandra's monitoring.

The total percentage of corrected and uncorrected miscues that had high contextual acceptability was 52%, which indicated that Sandra was aware that context does influence meaning construction in reading. However, there was little difference between corrected and uncorrected

errors in contextual acceptability, indicating that she did
not tend to correct miscues on this basis.

The total percentage of corrected and uncorrected
miscues rated as involving no or only a partial meaning
change was 37%. A higher percentage of miscues which were
corrected had high meaning change (77%) than those which
were uncorrected (61%), indicating that Sandra was aware
that responses that change the author's meaning should be
corrected. As well, a higher percentage of uncorrected
miscues involved partial and no meaning change (39%) than
did corrected miscues (23%). This indicates that errors
which did not significantly change the author's meaning were
often not deemed necessary to correct. However, 61% of the
uncorrected miscues did involve a significant change in the
author's meaning.

## Sandra's Miscue Comments

Sandra's comments about her oral reading miscues are
displayed in Table 15. In general, the results from the
miscue comments support those on the miscue analysis as
Sandra appeared to monitor her miscues on the basis of
meaning change rather than graphic similarities. Even
though she was aware of graphic cues and tried to use her
graphic knowledge to monitor, she experienced difficulty.
For example, she reported that "I know how to spell both

words (original word and substituted word) but it wasn't
till I read the rest of the sentence that I knew it".

**Table 15**

<u>Sandra's Miscue Comments Data</u>

| Criteria | During/After | Number |
|---|---|---|
| Didn't sound right | A | 1 |
| Sounds better makes the story make sense. | A | 2 |
| Because it's spelled a different way. | A | 1 |
| It didn't make sense that's why I said "I don't know". | A | 1 |
| I don't know. | D | 9 |
| What's that word? | D | 2 |
| No wait, is that" "? | D | 2 |
| I sounded it out and looked back. | A | 1 |
| There was a "n" and a apostrophe "t'. | A | 1 |
| I sounded it out and found out I knew it! | A | 1 |
| I sounded it out and it didn't sound like "Melvin". | A | 1 |
| I figured it out because I read the rest of the sentence. | A | 1 |
| I didn't know, so tried sounding it out, but I didn't know so I read on, but I still didn't know. | A | 1 |
| I read some more of the sentence and found out what it was. | A | 2 |
| I know how to spell "around" and "against", but it wasn't till I read the rest of the sentence that I knew it. | A | 1 |
| Didn't make sense, I knew it wasn't a doing word so I made it make sense. | A | 1 |
| I skipped it out because I couldn't figure it out by sounding it out or anything. | A | 1 |
| I read the sentence and then, I put another word in, so I'd have an idea. So, when I put in the second word, I found out what that word was. | A | 1 |
| It didn't make sense and I didn't understand when I sounded it out, so, I read the last part of the sentence and I understood it. | A | 1 |
| Total Score | | 31 |

Consequently, she tended to use reading ahead to monitor for understanding and resolve word identification difficulties. Sandra's responses could be categorized as either evaluative or regulative in focus. Comments such as, 1) "it didn't make sense, that why I said "I don't' know", 2) it's spelled a different way", 3) "What's that word?" and 4) "No wait, is that?", showed evaluative awareness or regulative monitoring. Her response "don't know" seemed to indicate her inability to decode a word in the story text. For example, when she was asked why she had said "I don't know" when she came to anxiously in the sentence "Brian looked anxiously at the goalie", she stated it was because she didn't know the word. From the miscue analysis and the miscue comments transcript it appeared that she sometimes skipped out unknown words. When asked why she had commented "I don't know" she said "I skipped it out because I couldn't figure it out by sounding it out or anything".

In relation to fix up or regulative strategies, Sandra tended to rely on reading ahead and sounding out unknown words to resolve a loss of understanding. This suggests that Sandra tended to integrate decoding and reading ahead as a strategy for restoring meaning loss. As well, she was aware of several alternate strategies as she attempted to use known spellings of words, individual letter cues, chunks of words, word substitutions and selecting a doing word to help restore her meaning loss.

Sandra seemed to have several regulative strategies at her disposal, but may have been unsure when to apply specific strategies to resolve problems since conditional knowledge did not emerge in the miscue data. As well, comments indicating an awareness of planning strategies did not emerge in the miscue comments data either.

## Sandra's Think Aloud Comments

Figure 9 illustrates the comments made by Sandra, the number of times they occurred within the think aloud activity and the manner in which they were classified. The results from figure 9 were compiled when Sandra was presented with two passages at her instructional level, "Johnny Appleseed" and "Amelia Earhart", from the Qualitative Reading Inventory.

The results indicated that Sandra tried to purposely guide her reading by drawing from her own background knowledge and made predictions to help clarify her understanding of the text. She was aware when she experienced difficulty identifying a word (Ohio) and was aware when she was able to figure out a word with which she had previously experienced difficulty (cider). Sandra also appeared to be concerned about whether her responses were right or wrong, which indicated that she was aware that the author's meaning should be maintained.

| Think Aloud Comments | PCT | HITQ | MUT | ES | WIA |
|---|---|---|---|---|---|
| Why are people moving west? | | * | | | |
| I think I know, why ... people wanted free land and Canada needed to be filled up. | * | | | | |
| What is that word? Is it Ohio? | | | | | * |
| I'm still wondering if i'm exactly right or if I have the wrong idea. | | | | * | |
| Why did he grab the apple seeds? | | | * | | |
| I know that word (cider) but I can't figure it out. | | | | * | |
| Oh, I got it, cider! | | | | * | |
| Why didn't he give up? | | * | | | |
| Why was his nickname Johnny Appleseed? | | * | | | |
| Why weren't they always true? | | * | | | |
| Why had no other woman done this before? | | * | | | |
| Why did she listen to what they said about flying? | | * | | | |
| Why did she face many dangers? | | * | | | |
| Why do women try things that men have tried? | | * | | | |
| Total Score for Categories | 1 | 8 | 1 | 3 | 1 |

**Figure 9.** Results from an analysis of the think aloud data for Sandra.

PCT: a prediction constrained by the text was made
HITQ: information requested by using text to pose new questions
ES: evaluative statement
MUT: misunderstanding of text
WIA: word identification assistance request

## Sandra's Error Detection Comments

From the results on the error detection task, it appeared that Sandra was able to locate 80% of the implanted errors and multisyllabic words. She found both of the implanted errors which focused on word order, multisyllable words and anomalous information; as well, she found one informational inconsistency error and one pronominal error. Figure 10 illustrates the results obtained from "The Dark

Tent" and "The Trap" as well as the comments made by Sandra

and the categories into which the comments were placed.

| Detection Comments | Implant | WI | PE | DMS | COT | DMSP | MII AS | EIS |
|---|---|---|---|---|---|---|---|---|
| Mike was excited. | No | * | | | | | | |
| To his surprise, Mike's mom and dad brought him a pup tent. | No | | * | | | | | |
| Each boy had tent own his now. (Word Order) | Yes | | | * | | | | |
| Since everything was packed and ready, they would leave early in the morning. | No | * | | | | | | |
| As Mike was getting ready for bed, she suddenly realized he'd have to spend the next night alone in a dark tent. (Pronominal) | Yes | | | | * | | | |
| He would be afraid but he certainly did not want his friends to find out. | No | * | | | | | | |
| No matter what happened, he would just have to hide his fear. | No | * | | | | | | |
| Early next morning the boys hiked to the spectacular campground. (Multisyllabic) | Yes | * | | | | | | |
| After supper they sat around the campfire and tried to scare each other with ghost stories. | No | | | | | * | | |
| The children enjoyed visiting the library and listening to the librarian read stories. (Anomalous Information) | Yes | | | | | * | | |
| He lay petrified. | No | * | | | | | | |
| A strange sound interrupted their play. | No | * | | | | | | |
| A big truck, towing a bear trap on wheels, came into the clearing. | No | | | | | | * | |
| Two men trap the unlocked, then left. (Word Order) | Yes | | | * | | | | |
| He ran to the trap and crawled inside. | No | | | | * | | | |
| Hearing the cub's frightened cry, the mother grizzly rushed to him and managed to lift the door. (Multisyllabic) | Yes | | | | | | * | |
| The cub sat back and enjoyed being trapped. (Informational Inconsistency) | Yes | | | | | | | * |
| The cub escaped. | No | | | | | * | | |
| The grizzly bear and her cub were together as they fled into the bushes. | No | * | | | | | | |
| The bears were ready to perform with the clowns at the zoo (Anomalous Information). | Yes | | | | * | | | |
| Total Scores | | 8 | 1 | 4 | 4 | 1 | 1 | 1 |

Figure 10. Results from an analysis of the error detection data for Sandra.

| | |
|---|---|
| Implant: | "Yes" under Implant indicates that the particular error was implanted in the text by the researcher and "No" indicates that the student interpreted it as an additional error |
| WI: | reported that a particular word was unknown |
| PE: | information was related to personal belief or experience |
| DMS: | indicated that the error was reported because it didn't make sense |
| COT: | student indicated that she was checking to determine if the sentence was on topic and had decided that it was not |
| DMSP: | indicated that the punctuation in the text did not make sense |
| MIIAS: | comment indicated that she had misunderstood the text by misinterpreting the text across several sentences |
| EIS: | indicated that there was an error in the story |

The category WI (student indicated that a word was unknown) indicated that Sandra was aware when she did not recognize individual words found in the text. This included multisyllable words as well as one and two syllable words. She was also aware when a loss of understanding occurred as she indicated when something did not make sense (DMS).

She used a look back strategy to determine if particular items were off topic (OT). Her use of the category EIS (error in the story) seemed to be very similar to the category OT (off topic). Hence, it appeared that Sandra was able to monitor her loss of understanding for both small chunks of information and larger sections across the passage. However, MIIAS (misunderstanding across sentences) indicated that Sandra experienced difficulty monitoring a larger segment of text on one occasion.

In addition, to the strategies noted above, Sandra brought her own experiences into the reading process and monitored for punctuation. She seemed to feel that a sentence punctuated such as: "A truck, towing a bear trap on wheels, came into the clearing" didn't make sense.

## Summary of Sandra's Results

Results from the IRA indicated that Sandra appeared to be aware of several different strategies (particularly regulation strategies).

An analysis of Sandra's oral reading miscues demonstrated that she did not monitor on the basis of graphic cues, but rather on the basis of the author's meaning.

Sandra's comments about miscue analysis errors provided further evidence that she monitored on a meaning basis rather than graphic similarities as she was aware when meaning loss had occurred and tried to resolve problems through the use of fix up strategies (regulative strategies).

Results for the think aloud tasks indicated that Sandra was aware when she experienced difficulty with some of the vocabulary words as she recognized that it was important to maintain the author's meaning and tended to evaluate her responses. As well, Sandra tried to bring her own background experiences into the interpretation of the text and extended her comprehension monitoring to include punctuation as well.

On the error detection task, Sandra demonstrated that she was aware when a loss of understanding occurred about 80% of the time. When she did locate errors, it appeared that she focused on meaning as a basis for monitoring and

used several criteria on which to base her evaluation of her response as she demonstrated that she monitored information at a word or sentence level as well as the larger story level.

Overall, it appeared that Sandra was aware of several reading strategies, recognized when loss of unders*unding occurred and monitored her understanding of written discourse on the basis of meaning. Furthermore, it seemed that Sandra was able to implement several regulation strategies to resolve loss of understanding across different text levels.

## Case Study Six - Norma

### Personal and Educational Background Information

Norma was ten years ol at the time the study took place. Her teacher reported that she was a c ᵢful girl who enjoyed playing with other children. Norᵢᵃ stated that she liked conducting science experiments and playing games on the computer at school. She indicated that after school hours, she took part in swimming and organ lessons. Norma also felt that she was not "that good at silent reading" and preferred to do oral reading if given a choice.

Norma's school records demonstrated that she had a history of school difficulty. An assessment by a district reading specialist reported that Norma had a very limited

sight word vocabulary and experienced difficulty with visual
motor integration. At this time, Norma has been in a class
for students with learning disabilities for two years.


## Metacognitive Interview

The total score Norma achieved on the Index of Reading
Awareness indicated that she was aware of several strategies
used in reading. Her scores on the evaluation, planning,
and regulation sections were relatively high, but awareness
of conditional strategies, knowing when to use specific
strategies, was an area of difficulty for her. Table 16
illustrates the different levels that Norma achieved on the
four scales of The Index of Reading Awareness.

Table 16

Norma's Index of Reading Awareness Results

| Scales on IRA | Score on IRA | Percentage Correct |
|---|---|---|
| Total Score | 26/40 | 67% |
| Planning | 8/10 | 80% |
| Evaluation | 8/10 | 80% |
| Regulation | 8/10 | 80% |
| Conditional | 3/10 | 30% |

In relation to planning knowledge, Norma was aware that selectively reading the most important information would enable her to understand the story being read as she suggested that one should read the sentences and words that tell the most about the story. However, she was not aware that skimming could be used to determine the general meaning of a story. Norma was also unaware that making plans before one begins to read helps to establish a purpose for reading as she indicated that the only planning strategy she engaged in was locating a comfortable place to read.

In relation to evaluation strategies, Norma responded "sounding out the hard words", to the question "What is the hardest part about reading for you?". However, she also indicated that if more people would help her when she reads, she could become a better reader. This response suggests that she has not realized that accepting more responsibility for resolving loss of understanding and becoming an active participant in the reading process will help to strengthen her reading skills. It seemed as if she attributed greater success in reading to other people rather than her own abilities/performance as a reader.

Nevertheless, Norma demonstrated that she was aware that text structure can provide the reader with valuable information as she indicated that the first sentence or two of a story often tells what the story is about, the last sentences of a story tell the reader what happened in the

story and the most important sentences were the ones that tell the most about the characters and what happens in the story.

On questions regarding regulation strategies, Norma indicated that information that has been read before can be read faster the next time it is read and recognized that rereading written discourse helps to clarify a loss of understanding. As well, she reported that unknown words could be decoded by using the surrounding text as an aid. However, she seemed unaware how to resolve sentence level problems as she reported that reading it again was the best strategy for resolving problems at the sentence level rather than indicating that thinking about the other sentences in the paragraph may help clarify one's understanding of written discourse. In addition, she did not seem aware that skipping nonessential words or story parts that do not disrupt the construction of meaning was acceptable practice.

Norma's awareness of when to use specific strategies, conditional knowledge, was less well developed than other areas of metacognitive awareness. She seemed unaware that people read for different purposes and had a rather limited knowledge of the many different kinds of strategies available for effectively retrieving information. Her responses, "concentrate and try hard to remember and "say the sentences over and over" when asked about study strategies indicated that she seemed to rely mainly on her

own memory to recall information. Nevertheless, Norma appeared to be aware that writing down information in her own words would be helpful in writing a book report. Because Norma engaged in book report writing in school, it is possible that s¦   ¡d a better understanding of the purpose of note t¬ ..ng in facilitating information retrieval for report writing than study tasks.

## Miscue Analysis

A detailed examination of the miscues was made across the independent and instructional level passages "Magic Boots", "Baby Deer's Lesson" "Rascal is Lost" and "Part of the Team". Table 17 illustrates the data. The percentage of miscues corrected across all of the instructional level passages was 13%. From examining Norma's miscues for graphic similarities, it appeared that she was generally aware that one should focus upon graphic cues in reading. The total percentage of corrected and uncorrected miscues with high graphic similarity indicated that Norma processed half or more of the letters in words 51% of the time. When comparing the percentages of corrected and uncorrected miscues with high graphic similarity, the percentage was higher for corrected than for uncorrected errors, demonstrating that she did not use graphic cues as a basis for monitoring her reading. In other words, she had a tendency to correct errors which already looked like the

words on the page. In addition, a higher percentage of
uncorrected (35%) than corrected (11%) miscues had no visual
similarity to text words.

Table 17

Norma's Miscue Data Profile

| Error Type | Error Rating | Graphic Similarity | | Contextual Acceptability | | Meaning Change | |
|---|---|---|---|---|---|---|---|
| Corrected | H | 6 | 67% | 4 | 44% | 5 | 56% |
| | P | 2 | 22% | 0 | 0% | 0 | 0% |
| | N | 1 | 11% | 5 | 56% | 4 | 44% |
| Uncorrected | H | 30 | 49% | 23 | 37% | 40 | 64% |
| | P | 10 | 16% | 18 | 29% | 6 | 10% |
| | N | 22 | 35% | 21 | 34% | 16 | 26% |

Note. H = High, P = Partial, N = None

The total percentage of corrected and uncorrected
miscues high in contextual acceptability was 38%, indicating
that Norma was aware context does play a role in reading.
Norma made some attempt to monitor her miscues on the basis
of contextual acceptability as 56% of the miscues which she
corrected had no contextual acceptability and 34% of the
miscues she left uncorrected had no contextual
acceptability. She also tended to leave miscues that were
partially correct (29%) uncorrected.

The total percentage of corrected and uncorrected miscues that were rated as having no or only a partial meaning change was 37%. There was little difference between the corrected miscues and uncorrected miscues for the percentage of miscues that involved a high meaning change, indicating that Norma did not monitor for significant changes in the author's meaning. She did not correct 64% of the miscues that involved a significant meaning change. As well, a higher percentage of corrected errors (44%) than uncorrected (26%) resulted in no meaning change. When these results are combined with those on contextual acceptability, it appears that Norma may have monitored more strongly on the basis of her own meaning construction rather than trying to maintain the author's meaning.

## Norma's Miscue Comments

The miscue comments sample is relatively small as many of Norma's errors were left uncorrected. Table 18 represents comments made in discussion with the examiner after reading as Norma made no comments while reading.

One criterion that was stated both alone or in conjunction with a look back strategy was "didn't sound right". Norma appeared to be using this category to signify a loss of meaning as she remarked "didn't sound right, it didn't make sense, one than just win" when asked why she had corrected her miscues after reading "Brian hoped for more

one than just a win" instead of "Brian hoped for more than just a win". As well, Norma made several comments pertaining to graphic cues although there were more occurrences of meaning related monitoring strategies. Therefore, the results from Norma's miscue comments support the results obtained on the miscue record as Norma appeared to be somewhat aware of graphic cues, but tended to rely on meaning to restore her understanding of written discourse.

Table 18

Norma's Miscue Comments Data

| Criteria | After | Number |
|---|---|---|
| Didn't sound right. | A | 4 |
| I checked the letters. | A | 1 |
| I knew it was the wrong word because nose had an "o" and did not have a "i". | A | 1 |
| I was confused. | A | 1 |
| It didn't make sense. | A | 2 |
| Because I thought it was past not present, I learned about past and present in school. | A | 1 |
| Didn't sound right, so I kind of read backwards. | A | 1 |
| I kept reading it again. | A | 1 |
| I just noticed it by sort of glancing back because it didn't sound right. | A | 1 |
| It didn't sound right, no such word. | A | 1 |
| Total Score | | 14 |

From the miscue comments sampled, it appeared that Norma's responses had either an evaluative or regulative focus. Responses such as, "didn't sound right" and "I knew it was the wrong word, "I was confused","it didn't make

sense" and "it didn't sound right, no such word" were categorized as being evaluative comments as they illustrated that she was cognizant of her own difficulties and seemed to recognize that understanding what one reads is an important part of the reading process.

Knowledge of fix up strategies or regulative strategy awareness also surfaced in Norma's miscue comments, e.g., "I corrected it because I thought it was past not present", "Didn't sound right, so I kind of read backwards", "I kept reading it again" and "I just noticed it by sort of glancing back because it didn't sound right". When Norma recognized that a misunderstanding of written discourse had occurred, she often tried to resolve the difficulties by using a look back strategy. As well, she attempted to use graphic cues to restore some difficulties, but overall appeared to be monitoring on the basis of meaning construction.

In general, she did not appear to have a strong arsenal of skills at her disposal as she left a great many errors uncorrected. In addition, conditional and planning knowledge awareness did not emerge in Norma's miscue comments. It is possible that she may have a limited understanding of these strategies or she may simply not have reported their use in the oral reading activities.

## Norma's Think Aloud Comments

Norma was presented with two passages at her instructional level, "Father's New Game" and "The Friend". Figure 11 illustrates the comments made by Norma, the number of times the comments occurred and the manner in which the comments were interpreted.

From the results, it appeared that Norma was usually able to monitor her understanding of written discourse as the highest number of responses recorded was for MITQ (more information requested by using the text to pose new questions). However, it seemed that she began to experience difficulty with the passage "The Friend" as the two questions she posed indicated that her understanding of the text appeared to be somewhat confused. As well, she appeared to be somewhat perplexed when she responded "Does it mean he reached his destiny" after she posed the question "what does it mean by he reached his goal". Thus, it seemed that she had failed to identify the fact that the boy's goal was to learn about dolphins. In fact, it appeared that she may have misunderstood the text as her response suggested that she felt that the boy may have met his destiny by drowning.

Norma indicated that one word, "Flute", had given her difficulty, but she also indicated that she had figured out the word a little later on. Thus, it was possible that she had used context and graphic cues to resolve the difficulty.

| Think Aloud Comments | ES | WIA | MITQ | MUT |
|---|---|---|---|---|
| Makes me wonder what they wanted to do that was interesting. | | | * | |
| What kind of ne⋅ ⋅me were they going to play? | | | * | |
| What am I?, What is the note telling them? | | | * | |
| That's it? What were they thinking about? | | | * | |
| What were they thinking when they thought it was in the kitchen? | | | * | |
| Makes me think, why would the clue searching just take them until the repairman was ready to go? | | | * | |
| Why would he like to go to the ocean so much? | | | * | |
| What's that word? (flute) | | * | | |
| Why would he want to learn about dolphins? | | | * | |
| I figured out that word, it's flute. | * | | | |
| What else could he play at school that starts with an "f". | | | * | |
| Why would he listen to the tapes of dolphin sounds? | | | * | |
| Why would the dolphins chase the sound coming from the boat? | | | | * |
| How could the boat tip over without anybody pushing it? | | | | * |
| What does it mean by he'd reached his goal? | | | * | |
| Does it mean, he reached his destiny? | | | | * |
| Total Score for Categories | 1 | 1 | 11 | 3 |

**Figure 11.** Results from an analysis of the think aloud data for Norma.

WIA: word identification assistance request
MITQ: more information requested by using text to pose new questions
ES: evaluative statement
MUT: misunderstanding of text

## Norma's Error Detection Comments

Figure 12 helps to illustrate the comments made by Norma on the error detection task, and the categories in which the comments were placed.

| Error Detection Comments | Implant | II | WIDMS | WI | RDMSS | LBSC | DMS |
|---|---|---|---|---|---|---|---|
| One beautiful summer day, we stopped at a campground by a lake. | No | * | | | | | |
| Only one spectacular camping site was left so that's where Dad parked the car. (Multisyllabic) | Yes | | * | | | | |
| What a surprise when we tried to stand it upright. | No | | | * | | | |
| We enjoyed the pizza from Pizza Hut. (Anomalous Information) | Yes | | | | * | | |
| Skip suddenly bounded over the skunks. | No | | | * | | | |
| A strange sound interrupted their play. (strange) | No | | | * | | | |
| Sensing danger the mother grizzly rushed to his cub. (Pronominal) | Yes | | | | | * | |
| Two men trap the unlocked, then left. (Word Order) | Yes | | | | | * | |
| The cub caught the scent of fish coming from inside the strange object. (strange) | No | | | * | | | |
| Hearing the cub's frightened cry, the mother grizzly rushed to him and managed to lift the door. (Multisyllabic) | Yes | | | * | | | |
| The cub sat back and enjoyed being trapped. (Informational Inconsistency) | Yes | | | | | | * |
| The cub escaped. | No | * | | | | | |
| The grizzly bear and her cub were together again as they fled into the bushes. | No | | * | | | | |
| The bears were ready to perform with he clowns at the city zoo. (Anomalous Information) | Yes | | | | | | * |
| Total Information | | 2 | 2 | 5 | 1 | 2 | 2 |

**Figure 12.** Results from an analysis of the error detection data for Norma.

| | |
|---|---|
| Implant: | "Yes" under implant indicates that the particular error was implanted in the text by the researcher and "No" indicates that the student interpreted it as an additional error |
| II: | indicated that there was insufficient information presented in the story |
| WIDMS: | indicated that there was a word in the story that didn't make sense, however the student was making an error in word identification |
| WI: | reported that a particular word in text was unknown |
| RDMSS: | recognized that information didn't make sense in relation to the rest of the story LBSC: looked back to verify that there was an error, then suggested what could be changed to make it correct |
| DMS: | indicated that an error was reported because it didn't make sense |

Data was collected from the error detection passages

"Camping Surprise" and "The Trip".

The results indicated that Norma was aware when loss of understanding occurred as she detected implanted errors and multisyllable words 70% of the time. She was able to locate both of the anomalous information errors and multisyllable words; as well, she was able to locate one informational inconsistency, one pronominal and one word order error. It is possible that the problems went unreported as she may have been able to resolve the problems while she read and consequently was not aware that she had corrected the errors.

Examining the reasons why Norma made particular monitoring decisions was also beneficial in helping to understand more about her monitoring of written discourse. The category WI indicated that Norma was aware when she did not know a word and the category WIDMS indicated that Norma was aware when a segment of text did not make sense. However, the WIDMS category also indicated that Norma had identified a word incorrectly and that was why the segment of text didn't make sense.

It seemed that Norma was aware that she should monitor on a meaning basis for the following reasons: 1) she indicated in RDMSS that the particular sentence did not go with the story, 2) she suggested how to change the text item to resolve the problem in LBSC and lastly, 3) in DMS, she indicated that her rationale for reporting the error was because it didn't make sense. As well, it seemed that Norma

was also concerned about the writer's ability to include details in the text as she commented twice that there was insufficient information presented to the reader.

## Summary of Norma's Results

Results from the Index of Reading Awareness indicated that Norma was aware of planning, regulative and evaluative strategies. On the other hand, she demonstrated less awareness of conditional knowledge strategies.

The miscue analysis results demonstrated that she did not monitor for graphic similarity as she left miscues with no visual similarity uncorrected and tended to correct ones that were already similar. As well, she made little attempt to monitor miscues on the basis of the author's meaning. However, she appeared to be trying to monitor for contextual acceptability, even though she left many miscues with no contextual acceptability uncorrected.

Results for the think aloud comments section indicated that Norma was aware when a word was unknown, recognized when meaning loss had occurred, posed relevant questions to guide her reading and made some use of contextual and graphic cues. In general, her comments indicated that she was attempting to use some fix up strategies and was trying to maintain her own understanding of the story passages.

On the error detection task, Norma demonstrated that she was aware when a loss of understanding occurred, was

able to locate implanted errors and multisyllabic words about 70% of the time, and recognized that the story text can be edited to make the selection easier to understand.

Overall, it appeared that Norma usually recognized when meaning loss occurred, was concerned about understanding story information and attempted to use fix up strategies. However, she did not appear to understand when to use particular strategies and often did not maintain the author's interpretation of the text.

## Comparing the Students on Monitoring Tasks

The following section will compare and contrast the student's performance across the different tasks presented in the study. First the results from the Index of Reading Awareness will be examined, followed by the miscue analysis, miscue comments, think aloud and error detection results.

## Comparison of the Students on The Index of
## Reading Awareness

An analysis of the six students' scores indicated that four of the total scores were in the 60 percent range and the remaining two were in the 50 percent range. Table 19 illustrates the similarities and differences between the students scores on the IRA.

Table 19

Total Group Metacognitive Interview Results

| Student | Total | Planning | Evaluation | Regulative | Conditional |
|---------|-------|----------|------------|------------|-------------|
| David   | 69%   | 80%      | 78%        | 50%        | 70%         |
| Karen   | 52%   | 50%      | 50%        | 50%        | 60%         |
| Nicole  | 67%   | 60%      | 70%        | 40%        | 70%         |
| Jrenda  | 50%   | 70%      | 50%        | 40%        | 40%         |
| Sandra  | 64%   | 55%      | 60%        | 80%        | 50%         |
| Norma   | 67%   | 80%      | 80%        | 80%        | 30%         |
| Average | 68%   | 66%      | 65%        | 66%        | 56%         |

The average scores for the planning, evaluation and regulation scales were similar (65-66%) as scores ranged from 40 to 80%. The average score for the conditional scale, 56%, was lower than that on the other scales, which suggested that the students as a group had a somewhat lower awareness of this type of metacognitive knowledge. The individual scores ranged from 30% to 70% for conditional knowledge awareness.

Even though the total scores were similar for some of the students, a great deal of variability existed when the questions for each of the Index of Reading Awareness scales were examined in greater detail. Therefore, comparing the students' responses on the IRA questions helped to provide a better understanding of the similarities and differences among students on strategy awareness.

## Evaluative Strategies

All students in the sample were aware of some evaluative strategies, which demonstrated that they were aware of their own reading difficulties to some degree. For example on the question "What is the hardest part about reading for you?" all students, except David, indicated that sounding out the words was the most difficult part of reading for them. David indicated that the hardest part of reading was losing his place while he read and suggested that his response be added to the selection of choices. As well, for the next question "What would help you become a better reader?", all students, except Norma, indicated that checking to make sure you understand what you've read helps students to become better readers. It appeared that the other students may have attributed reading success to their effort in maintaining an adequate understanding of the text. On the other hand, Norma did not seem to attribute reading success to her own abilities as a reader; she seemed to feel that assistance from skilled readers was necessary to improve her ability to understand information.

Fewer students demonstrated awareness of text structure. Four out of six (Sandra, Nicole, Norma and David) were able to identify that the first sentences of a story usually tell what the story is about, but only two out of six (Nicole and Norma) were able to identify that the sentences which tell the most about the story or the story

characters are the most important ones. As well, only
Karen, David and Norma seemed aware that the last sentences
of a story are special because they tell what happened in
the story.

## Planning Strategies

All of the students were aware that selectively reading
the words that tell the most about a story is important if
time is limited. Selectively reading the most vital story
information was identified as being important by three
students (Sandra, Brenda, and Norma). However, the students
seemed unaware that skimming through the story helps the
reader to identify the main parts. In fact, all of the
students suggested that reading the story and remembering
all of the words helps to determine the general meaning of a
story. It is possible that the term general idea was
unfamiliar to them as the term main idea is often used in
instruction. All of the students failed to recognize that
making plans is an important step to undertake before one
commences reading. Two students (Karen, Sandra) indicated
that one doesn't have to make any plans and the other four
(David, Nicole, Brenda and Norma) suggested that one should
just locate a comfortable place in which to read. None of
the students suggested that thinking about why one was
reading the selection was an important strategy to consider.
Sandra felt there were two correct answers to the question,

"When you tell other people what you read, what do you tell them?", and the rest of the students chose either "what happens in the story" or "who the characters are" as their responses.

## Regulative Strategies

All of the students except David were aware that stories read before were generally reread at a faster rate. Three out of the six students (Sandra, Nicole, Norma) were aware of the purpose of a rereading strategy and indicated that they would use the strategy to maintain an understanding of written discourse. The other students (David, Brenda, and Karen) indicated that students reread information simply because it is good practice. Four out of the six students (Sandra, Karen, David and Norma) indicated that using context to figure out unknown words is a worthy strategy to consider when you encounter an unknown word as you're reading. Only Sandra was aware that using the other sentences in the paragraph would help to figure out the meaning of an unknown sentence. The other students seemed to feel that rereading the entire selection would be the most effective way in which to restore understanding.

All of the students, except Brenda, indicated that they never skipped information as they read. Brenda indicated that she tended to skip out the hard words and parts that she didn't understand. Basically, it seemed that the

students failed to recognize that some irrelevant story information could be omitted as long as the author's meaning was not distorted.

## Conditional Knowledge Strategies

Sandra was the only student to indicate that writing down information in her own words would be useful in recalling a story. Three out of the six students (Nicole, Norma, David) indicated that the use of a visual imagery strategy, imagining the story like a movie in their minds, would be incorporated into their leisure reading. All students, except Nicole, indicated that concentrating and trying hard to remember were the best ways to retrieve information for a science or social test. Nicole, in contrast, suggested that asking herself que,tions about the important ideas was a better and more effective strategy. Only Karen was aware that talking about the information studied would help to check one's understanding of the text. In contrast, the other students believed that simply rehearsing the information over and over and reading the story as many times as possible would lead to effective information retrieval. It appeared that most of the students were unaware that there were more effective strategies than mere rehearsal or rereading of written discourse. Only three students (Sandra, David, Norma) were aware that writing down ideas in their own words would help

to increase their recall of important information for book report writing. The others believed that a sounding out approach or simply skipping the unknown parts would be a more effective way to increase information retrieval.

## Miscue Analysis Across Students

To help compare students' miscue analysis performance, table 20 presents results for each student. From the analysis it was evident that the percentage of miscues that were corrected was relatively low as the percentage of errors corrected ranged from 13% to 27%.

By examining the percentages of corrected and uncorrected miscues high in graphic similarity, it appeared that all of the students relied on graphic cues to identify words but that none of the students monitored their miscues on the basis of these cues. For five of the six students (Karen, Nicole, Brenda, Sandra and Norma) a higher percentage of corrected than uncorrected miscues were high in graphic similarity. This indicated that the students were correcting miscues that were already visually similar to text words rather than correcting miscues that were not visually similar.

Table 20

## Summary of Miscue Analysis Profiles

| Student | Percentage of Miscues | Graphic Similarity Percentage | | Contextual Acceptability Percentage | | Meaning Change Percentage | |
|---|---|---|---|---|---|---|---|
| | Cor | Cor | Uncor | Cor | Uncor | Cor | Uncor |
| David | 27 | H 57 | H 57 | H 36 | H 56 | H 64 | H 46 |
| | | P 7 | P 5 | P 43 | P 22 | P 0 | P 8 |
| | | N 36 | N 38 | N 21 | N 22 | N 36 | N 46 |
| Karen | 26 | H 80 | H 74 | H 20 | H 43 | H 80 | H 70 |
| | | P 10 | P 4 | P 50 | P 11 | P 20 | P 11 |
| | | N 10 | N 22 | N 30 | N 46 | N 0 | N 19 |
| Nicole | 19 | H 86 | H 81 | H 53 | H 53 | H 93 | H 56 |
| | | P 7 | P 0 | P 27 | P 23 | P 0 | P 10 |
| | | N 7 | N 19 | N 20 | N 24 | N 7 | N 34 |
| Brenda | 17 | H 61 | H 57 | H 1. | : 31 | H 69 | H 64 |
| | | P 8 | P 2 | P 70 | P 44 | P 0 | P 10 |
| | | J 31 | N 4. | N 15 | N 25 | N 31 | N 26 |
| Sandra | 14 | H 69 | H 56 | H 46 | H 53 | H 77 | H 61 |
| | | P 0 | P 6 | P 23 | P 12 | P 8 | P 15 |
| | | N 31 | N 38 | N 31 | N 35 | N 15 | N 24 |
| Norma | 13 | H 67 | H 49 | H 44 | H 37 | H 56 | H 54 |
| | | P 22 | P 16 | P 0 | P 29 | P 0 | P 10 |
| | | N 11 | N 35 | N 56 | N 34 | N (. | N 26 |

Note. Cor = Corrected, Uncor = Uncorrected

For contextual acceptability, David and Karen tended to monitor miscues that had high or partial contextual acceptability. Brenda monitored solely on the basis of partial contextual acceptability. On the other hand, Norma

tended to correct miscues that had no contextual acceptability and Nicole and Sandra did not monitor their errors on the basis of contextual acceptability as there appeared to be little difference between th  percentages of corrected and uncorrected miscues categorized as having high, partial or no contextual acceptability.

In relation to meaning change, it appears that David, Karen, Nicole, and Sandra monitored miscues that resulted in significant meaning change as there was a higher percentage of corrected than uncorre ted e.r  s which had high meaning change. On the other ha    B.er a and Norma did not appear to be trying to monitor on   .. basis of the author's meaning as there   - .ittle difference between the percentage of correct  .    . uncorrected miscues high in meaning change. Hence, Br. /  a and Norma appeared to be unaware that miscues which did not change the author's meaning could be left uncorrected and miscues which changed the author's meaning should be corrected

## Miscue Comments Across Students

Examining the miscue comments for each student revealed both similarities and differences across students. All students appeared to be aware of graphic cues, but monitored their miscues on a meaning basis. One student, Brenda, appeared to monitor on the basis of contextual acceptability whereas the other students reported that they monitored on

the basis of both the author's meaning and contextual acceptability.

All students demonstrated use of evaluative knowledge as they were able to recognize when a loss of understanding had occurred. When the students became aware of a loss of understanding, they stated that they had become aware of the problem because "it didn't make sense" anu "it didn't sound right". The category "didn't sound right" was discovered to be a category similar to "didn't make sense" as it seemed that the students interpreted it to mean the same thing.

All of the children demonstrated that they were aware of regulation or fix up strategies as they attempted to use context to resolve word identification problems by either reading ahead, looking back at text previously read or rereading the text. One regulation strategy for comprehension loss shared by all of the students was locking back at the text. As well, rea. .ng selections again and reading ahead were also used by most of the students.

All of the students appeared to be aware of graphic cues as they all made comments abrit individual letters in words and recognized the fact that their responses may not have matched the word in print. However, only David, Karen and Sandra indicated that they tried to sound out words in order to figure out unknown words. As well, little evidenre of planning strategies or conditional knowledge strategies emerged in the miscue comments.

## Comparison of Students on the Think Aloud Task

Figure 13 helps to illustrate some of the trends that emerged from the data analysis. From the analysis of the six students' raw scores, several categories emerged as being common among the students. As well, certain differences were noted from the data analysis. Three categories of comments were common to five of the six students: ES, MITQ, and WIA. All of the students, except David, provided evaluative statements about themselves. MITQ (more information requested by using text to pose new questions) and WIA (word identification assistance) were shared by all students except Brenda. MUT (misunderstanding of text) was shared by four students, MIWI (more information requested, but difficulty with word identification within text evident) was shared by three out of the six students as was MIWM (a request for more information on word meaning) and PCT (a prediction constrained by the text was made). In fact, three of the students (David, Karen, Nicole) seemed to be aware that they experienced difficulty with the meanings of particular words on the other hand, Sandra did not ask for help with the meaning of a word although she appeared to experience some difficulty.

| Category | David | Karen | Nicole | Brenda | Sandra | Norma |
|---|---|---|---|---|---|---|
| ES | | * | * | * | * | * |
| MITQ | * | * | * | | * | * |
| WIA | * | * | * | | * | * |
| MUT | * | | | * | * | * |
| MIWI | * | * | * | | | |
| MIWM | * | * | * | | | |
| PCT | * | | | * | * | |
| PPE | | | | * | | |
| NC | | | | * | | |
| BI | * | | | | | |
| Total | 7 | 5 | 5 | 5 | 5 | 4 |

Figure 13. Results from a comparison of all the students on the think aloud task.

| | |
|---|---|
| ES: | evaluative statement |
| MITQ: | more information requested by using text to pose new questions |
| WIA: | word identification assistance request |
| MUT: | misunderstanding of text |
| MIWI: | more information requested, but difficulty with word identification evident |
| MIWM: | a request for information on word meaning |
| PCT: | a prediction constrained by the text was made |
| PPE: | a prediction drawn from personal experience was made, but indicated a departure from the story meaning |
| NC: | no comment, nothing appeared confusing or made the child wonder |
| BI: | comment indicated use of background information constrained by text |

Some differences were also noted as one child (David) tried to bring his own background experiences into his reading. Another student, Brenda, indicated that she was unable to comment at some of the stopping points because nothing made her wonder. In addition Brenda made predictions that were not constrained by the text (PPE), which tended to influence her understanding of the text; consequently, she arrived at a different interpretation than the author had intended.

## Error Detection Summary

Table 21 shows the number of each type of errors detected by each student. The students were aware of between 50 and 80% of the implanted errors and multisyllabic words.

Table 21

## Summary of Types of Implanted Errors Detected

| Students | Total % | Pronominal | Multisyllabic | Word Order | Informational Inconsistency | Anomalous Information |
|----------|---------|------------|---------------|------------|------------------------------|-----------------------|
| David    | 50%     | 1/2        | 0/2           | 1/2        | 1/2                          | 2/2                   |
| Karen    | 70%     | 2/2        | 0/2           | 2/2        | 1/2                          | 2/2                   |
| Nicole   | 70%     | 2/2        | 0/2           | 2/2        | 1/2                          | 2/2                   |
| Brenda   | 80%     | 1/2        | 1/2           | 2/2        | 2/2                          | 2/2                   |
| Sandra   | 80%     | 1/2        | 2/2           | 2/2        | 1/2                          | 2/2                   |
| Norma    | 70%     | 1/2        | 2/2           | 1/2        | 1/2                          | 2/2                   |
| Total    |         | 8/12       | 5/12          | 10/12      | 7/12                         | 12/12                 |

All students were able to detect the anomalous errors and most students were able to detect the word order, pronominal and informational inconsistencies errors as well. However, David, Karen and Nicole, did not appear to be aware of some of the multisyllabic words that were implanted in the text. This may have been due to the fact that problems were simply not reported, students may have had no difficulty or students may not have been aware they had used

regulative strategies to determine unknown words.

Figure 14 presents the classification of error detection data for each student and the number of times categories were recorded. From the frequency count, it was evident that several categories were common among the students. It appeared that all of the students monitored on the basis of meaning as they indicated that particular text "did not make sense" 25 times. Five of the students monitored on the basis of word identification as they recognized that words were unknown 19 time . Two students, David and Sandra, ronitored implants by checking to see if the implants were on topic (COT). Three students, Karen, Nicole and Norma, recognized that information didn't make sense in relation to the rest of the story (RDMSS). The category DMSC revealed tha* navid and Nicole originally highlighted implants beca     .ey had thought that the implants didn't make sense; however, after reading ahead, they discovered they did make sense and indicated that they wished to change their responses.

In addition, one student, Brenda indicated, on three occasions, that the written composition itself could have been rewritten to enhance the clarity of expression (SWC). Three students, Karen, Nicole, and Brenda, monitored on the basis of word meaning as they reported word meaning errors within the text (WME). Two of the students (David and Nicole) who monitored for word meaning errors indicated that

they had originally thought that a word was used incorrectly but changed their mind after reading ahead (WIC). In addition, two students (Nicole and Sandra) related information to their own personal beliefs they read, which in turn, indicated that they brought their own experiences into the reading act (PE). The remaining responses to the error detection task occurred only once for one student.

Even though the responses were not worded exactly the same, it appeared that there were similarities across categories. For example, the categories DMS, DNF, EIS REWTRC, WI, WSE and WME all seemed to indicate that students were aware when there was an error or when they had difficulty comprehending written discourse. As well, the students also seemed to know when they had no difficulty as indicated by MSNP. However, several comments by some of the students under the categories MIIAS and WIDMS indicated that the students were sometimes unaware of their own difficulties In fact, the students sometimes indicated that there were errors in the text, but may have failed to recognize that the errors were related to their own inexperience with internal punctuation (DMSP) or unfamiliarity with the vocabulary in the text (DSRS).

| | David | Karen | Nicole | Brenda | Sandra | Norma | Number of Students | Total |
|---|---|---|---|---|---|---|---|---|
| DMS | 7 | 3 | 4 | 5 | 4 | 2 | 6 | 25 |
| WI | 3 | 1 | 2 | | 8 | 5 | 4 | 19 |
| COT | 1 | | | | 4 | | ? | 5 |
| RDMSS | | 2 | 2 | | | 1 | 3 | 5 |
| DMSC | 3 | | 1 | | | | | 4 |
| WME | | 1 | 1 | 1 | | | . | 3 |
| SWC | | | | 3 | | | | 3 |
| CI | | | | 3 | | | | 3 |
| LBSC | | | | | | 2 | 1 | 2 |
| WIDMS | | | | | | 2 | 1 | 2 |
| WIC | 1 | | 1 | | | | 2 | 2 |
| LBNRLS | | 2 | | | | | 1 | 2 |
| PL | | | 1 | | 1 | | 2 | 2 |
| II | | | | | | 2 | 1 | 2 |
| DSRS | | 1 | | | | | 1 | 1 |
| WC | | | 1 | | | | 1 | 1 |
| DNF | | | 1 | | | | 1 | 1 |
| RTC | | | | 1 | | | 1 | 1 |
| REWTRC | | | | 1 | | | 1 | 1 |
| MSNP | | | | 1 | | | 1 | 1 |
| WSE | | 1 | | | | | 1 | 1 |
| DMSP | | | | | 1 | | 1 | 1 |
| MIIAS | | | | | 1 | | 1 | 1 |
| EIS | | | | | 1 | | 1 | 1 |

**Figure 14.** Results from a comparison of all the students on the error detection task.

DMS:    indicated that an error was reported because it didn't make sense
WI:     reported that a particular word in the ' xt was unknown
DMSC:   indicated that a word in text had been highlighted t :ause he/she thought it didn't make sense, but after reading ahead had disco\ -red that it did make sense and wished to change his/her response
WIC:    reported that a particular word in text was unknown but changed mind after reading ahead
COT:    student indicated that he/she was checking tc determine if the sentence was on topic and had decided that it was not
LBNRLS: looked back and decided that the sentences were not related to the last sentences read
WME:    indicated that the meaning of the word was used incorrectly in the sentence
WSE:    reported that the word was misspelled

DSRS: indicated that the word "pup" didn't sound right in the sentence
WC: word change was suggested by the student
DNF: information in text was deemed as not fitting in
RDMSS: recognized that information didn't make sense in relation to the rest of the story
PE: information was related to personal belief or experience
RTC: recommended that the title be changed
REWTRC: recognized the error and explained the error to the researcher by using examples from the text
MSNP: appeared to have no difficulty with the multisyllable word "magnificent"
SWC: suggested that t  writer of the story should make some changes to improve clarity (make it easier to under. and)
CI: suggested that the information in a particular sentence contradicted with that from another part of the story
DMSP: indicated that the punctuation in the text did not make sense
MIIAS: comment indicated that he/she had misunderstood the text by misinterpreting the text across several sentences
EIS: indicated that there was an error in the story
II: indicated that there was insufficient information presented in the story
WIDMS: student indicated that there was a word in the story that didn't make sense, however the student was actually making an error in word identification
LBSC: looked back to verify that there was an error, then suggested what could be changed to make it correct

The categories WIC and DMSC both indicated that at first a word or segment of text did not make sense; however, the student decided that there was no longer a problem present in the text after the student used a reading ahead strategy.

The categories RDMSS, COT, CI and LBNRLS all indicated that the students seemed to feel that there was a loss of understanding as the students checked to determine if the error altered the story gist. Thus, students appeared to be aware of the story gist or the author's intended meaning and tended to monitor on that basis.

The categories WC, II, RTC and SWC all appeared to indicate that the students were concerned about the writing of the selection itself. In fact, it appears that the students were aware that printed words can be easily changed to help make text more comprehensible.

## Group Comparison Summary

After examining the student's results individually and as a group, it was apparent that the students were aware of several monitoring strategies. In fact, students' awareness of reading strategies was close to 60 percent on the various scales of the IRA. Most students demonstrated that they were cognizant of their own difficulties and suggested several ways to resolve text level difficulties. Brenda, in contrast, was somewhat limited in her awareness of regulative (40%) and evaluative (50%) strategies. As well, it appeared that the students, on the whole, may have been less aware of when to use particular strategies (conditional knowledge awareness).

The percentages for corrected and uncorrected errors ranged from 13% to 27% on the miscue analysis task. It seemed that, in general, the students were meaning focused in their monitoring because even though they were often aware of and used graphic cues, they all tended to monitor for meaning. The students were able to make comments of an evaluative nature on the miscue task and were observed attempting various fix up strategies; however, students did not overtly demonstrate an awareness of planning or conditional knowledge strategies on this task.

Results from the think aloud task indicated that some of the categories were shared by several students, namely, ES (evaluative statement), MITQ (more information requested

by using text to pose new questions, and WIA (word identification assistance request). In fact, all students, with the exception of David, made evaluative comments and indicated when they needed word identification help. One student, Brenda, appeared to be somewhat different in monitoring as she tended to make predictions that were not constrained by the text, which in turn, influenced her ability to accurately retrieve information.

In the error detection task, several themes emerged from the data which were similar to those on the other tasks. The following themes emerged: 1) students were frequently aware when meaning loss occurred or when they did not understand something, although they sometimes were unaware of their loss of understanding; 2) students demonstrated that they were able to use regulative strategies; 3) students were flexible in text analysis as they were able to monitor at a word, sentence and story level across the different tasks; 4) students extended their monitoring to include analysis of the written composition itself; and 5) students did not seem to demonstrate an awareness of planning or conditional strategies. In fact, students did not demonstrate an awareness of planning or conditional strategies on any task other than the IRA.

CHAPTER FIVE

SUMMARY, MAJOR FINDINGS AND DISCUSSION, IMPLICATIONS

AND RECOMMENDATIONS

This chapter contains a summary and the major findings
of the comprehension monitoring of six learning disabled
students; as well, conclusions drawn from a synthesis of the
results will be presented. A discussion of implications of
these findings, limitations that must be acknowledged and
recommendations for further research will follow.

## Summary of the Study

This study examined the comprehension monitoring of six
learning disabled students across five reading-like tasks to
determine how the students monitored their comprehension of
written discourse. Six students who were identified as
being learning disabled, by the criteria set out by Edmonton
Public Schools, and who were at grade two or higher reading
levels as determined by administration of the Diagnostic
Reading Program were selected to participate in the study.
As well, background information was informally collected
from each student's cumulative record and from the classroom
teacher.

Students were interviewed using the Index of Reading
Awareness to assess their metacognitive awareness of

evaluation, planning, regulation and conditional knowledge strategies. Each student's ability to monitor his/her understanding of written discourse was also examined and analyzed by gathering the following data: 1) oral reading miscues, 2) miscue comments, 3) think aloud comments, and 4) comments and underlining on an error detection task.

The students' oral reading miscues were recorded and then analyzed according to set criteria. Then the students were asked to retrospectively reflect why they had said what they had. The think aloud tasks required students to orally reflect on the questions, "What does the text make you wonder?" and "Was there anything that didn't make sense or was confusing in what you read?" as they came to predetermined stopping places. On the error detection task, the students were required to underline any written discourse that seemed confusing to them and then explain why they had underlined parts of the text.

Students' responses on all tasks were analyzed both quantitatively and qualitatively. The results were presented as individual case studies first and then a group comparison across the students was made.

## Major Findings and Results

The findings of the study will be presented in relation to the three research questions included in chapter one. The major findings will be presented first and then a

discussion of the findings in relation to selected literature will follow.

## Question 1

What do learning disabled students know about their comprehension monitoring?

This study examined the comprehension monitoring of six learning disabled students across a variety of tasks to help gain a better understanding of how they monitor their understanding of written discourse. The major source of information related to question one was obtained from the IRA questionnaire, although some reference will be made to the other tasks as well.

The six students' total scores on the IRA ranged from 52% to 69%, indicating that all six of the children were aware of some reading strategies. From an analysis of the IRA sub-scales, it appeared that the students were more aware of evaluation, regulation and planning strategies than of conditional strategies.

Bos and Filip (1984) report that in order "to evaluate comprehension one must be aware of the task demands and keep track of the success with which comprehension is proceeding" (p. 229). The students' scores on the evaluative section of the IRA ranged from 50% to 80%. Most students recognized that checking to make sure one understands what has been read is important as it helps make one a better reader. In

addition, individual students seemed cognizant of their own difficulties as several children indicated that word identification was difficult for them and one child indicated that his reading rate was too fast. However, fewer students demonstrated awareness of text structure as only four students were aware that the first sentence of a story usually tells what the story is about and only two students were aware that the sentences that tell the most about the story or story characters are the most important. This finding reflects that of other researchers as Wong (1987) reports that

> The lack of awareness/sensitivity to important parts of text among poor readers or learning disabled learners (Smiley, Oakely, Worthen, Campione, and Brown 1977; Winograd, 1984) cripples their study efforts since they do not know where to focus their attention. Moreover, they cannot perform summarization tasks because they do not know which parts are important to be summarized (p. 190).

Therefore, it might be beneficial if the students in this study were to become more familiar with text structure in general.

The students also demonstrated an awareness of evaluative strategies in their miscue comments as all students recognized when a loss of understanding had occurred by reporting that "the text did not make sense" or

the "text didn't sound right". All students, except David, made evaluative comments on the think aloud protocols and all of the students were involved in evaluative decision making throughout the error detection task. In fact, the students were aware of many of the implanted errors and multisyllabic words in the error detection task; each students' performance indicated that he/she was usually aware when meaning loss had occurred and was cognizant of why the underlined responses were inappropriate. Thus, students appeared to set "the criteria for judging whether comprehension is [was] adequate or not (Baker, 1979a) and then decides [decided] which, if any, remedial action to take" (Pitts, 1983, p. 517).

Regulation strategies ranged from 40% to 80% on the IRA, with Sandra and Norma scoring 80%, indicating that while all students were aware of regulative strategies, some had greater awareness of these strategies than did others. Students demonstrated awareness of the following regulative strategies: stories read before can be reread at a faster rate; particular strategies can be implemented in the event of loss of understanding; and context can be used to help decode unknown words. However, some students appeared to lack an adequate understanding of the different kinds of strategies available for resolving comprehension loss. For example, three students (David, Brenda, Karen) seemed unaware why we reread information; they felt people simply

reread information for extra practise. As well, only one student, Sandra, was aware that the other sentences in a paragraph could be used to figure out the meaning of an unknown sentence. Nevertheless, it appeared that the students were aware of some of the strategies used in restoring comprehension loss.

Students demonstrated their ability to engage in comprehension monitoring when reading orally. As well, their miscue comments helped to provide a greater understanding as to why particular strategies were activated when meaning was lost. Haller, Child and Walberg's (1988) comments on regulation strategies describe some of the regulation strategies used by the students in this study:

> Regulating consists of compensatory strategies to redirect and bolster faltering comprehension. When faltering ensues, rereading, backward and forward search strategies, self-questioning, contrasting textual information with prior knowledge, and comparing main ideas with each other and with details may restore comprehension. (p. 6)

When comprehension loss occurred, the students in this study attempted to draw upon strategies from their own repertoire. The fact that the students were aware of some regulative strategies was also apparent on the think aloud and error detection tasks. On the error detection task, the students were able to highlight information that was confusing,

discuss the nature of their choices, and suggest ways to resolve the problems. Nevertheless, the range of scores on the IRA indicated that some students had a more extensive awareness of regulation strategies than others.

Scores for planning knowledge, the ability to selectively choose or direct a course of action, ranged from 55% to 80% on the IRA. All students were aware that selectively reading the words that tell the most about a story is important if time is limited, and three students (Sandra, Brenda and Norma) indicated that selectively reading the vital information is critical if time is limited. However, none of the students seemed aware that constructing plans before becoming involved in the reading act or thinking about why one is reading the selection are useful strategies to engage in.

McGuire (1991) used Paris and Jacob's Index of Reading Awareness in her research on gifted learning disabled students. Her results on the IRA demonstrated that students were exceptionally low in planning strategies. In contrast, the student's planning scores in this study were not lower than their scores on evaluative and regulative strategies. The conditional knowledge scores were the lowest.

The results on the IRA indicated that the students had some awareness of planning strategies, but awareness of these strategies was not evident in the miscue comments, think aloud and error detection tasks. This may have been

due to the fact that planning knowledge wasn't reported, or the tasks did not lend themselves to this particular kind of comment.

Conditional knowledge awareness was somewhat weaker on the IRA as the average score was 56%, with Brenda scoring 40% and Norma scoring 30%. Hence, some students were not fully aware of when or why particular strategies should be used. For example, only Sandra reported that writing information in her own words would be useful in retrieving story information and only Nicole recognized that asking herself questions about the important ideas was a better and more effective strategy than simply concentrating and trying hard to remember. This finding is representative of the research on good reader and poor reader differences. It has been found that good readers are more knowledgeable about word analysis skills and understanding written discourse, but poor readers lack appropriate insight into when and why to use particular strategies (Garner, 1987). Students' limited awareness of conditional knowledge is a critical concern because unless students understand why and when a particular strategy should be used, they will be unable to use strategies independently. Wong (1987) reported that metacognitive components must be addressed in instructional settings because "without metacognitive components in remedial programs, learning disabled students would fall back on the remedial teacher for direction, feedback, and

assurance. That is, they would not be able to function independently without the prop of the remedial teacher" (p. 191). In addition, awareness of conditional knowledge was identified as being a critical factor in effective comprehension of written discourse by Jacobs and Paris (1987). From their research they concluded that "Explaining the thinking skills that can be used before, during, and after reading proved beneficial to children of all ages and reading abilities" (Jacobs and Paris, 1987, p. 265).

In addition to relatively low scores for awareness of conditional knowledge on the IRA for most students, there was no overt indication of conditional knowledge awareness on the other tasks. It is possible that the students were aware of conditional knowledge strategies but did not report them, although this does appear to have been a relative weakness for the students in this study.

The findings from the <u>Index of Reading Awareness</u> indicated they although there appeared to be common trends present in the data, it was also evident that there were individual differences between the students. It appeared that each student had specific strengths and weaknesses. For example, David's scores on th' IRA indicated that his awareness of planning and evaluative strategies was strongest; however, this trend was not supported by the data from the other tasks as there were no indicators of planning or conditional awareness observed on any of the other tasks.

As well, awareness of regulative knowledge emerged as his weakest area on the IRA.

Karen's scores on the IRA indicated that her awareness of conditional knowledge strategies appeared to be strongest. In fact, she achieved relatively low evaluative, regulative, and planning scores on the IRA as her scores for all were 50%. In contrast, her performance on the other tasks indicated that her awareness of planning and conditional knowledge strategies was considerably lower than that of evaluative or regulative strategies.

Nicole's awareness of evaluative and conditional strategies were her strengths. Her areas of weakness were similar to David's as she appeared to have a limited awareness of regulative strategies on the IRA, even though her performance on the other tasks indicated that she was aware of several regulative strategies. In addition, Nicole's understanding of conditional or planning strategies did not emerge on any task but the IRA.

Brenda's awareness of planning strategies was the strongest. Areas of weakness that emerged on the IRA were evaluative, regulative and conditional knowledge awareness although, she appeared to be able to use some regulative strategies on the other tasks.

Awareness of regulative strategies emerged as a strength for Sandra on the IRA. Her knowledge of planning, evaluative and conditional knowledge awareness was somewhat

weaker as the scores ranged from 55% to 60%.

Norma's awareness of planning, evaluative and regulative strategies emerged as strengths on the IRA and conditional knowledge awareness emerged as an area of need. Even though Norma's scores on the IRA indicated that she had a strong awareness of planning strategies, this same trend did not emerge on any other task.

In summation, it appeared that as a whole, the learning disabled students had some knowledge about their own comprehension monitoring. It was also evident that there were also individual differences between the students present.

## Question 2

How do learning disabled children monitor their oral reading miscues when reading material at their instructional levels?

Goodman (1977) believes that miscue analysis helps researchers to determine how students make use of different cuing systems while engaged in the reading process. Beebe (1980) concurs with Goodman; she feels that "an analysis of oral reading miscues is an effective way of inferring what kinds of miscues may occur during silent reading" (p.335). Others have suggested that it is beneficial to pair miscue analysis with other data collection methods (Lipson and Wixson, 1991; Myers, 1991). Myers' (1991) illustrates some of the concerns surrounding the use of on-line measures such

as oral reading miscues; he reports that "they do not
furnish information about ongoing comprehension monitoring
activities and about comprehension, they do not assess
comprehension" (261). He concludes that an accurate
understanding of on-line data can be produced by including
the following: "(1) on line interpretations from the
subjects of what they read and (2) their on-line analyses of
the processes they went through while reading" (Myers, 1991,
p. 261-262). In accordance with Myers' (1991) observations,
students' comments about miscues were analyzed as well as
their actual miscues themselves.

Results from the miscue analysis indicated that the
students monitored a relatively low percentage of errors
(13% to 27%). However, when their miscues were analyzed and
combined with information from the students' miscue
comments, it appeared that the students were frequently
aware when loss of understanding occurred and accordingly
engaged in fix-up strategies.

In relation to graphic cues, it appeared that all
students were aware of the graphic cues. However, their
comprehension monitoring did not appear to be based on
graphic cues, but rather on meaning.

For contextual acceptability, David and Karen seemed to
monitor miscues that were either high or partially
contextually acceptable. As well, Brenda monitored on the
basis of partial contextual acceptability. Norma, on the

other hand, monitored miscues that had no contextual acceptability. However, Nicole and Sandra did not appear to monitor on the basis of contextual acceptability.

In relation to meaning change, David, Karen, Nicole and Sandra monitored miscues that resulted in significant meaning changes. In contrast, Brenda and Norma did not appear to be monitoring on the basis of the author's meaning.

An analysis of the students' comments about their miscues helped to provide further information about the students' miscue monitoring. The results demonstrated that the students were aware when meaning loss occurred as they made several evaluative comments. As well, they reported that they engaged in several regulation strategies in their efforts to maintain their understanding of written discourse such as looking back at text previously read, reading sections again, and reading ahead. All students seemed aware of graphic cues, but only three students indicated that they tried to sound out words to resolve difficulties. In general, it appeared that the students relied strongly on context to resolve difficulties as they interacted with and analyzed the text in novel ways.

Paris and Meyers (1980) found that poorer readers' attention was often directed towards decoding rather than constructing meaning. The current study, in contrast, found that four of the six students appeared to monitor more on a

meaning basis. It is possible that the difference between the results may have been attributable to the fact that the passages that were presented in the current study were at each student's instructional level. This may have facilitated the students' efforts to direct their focus towards text comprehension rather than decoding. On the other hand, it is possible that the classroom teacher emphasized a strong meaning based instructional program which encouraged students to direct their focus accordingly.

## Question 3

What do learning disabled readers do to help maintain understanding when they are faced with a problem in silent reading comprehension?

Students must first be aware that comprehension has been lost and be able to determine that comprehension is ineffective in order to implement compensatory strategies. How students come to engage in regulatory strategies is based upon many factors. Jacobs and Paris (1987) indicate that "what children know about the goals, tasks, and strategies of reading can influence how well they plan and monitor their own reading" (p. 255). The think aloud and error detection tasks were used to obtain data on students' comprehension monitoring during silent reading.

Results from the think aloud tasks demonstrated several common trends as well as several individual differences.

For example, all of the students except David made evaluative comments and all of the students except Brenda requested more information to help them understand the written discourse. This result was interesting as it revealed that the students felt that the information that was presented was not sufficient and that more information should have been provided. The students also indicated that they were able to monitor at a word level; in fact, all students, except Brenda, reported that there were several words with which they needed assistance. In addition, three students indicated that they needed help with word meanings and three students made predictions constrained by the text. However, there also appeared to be times when the students were unaware of their difficulties as several students actually misunderstood segments of text. Baker and Brown (1984) obtained similar findings, indicating that perhaps readers failed to "detect confusions because they had assigned alternate interpretations to the text; they felt they understood but in fact did not get the intended meaning" (p. 366). This trend seemed to apply particularly to Brenda as she often made predictions that were not constrained by the text and appeared to be unaware of her errors. On the other hand, David brought his own experiences into his processing of information but was still able to maintain the author's interpretation.

Some word identification errors resulted in

inappropriate questions being raised. As Baker (1985, p. 162) has noted, it appeared that the students "may make judgments about the meanings of individual words on the basis of only partially correct visual information". For example, in the think aloud task several students made errors on the word "Indies", identifying "Indies" as "India" or "Indians".

Error detection tasks have been used by many researchers to investigate students' comprehension monitoring (Garner, 1980; Markman, 1979; McGuire, 1991; and Paris and Myers, 1981). The following section reviews the number and kinds of errors located by the learning disabled students in this study.

The results indicated that the students were able to detect from 50% to 80% of the implanted errors and multisyllabic words. When the individual categories were examined, it became evident that all students could detect anomalous information. Baker (1985) refers to Williams (1981) who reported that "readers are better able to identify contextually anomalous sentences when there are no collocational ties with the theme of the passage, in other words, when there are no semantic features in common" (Baker, 1985, p. 179). This finding relates directly to the types of errors implanted as they were not related to the text semantically. Fewer students were able to locate informational inconsistency errors. This may have been

related to the fact that the students were required to integrate information from different sections of the text. Wagoner (1983) refers to Pace's (1980) results which indicated that questions that required students to integrate "intersentential information" were the most difficult as students had to monitor their understanding across segments of text (Wagoner, 1983, p. 341). In contrast, Baker (1985) concluded that students were able to detect inconsistencies if the task demands were explicit and simple. Students in the current study had some difficulty detecting inconsistencies; however, the number of errors detected was still 7/12, indicating that they still managed to locate a fair number of inconsistencies within the text.

Students appeared to find word order errors fairly easy to locate as they found 10/12 errors. Baker (1985) found that "syntactically anomalous text [such as the implanted word order errors], is also semantically anomalous so it may be difficult to tell whether syntactic or semantic evaluation leads to detection of the anomaly" (p. 163). Hence, one should not assume that students were monitoring solely on a syntactic basis for word order implants. In fact, the results accumulated from the different monitoring measures indicated that the students monitored largely on a meaning basis. Hence, the students probably used both syntactic and semantic cues to monitor their comprehension of word order implants.

Students were able to locate several implanted pronominal errors (8/12). However, they located only 5/12 of the multisyllabic words. It is possible that the students had no difficulty decoding the implanted multisyllabic words, that their difficulties were resolved subconsciously while they read, or that they experienced difficulty but failed to report it.

From examining the student's error detection responses, it became evident that the students were aware of several different aspects of text. Baker (1985) suggests that when "comprehension monitoring is regarded as a unitary phenomenon--that is, when a researcher concludes that subjects did not evaluate their understanding on the grounds that they failed to notice the intended problems", the researcher may assume that the students were unable to monitor their understanding of the discourse when in fact they may have been using different standards to evaluate the text (p. 158). Furthermore, Baker (1985) indicated that students' monitoring of written discourse can be broken down into three basic categories: lexical, syntactic and semantic. Each of these categories can also be broken down into several subcategories.

From an examination of the results presented, the students appeared to be relying strongly on semantic evaluation standards as they frequently indicated that items did not make sense. Several students indicated that

information didn't make sense in relation to the rest of the story and two students monitored implants to determine if they were on topic. Hence, it appeared that the students were able to identify that a loss of understanding had occurred and had in fact attempted to restore their understanding of the text by first evaluating their loss of understanding in relation to the surrounding context. It seemed that the students evaluated the text for "structural cohesiveness", a semantic sub-category derived from Baker's (1985) classification system.

Some of the students appeared to bring their own experiences into their readings of text and several students seem to be perplexed when the text offered an idea different from their own experiences. For example, several students indicated that something was confusing when presented with the sentence "To his surprise, Mike's mom and dad had bought him a pup tent" because they compared the content to their own experiences, which indicated that the tents were to be shared. Consequently, the statement that each student had their own tent was presumed to be incorrect. Baker (1985) considered this kind of rationalizing to be related to the evaluation of external consistency as the students based their decision making on the information being consistent or not being consistent with their own experiences.

Four of the students indicated that word identification was a problem, three students indicated that

there were word meanings errors within the text and three students appeared to be using context as they indicated that they wished to change their mind about the classification of items as errors after they had read ahead. These responses appeared to reflect use of a lexical standard (Baker, 1985).

## Limitations

1. The reading situation presented in this study may be atypical for some of the students. The structure of the error detection task itself, may have limited the students somewhat as they were required to read one sentence at a time. By only reading one sentence at a time, the students may have been predisposed towards the use of specific strategies more than when they were engaged in other reading activities. Nevertheless, allowing the students to refer back and forth as they read, using direct instructions, and providing a practise session ensured that students would experience greater success in recalling and explaining reading processes. Garner (1987) concurs as she indicated that when longer reading selections were used, students experienced difficulty recalling information. However, by providing the students with practise in locating the different kinds of implanted errors and keeping the instructions simple and direct, the students were able to understand the tasks more readily; consequently,

they were able to locate many of the implanted errors.

2.  Criticisms directed towards self-report questionnaires
    also apply to the _Index of Reading Awareness_. For
    example, students may simply report what they believe
    the researcher wants to hear; consequently, their
    answers may be suspect to bias. As well, having
    children respond to questions based on the recollection
    of a reading act may be difficult for the following
    reasons: students may experience difficulty effectively
    recalling a significant reading event and students may
    refrain from putting in their best effort as they do
    not perceive the tasks as being important.

3.  The fact that the _Index of Reading Awareness_ is a
    recognition task and is presented in a multiple choice
    format, introduces the issue of student guessing. As
    well, the multiple choice format seemed to pose some
    problems as a few students indicated that alternative
    choices should be added to the answer selection.
    Therefore, the format itself may have been somewhat
    restrictive as students may have chosen responses that
    did not actually correspond to their individual reading
    styles. Nevertheless, the IRA still provided the
    researcher with valuable information about each
    student's reading awareness. Therefore, in light of
    the limited number of metacognitive reading awareness
    instruments available, it may be more appropriate for

researchers to use other instruments in conjunction
with the IRA rather than abandon the use of the .
4.  Because of the small sample size, it is not possible to
generalize the results of this study to the learning
disabled population in general.

## Implications of the Study

This indepth exploration of learning disabled students'
comprehension monitoring helped to reveal the unique and
multidimensional nature of comprehension monitoring.  As
well, the results of the study provide implications for the
six students in the study, the classroom teacher, educators,
and researchers in general.

The findings demonstrated that all of the learning
disabled students in this study engaged in comprehension
monitoring.  As it is often assumed that learning disabled
students do not engage in comprehension monitoring, this
finding was significant.  Examination of the results
indicated that the students showed some similarities in
their monitoring of written discourse but some differences
emerged as well.  Therefore, when making speculations about
learning disabled students' comprehension monitoring, it is
critical that one acknowledge that learning disabled
students do engage in comprehension monitoring and vary in
the manner in which they monitor their understanding of
written discourse.

Teachers and researchers must take into consideration the methods in which reading processes/comprehension monitoring are assessed and recognize that comprehension monitoring is a formidable skill to measure. Therefore, when seeking information on students' reading processes/comprehension monitoring, teachers and researchers must consider the following: the needs of their students, the tasks presented, the kinds of assessment instruments used, and the relationship between assessment and instruction. From the research findings in this study, it is recommended that both formal and informal assessment instruments be used to uncover indepth information about learning disabled students' comprehension monitoring if one is to fully understand how students monitor written discourse, identify what students know about the reading process, and plan/implement more effective instructional practices.

Several researchers have indicated that metacognitive reading awareness and strategy instruction should be addressed when instructing students (Baker and Brown, 1984; Chan and Cole, 1986; Paris and Jacobs, 1984; and Wagoner, 1983). Because the study results indicated that the children experienced difficulty knowing when to use particular strategies, were unaware why one should set a purpose for reading, and seemed unaware why particular strategies are more effective than others, the instructional

strategies or program direction should focus on ways to help strengthen students' awareness, understanding and use of conditional and planning knowledge strategies--namely, directly teach students about metacognitive processes. In addition, Short and Weissberg-Benchell (cited in McCormick, Miller, and Pressley, 1989) advocate that "teachers should actively promote a general awareness of cognitive, metacognitive and motivational processes" when instructing students (p. 49). In their view, students must be made aware that successful strategy usage is dependent upon many factors such as the following: 1) effort, 2) metacognitive knowledge, 3) awareness of the context in which the strategies are to be applied and 4) the student's own attributional profile (Short and Weissberg-Benchell, 1989). Therefore, the role of motivation and value of attribution training should also be considered in strategy instruction.

Baumann and Cassidy-Schmidt (1986) found that conditional knowledge instruction is usually where metacognitive instruction has broken down. They reported that "comprehension instruction has more often been successful in providing readers declarative and procedural knowledge (the what and how of comprehension) than it has been in providing the conditional knowledge (the why and when of comprehension) needed to monitor and regulate the use of comprehension skills" (Baumann and Cassidy-Schmidt, p. 641). Hence, because comprehension monitoring is a

process unique to each individual, the qualitative differences inherent in the students' comprehension monitoring and the role of metacognitive processes in reading instruction must be taken into account when planning for instruction.

## Recommendations for Further Research

As the current study only addressed the students' comprehension monitoring of narrative discourse, more research with different types of discourse is needed. Moreover, the examination of comprehension monitoring should extend across subject areas to help the teacher or researcher become more aware of the different ways in which students monitor their understanding of written discourse.

Additionally, more research is needed to determine how manipulation of text influences students' comprehension monitoring. For example, more research could address how varying the length of the text, varying the text difficulty or having students' choose reading selections influence comprehension monitoring.

Research by Wong (1987) indicated that learning disabled students may not be actively involved in the reading process and consequently, are unable to monitor their performance or effectively understand what they are reading as they are unsure where to direct their focus. The work of Chan and Cole (1986) and Chan et al. (1987),

however, has indicated that learning disabled students can be taught comprehension monitoring strategies through direct instruction. Therefore, more research should be directed towards the development of effective teaching strategies for comprehension monitoring/reading process instruction.

Research by Short and Ryan (1984) indicated that students' beliefs about mental functioning can greatly influence their performance as "children with prior dispositions to attribute success to effort and with good metamemory knowledge receive greater cognitive boosts from strategy training than other children" (352). As the current study did not investigate the relationship between motivation or attributional training on the students' comprehension monitoring, it may prove fruitful to investigate how children's motivation or attributional profiles influence comprehension monitoring of written discourse.

Because there are few reading process instruments available, there is a definite need for the development of more effective assessment instruments which directly address the assessment of comprehension monitoring. The research could investigate the different combinations of assessment instruments and the value of the information gleaned from these combinations.

## Concluding Comments

In order to help students become more proficient readers, educators must first discover how students monitor their understanding of written discourse. This exploratory study demonstrated that a better understanding of students' comprehension monitoring can be gleaned by using a variety of assessment measures to uncover information about students' understanding/use of reading processes. As students differ in their ability to construct meaning and traditional assessment measures often do not provide a great deal of information on students' reading processes, the manner in which information is acquired is of utmost concern.

The findings demonstrated that the learning disabled students in this study were aware of several metacognitive strategies such as rereading, looking back, looking ahead, sounding out words, and using context to support understanding. Hence, they engaged in comprehension monitoring. This finding was significant as it demonstrated that some learning disabled students do monitor their understanding of written discourse under certain conditions. Furthermore, even though there were some similarities in the students' comprehension monitoring, students still monitored their understanding of written discourse in highly unique ways. Since comprehension monitoring is a dynamic and complex process, it is critical that educators and

researchers recognize that all learning disabled students
are not identical in their comprehension monitoring. If we
are to fully understand how students monitor their
understanding of written discourse, we must be aware of the
different processes individual readers use as they engage in
meaning construction; thus, we must look at the processes
readers engage in more than the product. Myers (1991),
proposes a relevant question to ponder when teaching or
researching comprehension monitoring, "Without abdicating
our interest in product, could it be that a bottom line
necessity is that we occupy ourselves some more with
process?" (p. 268).

REFERENCES

Alberta Education. (1986). Diagnostic reading program. Edmonton, Alberta, AB: Student Evaluation Branch.

Alverman, D. E. (1984). Second graders' strategic preference while reading basal stories. Journal Educational Research, 77 (3), 184-189.

Babbs, P.J. and Moe, A.J. (1983). Metacognition: A key for independent learning from text. Reading Teacher. 36, 422-426.

Baker, L. (1979). Do I understand or do I not understand: That is the question? (Reading Education Report no. 10). Urbana-Champaign, IL: University of Illinois, Center for the Study of Reading.

Baker, L. and Anderson, R.I. (1982). Effects of inconsistent information on text processing: Evidence for comprehension monitoring. Reading Research Quarterly, 17 (2), 281-293.

Baker, L. and Brown, A. (1984). Metacognitive skills and reading. In P. D. Pearson (Ed.), Handbook of Reading Research. (pp.352-394). New York: Longman.

Baker, L. (1985). How do we know when we don't understand? Standards for evaluating text comprehension. In D. L. Forrest-Pressley, G. E. MacKinnon and T. Gary Waller (Eds.), Metacognition, cognition, and human performance. (pp.155-205). NJ: Lawrence Erlbaum Associates.

Baumann, J. F. and Cassidy Schmitt, M. (1986). The what, why, how and when of comprehension instruction. The Reading Teacher, March, 640-645.

Beebe, M. J. (1980). The effects of different types of substitution miscues on reading. Reading Research Quarterly, 15 (3), 324-335.

Bereiter, C. and Bird, M. (1985). Use of thinking aloud in identification and teaching of reading comprehension strategies. Cognition and Instruction, 2 (2), 131-156.

Book, C., Duffy, G., Roehler, L., Meloth, M. and Vavrus, L. (1985). A study of the relationship between teacher explanation and student metacognitive awareness during reading instruction. Communication Education, 34, 29-36.

Borg, W. R. and Gall M.D. (1989). Educational research: An Introduction. (5th ed.). New York: Longman.

Bos, C. S. and Filip, D. (1984). Comprehension monitoring in learning disabled average students. Journal of Learning Disabilities, 17 (4), 229-233.

Chan, L. K. S. and Cole, P. (1986), The effects of comprehension training on the reading competence of learning disabled and regular class students. Remedial and Special Education, 7 (4), 33-40.

Chan, L. S. K. and Cole, P. G. and Barfett, S. (1987).
Comprehension monitoring: Detection and identification
of text inconsistencies by LD and normal children.
Learning Disabilities Quarterly, 10, 114-124.

Clay, M. (1979). Reading: The patterning of complex
behaviour. (2nd ed.), Auckland/Exter, NH: Heinemnann.

Daniluk, L.F. (1991). Metacognitive knowledge of young
children as they engage in reading. Unpublished
master's thesis, University of Alberta.

Devine, T. G. (1986). Teaching reading comprehension: From
theory to practise. Toronto, Canada: Allyn and Bacon,
Inc.

Di Vesta, F. J., Hayward, K. G. and Orlando, V.P. (1979).
Developmental trends in monitoring text for
comprehension. Child Development, 50, 97-105.

Dole, J. A., Duffy, G. G., Roehler, L.R. and Pearson, P. D.
(1991). Moving from the old to the new: Research on
reading comprehension instruction. Review of
Educational Research, 61 (2), 239-264.

Duffy, G. G., Roehler, L. R., Sivan, E., Rackliffe, G.,
Book, C., Meloth, M. S., Vavrus, L. G., Wesselman, R.,
Putnam, J. and Bassiri, D. (1987). Effects of
explaining the reasoning associated with using
strategies. Reading Research Quarterly, 22 (3), 347-
368.

Duffy, G. G. and Roehler, L. (1989). Improving Classroom Reading Instruction: A Decision-Making Approach. New York: Lane Akers, Inc.

Edmonton Public Schools. (1992). Special Needs Eligibility Procedures and Criteria. Edmonton, Alberta.

Fagan, W. T. (1987). The learning and teaching of reading: An interactive processes model. Edmonton: Eolas Educational Consulting and Publishing Enterprises.

Flavell, J. H. (1976). Speculations about the nature and development of metacognition. In F. E. Weinert and R. H. Kluwe (Eds.), Metacognition, motivation and understanding. (pp. 21-29). Hillsdale, NJ: Erlbaum.

Flavell, J. H. (1978). Speculations about the nature and development of metacognition. In F. E. Weinert and R. H. Kluwe (Eds.), Metacognition, motivation and understanding. (pp. 21-29). Hillsdale, NJ: Erlbaum.

Flavell, J. H. (1979). Speculations about the nature and development of metacognition. In F. E. Weinert and R. H. Kluwe (Eds.), Metacognition, motivation and understanding. (pp. 21-29). Hillsdale, NJ: Erlbaum.

Flavell, J. H. (1981). Speculations about the nature and development of metacognition. In F. E. Weinert and R. H. Kluwe (Eds.), Metacognition, motivation and understanding. (pp. 21-29). Hillsdale, NJ: Erlbaum

Flavell, J. H. (1979). Metacognition and cognitive
    monitoring: A new area of cognitive--developmental
    inquiry. <u>American Psychologist</u>, <u>34</u> (10), 906-911.

Flavell, J. H. and Wellman, H. M. (1977). Metamemory. In
    R. V. Kail and J.W. Hagen (Eds.), <u>Perspectives on the
    development of memory and cognition</u>. (pp. 3-34).
    Hillsdale. NJ: Lawrence Erlbaum Associates.

Flavell, J. H. (1987). Speculations about the nature and
    development of metacognition. In F. E. Weinert and R.
    H. Kluwe (Eds.), <u>Metacognition, motivation and
    understanding</u>. (pp. 21-29). Hillsdale, NJ: Erlbaum.

Flavell, J. H. (1989). Speculations about the nature and
    development of metacognition. In F. E. Weinert and R.
    H. Kluwe (Eds.), <u>Metacognition, motivation and
    understanding</u>. (pp. 21-29). Hillsdale, NJ: Erlbaum

Gambrell, L. B. and Bales, R. J. (1986). Mental Imagery
    and the comprehension-monitoring performance of fourth
    and fifth grade poor readers. <u>Reading Research
    Quarterly</u>, <u>21</u> (4), 454-464.

Garner, R. (1980). Monitoring of understanding: An
    investigation of good and poor readers' awareness of
    induced miscomprehension of text. <u>Journal of Reading
    Behaviour</u>, <u>12</u> (1), 55-63.

Garner, R. (1981). Monitoring of passage inconsistency among poor comprehenders: A preliminary test of the "piecemeal processing" explanation. Journal of Educational research, 74 (3), 159-162.

Garner, R. (1982). Verbal-report data on reading strategies. Journal of Reading Behaviour, 14 (2), 159-167.

Garner, R. (1987). Metacognition and reading comprehension. New Jersey: Ablex Publishing Corporation.

Garner, R. and Alexander, P. A. (1989). Metacognition: Answered and unanswered questions. Educational Psychologist, 24 (2), 143-158.

Garner, R. and Anderson, J. (1982). Monitoring-of-understanding research: Inquiry directions, methodological dilemmas. Journal of Experimental Education, 50, 70-76.

Garner, R. and Reis, R. (1981). Monitoring and resolving comprehension obstacles: an investigation of spontaneous text look backs among upper-grade good and poor comprehenders. Reading Research Quarterly, 16 (4), 569-583.

Garner, R. (1990). In S. E. Wade, Using think alouds to assess comprehension. The Reading Teacher, March, 442-451.

Goodman, K.S. (1970). Behind the eye: What happens in
reading. In K. S. Goodman and C.S. Niles (Eds.),
Reading process and program. (pp. 3-38). Urbana, IL:
National Council of Teachers of English.

Haller, E. P., Child, D. A. and Walberg, H. J. (1988). Can
comprehension be taught?: A quantitative synthesis of
"metacognitive skills". Educational Researcher, 17
(9), 5-8.

Hare, V. and Smith, D. C. (1981). Reading to remember:
Studies of metacognitive reading skills in elementary
school-aged children. Journal of Educational Research,
75, 165-168.

Jacobs, J. E. and Paris, S. G. (1987). Children's
metacognition about reading: Issues in definition,
measurement, and instruction. Educational
Psychologist, 22 (3 & 4), 255-278.

Johns, J. L. (1980). First grader's concepts about print.
Reading Research Quarterly, 15, 539-549.

Lapp, D. and Flood, J. (1986). Teaching students to read.
New York: Macmillan Inc.

Leslie, L. and Caldwell, J. (1990). The Qualitative Reading
Inventory. Glenview: Scott Foresman/Little, Higher
Education Division of Scott Foresman and Company.

Lipson, M. and Wixson, K. (1991). Assessment and
instruction of reading disability: An interactive
approach. New York: Harper Collins Publishers Inc.

Malicky, G. (1991). Miscue Analysis. [Ed. El. 508 Class

    Notes]. Edmonton, Canada: University of Alberta.

Markman, E. (1977). Realizing that you don't understand: A

    preliminary investigation. Child Development, 48,

    986-992.

Markman, E. (1979). Realizing that you don't understand:

    Elementary school children's awareness of

    inconsistencies. Child Development, 50, 643-655.

McGuire, K. L. (1991). Gifted learning disabled:

    Metacognitive reading strategies. Unpublished master's

    thesis, University of Alberta, Edmonton Alberta.

McLain, K. V. (1991). Effects of two comprehension

    monitoring strategies. (Report No. CS-010-488).

    University of Houston. (ERIC Document Reproduction

    Service No. Ed 329 936).

Merriam, S. B. (1988). Case study research in education: A

    qualitative approach. San Francisco, California:

    Jossey-Bass Inc. Publishers.

Miller, G. E. (1985). The effects of general and specific

    self-instruction training on children's comprehension

    monitoring performances during reading. Reading

    Research Quarterly, 20 (5), 616-629.

Myers, S. S. (1991). Performance in reading

    comprehension--product or process? Educational Review,

    43 (3), 257-272.

Myers, M. and Paris, S. G. (1978). Children's
    metacognitive knowledge about reading. Journal of
    Educational Psychology, 70 (5), 680-690.

Olshavsky, J. (1976-77). Reading as problem solving: An
    investigation of strategies. Reading Research
    Quarterly, 12, 654-674.

Pace, A. (1980). The ability of young children to correct
    comprehension errors: An aspect of comprehension
    monitoring. (Report No. PS-011-389). University of
    North Carolina at Greensboro. (ERIC Document
    Reproduction Service No. Ed 184 730).

Pace, A. (1981). Comprehension monitoring by elementary
    students: When does it occur? (Report No. CS-006-064).
    University of North Carolina at Greensboro. (ERIC
    Document Reproduction Service No. Ed 201 970).

Pace, A., Sherk, J. K., Peck, A. R. and Baldwin, D. (1985).
    The relation between students' self-reports of studying
    procedures and measures of reading comprehension. In
    J. A. Niles and R. V. Lalik (Eds.). Issues in
    Literacy: A research perspective (34th yearbook of the
    national reading conference. (pp. 232-236). The
    National Reading Conference Inc.

Paris, S. G., Cross, D. R. and Lipson, M. Y. (1984).
    Informed strategies for learning: A program to improve
    children's reading awareness and comprehension.
    Journal of Educational Psychology, 76 (6), 1239-1252.

Paris, S. G. and Jacobs, J. E. (1984). The benefits of informed instruction for reading awareness and comprehension skills. Child Development, 55, 2083-2093.

Paris, S. G. and Meyers, M. (1981). Comprehension monitoring, memory, and study strategies of good and poor readers. Journal of Reading Behaviour, 23 (1), 5-22.

Paris, S. G. and Oka, E. R. (1989). Strategies for comprehending text and coping with reading difficulties. Learning Disabilities Quarterly, 12, 32-42.

Paris, S. G., Wasik, B. A. and Turner, J. C. (1991). The development of strategic reading. In R. Barr, M. Kamil, P. Mosenthal and D. Pearson. (Eds.), Handbook of reading research. (Volume 2). (pp.609-671). New York: Longman Publishing Group.

Pearson, D., Roehler, L., Dole, J. and Duffy, G. (1990). Developing expertise in reading comprehension: What should be taught? How should it be taught? (Report No. CS-010-267). University of Illinois. (ERIC Document Reproduction Service No. ED 324 648).

Pitts, M. M. (1983). Comprehension monitoring: Definition and practice. Journal of Reading, 26 (6), 516-523.

Shapka, M. L. (1990). Metacognitive reading strategy awareness of gifted, average, and learning disabled students. Unpublished master's thesis, University of Alberta, Edmonton, Alberta.

Short, E. J. and Ryan, E. (1984). Metacognitive differences between skilled and less skilled readers: Remediating deficits through story grammar and attributional training. Journal of Educational Psychology. 76, (2), 225-235.

Short, E. J. and Weissberg-Benchell, J. A. (1989). The triple alliance for learning: Cognition, metacognition, and motivation. In C.B. McCormick, G.E. Miller and M. Pressley (Eds.), Cognitive Strategy Research: From Basic Research to Educational Applications (pp. 33-63). New York: Springer Verlag Inc.

Thomas, Y. M. (1984). An investigation of comprehension monitoring by average and learning disabled readers. Unpublished master's thesis, University of Alberta, Edmonton, Alberta.

Wade, S. E. (1990). Using think alouds to assess comprehension. The Reading Teacher, March, 442-451.

Wagoner, S. A. (1983). Comprehension monitoring: What it is and what we know about it. Reading Research Quarterly, 28 (3), 229-346.

Winograd , P. and Johnston, P. (1982). Comprehension

monitoring and the error detection paradigm. Journal

of Reading Behaviour, 14 91), 61-76.

Wittrock, M. C. (1987). Process oriented measures of

comprehension. The Reading Teacher. April, 734-737.

Wong, B. (1985). Metacognition and Learning Disabilities.

In D. L. Forrest-Pressley, G. E. MacKinnon, and T. G.

Waller. (Eds.), Metacognition, Cognition and Human

Performance. (pp. 137-179). Toronto: Academic Press,

Inc.

Wixson, K. K., Bosky, A. B., Yochum, M. N. and Alvermann, D.

E. (1984). An interview for assessing students'

perceptions of classroom reading tasks. The Reading

Teacher, January, 346-352.

Wong, B. (1987). How do the results of metacognitive

research impact on the learning disabled individual.

Learning Disability Quarterly, 10, 189-195).

Yussen, S. R., (1985). The role metacognition in

contemporary theories of cognitive development. In D.

L. Forrest-Pressley, G. E. MacKinnon and T. Gary Waller

(Eds.). Metacognition, Cognition and Human Performance

(Vol. 1). New York: Academic Press Inc.

APPENDIX A

The Index of Reading Awareness Questionnaire

Name                    School                    Teacher

## MULTIPLE CHOICE

Circle the best answer for you.

E    1.  What is the hardest part about reading for you?

         1 a.    Sounding out the hard words.
         2 b.    When you don't understand the story.
         0 c.    Nothing is hard about reading for you.

E    2.  What would help you become a better reader?

         1 a.    If more people would help you when you read.
         0 b.    Reading easier books with shorter words.
         2 c.    Checking to make sure you understand what you
                 read.

CK   3.  If you are reading a story for fun, what would you
         do?

         1 a.    Look at the pictures to get the meaning.
         0 b.    Read the story as fast as you can.
         2 c.    Imagine the story like a movie in your mind.

E    4.  What is special about the first sentence or two in a
         story?

         1 a.    They always begin with "Once upon a time..."
         0 b.    The first sentences are the most interesting.
         2 c.    They often tell what the story is about.

E    5.  How are the last sentences of a story special?

         1 a.    They are exciting, action sentences.
         2 b.    They tell you what happened.
         0 c.    They are harder to read.

CK   6.  If you are reading for science or social studies,
         what would you do to remember the information?

         2 a.    Ask yourself questions about the important
                 ideas.
         0 b.    Skip the parts you don't understand.
         1 c.    Concentrate and try hard to remember it.

R    7.  What things do you read faster than others?

         1 a.    Books that are easy to read.
         2 b.    When you've read the story before.
         0 c.    Books that have a lot of pictures.

P   8. If you could only read some of the sentences in the
       story because you were in a hurry, which ones would
       you read?

       0 a.    Read the sentences in the middle of the
               story.
       2 b.    Read the sentences that tell you the most
               about the story.
       1 c.    Read the interesting, exciting sentences.

E   9. How can you tell which sentences are the most
       important ones in a story?

       2 a.    They're the ones that tell the most about the
               characters and what happens.
       1 b.    They're the most interesting ones.
       0 c.    All of them are important.

CK 10. If you are reading for a test, which would help
       most?

       1 a.    Read the story as many times as possible.
       2 b.    Talk about it with somebody to make sure you
               understand it.
       0 c.    Say the sentences over and over.

P  11. When you tell other people about what you read, what
       do you tell them?

       2 a.    What happens in the story.
       0 b.    The number of pages    the book.
       1 c.    Who the characters ᴀ  .

P  12. If the teacher told you to read a story to remember
       the general meaning, what would you do?

       2 a.    Skim through the story to find the main
               parts.
       1 b.    Read all of the story and try to remember
               everything.
       0 c.    Read the story and remember all of the words.

CK 13. If you are reading a library book to write a book
       report, which would help you the most?

       1 a.    Sound out words you don't know.
       2 b.    Write it down in your own words.
       0 c.    Skip the parts you don't understand.

P 14. Before you start to read, what kind of plans do you make to help you read better?

    0 a.      You don't make any plans. You just start reading.
    1 b.      You choose a comfortable place.
    2 c.      You think about why you are reading.

R 15. Why do you go back and read things over again?

    1 a.      Because it is good practice.
    2 b.      Because you didn't understand it.
    0 c.      Because you forget some words.

P 16. If you had to read very fast and could only read some words, which ones would you try to read?

    1 a.      Read the new vocabulary because they are important.
    0 b.      Read the words that you can pronounce.
    2 c.      Read the words that tell the most about the story.

R 17. What do you do if you come to a word and you don't know what it means.

    2 a.      Use the words around it to figure it out.
    1 b.      Ask someone else.
    0 c.      Go on to the next word.

R 18. What do you do if you don't know what a whole sentence means?

    1 a.      Read it again.
    0 b.      Sound out all of the words.
    2 c.      Think about the other sentences in the paragraph.

R 19. What parts of the story do you skip as your read?

    1 a.      The hard words and parts you don't understand.
    2 b.      The unimportant parts that don't mean anything for the story.
    0 c.      You never skip anything.

CK 20. Which of these is the best way to remember a story?

    0 a.      Say every word over and over.
    1 b.      Think about remembering it.
    2 c.      Write it down in your own words.

APPENDIX B

Breakdown of Index of Reading Awareness Questions

| Type | Question | David | Karen | Nicole | Brenda | Sandra | Norma |
|------|----------|-------|-------|--------|--------|--------|-------|
| E | 1. | Keeping my place | a | a | a | a | a |
| E | 1. | c | c | c | c | c | a |
| CK | 3. | c | c | c | a | a | b |
| E | 4. | c | b | c | a | c | c |
| E | 5. | b | b | c | c | a | b |
| CK | 6. | c | c | a | c | c | c |
| R | 7. | a | b | b | b | b | b |
| P | 8. | b | c | a | b | b | b |
| E | 9. | c | c | a | c | c | a |
| CK | 10. | a | b | a | a | c | c |
| P | 11. | a | c | a | c | a/c | a |
| P | 12. | b | b | b | b | b | b |
| CK | 13. | 2 | a | a | c | b | b |
| P | 14. | b | a | b | b | a | b |
| R | 15. | a | a | b | a | b | b |
| P | 16. | c | c | c | c | c | c |
| R | 17. | a | a | c | b | a | a |
| R | 18. | a | b | b | a | c | a |
| R | 19. | c | c | c | c | c | a |
| CK | 20. | b | a | b | b | c | a |

Figure 15. Breakdown of index of reading awareness questions

E:     Evaluative Knowledge
CK:    Conditional Knowledge
R:     Regulative Knowledge
P:     Planning Knowledge

APPENDIX C

Miscue Analysis Sample

# MISCUE CODING SHEET

**NAME:** Karen                    **PASSAGE:** Alone
                                                 (Instructional 6BN)

|     | Text Word | Reader's Response | Correction | Graphic Similarity | Contextual Acceptability | Meaning Change |
|-----|-----------|-------------------|------------|--------------------|--------------------------|----------------|
| 1.  | Alexis | Alex | N | H | H | H |
| 2.  | short | (omit) | Y | N | H | P |
| 3.  | snow | show | Y | H | P | H |
| 4.  | whipping | wiping | N | H | N | H |
| 5.  | all | (omit) | N | N | H | N |
| 6.  | fear | self | N | H | H | H |
| 7.  | the | her | N | H | H | P |
| 8.  | reassured | (omit) | N | N | H | H |
| 9.  | now | how | Y | H | N | H |
| 10. | consciously | (omit) | N | N | N | H |
| 11. | | | | | | |
| 12. | | | | | | |
| 13. | | | | | | |
| 14. | | | | | | |
| 15. | | | | | | |
| 16. | | | | | | |
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| 18. | | | | | | |
| 19. | | | | | | |
| 20. | | | | | | |
| 21. | | | | | | |
| 22. | | | | | | |
| 23. | | | | | | |
| 24. | | | | | | |
| 25. | | | | | | |

# MISCUE CODING SHEET

**NAME:** Karen    **PASSAGE:** The Wrong Decision (Instructional 5AN)

| | Text Word | Reader's Response | Correction | Graphic Similarity | Contextual Acceptability | Meaning Change |
|---|---|---|---|---|---|---|
| 1. | bought | brought | N | H | H | H |
| 2. | anyone | you | Y | P | H | H |
| 3. | sheepishly | sleepishly | N | H | H | H |
| 4. | at | to | Y | H | N | P |
| 5. | launched | lunched | N | H | P | H |
| 6. | purred | poured | N | H | P | H |
| 7. | cast | coast | N | H | N | H |
| 8. | manoeuvred | manovered | N | H | N | H |
| 9. | several | selveral | Y | H | N | H |
| 10. | converged | convered | N | H | N | H |
| 11. | scene | sense | N | H | N | H |
| 12. | canoe | canoes | N | H | N | H |
| 13. | prow | (prow) | N | H | N | H |
| 14. | I have | I've got | N | H | H | N |
| 15. | | | | | | |
| 16. | | | | | | |
| 17. | | | | | | |
| 18. | | | | | | |
| 19. | | | | | | |
| 20. | | | | | | |
| 21. | | | | | | |
| 22. | | | | | | |
| 23. | | | | | | |
| 24. | | | | | | |
| 25. | | | | | | |

# MISCUE CODING SHEET

**NAME:** Karen                          **PASSAGE:** Just One More
(Instructional 4AN)

| | Text Word | Reader's Response | Correction | Graphic Similarity | Contextual Acceptability | Meaning Change |
|---|---|---|---|---|---|---|
| 1. | on | in | N | H | H | N |
| 2. | it | is | N | H | H | N |
| 3. | that | what | Y | H | P | H |
| 4. | coax | cox | N | H | N | H |
| 5. | remained | remainders | N | H | N | H |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| 11. | | | | | | |
| 12. | | | | | | |
| 13. | | | | | | |
| 14. | | | | | | |
| 15. | | | | | | |
| 16. | | | | | | |
| 17. | | | | | | |
| 18. | | | | | | |
| 19. | | | | | | |
| 20. | | | | | | |
| 21. | | | | | | |
| 22. | | | | | | |
| 23. | | | | | | |
| 24. | | | | | | |
| 25. | | | | | | |

# MISCUE CODING SHEET

**NAME:** Karen                             **PASSAGE:** Rascal is Lost (Independent 3A1)

| | Text Word | Reader's Response | Correction | Graphic Similarity | Contextual Acceptability | Meaning Change |
|---|---|---|---|---|---|---|
| 1. | cub | crib | Y | H | P | H |
| 2. | is | (insert) | N | N | P | H |
| 3. | wind | window | Y | H | P | H |
| 4. | all | about | N | H | N | H |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
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| 20. | | | | | | |
| 21. | | | | | | |
| 22. | | | | | | |
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| 24. | | | | | | |
| 25. | | | | | | |

## MISCUE CODING SHEET

**NAME:** Karen      **PASSAGE:** Part of the Team
(Independent 3A2)

| | Text Word | Reader's Response | Correction | Graphic Similarity | Contextual Acceptability | Meaning Change |
|---|---|---|---|---|---|---|
| 1. | anxiously | angdxiously | N | H | N | H |
| 2. | now | how | Y | H | N | H |
| 3. | that | (omit) | N | N | H | N |
| 4. | the | (omit) | N | N | P | P |
| 5. | | | | | | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| 11. | | | | | | |
| 12. | | | | | | |
| 13. | | | | | | |
| 14. | | | | | | |
| 15. | | | | | | |
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| 17. | | | | | | |
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| 20. | | | | | | |
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| 25. | | | | | | |

APPENDIX D

Think Aloud Instructions

Think Aloud Instructions/Sample Passage

Instructions to students

We are going to begin with some practise exercises.
Sometimes when we read we come to sentences that don't make
sense to us right away.  Sometimes we aren't quite sure what
the author means because what he's saying doesn't seem right
to us.  Other times we might feel that we missed something
or don't really know how the story line got to where it is.
I would like you to read this sample exercise and stop at
the dot.  Then you can tell me if there is anything that
seems unclear or confusing or that you might be wondering
about?

Sample One:   The girl ran into the store.  She was

breathing hard and trying to talk at the same

time.   *

Mr. Green brought her a glass of water and

after a few moments she told him about the

bank robber on the corner.


Sample Two:   The brown dog walked quickly towards the

kitten, trying hard not to bark or wag his

tail.   *

The brown dog had missed his friend since

their master gave him to Mrs. Hill who lived

down the street.


Sample Three:   The children ran down to the water and were

ready to jump in when they suddenly stopped.*

A family of ducks slowly floated by.  The

children quietly watched the ducks swim by.

APPENDIX E

Error Detection Directions and Practise Passage

Directions

1.    The following stories have been written by some of
      my students.  They contain some problems and the
      students would like your help in locating them.

2.    You do not have to look for any spelling errors as
      the spelling has all been corrected.

3.    There will not be an error on every page.

4.    If you think there is a problem highlight the word
      or words with the high lighter.

5.    You will be given a chance to discuss your work with
      me when you have completed the activity.

6.    Take your time and read carefully.


                        The Cat


(Sample Passage - Presented to students before they began
error detection study tasks.)


I have a pet cat at home.

She is very nice.

My cat big is a one.    (Word Order)

She had six kittens.

He is a good mother cat.   (Pronominal)

She is fabulous at catching rodents.   (Multisyllabic)

She is gray and white.

I like to pet my purple cat. (Informationally Inconsistent)

I feed my cat, cat food, milk, and water.

I like to see elephants at the zoo.   (Anomalous Information)