METACOMPREHENSION AND READING PROFICIENCY

by

Patricia McEwan

B. Ed., University of British Columbia, 1988
Diploma in Education, University of British Columbia, 1991

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE STUDIES

(Department of Language Education)

We accept this Thesis as conforming

to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

March, 1993

(Signature)

Department of Language Education

The University of British Columbia
Vancouver, Canada

Date April 29th, 1993

ABSTRACT

The purpose of this study was to investigate whether children, 6 and 7 years old, who received direct teaching and modelling of specific metacognitive strategies would show a greater increase in reading comprehension and metacognitive strategy awareness, as compared to a control group who did not receive any such treatment. A second purpose was to determine if the treatment would have a greater or lesser effect on the reading comprehension of children dependent on their initial level of metacomprehension awareness.

A pretest - posttest control group design was used. Subjects were 27 children in their third year of school (formerly called Grade 2, 6 and 7-year-olds) from two different multi-age classes in the same school. Children were assigned to the two groups using the matched pairs technique based on the pretest of the Gates - MacGinitie Reading Test - Primary B Form 1. All subjects were tested individually on the Meta-comprehension Strategy Index on that same day. Both groups received instruction for 1 hour daily, Monday through Thursday for a 4 week period. The experimental group received 30 minutes of direct teaching of metacomprehension strategies, and then 30 minutes of a reading lesson with the reader **Adventures With Mac.** In place of the experimental procedure, the control group was read to by the control teacher, and then they were given time to

read independently or with a partner. The following 30 minutes of the lesson was the same reading lesson with the reader **Adventures With Mac** that the experimental group received.

Following the 4 week study period, both groups then took the posttest of the Gates - MacGinitie Reading Test Primary Form 2, and they were again tested individually on the Meta-comprehension Strategy Index. The children in the experimental group did not show a statistically significant difference in the mean gain scores on the Gates - MacGinitie Reading Test. The children in the experimental group did show statistically significant mean gain scores on the modified Metacomprehension Strategy Index compared to the children in the control group.

Qualitative observations during and after the study indicated the need to develop tools to help teachers to understand, record and evaluate children's metacomprehension strategy awareness, so that they can plan and carry out a reading program to lead each child towards becoming a proficient reader.

TABLE OF CONTENTS

LIST OF TABLES

Table **Page**

LIST OF FIGURES

ACKNOWLEDGEMENTS

The author would like to thank all children, parents and administrators who made this study possible to take place. Special thanks go to Mrs. Terra Higgins, Mrs. Dorothy Robertson, and Mrs. Betty Williams for generously providing their time, expertise, and students for the study.

To Dr. Kenneth Reeder, my thesis advisor, for his guidance, and patience.

I would also like to thank the members of my committee in the Department of Language Education, Dr. Marilyn Chapman, Dr. Robert Chester, and Dr. Claire Staab.

Special thanks need to be made to my sister Katherine for her unfailing encouragement, and above all, to my fiance, Paul, for his faith in me from the beginning and for his willingness to put his life on hold for two years as I pursued this goal.

CHAPTER ONE

Metacomprehension And Reading Proficiency

1.1 Introduction

Theories of teaching reading have been an area of educational interest for many years and have experienced a strong renewal of interest in the past 5 years. Educators have known how vital the three cueing systems are to the process of reading for many years now (Goodman, K. 1973). It is widely accepted that beginning readers make use of the grapho-phonic system (the relationship between sounds and letters), the syntactic or grammatical system and the semantic or meaning system of language (Clay 1961 & Goodman, 1971). "Beginning readers" is used here to describe children who are 6 or 7 years old and who are in the early stages of formal reading instruction. Some children may be considered "emergent" while other may be able to read fluently. Although researchers and educators often speak separately of the three different cueing systems, it is argued that "...they are a part of an integrated whole, and that without integration the reading process breaks down" (Cochrane et al. 1985, p. 10).

In addition, over the last 5 years with the introduction of British Columbia's Year 2000 - A Learner-Focused Curriculum and

Assessment Framework for the Future draft document (1989) and Whole Language philosophy into primary classrooms, reading theory has been reexamined, and instructional guidelines reshaped.

The "Whole Language" philosophy espoused by the Year 2000 - A Learner-Focused Curriculum and Assessment Framework for the Future draft document (1989) and its ensuing publications maintain that keeping language "whole" by integrating the four language strands (reading, writing, speaking and listening) into each lesson is critical (Weaver, 1990).

A debate continues over which approach should be used in teaching beginning reading skills, a code-emphasis or a meaning-emphasis approach. The code-emphasis approach initially stresses breaking the alphabetic code, and the meaning-emphasis approach is one that initially stresses getting meaning from text (Chall, 1983). Vellutino (1991) states:

> At the heart of the debate between code and meaning advocates is the question of whether fluency (automaticity) in identifying words out of context is a prerequisite for effective and efficient comprehension of what is read. On one side of this debate are the whole-language theorists... who have held that reading is a context-driven process and that skilled readers use semantic and syntactic constraints in full measure to generate predictions as to the words that are likely to appear in given contexts. ...Code-oriented theorists have taken an alternative position, contending that skilled reading in terms of facility in word identification is...a highly automatized modular process that need not import any

> contextual information for its execution. Conversely, effective use of contextual information for purposes of comprehension is critically dependent on rapid and automatic word identification. ...Accordingly, activities that engender automaticity in word identification should be a central component of the child's instructional program. (pp. 437-438)

1.2 Reading as an Active Process

Reading is considered an active mode of communication by the whole-language theorists. Readers are thinkers trying to bring meaning to print by utilizing strategies that will help them to get meaning from the text. It is believed that the strategies that the reader uses are: predicting; confirming, or disconfirming and correcting; (Cochrane, Cochrane, Scalena, & Buchanan, 1985). The reader is enabled to use these strategies through his or her knowledge and use each of the three language cueing systems. Y. Goodman suggests that children make use of the cueing systems "...intuitively by virtue of being users of a language." (1976) Others support this claim and propose that children learn to read in much the same way that they learned to talk, "...gradually, naturally, without a great deal of direct instruction..." (Weaver, 1990, p. 6). Weaver suggests that "direct instruction" can take various forms, depending on whether the instructional model is one of transmission or of transaction. In the previous quote, Weaver is referring to the direct instruction in a transmission model of teaching. In this

model isolated skills are taught by the teacher, and students then practice these skills before being tested to determine if mastery of the skills has occurred. In the context of the present study, "direct teaching" includes teacher demonstrations, modelling of mental processes, and mini lessons where both the children and the teacher were actively involved in discussions and activities intended to promote the development of strategies within meaningful contexts. This latter type of "direct teaching" would be consistent with a transactional model of teaching (Weaver, 1990).

1.3 **The Role of Comprehension**

Some researchers believe that comprehension is vital in the process of reading. They promote the notion that "comprehension must be involved for reading to be taking place [and that] there is no reading without comprehension" (Goodman, 1976). Paris and Arbor (1991) suggest three significant aspects of reading comprehension. First, they define comprehension strategies as the various ways in which readers can get meaning from the text. Second, they think reading comprehension involves an awareness of one's own thinking processes, known as metacognition, and third, motivation to read is considered to be an aspect of reading comprehension. "Strategic reading involves awareness and self-control, two components of metacognition" (Paris &

Arbor, 1991, p.33). The suggestion here is that strategic reading not only involves knowing about the different strategies used to get meaning from text, but, in addition, to be aware of why the strategy is used and which strategy would best fit the demands of the present text. Cognitive awareness and choice must be involved. Are teachers addressing this aspect of reading in their instruction, and if so how? According to Durkin, (1978; 1979), teachers spend so much time asking questions, giving directions, and maintaining order that they devote little time to teaching children how to think while reading.

There have been studies that have indicated that children are able to learn metacognitive strategies. Paris, Cross, and Lipson, (1984) conducted a 14 week study with 87 students in the third grade and 83 students from the fifth grade from eight intact classes to test if giving students declarative, procedural and conditional knowledge (see page 18) about reading strategies would improve their reading comprehension. For example:

> a lesson on skimming would describe the strategy and show how to use it. In addition, children would be told when it is a useful strategy to apply (e.g., as a preview or review technique) and when it is not. But more than information was provided. Children had opportunities to observe other people using strategies and to practice them in the classroom. Dialogues with teachers and peers provided feedback and guidance. (p.1243)

Three modes of instruction were used: classroom lessons, bulletin board materials, and suggestions for the classroom teacher on how to use these strategies. The classroom instruction involved 30 minutes of group instruction twice a week for the fourteen week study.

The measures used in their study were the Comprehension subtest of the Gates - MacGinitie Reading Tests, the Paragraph Reading subtest of the Test of Reading Comprehension, cloze procedures that they developed, and error detection tasks. They found that:

> ...children in the experimental classes generally had greater knowledge about reading strategies than children in control classes. They also performed significantly better on cloze and error detection tasks. ...The increased knowledge and strategy use of children in experimental classes also reflected their increased awareness about reading. ...However, [the treatment] did not lead to significant changes in children's GATES and TORC scores. The performance improvements on standardized, norm-referenced tests of reading comprehension were comparable for experimental and control groups at both grade levels. (p. 1248)

Paris et al. (1984) pose questions which seem to revolve around the relationship between metacognitive awareness and reading comprehension. Does awareness of cognitive processes strengthen children's comprehension in reading? The problem is that there is little research done with 6 and 7-year-olds to indicate the presence of a relationship between cognitive awareness and reading comprehension.

This issue is of interest to teachers who could benefit from knowing whether it is meaningful to plan and carry out specific lessons which teach children to think about what they do as they read. Schmitt (1990) believes that, "comprehension skill instruction should focus on the teaching of skills as strategies for getting meaning" (p. 458). Looking at the issue on a larger scale, it becomes of great importance to publishers who create and sell materials that teachers will buy to support their programs. If metacomprehension is shown to be an important aspect in the teaching of reading, then publishers will be sure to include information for teachers about metacomprehension strategies in their teaching guides. Durkin (1981) analyzed teachers' manuals and found that they steered teachers into spending much of their time in questions related to the content of the story. Most of them provided little or no instruction about how to read. If we could show that metacognitive tasks were involved in increasing reading comprehension, then the manuals may begin to reflect this fact. Students in teacher training would also benefit from understanding what metacognitive strategies, if any, might improve reading comprehension.

1.4 Purposes of the Study

The first purpose of this study was to determine whether

children, 6 and 7 years old, in the experimental group who received the direct teaching and modelling of metacognitive strategies would show a greater increase in reading comprehension than a control group who received no such instruction.

The second purpose of this study was to determine whether the children, 6 and 7 years old, in the experimental group who received the direct teaching and modelling of metacognitive strategies would show a greater increase in awareness of metacomprehension strategies than a control group.

The third purpose of this study was to determine whether the treatment would have a greater or lesser effect on some children, depending on their initial level of metacomprehension awareness.

CHAPTER TWO

The Effect Of Metacomprehension Strategies On Reading Comprehension

2.1 Introduction

Does awareness of metacognitive processes strengthen children's comprehension in reading? A problem for the present study is that there is little research with children, 6 and 7 years old, to show that the direct teaching of metacognitive awareness strategies will increase reading comprehension.

Metacognition refers to "...one's knowledge concerning one's own cognitive processes and products or anything related to them" (Flavell, 1976, p. 232). Metacomprehension refers to "...being aware that you have ... strategies [such as activating one's own schema] that will help you to understand text better, and being able to use them consciously" (Weaver, 1988, p. 23). The word metacognition is used in this chapter with the understanding that we are speaking about awareness of one's own cognitive processes related to comprehension of text. Further discussion of metacognition and metacomprehension occur later in this chapter.

Some 6 and 7-year-olds develop into strong readers, while

others under the same instruction may struggle with the process of reading. What skills or knowledge do these strong readers have that poor readers are lacking? Are these strong readers learning metacomprehension strategies intuitively? Will direct teaching and modelling of metacomprehension strategies to good readers alter their development in any way? Is direct teaching and modelling of metacomprehension strategies beneficial to improving the comprehension of poor readers?

There are many questions that educators, parents and students have and need answered about the process of reading. Before educators can effectively teach children to be good readers, they, themselves, must understand the reading process and what it really encompasses.

2.2 **The Reading Process - A Meaning Making Process**

What is reading? Here are some thoughts that children shared: (Harste 1977, p.92):

> "It's filling out workbooks."
> "Pronouncing the letters."
> "It's when you put the sounds together."
> "Reading is like learning hard words."
> "Reading is like thinking...you know, it's understanding the story."
> "It's when you find out things."

However **Becoming a Nation of Readers: The Report on the Commission on Reading** (National Academy of Education, 1985) states that:

> Reading is the process of constructing meaning from written texts. It is a complex skill requiring the coordination of a number of interrelated sources of information (1984 p. 7).

The interpretation that one might take from this statement is that reading is making meaning - understanding what you are reading. Additionally, we acquire the needed information to understand what we read through the use of various means. Y. Goodman (1976) would agree with the statement from the Commission on Reading. She believes that "Reading Comprehension" is a redundant phrase. She has argued that reading, because of the constitutive nature of comprehension within reading, cannot occur without comprehension.

If a person does not understand a text, then that person is not reading. Reflecting back to the statements from the children about what reading is, we now know that reading is not merely filling out workbooks, pronouncing the letters, putting sounds together or learning hard words. Rather, as one child stated, reading is understanding. If reading then, is thought to be obtaining meaning from the text, and readers apparently do this with the use of various strategies, what then are the strategies that readers use to obtain meaning?

2.3 Unlocking Meaning From Text

To unlock meaning from the text, Cochrane et al. claim that the good reader uses the strategies of "...predicting; confirming; or disconfirming and correcting" (1985, p. 9). Readers bring all their experiences with them to the text when they read. This organized "chunk" of knowledge and experiences is called a schema (Anderson, Spiro, & Anderson 1977; Rumelhart 1980). A schema is a way in which we organize information, the organization of knowledge into categories so that we can begin to understand, manage and use the vast amount of information we are flooded with daily.

Prior knowledge organized into schemata aids readers in predicting what the text will be about, and what will appear next. For example, if they are reading about the beach, their schemata of the beach might include: water, sand, bathing suits, hot weather, boats, sunshine, wind, buckets, shovels, picnic baskets, etc. They will begin to create an image in their own minds about what the beach may be like. If their predictions are confirmed as they are reading, they will continue reading. However, if they find that their predictions are disconfirmed within their schemata they will then reread to try and gain meaning. Perhaps through this rereading, they will confirm their original prediction and continue reading, or alter their predictions and integrate this information change into their

schema. When they have once again confirmed their predictions, or reevaluated and made new predictions, they will continue reading.

The good reader is able to use the strategies of predicting, confirming and disconfirming through his use of the three language cueing systems, according to Goodman, (1976). These cueing systems are as follows:

Syntactic cues: that is, grammatical cues like word order, function words, and word endings

Semantic cues: that is, meaning cues from each sentence and from the developing whole, as one progresses through the entire text

Grapho/phonemic cues: that is, letter/sound cues, the correspondences between letters (graphemes) and sounds (phonemes), [punctuation marks, and spaces between words] (Weaver, 1988, p. 4)

Although the cueing systems are often separated when spoken of, it is essential to understand that "...they are a part of an integrated whole, and that without integration the reading process breaks down" (Cochrane et al. 1985, p. 10). Good readers utilize all three cueing systems in "balance". Poor readers often begin to rely on one cueing system more heavily than the others and the reading process begins to break down and become less effective, simply because there is no longer a balance between the cueing systems. In most cases, it is the

grapho-phonemic cueing system that poor readers tend to over-utilize. "Since the reader's energies are focused on lower level reading processes such as decoding, there is little left for the application of higher order mental processes used for comprehension" (Ellis, 1989 p. 409). They do not expect or understand that the text should make sense and they do not monitor their understanding of what they are reading as good readers do.

Why is it that under the same instruction, some children understand and expect that the text should make sense and monitor their understanding as they read and others do not? Do good readers learn to do this intuitively? If poor readers do not learn these skills intuitively, how then, can they provided with this information?

2.4 Instructional Focus for Teaching Reading

Durkin (1981) analyzed teacher's manuals and found that the focus provided for teachers was on assessing the content of the reading material through question and answer sessions. Traditional basal reading lessons included "little comprehension instruction and ... the teacher's editions seldom included information about the cognitive strategies students were supposed to master" (Winograd & Paris, 1989 p. 31).

Although many teacher's manuals now include information for teachers about metacomprehension strategies, because these reading series are not prescribed in British Columbia not all teachers have access to information about metacomprehension strategies. Some teachers may choose to use a newer reading series that deals with the direct teaching and modelling of metacomprehension strategies, and thus, are starting to incorporate this information into the planning of their reading programs. Many other teachers, who may choose not to use a basal reading series, may get the information through workshops, professional reading, and/or university courses. All three of these sources provide a vast amount of information. However, if the direct teaching and modelling of metacomprehension strategies is shown to increase comprehension, should information about metacomprehension strategies be limited to only those teachers who choose to take additional university courses, do a lot of professional reading, attend workshops or decide to use a basal reading series? The argument is that all teachers should have free equal access to current information and research on the effects of the direct teaching and modelling of metacomprehension strategies on increased reading comprehension. If all teachers are not provided with free equal access to current information about the process of reading, how can they effectively teach poor readers to be good readers, unless, they, themselves, understand the reading process and what it really encompasses. If teachers are not provided with

the means to teach metacomprehension strategies to children is it any wonder that poor readers do not develop adequate comprehension strategies for what they read?

What is it then that strong readers do that poor readers do not do? According to Davey (1983) poor readers:

-do not form good hypothesis about the text's meaning before they begin to read it (Bruce and Rubin, 1981)

-do not spontaneously organize information into mental images while they read (Gagne and Memory, 1978; Levin, 1973)

-do not effectively use their prior knowledge about the topic (Spiro, 1980)

-do not always monitor how well they are comprehending as they go along (Baker, 1979)

-do not seem to have active ways to fix up the difficulty when they have comprehension problems (Brown, Campione, and Day, 1981).

Durkin (1978; 1979) would argue that when teachers are "...actively, intensively, and systematically involved with instruction in reading comprehension, students learn to comprehend better than when instruction is incidental, undirected, or nonexistent."

As mentioned in detail in Chapter One, Paris, Cross, and Lipson (1984) taught children some metacomprehension strategies such as setting purposes for reading, activating prior knowledge, monitoring comprehension and other strategies.

Having a tool which would evaluate students' awareness of metacomprehension strategies would be useful to teachers since it has been proven that strong readers utilize metacomprehension strategies. (Paris & Jacobs, 1984; Schmitt, 1988) This information could be used in planning a reading program that includes explicit instruction in metacomprehension strategies (Paris et al., 1984). The Metacomprehension Strategy Index (MSI) (Schmitt, 1990) is a multiple choice questionnaire designed to measure students' awareness of metacomprehension strategies, and help teachers focus. As previously defined in Chapter 2 metacomprehension refers to "...being aware that you have...strategies [such as activating one's own schema] that will help you to understand text better, and being able to use them consciously" (Weaver, 1988, p. 23). The MSI measures students' awareness of metacomprehension strategies. However, it doesn't measure their ability to use these strategies consciously which is the second component of metacomprehension. A reading miscue analysis accompanied by some teacher's questions such as: Why were you thinking that? What strategies did you use to figure that out? etc. and then followed with an oral retelling would be an appropriate measure of how a reader is able to consciously use metacomprehension strategies while interacting with text. The results from the MSI can be used in planning a program of reading comprehension for students. Further details on the MSI are provided in Chapter 3.

2.5 Planning and Implementation of Metacognitive Strategies in Reading Instruction

Metacognitive awareness should be a focus for teachers when planning their instructional programs. As stated in the beginning of the chapter, Flavell defines metacognition as "one's knowledge concerning one's own cognitive processes and products or anything related to them" (1976, p. 232). Taking this concept of metacognition further, Brown (1982) splits it into two parts: knowledge about various aspects of the learning situation, and self regulatory activities that learners use to produce comprehension. Subsequent examination and definition of the actual instructional process occurs with Paris, Lipson and Wixson (1983) who divide metacognition instruction into three categories:

> **1. Declarative Knowledge** - refers to the **what** of comprehension instruction - a simple description or definition of the skill.
>
> **2. Procedural Knowledge** - involves the **how** of comprehension instruction - how the skill or strategy operates and how to use various steps or procedures that are part of the strategy.
>
> **3. Conditional Knowledge** - involves the **why** and **when** of comprehension instruction - why the strategy is important and why its mastery will improve comprehension, and when the strategy should be used and not used.

How can teachers implement these metacognitive awareness strategies in reading? It has been shown that teacher modelling

techniques can be one way to teach metacognitive awareness strategies. Davey and Porter (1982) have devised a three part procedure for teaching:

> **1.** The teacher first clarifies her own views on the primacy of comprehension in reading.
>
> **2.** The teacher discusses with students his or her own comprehension breakdowns during reading and some self-help strategies he or she uses (e.g. rereading, [and] reading ahead...)
>
> **3.** The teacher demonstrates comprehension strategies while reading aloud to students ("Oh, I don't know how to say this word, but I understand what it means from the words around it" or "I'm confused at this point, but maybe I'll understand if I read to the end of this paragraph" or "This doesn't make sense - I'll reread.")

Duffy, Roehler and Herrmann (1988) also support the need for modelling and have devised a two part procedure for teachers to follow. Their two part activity is referred to as "Mental Modelling" and is based on the research on mental rehearsals (Bandura, 1986), and on "think alouds" (Whimbey, 1985), as well as on comprehension instruction research (Duffy et al., 1987). To provide this type of modelling for students teachers must:

> **1.** transfer metacognitive control from themselves to the students; [and]
>
> **2.** model mental processes, not procedural steps (Duffy et al., p. 763)

Mental modelling is similar to the three part procedure devised

by Davey and Porter (1982) in that mental modelling is making the teacher's mental processes visible to the children by speaking aloud. However, Duffy et al. (1987) have tried to make teachers aware of and distinguish between modelling mental processes and modelling procedural steps. Modelling of procedures involves telling students directions or steps to follow in carrying out a task. The following two examples clearly illustrate the difference between modelling of mental processes versus the modelling of procedural steps.

> T: I want to show you what I look at when I come across a word I don't know the meaning of. I'll talk out loud to show you how I figure it out.
>
> [Teacher reads] "The cocoa steamed fragrantly. "Hmm, I've heard that word **fragrantly** before, but I don't really know what it means here. I know one of the words right before it though -- **steamed**. I watched a pot of boiling water once and there was steam coming from it. That water was hot, so this must have something to do with the cocoa being hot. OK, the pan of hot cocoa is steaming on the stove. That means steam coming up and out, but that still doesn't explain what **fragrantly** means. Let me think again about the hot cocoa on the stove and try to use what I already know about cocoa as a clue. Hot cocoa bubbles, steams and ...smells! Hot cocoa smells good. "The cocoa steamed fragrantly." That means it smelled good!
>
> [Teacher addresses the students.] Thinking about what I already know about hot cocoa helped me figure out what the word meant. (p. 765)

Compare this example to another lesson about using context to get meaning from text, in which the teacher is modelling procedural steps to her students:

> T: The first thing that you do is try to guess from your own experience what the word is. Do you know what experience means? If you can predict what the word is then put the word into the sentence to see if it makes sense.
>
> Second, if you can't guess, ask yourself if this is the word defined in the passage? Look before and after the word. If it is, then see if the word makes sense.
>
> Third, ask yourself this: Is there a synonym for the word before or after the word? Do you know what synonym is? It's when the words have the same meaning, like big and large.
>
> Fourth, ask yourself if you can guess what the word is by the general mood or feeling of the passage. Using these steps will help you to predict what the word might mean and it's faster than going to a dictionary. (p. 766)

Mental modelling is explicit, and in turn, clearly makes visible the teacher's thinking so that the children can match their thinking processes with the teacher's. Mental modelling develops a clearer picture in comparison to modelling of procedures where several scaffolding lessons might have to occur to ensure that the steps were remembered and subsequently, carried out correctly. Mental modelling does not portray a sense of right and wrong as the procedure modelling does.

Davey (1983) has developed a list of five teaching techniques for mental modelling to help poor comprehenders to read for meaning:

> 1. Make predictions. (Show how to develop hypotheses.)

2. Describe the picture you're forming in your head from the information. (Show how to develop images during reading.)

3. Share an analogy. (Show how to link prior knowledge with new information in text.)

4. Verbalize a confusing point. (Show how you monitor your ongoing comprehension.)

5. Demonstrate fix-up strategies. (Show how your correct your lagging comprehension.)

Each one of these five techniques developed by Davey was used in the example of the hot cocoa in which a teacher used mental modelling to show how context can help to determine word meaning. These concepts are very interrelated as are the following four steps devised by Baumann and Schmitt.

Baumann and Schmitt (1986) have produced a series of four steps as a strategy for teaching comprehension skills. Each of these four steps can be applied to each technique that Davey has developed above because each of these techniques is essentially a different skill in the process of reading that students need to practice and master. Mental modelling would fall into the third of these four steps and could effectively be used at the fourth step as well. The steps are as follows:

Step 1: WHAT is the reading skill?
Step 2: WHY is the reading skill important to learn?
Step 3: HOW does one use the reading skill?
Step 4: WHEN should the reading skill be used?

Baumann and Schmitt advocate the use of "think alouds" which are times when the teacher would model their thinking, similar to the mental modelling procedures. Later, though, the thinking aloud in Baumann and Schmitt's model shifts from being a teacher activity to a student activity.

2.6 **Research Questions**

The effects of direct teaching of metacomprehension strategies have been shown to be effective for low ability third grade readers (Duffy et al., 1987); and for learning disabled children (Paris and Oka, 1989). However, the question remains as to whether this direct teaching and modelling of metacomprehension strategies is effective in strengthening metacomprehension awareness and comprehension in 6 and 7-year-olds. Will all children benefit with improved comprehension scores or will only the children having difficulty with reading benefit? How will this direct instruction and modelling affect the children who seem to learn these metacomprehension strategies intuitively, regardless of the program? These questions and concerns need to be addressed through research which focuses on direct teaching and modelling of metacomprehension strategies to 6 and 7-year-olds. If good comprehenders show an awareness and use of metacomprehension strategies, it seems logical that teachers would be interested

in knowing if planning a reading program that included these metacomprehension strategies would benefit all the students they enrolled.

1. The first question is whether 6 and 7-year-olds who receive the direct teaching and modelling of metacomprehension strategies will show a greater increase in reading comprehension over a control group who do not receive such instruction, as measured by the Gates MacGinitie Reading Test - Primary B Forms 1 and 2.

2. The second question is whether 6 and 7-year-olds who receive the direct teaching and modelling of metacomprehension strategies will show a greater increase in metacomprehension awareness as measured by the modified Metacomprehension Strategy Index.

3. The third question, which relates directly to the first, is whether the treatment would have a greater or lesser effect on the reading comprehension gain scores of some 6 and 7-year-olds, depending on their initial level of metacomprehension awareness as measured by the pretest of the modified Metacomprehension Strategy Index.

CHAPTER THREE

Method

3.1 Overview

The purpose of this study was to examine three problems. The first problem of this study was to determine whether 6 and 7-year-olds at the beginning of their third year in school (formerly called Grade 2) who received the direct teaching and modelling of metacomprehension strategies would show a greater increase in reading comprehension over the control group who received no such instruction as measured by the Gates MacGinitie Reading Test - Primary B Forms 1 and 2. The second problem of this study was to determine whether 6 and 7-year-olds in the experimental group who received direct teaching and modelling of metacomprehension strategies would show greater increase in metacomprehension awareness as measured by the modified Metacomprehension Strategy Index. The third problem of this study was to determine whether the treatment in the experimental group would have a greater or lesser effect on some 6 and 7-year-olds depending on their initial level of metacomprehension awareness as measured by the pretest of the modified Metacomprehension Strategy Index. The built-in dependent measure is reading comprehension, as measured by the Gates - MacGinitie Reading Test.

3.2 **Design**

The design of this study was a Pretest - Posttest Control Group Design. There were approximately 27 children at the beginning of their third year in school from two multi-age classes used as subjects for the study.

On September 11th, 1992, all subjects took a pretest of the Gates - MacGinitie Reading Test - Primary B Form 1. Mrs. Dorothy Robertson, the teaching assistant in the school, individually administered the modified Metacomprehension Strategy Index to each child.

The children were assigned to the two groups by means of the matched pairs technique. This was based on the pretest comprehension scores of the Gates - MacGinitie Reading Test - Primary B - Form 1 taken on September 11th, 1992. Both the control group and the experimental group received instruction for 1 hour daily, Monday through Thursday for four weeks. It was originally intended that the children would receive instruction 5 hours per week, Monday through Friday, but in September the teacher of the control group, Mrs. Terra Higgins, was changed to an 80% assignment from full time so she was only available to teach the control group Monday through Thursday. All the children were taught on Friday by Miss Patricia McEwan and that instruction focused on written composition.

The experimental group (Reading and Thinking Skills Group) received instruction from the student investigator, Miss P. McEwan. The control group (Reading Skills Group) received instruction from Mrs. T. Higgins, who was also the school's learning assistance teacher.

Both groups received exactly the same lessons using the novelette, **Adventures with Mac.** The experimental group received the direct teaching and modelling of metacomprehension strategies, using mental modelling and think alouds as two main techniques, from Miss P. McEwan. In place of these thinking skills which were taught to the experimental group, the control group was read to by Mrs. T. Higgins and then provided with some time to read independently or with a partner. All other components of the lessons were identical. More detail of the lessons is provided in the Section 3.4 Instructional Procedures.

One month later, the subjects in both groups took a posttest of the Gates - MacGinitie Reading Test - Primary B - Form 2 and were again tested individually by Mrs. D. Robertson on the modified Metacomprehension Strategy Index. The design of the study is summarized in Table 1.

TABLE 1

Design of the Study

Purpose	Independent Variable	Dependent Variable	Dependent Measures
#1	Treatment (C,E)	Mean gain scores reading comprehension	Gates - MacGinitie
#2	Treatment (C,E)	Mean gain scores metacomprehension strategies	Modified MSI
#3	Treatment (C,E) (X Beginning Level Metacomprehension Awareness (Low - High)	Mean gain scores reading comprehension	Gates - MacGinitie

3.3 Subjects

Twenty-seven children at the beginning of their third year of school (n = 7 boys and 20 girls) were recruited from two multi-age classes at Devon Gardens Elementary School. The two teachers of the children who were recruited were Mrs. Betty

Williams and student investigator, Miss P. McEwan. The bases of recruitment were enrolment and the other teachers' willingness to cooperate, similarity in composition of other class and similarity in instructional history.

Two children dropped out of the study from the experimental group. Consequently, their matched pairs from the control group were also dropped. Thus, 22 children, 6 boys and 16 girls, were identified, giving both the control and the experimental groups 11 subjects each. On September 1st, 1992 they ranged in age from 6.8 to 7.8 years, with a mean age of 6.9 years. One of the children was not a native English speaker. Her mother tongue was Cantonese and she was receiving E.S.L. assistance 3 times a week for a 30 minute period. All of the other children in the study spoke English as their home language.

TABLE 2

Characteristics of the Sample

		Experimental	Control
Gender	F	9	8
	M	2	3
Average Age year/months		7.0	7.1
Range in Age year/months		6.9 - 7.8	6.8 - 7.8
Pretest Scores			
Gates			
Mean		21.36	21.27
Range		11-34	11-37
Modified MSI			
Mean		8.00	5.64
Range		4-15	1-14

All subjects lived in North Delta, British Columbia. The socio-economic status of their families was judged to be mostly middle class status on the basis of the investigator's impression. Devon Gardens School has been a part of this suburban, single family residential community for 28 years. It is a relatively small school with approximately 450 students enrolled, consisting of 18 classes of which 6 of the classes provide a French Immersion Programme. The English primary classes are organized into three multi-age classes of children in their

second and third year of school, one class of children in their fourth year of school and one multi-age class of children in their fourth year of school and children in Grade 4.

3.4 **Instructional Procedures**

The 11 subjects in the control group (Reading Skills Group) received 1 hour of instruction on Monday through Thursday from Mrs. T. Higgins. The format of her lesson was as follows:

15 min.	Story time - teacher reads novel to the children
30 min.	Reading Lesson - **Adventures With Mac**
10 min.	Independent Reading - children choose a library book and read by themselves or with a partner

Sample lesson appears in Appendix A.

The 11 subjects in the experimental group (Reading and Thinking Skills Group) received 1 hour of instruction, Monday through Thursday, with student investigator, Miss P. McEwan. The format of her lesson was as follows:

30 min.	Direct Teaching and Modelling of Metacomprehension Strategies
30 min.	Reading Lesson - **Adventures with Mac**

The first 30 minutes of the lesson encompassed the direct teaching and modelling of metacomprehension strategies. Each lesson focused on one new metacomprehension strategy, and review of strategies taught in previous lessons. The lesson began with a simple description or definition of the strategy, followed with discussion of how the strategy worked, and how to use it. The teacher then made her thinking visible using the mental modelling discussed by Duffy et al. (1987). Discussion developed about why the strategy is important in becoming a better reader. The children would then participate in a planned activity that was created to practice the metacomprehension strategies they had worked with on that day and prior days. Next, the teacher would read aloud a story to the children. Incorporated into this read aloud session was the three part procedure devised by Davey and Porter (1982). Recalling from Chapter 2, this procedure consisted of the teacher first clarifying her own view on the importance of comprehension in reading, then discussing her own comprehension breakdowns during reading and some self help strategies, and finally modelling comprehension strategies while reading aloud to the children. This would conclude the section of the lesson that was devoted to the direct teaching and modelling of metacomprehension strategies. A sample outline of the format of the lesson appears in Appendix B. The remainder of the hour was devoted to the Reading lesson with the novelette **Adventures with Mac.** This lesson was identical to that in the control group, except that

there was some informal talk about metacomprehension strategies that would come up from the students and the teacher took these "teachable moments" and utilized them when they occurred. A sample lesson appears in Appendix C.

3.5 **The Reading Comprehension Measure**

The Gates - MacGinitie Reading Test, Canadian Edition (1979), was chosen to examine the children's reading comprehension for a number of reasons. The Canadian Edition is based on the Second Edition of the Gates - MacGinitie Reading Tests published in 1978. One of the rationales in developing the Gates - MacGinitie Reading Test was for use in evaluating the general effects of instructional programs, and in our situation the instructional program consisted of the direct teaching and modelling of metacomprehension strategies to 6 and 7-year-olds to improve their reading comprehension. Dreher states that, "the Gates - MacGinitie Reading Tests, Canadian Edition, appear to be worthwhile tests of reading progress" (1985, p. 598). The reading passages in the comprehension section were written to suit the knowledge and interests of Canadian children. The **Gates - MacGinitie Reading Tests, Canadian Edition, Teacher's Manual** states that, "The 1978-1979 Canadian norms were developed from the results of testing 46,000 students - between 3000 and 4500 students at each grade level -

throughout the ten provinces and the Yukon. Testing with ... Level B was done during Nov., 1978" (1979,p. iv). Additionally, Pflaum (1985) wrote that, "the Gates - MacGinitie Reading Tests were developed in Canadian schools by establishing Canadian norms, by correcting spelling to conform to Canadian usage,...and by substituting some new items that reflected Canadian writers and experiences" (p. 599). Although previous editions of this test have been criticized because many of the questions in the comprehension section were built entirely upon one word, Dreher (1985) notes that in the Canadian Edition, "the comprehension subtests for ...Level B require students to select a picture that answers questions or matches the information given in a sentence or short passage. The comprehension subtests at all levels involve both literal and inferential questions" (p. 597). Items were designed that required the child to use inferences and abstraction. Rupley (1985) makes note that in the later editions of the Gates not one question in the comprehension section was built entirely on one word, and that what was being measured was the subject's comprehension instead of vocabulary knowledge. Another noted strength of this test was the complete and extremely "teacher friendly" level manuals and technical manuals which make administration and scoring of the test very simple. As compared with other general reading tests, Dreher (1985, pp. 597-598) stated that "each teacher's manual contains complete, clear, directions for administering and scoring the tests." These were considered to

be strengths of the test. Additionally, the student investigator felt that because the MSI, an experimental instrument, was being used (described in Section 3.6) it was necessary to use a standardized measure such as the Gates - MacGinitie Reading Test.

The children in their third year of school took the Gates - MacGinitie Reading Test - Primary B Forms 1 and 2 which was developed for this age level. This consisted of two parts: Vocabulary and Comprehension. However, only the comprehension section was administered to the subjects.

The Vocabulary Test is made up of 48 exercises which required the child to recognize or analyze isolated words to match a given picture. Four words were adjacent to each picture and the child was asked to circle the word that best fit the picture. The words gradually became harder as the test progressed. It was felt that administration of this section of the test could have conveyed to the children that reading consisted merely of decoding isolated words. For this reason, and because the investigator felt that scores from this section would not have addressed any of the purposes set out in this study, the vocabulary section of the Gates - MacGinitie Reading Test - Primary B Forms 1 and 2 was not administered to the subjects.

The Comprehension Test gives us an idea of the child's ability to read and understand whole sentences and paragraphs. There are 34 passages in the test that increase in difficulty as the child proceeds through the test. In this section each passage was situated next to a panel of four pictures. The child was asked to mark the picture that best illustrated the meaning of the passage or answered the question in the passage. The children were given 35 minutes to complete this section of the test. The standard error of measurement in standard score units for this comprehension section of the Primary B Form is 3.6.

3.6 **The Metacomprehension Measure**

The Metacomprehension Strategy Index (MSI) is a multiple choice questionnaire which was mentioned briefly in Chapter 2 on page 17. In 1988 Schmitt "originally developed [it] to measure strategic awareness of students who participated in a meta-comprehension training study" (Schmitt, 1990, p. 454). As stated previously, the MSI was not designed to measure the reader's actual ability to use these metacomprehension strategies while reading but merely asks students to predict or to recall what they might do or have done in actual reading situations. It consists of 25 items, with four options for each item that asked students about strategies that they used before,

during and after reading a narrative selection. These metacomprehension strategies fell into six major categories:

1. predicting and verifying
2. previewing
3. purpose setting
4. self questioning
5. drawing from background knowledge
6. summarizing and applying fix-up strategies

The MSI was designed so that it could be adapted for classroom use and interpretation. For the purposes of this study the student investigator chose to adapt the MSI to better meet the needs of the subjects in the study. Two suggestions provided by the authors of the MSI were seen as valuable to this particular study. One suggestion used was to individually administer the test aloud to each child. A second suggestion used was to rewrite the questions so that wording would be more appropriate to the subjects whom the questionnaire was being administered. Mrs. D. Robertson individually administered the test to ensure that children with limited decoding ability or slow reading rate would not be limited in their ability to perform on the questionnaire. Secondly, the questionnaire that was administered in this study only had three options per question. This change was made after practise sessions administering the test to four children entering their third year of school. All of these children had difficulty remembering the first option by the time they had heard the fourth option. So, the questionnaire was shortened to provide only three

options and the children seemed to be able to remember the first option when the third was read. Third, the length of the questionnaire was shortened from 25 questions to 20 questions. Eliminated were one question from each of the following five categories: predicting and verifying, purpose setting, self questioning, drawing from background knowledge and summarizing and applying fix-up strategies. This decision was made when the number of lessons changed from 20 to 16, because of a shortened work week for Mrs. T. Higgins who was teaching the control group.

The questionnaire still contained six major categories. Following is a list of the six categories and the items that corresponded with each category.

1. predicting and verifying (1,4,13,15,16,18)
2. previewing (2,3)
3. purpose setting (5,7)
4. self questioning (6,14,17)
5. drawing from background knowledge (8,9,10,19)
6. summarizing and applying fix-up strategies (11,12,20)

Appendix D provides a sample of the questionnaire that we administered to the subjects in the study.

3.7 Data Analysis and Hypothesis Testing

Data were organized to address the three working hypotheses

posed in Chapter 1. Hypothesis I was designed to determine whether 6 and 7-year-olds in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies would show greater increase in reading comprehension than the control group (Reading Skills Group) who received no such instruction. To address this hypothesis raw scores were calculated for each subject on the pretest and posttest of the Gates - MacGinitie Reading Test - Primary B Forms 1 and 2. A mean, median, standard deviation and range was calculated for each test. A one-way analysis of variance was used to compare each group's mean gain scores with a level of significance of $p < .05$.

Hypothesis II was designed to determine whether 6 and 7-year-olds in the experimental group who received the direct teaching and modelling of metacomprehension strategies would show a greater increase in awareness of metacomprehension strategies than the control group who received no such instruction as measured by the modified Metacomprehension Strategy Index. A mean, median, standard deviation and range was calculated for each test. A one-way analysis of variance was used with a level of significance of $p < .05$ to compare each group's mean gain scores.

Hypothesis III was designed to determine whether the treatment would have a greater or lesser effect on some 6 and 7-

year-olds' comprehension gains, depending on their initial level of metacomprehension awareness as measured by the pretest of the modified MSI. Using the groups' mean gain scores from the Gates -MacGinitie Reading Test - Primary B Forms 1 and 2, a one-way analysis of co-variance with entry level score on the modified MSI as the covariate was completed.

3.8 **Statistical Tests**

Following is discussion pertaining to the choices of particular statistical tests used to evaluate Hypothesis I, II, and III of this study.

3.8.1 **Analysis of Variance (ANOVA)**

For the purposes of this study, analysis of variance was used to determine if the mean gain scores of the experimental and control groups differed significantly from each other. Borg and Gall (1989) explain that when researchers want to determine if two sample means differ significantly from one another, "...the use of analysis of variance will yield the same result as the calculation of a **t** or **z** value" (p. 355). Thus, the statistical procedure of analysis of variance was chosen to analyze both Hypothesis I and Hypothesis II.

In the case of Hypothesis I, analysis of variance was used to determine whether the children in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies would show a greater increase in reading comprehension as measured by the Gates - MacGinitie Reading Test than the children in the control group (Reading Skills Group) who received no such instruction. The mean gain scores of each group were compared using ANOVA on the computing package Minitab Release 6 on an IBM Personal Computer. The results of this statistical procedure are listed and discussed in detail in Chapter 4, Sections 4.2 and 4.3 and in Appendix F and G.

With Hypothesis II, analysis of variance was also applied. Hypothesis II sought to determine whether the children in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies would show a greater increase in metacomprehension awareness as measured by the modified MSI as compared to the children in the control group (Reading Skills Group) who received no such instruction. The mean gain scores of each group were compared using ANOVA. The results of this statistical procedure are listed and discussed in detail in Chapter 4, Sections 4.4 and 4.5.

As shown in the next chapter, the analysis of variance

proved to be an appropriate measure for both Hypothesis I and Hypothesis II. However, another analytical procedure, analysis of covariance, was seen as more suitable for Hypothesis III. The following Sections 3.8.2 and 3.8.3 deal with both the purpose of analysis of covariance and application of analysis of covariance to Hypothesis III.

3.8.2 **Analysis of Covariance (ANCOVA)**

According to Borg and Gall (1989) the "...statistical technique of analysis of covariance is used to control for initial differences between groups. The effect of analysis of covariance is to make the two groups equal with respect to one or more control variables. If a difference is still found between the two groups, [one] cannot use the control variable to explain the effect" (p. 556). Furthermore, Hinkle, Wiersma and Jurs (1988) state that in using ANCOVA you "...control for the effects of this extraneous variable, called a covariate, by partitioning out the variation attributed to this additional variable" (p. 492).

With the above understanding of analysis of covariance Hypothesis III will be restated for clarity. Hypothesis III was designed to explore whether the direct teaching and modelling of metacomprehension skills would have a greater or lesser effect

on the posttest comprehension scores of the Gates - MacGinitie Reading Test Primary B Form 2, depending on the child's initial level of metacomprehension awareness as measured by the pretest of the modified MSI.

Hypothesis III is a finer grained look at Hypothesis I. Hypothesis I was designed to determine whether the treatment of direct teaching and modelling of metacomprehension strategies would cause a greater mean gain score in the experimental group as measured by the Gates - MacGinitie Reading Tests. Hypothesis III was designed to determine which, if any, subjects benefitted the most from the direct teaching and modelling of metacomprehension strategies. Did subjects with little incoming metacomprehension awareness, as measured by the pretest of the modified MSI, show the greatest reading comprehension gain scores, or perhaps the subjects with the highest incoming metacomprehension awareness levels, as measured by the pretest of the modified MSI, indicated the greatest reading comprehension gain scores on the Gates - MacGinitie Reading Test? Educationally speaking, the implications for teaching are vital. This type of sensitive measure allows focus to be placed on individual groups of children who might benefit most from the direct teaching and modelling of metacomprehension strategies.

3.8.3 **Application of Analysis of Covariance to Hypothesis III**

First, in removing (or partitioning out) the variance in initial entry level on the modified MSI pretest scores which can be attributed to the Gates - MacGinitie Reading Test comprehension scores, we could have a more refined test of Hypothesis I which stated that children in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies would show a greater increase in reading comprehension than the children in the control group (Reading Skills Group). So in using ANCOVA, Hinkle et al. would argue that as researchers we have increased the "...precision of the research by partitioning out the variation attributed to the covariate, which results in a smaller error variance" (p. 492).

Second, variability in performance on the posttest of the Gates - MacGinitie Reading Test could be directly attributable to differences in initial entry level scores on modified MSI pretest. If variability in performance is directly attributable to differences in entry level on modified MSI pretest scores, then we are interested in understanding who showed a greater or lesser effect.

Analysis of variance used with Hypothesis I and Hypothesis II allowed for comparison of the two groups' mean gain scores.

Analysis of covariance used with Hypothesis III allowed for comparison of all the subjects in the study (n=22) as separate groups. This was a reason why analysis of covariance was chosen for analyzing Hypothesis III rather than just grouping the subjects in both the experimental and control groups on their incoming metacomprehension levels as either high or low. In such a four group design, the researcher would have chosen the standing which divided children into either the high metacomprehension awareness group or the low metacomprehension awareness group. Since research on metacomprehension awareness in 6 and 7-year-olds is still so limited, how can we be sure that the standing chosen to group children into either high or low metacomprehension awareness is a suitable boundary for children of this age? On what basis do we make this arbitrary boundary to divide the children into these two groups? Controversy over the chosen standing would clearly be an issue in interpreting the results had this type of four group design been used. From this data, patterns may be explored and discussed in effort to explain if certain children's comprehension gains were affected by a greater or lesser amount by the direct teaching and modelling of metacomprehension awareness skills because of their incoming metacomprehension awareness levels as measured by the modified MSI.

3.9 Limitations of the Study

The conclusions to be presented must be considered in light of the following limitations of the study:

1. The instructor of the control group had limited participation time. She was only able to participate in the study for the first 5 weeks of the school year. This placed a time constriction on the length of the period of data collection, because without her to teach the control group for 1 hour a day, 4 days a week, we could not have run the study. Thus, because the study took place over 4 weeks, the results are limited to the responses that children were capable of forming over that time.

2. The experimental treatment was limited to 30 minutes a day. Both the control group and the experimental group were made up of children from two multi-age classes. This placed a time constriction on the length of time each day for the direct teaching and modelling of metacomprehension strategies. Had the experimental group been made up of a whole class of children in their third year of school, then during the rest of the teaching day (buddy reading, story time, Language Arts, Socials, etc.) when the teacher

was working with students they could discuss, model and use their metacomprehension strategies when confronted with text from an array of different sources. The 30 minute time limitation could constrain any results of the treatment.

3. A further limitation is the short study period of 4 weeks over which the Gates - MacGinitie Primary B Forms 1 and 2 were administered. Since the length of time between the administration of Forms 1 and 2 was less than one month, any gains obtained may be due to a practice effect. In addition, with the standard error of measurement for the comprehension section of the Primary B Forms 1 and 2 being 3.6 standard score units, it is possible that any gains seen over the study period could be directly related to the standard error of measurement. Fuller discussion of these problems will be addressed in Chapters 4 and 5.

4. A fourth limitation is that conclusions cannot be generalized beyond the population sampled.

CHAPTER FOUR

Results And Discussion

4.1 Summary of the Problem

This study was carried out in an effort to explore the effect of the direct teaching and modelling of metacomprehension strategies on the comprehension and metacomprehension awareness levels of readers 6 and 7 years old. This chapter presents the results of the statistical analysis of the data relevant to the three hypothesis examined in this study. All test scores are found in Appendix E, and full details of the three statistical analyses are found in Appendix F.

4.2 Tests of Hypothesis I

Null Hypothesis

> Children in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies will not show a statistically significant increase in reading comprehension mean gain scores as measured by the Gates - MacGinitie Reading Test than the children in the control group (Reading Skills Group) who received no such instruction.

Based on the data provided in Table 3 below, the first null hypothesis was accepted. The experimental group (Reading and

Thinking Skills Group) was not affected by the direct teaching and modelling of metacomprehension strategies and did not show a greater increase in mean gain scores over the control group (Reading Skills Group).

TABLE 3

Mean Gain Scores Of Reading Comprehension As Measured By The Gates - MacGinitie Reading Test

Group	Mean (n)	SD
Control	**4.55** (11)	**3.83**
Experimental	**5.45** (11)	**5.47**

p=.656

4.3 Discussion of Hypothesis I

From an examination of Table 3 it is clear that the experimental group (Reading and Thinking Skills Group) was not affected by the direct teaching and modelling of metacomprehension strategies and did not show a greater increase

in mean gain scores as measured by the Gates - MacGinitie Reading Test over the control group (Reading Skills Group) who received no such instruction.

One of the reasons that may explain these results is the time span of the study. As mentioned in Chapter 3 Section 3.5 one of the rationales in developing the Gates - MacGinitie Reading Test was for use in evaluating the general effects of instructional programs, and in our situation the instructional program consisted of the direct teaching and modelling of metacomprehension strategies to children 6 and 7 years old to improve their reading comprehension. However, the Gates - MacGinitie Reading Test was meant to be used as a long term measure with initial testing early in the school year (September or October) and final testing late in the school year (May or June). For this study the pretest and posttests of the Gates - MacGinitie Reading Test - Primary B Forms 1 and 2 were administered within 4 weeks of each other. Also, the Gates - MacGinitie was designed to be used with a large n rather than a small n.

Second, the uneven nature of children's development could account for the results that indicate there was no statistical difference in pretest and posttest scores on the Gates - MacGinitie Reading Test. The smooth linear developmental line often depicted as the manner of children's development is simply

the result of large sample sizes where the high scores are cancelled out by the low scores producing a developmental line that appears to be linear and constant. However, children's reading development is much more erratic. Johnson and Louis (1989) discuss this issue in their book Bringing It All Together: A Program For Literacy:

> While the mean performance of a large group may advance regularly, month by month, through the year, this does not mean that each individual progresses in the same regular manner. The regularity of group progress results in a wide range of individual differences which tend to cancel each other out and produce the smoothness of the observed learning curves. The progress of any given individual may be much more erratic. In reading, children seem to pass through a series of exploratory plateaus which are followed by sudden leaps. It is as though the learner explores in an apparently random fashion, making individual but non incremental connections. A sufficient number of these connections seem to result in an "Ah-ha!" reaction which leads to a marked increase in performance. New situations may require temporary regressions or plateaus to permit consolidations. (p. 204)

Perhaps many of the subjects were in one of these exploratory plateaus when the Gates - MacGinitie Reading Test - Primary B Form 2 was administered. If a larger sample had been used (n=100) the inconsistent pattern produced from subjects with high and low scores might not have been seen if these high and low scores had cancelled each other out, producing a pattern which would have showed group development as gradual and linear.

Another possible way in which to look at the results of

Table 3 is to bring in the notion of confounding effect. The teacher - researcher worked with the experimental group (n=11) for 1 hour a day, 4 days a week. For the rest of the school week all of the experimental subjects were equally distributed into the two source classrooms with the control subjects. Conceivably, these experimental subjects could have been teaching their control peers during these remaining school hours when the control and the experimental subjects were combined. Discussion of this point continues further below in Section 4.8 Qualitative Findings.

Finally, because of the short length of time of both the study and the duration of time between the pretest and the posttest of the Gates - MacGinitie Primary B, we expect the gain scores to be smaller than if both the study period and the duration between the pretest and the posttest had been 7 months. Much of any gain score seen over such a short duration could be accounted for in error of measurement. For this test the standard error of measurement in standard score units is 3.6. Simply, if a gain score of 5.45 standard units was seen, 3.6 standard units of that gain score could be the result of error of measurement.

4.4 Tests of Hypothesis II

Null Hypothesis

Children in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies will not show a statistically significant increase in mean gain scores of metacomprehension strategy awareness as measured by the modified Metacomprehension Strategy Index than the control group (Reading Skills Group) who received no such instruction.

The mean gain scores were significantly different between the two groups (see Table 4). The null hypothesis was rejected using .05 level of significance and a p=0.017. This indicates that the experimental group (Reading and Thinking Skills Group) did show a statistically significant increase in mean gain scores of metacomprehension awareness as measured by the modified Metacomprehension Strategy Index than the control group (Reading Skills Group) who received no such instruction.

TABLE 4

Mean Gain Scores of Metacomprehension Awareness as Measures by the Modified MSI

Group	Mean (n)	SD
Control	**0.909** (11)	**1.814**
Experimental	**4.820** (11)	**4.640**

p=.017

4.5 Discussion of Hypothesis II

Table 4 clearly shows that 6 and 7-year-olds who received the direct teaching and modelling of metacomprehension strategies did show a statistically significant increase in mean gain scores of their awareness of metacomprehension strategies as measured by the modified MSI. The direct teaching and modelling of metacomprehension strategies works. In this study the teacher-researcher used Paris, Lipson and Wixson's (1983) metacognitive instructional categories which are:

1. **Declarative Knowledge** - refers to the **what** of comprehension instruction - a simple description or definition of the skill.

2. **Procedural Knowledge** - involves the **how** of comprehension instruction - how the skill or strategy operates and how to use various steps or procedures that are part of the strategy.

3. **Conditional Knowledge** - involves the **why** and **when** of comprehension instruction - why the strategy is important and why its mastery will improve comprehension, and when the strategy should be used and not used.

Further, the teacher - researcher used Davey and Porter's (1982) three part procedure for teaching:

1. The teacher first clarified her own views on the primacy of comprehension in reading.

2. The teacher discussed with students her own comprehension breakdowns during reading and some self-help strategies she uses (e.g. rereading, [and] reading ahead...)

3. The teacher demonstrated comprehension strategies while reading aloud to students ("Oh, I don't know how to say this word, but I understand what it means from the words around it" or "I'm confused at this point, but maybe I'll understand if I read to the end of this paragraph" or "This doesn't make sense - I'll reread.")

Duffy, Roehler and Herrmann's (1988) mental modelling was used with a conscious effort to stay away from modelling procedural steps. Mental modelling was conveyed using the five teaching techniques developed by Davey (1983):

1. Make predictions. (Show how to develop hypotheses.)

2. Describe the picture you're forming in your head from the information. (Show how to develop images during reading.)

3. Share an analogy. (Show how to link prior knowledge with new information in text.)

4. Verbalize a confusing point. (Show how you monitor your ongoing comprehension.)

5. Demonstrate fix-up strategies. (Show how your correct your lagging comprehension.)

The direct teaching and modelling of metacomprehension strategies did increase the metacomprehension awareness of the experimental group as seen in the mean gain scores in Table 4. Durkin (1978; 1979) would argue that when teachers are "... actively, intensively, and systematically involved with instruction in reading comprehension, students learn to comprehend better than when instruction is incidental, undirected, or nonexistent." However, as discussed in detail in Section 4.7, what is essential is a tool that measures comprehension with emphasis on the processes children use in coming to their understandings. For a detailed outline of the lesson format for the teaching of the metacomprehension strategies see Appendix B.

4.6 Tests of Hypothesis III

Null Hypothesis

> The direct teaching and modelling of metacomprehension strategies will not have a greater or lesser effect on the posttest comprehension scores of the Gates - MacGinitie Reading Test Primary B Form 2, dependent on the child's initial level of metacomprehension awareness as measured by the pretest of the modified Metacomprehension Strategy Index.

The analysis of covariance which co-varied the modified MSI indicated that the null hypothesis was accepted. The direct teaching of meta-comprehension strategies did not have a greater or lesser effect on children's posttest scores of the Gates - MacGinitie Reading Test Primary B Form 2 depending upon their initial entry level on the pretest of the modified Metacomprehension Strategy Index. Scatter plots (Figure 1 and 2) show mean comprehension gains as a function of the modified MSI scale for both the experimental and control groups.

FIGURE 1

Scatterplot showing Control Group's Mean Comprehension Gains as a function of Incoming Modified MSI Level

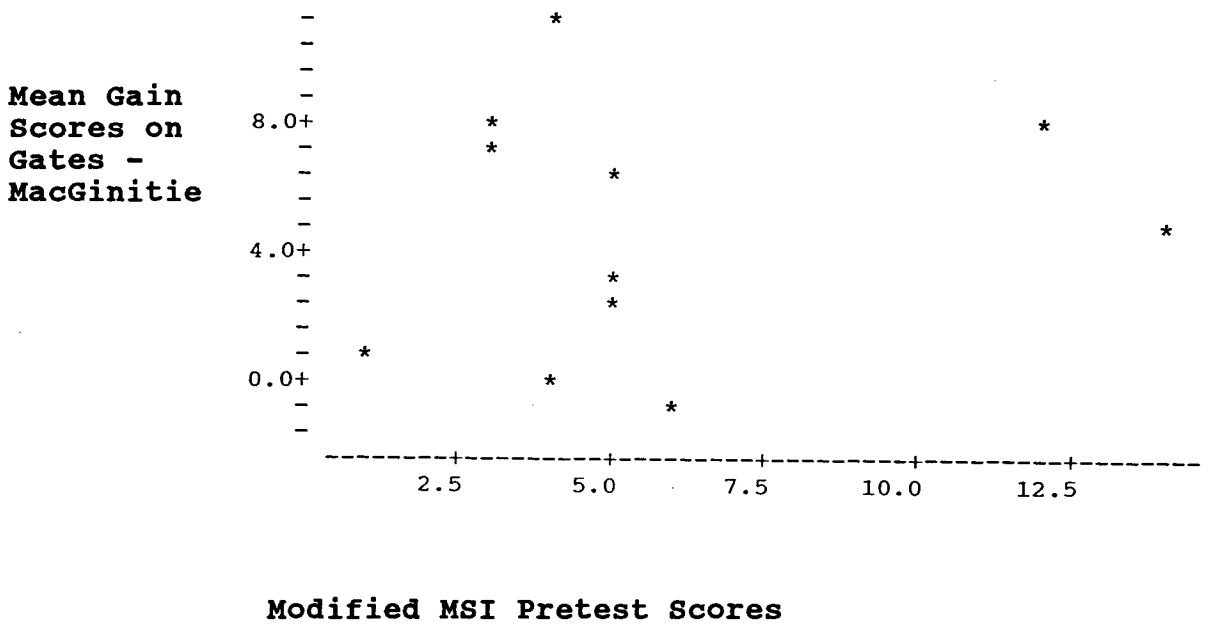
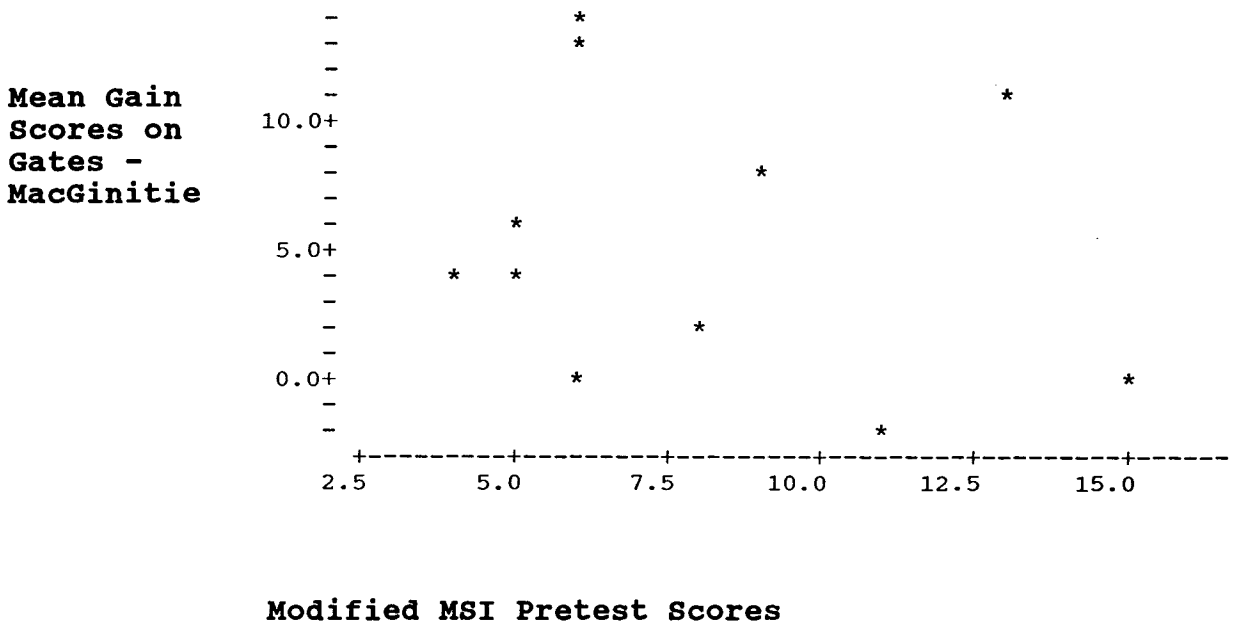


FIGURE 2

Scatterplot showing Experimental Group's Mean Comprehension Gains as a function of Incoming Modified MSI Level



4.7 Discussion of Hypothesis III

Hypothesis III was intended to give a finer grained look at the results of Hypothesis I, which was formulated to determine if children in the experimental group (Reading and Thinking Skills Group) who received the direct teaching and modelling of metacomprehension strategies would show a statistically significant increase in reading comprehension than the children in the control group (Reading Skills Group), who received no such instruction. Hypothesis III was designed to look at which children in particular benefitted the most from the direct teaching and modelling of metacomprehension strategies. This is very appropriate in educational research, because educators realize that not all children learn in the same manner and that different techniques have varied effects on different children. Perhaps the direct teaching and modelling of metacomprehension strategies would have benefitted the subjects with lower reading ability by providing a framework with which to approach unfamiliar text and to work with the text to gain an understanding. However, no correlation was found between incoming metacomprehension awareness level as measured by the modified MSI and mean gain scores as measured by the Gates - MacGinitie Reading Test. Following are some possible arguments as to why no correlation was found.

As discussed previously in Section 4.3, when describing

results from the Gates - MacGinitie Reading Test it is critical to keep in mind the original purpose used in developing the tests. One of these purposes was to evaluate the general effects of instructional programs. Additionally, it must be realized that the Gates - MacGinitie Reading Tests can not measure items that it was not originally intended to measure. This test is a product measure. Children's answers are either right or wrong. Their raw scores are converted into grade equivalents. The Gates - MacGinitie Reading Test has never claimed to tap into the thinking components of reading. Consequently, when the examiner sits down and explores the results from the tests, the examiner is given no indication of the subject's thought processes.

Perhaps another measure would have provided an indication of the relationship between incoming metacomprehension awareness level and reading comprehension gains. Needed would be a reading comprehension measure to take the place of the Gates - MacGinitie Reading Test. The measure would need to give the examiner information about the processes the subject was using while still providing the examiner with a measure of reading comprehension. By providing information about the processes the subject is choosing to use, the examiner is able to look at the component of metacomprehension that deals with the ability to consciously use strategies which the modified MSI doesn't measure. Used with the modified MSI, the examiner would have a

clearer picture of the subject's incoming level of metacomprehension.

Such a measure might be a taped reading miscue inventory and a retelling of the story in which the examiner and the subject interact during the reading and retelling. The examiner could explore the processes the child was using in coming to his or her answers during the interview or conference. The reading miscue inventory would allow the teacher to see the strategies the reader used while reading the text aloud. It would also provide a measure of how well the reader seemed to comprehend the text as they read. The retelling would provide another measure of comprehension. This comprehension measure would look at how well the reader remembered and understood the text after reading (see page 74). These aspects of reading miscue analysis and retelling would have been useful in looking at both hypothesis I and III.

However, this type of measure would require more assistance and time for the supervision and collection of data, and of course, for the results and analysis of the data. Unfortunately a teacher would not undertake such research simply because alone, the teacher would have a difficult time carrying out and completing the evaluation in the real world of the classroom. This type of measure was beyond the resources of the present study and was not chosen as a dependent measure. Reading miscue

inventories and retellings would be very useful dependent measures in larger scale studies where resources are available to collect and analyze such data.

The results of the analysis of covariance indicated that covarying incoming modified MSI level with mean gain scores on the Gates - MacGinitie Reading Test indicated no relationship between the two measures. What we have learned from this result is that the Gates - MacGinitie Reading Test is a product measure furnishing the best results when used as a long term measure and the modified MSI is a process measure. Hence, a better understanding of which young children benefit the most from the direct teaching of metacomprehension strategies will come when more sensitive measures are developed that are realistic in terms of time and ease of administration and analysis.

4.8 **Qualitative Findings**

To use only the quantitative data in this study would result in an incomplete picture of the findings. Following are several instances where I as teacher - researcher observed growth in the children.

4.8.1 **The Experimental Period**

Three observations need to be noted. First, during the month when the study was being conducted, as I read with children from my class during the day, I noticed that the experimental group children would share their predictions and wonder questions before they began reading a story to me. These were questions that the children would pose about what they **wondered** about the story. The phrase, **I wonder if...** would start their questions. These experimental group children would also stop more often than their control group counterparts and recap the events or share connections to their personal life or other literature with me. Children from the control group would read the title, begin the story, and sometimes spend a minute or so at the end discussing a part they enjoyed or maybe make a comment such as, "That was a good story wasn't it, Miss McEwan?"

Second, twice a week the children from both multi-age classes got together to "buddy read", where the children read aloud with a friend. This included all the children in the study and all the children in their second year of school from both classes. In each pair there was a child in their third year of school and a child in their second year of school. As teacher-researcher I observed that there was far more discussion around and about the book when the child in their third year of school was from the experimental group. The teacher -

researcher caught glimpses of herself as some of these children became the teacher to the younger child and asked questions of them, "What do you think this story will be about?" or "Do you have any wonder questions?" or "What do you know about _____?"

The third and final teacher - researcher observation that needs to be noted encompasses story time in my class. For the duration of the study, when I read a story to the class, I did not model or discuss predictions or wonder questions, simply because half of the children in their third year of school were from the control group. However, children from the experimental group would volunteer their predictions and wonder questions. They were also very curious why we were not using the strategies that we had talked about during the experimental period. At the end of the four week study when the groups came together and teacher-researcher began teaching the strategies to the control group as agreed in the consent form, it was noticeable that the control group children were beginning to understand what the other children had been talking about and the gap between the two groups began to close and the control children began to share their thoughts as well.

4.8.2 **The Post-Experimental Period**

When the 4 week period of the study ended the teacher-

researcher began to instruct all children, including both the experimental and control groups in the study (n=22), each day for an hour as set out in the consent form.

Again, three qualitative observations were made pertaining to the post-experimental period. Instruction of the whole group of children in their third year of school began. We went back to the first strategies introduced to the experimental group and with different materials we focused in on the same thinking strategies. Although we had started again with the beginning strategies, many children from the experimental group had raised hands wanting to share their "think alouds" which clearly showed their use of the many different strategies we had worked on for the previous month.

Second, the children from the experimental group **clearly** stood out as being more interested in discussing and sharing of ideas before and during the reading lessons. One particular example occurred when two children from the experimental group had just shared some of their "wonder questions". A child from the control group asked me, "What are wonder questions?" Before I had a chance to say it was a good question and answer the child, a boy from the experimental group replied to that child 2and the whole group, "It's when you are thinking about what will happen in the story and you share your ideas and make questions about what you wonder will happen."

A third observation made as teacher - researcher is that having 12 people modelling and sharing their think alouds (11 experimental students and 1 teacher) is far more effective than having one person modelling and sharing their think alouds (one teacher). As mentioned earlier, when the 4 week study period was over instruction of the whole group began using the first strategies introduced to the experimental group. Having the experimental children modelling and thinking aloud helped the control children to feel more at ease and willing to participate. The control children "caught on" very quickly and were willing to get involved in discussions by sharing their thoughts with the group and with partners. Perhaps they felt more at ease because they listened to both their peers from the experimental group and the teacher sharing their ideas throughout each lesson compared to just the teacher modelling her thinking during the 4 week period of the study.

4.8.3 **Qualitative Conclusions**

These qualitative observations shed light on two of the hypotheses set out in this study. The first hypothesis was designed to determine if the direct teaching and modelling of metacomprehension strategies would improve reading comprehension in 6 and 7-year-olds. The qualitative observations made during the 4 week study period indicated that the experimental children

were beginning to develop comprehension strategies for what they read. Bruce and Rubin (1981) suggested that strong readers formed hypotheses about the text's meaning before they started to read it. This is exactly what the experimental children were observed to be doing when they shared their predictions and wonder questions before they began reading. The experimental children were also observed to recap the events of the story and make connections to their personal life. Baker (1979) suggested these types of monitoring comprehension were traits of strong readers. In conclusion, these qualitative observations suggest that the experimental children who received the direct teaching and modelling of metacomprehension strategies were beginning to improve their comprehension. However, the Gates - MacGinitie Reading Test was not as sensitive to the comprehension gains the children were making as observations made by the teacher-researcher. As discussed earlier, better means to measure reading comprehension were needed in this study which is now completed.

The second hypothesis was designed to determine if the direct teaching and modelling of metacomprehension strategies to children, 6 and 7 years old, would increase their metacomprehension awareness level. Qualitative observations made both during and after the 4 week study period supported the quantitative findings that determined that the direct teaching and modelling of metacomprehension strategies did increase the

metacomprehension awareness levels of children, 6 and 7 years old. The experimental children were observed to be using the strategies in their daily interactions with text, but more importantly they were observed to question the teacher why she and the group were not using these strategies in other reading activities during the remainder of the school day. The observations made during the post-experimental period when all the children (n=22) were taught together by the teacher - researcher reaffirmed the quantitative findings that the children in the experimental group had increased their metacomprehension awareness. The teacher-researcher noted that in the first few lessons after the 4 week study period had ended the experimental group children clearly stood out from the control group children in respect to their increased involvement, interest level and use of the metacomprehension strategies they used.

These qualitative observations give insight into children's thinking processes that the quantitative measures employed may not be as sensitive to. They are an important part of our learning about the effects of the direct teaching of metacomprehension awareness strategies to children 6 and 7 years old.

CHAPTER FIVE

Summary and Conclusions

Implications For Further Educational Research

5.1 Summary of the Purposes of the Study

The purpose of this study was to explore the effect of the direct teaching and modelling of metacomprehension strategies to children, 6 and 7 years old. The three specific questions posed in Section 1.4 of Chapter 1 of this study were:

1. Will children, 6 and 7 years old, in the experimental group who received the direct teaching and modelling of metacognitive strategies show a greater increase in reading comprehension than a control group who received no such instruction?

2. Will children, 6 and 7 years old, in the experimental group who received the direct teaching and modelling of metacognitive strategies show a greater increase in awareness of metacomprehension strategies than a control group who received no such instruction?

3. Will the treatment have a greater or lesser effect on some children depending on their initial level of

metacomprehension awareness?

5.2 Limitations of the Study

As previously noted in section 3.9 the conclusions to be presented must be considered in light of the following limitations of the study:

1. The instructor of the control group had limited participation time. She was only able to participate in the study for the first 5 weeks of the school year. This placed a time constriction on the length of the period of data collection, because without her to teach the control group for 1 hour a day, 4 days a week, we could not have run the study. Thus, because the study took place over 4 weeks, the results are limited to the responses that children were capable of forming over that time.

2. The experimental treatment was limited to 30 minutes a day. Both the control group and the experimental group were made up of children from two multi-age classes. This placed a time constriction on the length of time each day for the direct teaching and modelling of metacomprehension strategies. Had

the experimental group been made up of a whole class of children in their third year of school, then during the rest of the teaching day (buddy reading, story time, Language Arts, Socials, etc.) when the teacher was working with students they could discuss, model and use their metacomprehension strategies when confronted with text from an array of different sources. The 30 minute time limitation could constrain any results of the treatment.

3. A further limitation is the short study period of 4 weeks over which the Gates - MacGinitie Primary B Forms 1 and 2 were administered. Since the length of time between the administration of Forms 1 and 2 was less than one month, any gains obtained may be due to a practice effect. In addition, with the standard error of measurement for the comprehension section of the Primary B Forms 1 and 2 being 3.6 standard score units, it is possible that any gains seen over the study period could be directly related to the standard error of measurement.

4. A fourth limitation is that conclusions cannot be generalized beyond the population sampled.

5.3 **Conclusions**

No statistically significant difference between the groups' mean gain scores in reading comprehension on the Gates - MacGinitie Reading Test were found. So one can conclude that the direct teaching and modelling of metacomprehension strategies to the sample, for 30 minutes daily over a 4 week study period does not increase their reading comprehension as measured by the Gates - MacGinitie Reading Test.

Statistically significant differences between the groups' mean gain scores in metacomprehension awareness as measured by the modified MSI were found. One can conclude that the direct teaching and modelling of metacomprehension strategies to the sample, for 30 minutes daily over a 4 week study period does increase their metacomprehension awareness level as measured by the modified MSI.

No correlations between incoming metacomprehension awareness level and mean gain scores in reading comprehension were found. One can conclude that the direct teaching and modelling of metacomprehension strategies to the sample, for 30 minutes daily over a 4 week study period did not have a greater or lesser effect depending upon incoming metacomprehension awareness level. This supports the findings from Paris, Cross, and Lipson, (1984) (see Chapter 1 above, pp. 4-5) that teaching

children declarative, procedural, and conditional knowledge about reading strategies did not lead to significant changes in the children's GATES scores.

This study has shown that the direct teaching and modelling of metacomprehension strategies to the sample, for 30 minutes daily over a 4 week study period will increase their metacomprehension awareness levels. This also supports the findings of Paris, Cross, and Lipson (1984) (see Chapter 1 above, pp. 4-5) that children were able to learn metacomprehension strategies when cloze and error detection tests were used which required children to use cognitive strategies to supply missing words and to monitor meaning in text.

5.4 Implications for Further Educational Research

Based on the findings and explanations for these findings, some suggestions are made for further research so that we as educators will begin to develop a better understanding of the effects of the direct teaching and modelling of specific metacomprehension strategies to children, 6 and 7 years old.

1. Related to the finer grained analysis set out in Hypothesis III in this study, further research is

needed to determine whether some children will benefit more than others from the direct teaching and modelling of specific metacomprehension strategies. The same design used in this study could be used but with a more sensitive comprehension measure such as a taped reading miscue inventory and retelling to measure the comprehension gains. Weaver (1988) states:

> "...we [can] determine a reader's strategies for dealing with print by analyzing the reader's miscues... [and then] we need to have the reader retell what he or she recalls and understands from the material read. This retelling provides an important check on our miscue analysis. Some readers are good at reproducing surface structure, but not very good at getting meaning. Others get most of the meaning, even though they may have made a number of miscues that did not seem to preserve meaning and that they did not overtly correct. Besides providing a balanced view, an examination of both the miscues and the retelling provides us with two different measures of comprehension: a measure of how well the reader seemed to comprehend while in the process of reading, and a measure of what the reader remembered and understood after reading the selection. (p. 329)

The study would look at Group Comprehension Gains using taped reading miscue inventory and retelling as a function of incoming modified MSI level. In addition to being a more sensitive comprehension measure, a reading miscue inventory would also give

the examiner a indication of the subject's ability to use metacomprehension strategies consciously, which is the second component of metacomprehension as was previously discussed at the beginning of Chapter 2.

2. Further research is necessary to develop measures for analyzing the reading strengths and needs of students. These measures need to be designed to give teachers insight into the thinking processes children are utilizing in reading. Development of these measures must maintain the utility of the classroom teacher who, in reality, has limited time to administer measures individually to children.

3. Over a 4 week study period the children who received the direct teaching and modelling of specific metacomprehension strategies showed an increase in mean gain scores in metacomprehension awareness as measured by the modified MSI. Further research with children at this age level to determine the effects of year long exposure to the direct teaching and modelling of specific metacomprehension strategies would possibly give us a better understanding of which types of metacomprehension strategies children at this age level master and which metacomprehension strategies are difficult for this age level to

internalize. Results from this type of additional research would provide teachers with more knowledge about metacomprehension awareness which would guide them in their reading program planning.

4. Similarly, additional research may lead us to understand how much direct instruction needs to take place before children internalize these meta-comprehension strategies and continue to use them in the following school year even if these strategies are not reinforced by their next teacher. How long must children be surrounded by language and experiences relating to metacomprehension strategies before they internalize the strategies and use them independently to become more proficient readers?

5. With more researchers and time to gather data, it would be interesting to investigate if children who receive the direct teaching and modelling of specific metacomprehension strategies carry over this knowledge to their reading of content area texts.

In closing, this study has created many more questions and avenues which need to be explored and documented in effort to create a better understanding of the effects of the direct teaching and modelling of metacomprehension strategies to

children, 6 and 7 years old. Learning is a continual process in which one is always trying to gain a better understanding of the world. Perhaps readers of this thesis will create their own "wonder questions" that they can set out to explore in efforts to gain a better understanding of children's literate development.

REFERENCES

Anderson, R.C., Spiro, R.J., & Anderson, M.C. (1977). Schemata as scaffolding for the representation of meaning in connected discourse (Tech. Rep. No. 24). Urbana:

University of Illinois, Centre for the Study of Reading. (ERIC Document Reproduction Service (No. ED 136 236).

Baker, L. (1979). Comprehension monitoring: identifying and coping with text confusions. Journal of Reading Behaviour, 11, 365-374.

Bandura, A. (1986). Social foundations of thought and action. Englewood Cliffs, NJ: Prentice Hall.

Baumann, J.F., & Schmitt, M.C. (1986). The what, why, how and when of comprehension instruction. The Reading Teacher, 39, 640-646.

National Academy of Education. Commission of Reading. (1985). Becoming a nation of readers: the report on the commission of reading. Pittsburgh, PA: The National Institute of Education.

Borg, W. R. & Gall, M. D. (1989). Educational research: an introduction, (5th ed.). White Plains, NY: Longman.

Boyle, O. F., & Peregoy, S. F. (1990). Literacy scaffolds: strategies for first - and second - language readers and writers. The Reading Teacher, 44(3), 194-200.

British Columbia Ministry of Education. (1989). The year 2000: a learner-focused curriculum and assessment framework for the future, draft document. Victoria, B.C.

British Columbia Ministry of Education. (1990). Primary program: foundation document. Victoria, B.C.

Brown, A. L. (1982). Learning how to learn from reading. In J. A. Langer, & M. T. Smith-Burke (Eds.) Reader meets author: bridging the gap (pp. 26-54). Newark, DE: International Reading Association.

Brown, A. L., Campione, J. C., & Day, J. D. (1981). Learning to learn: on training students to learn from texts. Educational Researcher, 10, 14-21.

Bruce, B., and Rubin, A. (1981). Strategies for controlling hypothesis formation in reading (Reading Education Report No. 22). Urbana: University of Illinois, Centre for the Study of Reading.

Clay, M. M. (1961). The reading behaviour of five year old children: a research report. New Zealand Journal of Educational Studies 2(5), 11-31.

Chall, Jeanne. (1983). Learning to read: the great debate (rev. ed.). New York: McGraw-Hill.

Cochrane, O., Cochrane, D., Scalena, S., & Buchanan, R. (1985). Reading writing and caring. Winnipeg, Manitoba: Whole Language Consultants.

Crane, S. K. (1988). Metacognition and the teaching of reading. Journal of Reading, 31(7), 682-685.

Davey, B. (1983). Think aloud -- modelling the cognitive processes of reading comprehension. Journal of Reading, 27, 44-47.

Davey, B., & Porter, S. M. (1982). Comprehension-rating: a procedure to assist poor comprehenders. Journal of Reading, 26(3), 197-202.

Doyle, J., Valencia, S., Greer, E. & Wardrop, J. (1991). Effects of two types of prereading instruction on the comprehension of narrative and expository text. Reading Research Quarterly, 26(2), 142-158.

Dreher, M. J. (1985). Review of gates - macginitie reading tests, canadian edition. In J. V. Mitchell (Ed.), The ninth mental measurements yearbook (Vol. 1, pp. 595-599). Lincoln: The University Of Nebraska Press.

Duffy, G. G., Roehler, L. R., & Herrmann, B. A. (1988). Modelling mental processes helps poor readers become strategic readers. The Reading Teacher, 41(8), 762-767.

Duffy, G., Roehler, L., Sivan, E., Rachkiffe, G., Book, C., Meloth, M., Vavrus, L., Wesselman, R., Putnam, J., & Bassiri, D. (1987). The effects of explaining the reasoning associated with using reading strategies. Reading Research Quarterly, 22, 347-367.

Durkin, D. (1978-79). What classroom observations reveal about reading comprehension instruction. Reading Research Quarterly, 14, 481-583.

Durkin, D. (1981). Reading comprehension instruction in five basal reading series. Reading Research Quarterly, 16, 515-544.

Ellis, E. S. (1989). A model for assessing cognitive reading strategies. Academic Therapy 24(4), 407-424.

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The nature of intelligence (pp. 231-235). Hillsdale, N. J.: Erlbaum.

Gagne, E. D., & Memory, D. (1978). Instructional events and comprehension: generalizations across passages. Journal of Reading Behaviour, 10, 321-336.

Goodman, K. (1973). Psycholinguistic universals in the reading process. In F. Smith (Ed.), Psycholinguistics and reading. (pp. 21-27). New York, NY: Holt, Rinehart and Winston.

Goodman, K. (1976). Reading: a psycholinguistic guessing game. In H. Singer & R. Ruddell (Eds.), Theoretical Models and Processes of Reading. (pp. 370-373). Newark: The International Reading Association.

Goodman, Y. M. (1971). Longitudinal study of children's oral reading behaviour(Project No. 9-E-062). U.S. Dept. of Health, Education, and Welfare.

Goodman, Yetta. (1976). Reading Comprehension: A redundant phrase. In N. A. Johnson (Ed.), Current topics in language (pp. 442-448). Cambridge, MA: Winthrop Publishers.

Harste, Jerome C. (1977). Understanding the hypothesis, it's the teacher that makes the difference: part I. Reading Horizons, 18, 32-43.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1988). Applied statistics for the behavioral sciences. Boston, MA: Houghton Mifflin Company.

Howel, D. C. (1982). Statistical methods for psychology. Boston, MA: Duxbury Press.

Johnson, T. D., & Louis, D. R. (1989). Bringing it all together: A program for literacy. Richmond Hill, Ont.: Scholastic.

Levin, J. (1973). Inducing comprehension in poor readers. Journal of Educational Psychology, 65, 19-24.

Lonberger, R. (1988, February). Effects of training in a self-generated learning strategy on the prose processing abilities of 4th and 6th graders. Paper presented at the annual meeting of the Eastern Education Association, Savannah, GA.

MacGinitie, W. H., Kamons, J., Kowalski, R. L, MacGinitie, R. K., & MacKay, T. (1979). Gates - MacGinitie reading tests, Canadian edition, teacher's manual. Canada: Nelson Canada Ltd.

Otto, W. (1985). Metacognition and reading instruction. Journal of Reading, 28(6), 415-422.

Paris, S. G., & Arbor, A. (1991). Assessment and remediation of metacognitive aspects of children's reading comprehension. Topics in Language Disorders, 12(1), 32-50.

Paris, S. G., Cross, D. R., & Lipson, M. Y. (1984). The benefits of informed instruction for children's reading awareness and comprehension skills. Child Development, 55, 2083-2093.

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

Paris, S. G., Lipson, M. Y., & Wixson, K. K. (1983). Becoming a strategic reader. Contemporary Educational Psychology, 8, 293-316.

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

Pflaum, S. W. (1985). Review of gates - macginitie reading tests, canadian edition. In J. V. Mitchell (Ed.), The ninth mental measurements yearbook (Vol. 1, pp. 595-599). Lincoln: The University Of Nebraska Press.

Rumelhart, D. E. (1980). Schemata: the building blocks of cognition. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), Theoretical issues in reading comprehension (pp. 33-58). Hillsdale, NJ: Erlbaum.

Rupley, W. H. (1985). Review of gates - macginitie reading tests. In J. V. Mitchell (Ed.), The ninth mental measurements yearbook (Vol. 1, pp. 595-599). Lincoln: The University Of Nebraska Press.

Schmitt, M. C. (1988). The effects of an elaborated directed activity on the metacomprehension skills of third graders: Dialogues in literacy research. The 37th Yearbook of the National Reading Conference, 167-181.

Schmitt, M. C. (1990). A questionnaire to measure children's awareness of strategic reading processes. The Reading Teacher, 44(7), 454-461.

Spiro, R. (1980). Constructive processes in prose comprehension and recall. In R. J. Spiro, B. C. Bruce, & W. F. Brewer (Eds.), Theoretical issues in reading comprehension. (pp. 245-278). Hillsdale, NJ: Erlbaum.

Vellutino, F. R. (1991). Introduction to three studies on reading acquisition: convergent findings on theoretical foundations of code-oriented versus whole-language approaches to reading instruction. Journal of Educational Psychology, 83(4), 437-443.

Weaver, C. (1988). Reading process and practice - from socio-psycholinguistics to whole language. Portsmouth, NH: Heinemann Educational Books, Inc.

Weaver, C. (1990). Understanding whole language - from principles to practice. Toronto, Canada: Irwin Publishing.

Whimbey, A. (1985). Reading, writing, reasoning linked in testing and training. Journal of Reading, 29, 118-123.

Winograd, P., & Paris, S. G. (1989). A cognitive and motivational agenda for reading instruction. Educational Leadership, 46(4), 30-36.

APPENDIX A

Sample Lesson Plan

Control Group

APPENDIX A

Sample Lesson Plan

Control Group

Subject: Fall

- introduce and discuss the season of fall
- what are "fall" things
- what happens in nature, to people and animals in fall
- Read the two fall poems and discuss how they match or extend our ideas about fall

<u>Autumn Leaves</u>

Down,
    down,
        down.
Yellow and brown.
The leaves are falling on the ground.
Red leaves flutter,
Yellow leaves fall,
Brown leaves gather along the wall.

<u>In Motion</u>

Leaves swirl,
Twist, twirl,
Dive, swoop,
In a group.
Or one by one,
Drift, glide,
Sift, slide,
Fall, cling,
Sway, swing,
While we run,
In among them,
Having fun.

Lesson - <u>Adventures With Mac</u> - Novelette

- teach word patterns oo /u/ too
  oo /uu/ wood

- have children think of words that fall in each category

- use words in teacher guide on page 4 work with children and write into spelling books.

- introduce the novelette **Adventures With Mac**

    - read through table of contents and browse through the pictures.

- directed reading for first chapter A Rat with a Sac pp. 6 - 10, teacher's guide page 5.

- teach language skills:

    - doubling of final consonants when there is but one sound after the short vowel sound

    - opposites - introduce orally

- guided practice:

    - exercises B, and C page 6 of teacher's guide book.

- if children finish up their work they may choose to read with a buddy or independently

APPENDIX B

Blank Format Sheet For

Teaching Of Metacomprehension Strategies

APPENDIX B

Blank Format Sheet For

Teaching of Metacomprehension Strategies

Lesson # _____

Strategy: _____

_____

_____

Materials: _____

_____

_____

Procedures: _____

_____

_____

_____

Discussion of Strategy:

1. Simple description / definition of the strategy:

_____

_____

_____

_____

2. How the strategy works / how to use it:

_____

_____

_____

_____

Teacher Modelling:

I want to show you what _____

_____

_____

I'll talk out loud to show you how I figure it out. _____

_____

_____

Thinking about _____

_____

helped me to understand _____

_____

_____

3. Why the strategy is important and how its mastery will improve comprehension and when the strategy should and shouldn't be used.

_____

_____

_____

_____

Activity: _____

_____

_____

_____

Storytime - book title: _____

Teacher modelling:

1. Teacher first clarifies her own views on the primacy of comprehension in reading.

_____

_____

_____

2. Teacher discusses with students her own comprehension breakdowns during reading and some self-help strategies.

_____

_____

_____

3. Teacher modelled comprehension strategies while reading aloud to students.

_____

_____

_____

Lesson - <u>Adventures With Mac</u> - identical lesson to that of the control group.

APPENDIX C

Sample Lesson Plan

Experimental Group

APPENDIX C

Sample Lesson Plan

Experimental Group

Lesson # 1

Strategies: Before I begin reading it's a good idea to:

- make some guesses about what I think will happen in the story
- look at the pictures to see what the story is about

Materials: chart paper with the heading: Before I begin reading...

chart paper to record the responses from the children

library book - one for each child (be sure to pick stories that have pictures and titles that support the stories

Procedures: -bring students to board area. Brainstorm with them all the ideas that they have that answer the question - Before I begin reading it is a good idea to:

- zero in on the two focus strategies if the children have offered them

Discussion of Strategy:

1. Simple description / definition of the strategy:

Two strategies that I would like to talk to you about today are: 1. Making guesses about what you think will happen in the story and 2. Looking at the pictures to see what the story might be

about.

2. How the strategy works / how to use it:

It is important that we learn about different strategies that will help us to understand what we are reading.

Teacher Modelling:

I want to show you what I think about in my head when I pick up a story or book. Normally you don't know what I am thinking because I think quietly in my own mind, but today **I'll talk out loud to show you how I figure it out.**

Thinking about the title and the pictures on the cover **helped me to understand** that this book might be about (topic) . It also helped me to see that I already know quite a lot of information about (topic) before I even start to read the book.

3. Why the strategy is important and how its mastery will improve comprehension and when the strategy should and shouldn't be used.

Can anyone think of a reason why it might be important to make titles for your writing? Would drawing a picture about your writing help a reader before they read your work? Why? Thinking about the title and pictures helps me to draw a picture in my mind about what the story will be about. It also helps me to realize how much I already know about the story before I begin reading it. This will help me to make a picture in my mind about what could happen in the story and then I will have

a better understanding of what I read.

Activity: Pair children - label A/B

give each child a book

A's first - think aloud to partners using two strategies

B's second - same procedure

children may share additional information they thought of with their partner about the books

Storytime - book title: _____

Teacher modelling:

1. Teacher first clarifies her own views on the primacy of comprehension in reading.

Reading means understanding the words. If you don't understand the words then you are not really reading, you are just saying the words, or just looking at the words. That's why it's a good idea to always be checking that you do understand what the story is about by asking yourself - what's this story about. If you can answer that question then you should continue reading. If you can't answer that question, and it happens to me sometimes too, then you should go back and reread that part of the story to see if you could start to understand.

2. Teacher discusses with students her own comprehension breakdowns during reading and some self-help strategies.

focus on making predictions based on the title and pictures in the story

3. Teacher modelled comprehension strategies while reading aloud to students.

Lesson Plan for Experimental Group - identical lesson as control group.

Lesson - Adventures With Mac - Novelette

- teach word patterns oo /u/ too
  oo /uu/ wood

- have children think of words that fall in each category
- use words in teacher guide on page 4 work with children and write into spelling books.

- introduce the novelette **Adventures With Mac**

  - read through table of contents and browse through the pictures.

- directed reading for first chapter A Rat with a Sac pp. 6 - 10, teacher's guide page 5.

- teach language skills:

  - doubling of final consonants when there is but one sound after the short vowel sound

  - opposites - introduce orally

- guided practice:

  - exercises B, and C page 6 of teacher's guide book.

- if children finish up their work they may choose to read with a buddy or independently

APPENDIX D

Modified Metacomprehension Strategy Index

APPENDIX D

Modified Metacomprehension Strategy Index

In each statement of three, choose the statement which tells a good thing to do to help you to understand a story better before you read it.

1. Before I begin reading, it's a good idea to:

A. See how many pages are in the story.
B. Make some guesses about what I think will happen in the story.
C. Think about what has happened so far in the story.

2. Before I begin reading, it's a good idea to:

A. Look at the pictures to see what the story is about.
B. Sound out the words I don't know.
C. Check to see if the story is making sense.

3. Before I begin reading, it's a good idea to:

A. Ask someone to read the story to me.
B. Read the title to see what the story is about.
C. Check to see if the pictures are in order and make sense.

4. Before I begin reading, it's a good idea to:

A. Check to see that no pages are missing.
B. Make a list of the words I'm not sure about.
C. Use the title and pictures to help me make some guesses about what will happen in the story.

5. Before I begin reading, it's a good idea to:

A. Decide on why I am going to read the story.
B. Reread some parts to see if I can figure out what is happening if things aren't making sense.
C. Ask for help with difficult words.

6. Before I begin reading, it's a good idea to:

A. Retell all of the main points that have happened so far.
B. Ask myself questions that I would like to have answered in the story.
C. Look through the story to find all the words with three or more syllables.

7. Before I begin reading, it's a good idea to:

A. Check to see if I have read this story before.
B. Use my questions and guesses as a reason for reading the story.
C. Make sure I can pronounce all of the words before I start.

8. Before I begin reading, it's a good idea to:

A. Think of what I already know about the things I see in the pictures.
B. See how many pages are in the story.
C. Read the story aloud to someone.

9. Before I begin reading, it's a good idea to:

A. Practice reading the story aloud.
B. Think of what the people in the story might be like.
C. Decide if I have enough time to read the story.

10. Before I begin reading, it's a good idea to:

A. Check to see if I am understanding the story so far.
B. Think about where the story might be taking place.
C. List all of the important details.

II. In each set of three, choose the one statement which tells a good thing to do to help you understand the story better while you are reading it.

11. While I'm reading, it's a good idea to:

A. Read the title to see what the story is about.
B. Check to see if the pictures have anything missing.
C. Check to see if the story is making sense by seeing if I can tell what's happened so far.

12. While I'm reading, it's a good idea to:

A. Stop to retell the main points to see if I am understanding what has happened so far.
B. Read the story quickly so that I can find out what has happened.
C. Skip the parts that are too difficult for me.

13. While I'm reading, it's a good idea to:

A. Put the book away and find another one if things aren't making sense.
B. Keep thinking about the title and the pictures to help me

decide what is going to happen next.
C. Keep track of how many pages I have left to read.

14. While I'm reading, it's a good idea to:

A. Keep track of how long it is taking me to read the story.
B. Check to see if I can answer any of the questions I asked before I started reading.
C. Read the title to see what the story is going to be about.

15. While I'm reading, it's a good idea to:

A. Have someone read the story aloud to me.
B. Keep track of how many pages I have read.
C. Check to see if my guesses are right or wrong.

16. While I'm reading, it's a good idea to:

A. Make a lot of guesses about what is going to happen next.
B. Not look at the pictures because they might confuse me.
C. Read the story aloud to someone.

17. While I'm reading, it's a good idea to:

A. Try to answer the questions I asked myself.
B. Read the story silently.
C. Check to see if I am saying the new vocabulary words correctly.

18. While I'm reading, it's a good idea to:

A. Try to see if my guesses are going to be right or wrong.
B. Reread to be sure I haven't missed any of the words.
C. Decide on why I am reading the story.

19. While I'm reading, it's a good idea to:

A. See if I can recognize the new vocabulary words.
B. Be careful not to skip any parts of the story.
C. Keep thinking of what I already know about the things and ideas In the story to help me decide what is going to happen.

20. While I'm reading, it's a good idea to:

A. Reread some parts or read ahead to see if I can figure out what is happening if things aren't making sense.
B. Take my time reading so that I can be sure I understand what is happening.
C. Check to see if there are enough pictures to help me make the story ideas clear.

APPENDIX E

Data for Pretests and Posttest of

Gates - MacGinitie and Modified MSI

APPENDIX E

Data for Pretests and Posttest of

Gates - MacGinitie and Modified MSI

ROW	gatespre	msipre	gatespst	msipost	group
1	37	4	37	5	0
2	28	5	30	5	0
3	27	1	28	5	0
4	25	5	28	5	0
5	24	3	32	3	0
6	19	14	24	13	0
7	18	4	29	7	0
8	18	12	26	15	0
9	15	6	14	5	0
10	12	5	18	4	0
11	11	3	18	5	0
12	34	6	34	19	1
13	33	8	35	15	1
14	27	5	31	17	1
15	26	4	30	11	1
16	22	15	22	18	1
17	19	13	30	15	1
18	18	5	24	5	1
19	17	9	25	12	1
20	16	6	29	11	1
21	12	6	26	9	1
22	11	11	9	9	1

	group	N	MEAN	MEDIAN	TRMEAN	STDEV	SEMEAN
gatespre	0	11	21.27	19.00	20.67	7.77	2.34
	1	11	21.36	19.00	21.11	7.80	2.35
msipre	0	11	5.64	5.00	5.22	3.91	1.18
	1	11	8.00	6.00	7.67	3.61	1.09
gatespst	0	11	25.82	28.00	25.89	6.82	2.06
	1	11	26.82	29.00	27.89	7.17	2.16
msipost	0	11	6.55	5.00	6.00	3.83	1.15
	1	11	12.82	12.00	13.00	4.35	1.31

	group	MIN	MAX	Q1	Q3
gatespre	0	11.00	37.00	15.00	27.00
	1	11.00	34.00	16.00	27.00
msipre	0	1.00	14.00	3.00	6.00
	1	4.00	15.00	5.00	11.00
gatespst	0	14.00	37.00	18.00	30.00
	1	9.00	35.00	24.00	31.00
msipost	0	3.00	15.00	5.00	7.00
	1	5.00	19.00	9.00	17.00

APPENDIX F

Data for ANOVA on Groups' Mean Gain Scores on Gates - MacGinitie Reading Test

APPENDIX F

Data for ANOVA on Groups' Mean Gain Scores on Gates - MacGinitie Reading Test

	group	N	MEAN	MEDIAN	TRMEAN	STDEV	SEMEAN
gatesdif	0	11	4.55	5.00	4.44	3.83	1.15
	1	11	5.45	4.00	5.33	5.47	1.65

	group	MIN	MAX	Q1	Q3
gatesdif	0	-1.00	11.00	1.00	8.00
	1	-2.00	14.00	0.00	11.00

ANALYSIS OF VARIANCE ON gatesdif

SOURCE	DF	SS	MS	F	p
group	1	4.5	4.5	0.20	0.656
ERROR	20	445.5	22.3		
TOTAL	21	450.0			

APPENDIX G

Data for ANOVA of Groups' Mean Gain Scores on Modified MSI

APPENDIX G

Data for ANOVA of Groups' Mean Gain Scores on Modified MSI

	group	N	MEAN	MEDIAN	TRMEAN	STDEV	SEMEAN
msidif	0	11	0.909	0.000	0.778	1.814	0.547
	1	11	4.82	3.00	4.67	4.64	1.40

	group	MIN	MAX	Q1	Q3
msidif	0	-1.000	4.000	-1.000	3.000
	1	-2.00	13.00	2.00	7.00

ANALYSIS OF VARIANCE ON msidif

SOURCE	DF	SS	MS	F	p
group	1	84.0	84.0	6.76	0.017
ERROR	20	248.5	12.4		
TOTAL	21	332.6			

APPENDIX H

Data for ANCOVA showing Gain Scores in Reading Comprehension as a function of Incoming Modified MSI Level

APPENDIX H

Data for ANCOVA showing Gain Scores in Reading Comprehension as a function of Incoming Modified MSI Level

Source	DF	ADJ SS	MS	F	P
Covariates	1	1.39	1.39	0.06	0.810
group	1	5.73	5.73	0.25	0.626
Error	19	444.06	23.37		
Total	21	450.00			

Covariate	Coeff	Stdev	t-value	P
msipre	-0.07014	0.288	-0.2439	0.810