

Using Metacognitive Strategies to Enhance
Reading Comprehension for Students with
Learning Disabilities

by

Lynda M. Milne ©

A Thesis submitted in conformity with the requirements for
the degree of Master of Education at Lakehead University.

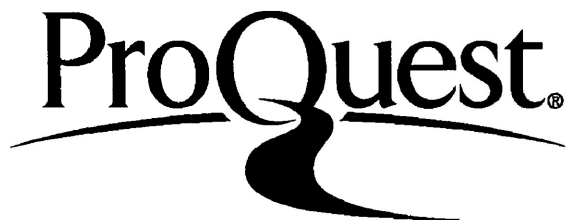
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ISBN 0-315-69154-9

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ABSTRACT

Using Metacognitive Strategies to Enhance Reading Comprehension for Students with Learning Disabilities

Research has suggested that students with learning disabilities can become actively involved in their own learning. A metacognitive orientation provides a conceptual base on which to build instructional interventions.

In this study twenty students with learning disabilities in special classes in Thunder Bay participated. Students were from three intact classes at different schools. Three general expectations guided the investigation:

First, through explicit teaching, students with learning disabilities can be instructed to employ self-questioning learning strategies for identification of main ideas in a reading passage;

Second, reading comprehension will be enhanced through metacognitive training as measured by: Miscue Analysis; Canadian Tests of Basic Skills, Form 3 and 4; and Gates-MacGinitie Reading Tests, Form 1 and 2.

Third, students who perceive an external control of

reinforcements, as measured by the Intellectual Achievement Responsibility Questionnaire, will experience more difficulty using an intervention strategy.

A simple pre-posttest design was used supplemented with observational and interview methods. The comprehension subtests of Gates-MacGinitie Reading Test, Form 1 (MacGinitie, Kamons, Kowalski & MacGinitie, 1979) and Canadian Tests of Basic Skills, Form 3 (King & Hieryonymus, 1975) were administered to each student and baselines for reading comprehension established. Using a reciprocal teaching procedure, a self-questioning strategy was developed while studying a Canadian novel, Hunter in the Dark by M. Hughes. Miscue analysis and observation were employed to monitor the training sessions.

Results indicated that the participants' reading comprehension did improve on all criteria, miscue analysis and Gates-MacGinitie Reading Test were at a statistical significant level. The students' belief in their own control, as measured by the Intellectual Achievement Responsibility questionnaire, was found not to be a predictor of achievement.

Interventions which incorporate a teaching methodology that promotes strategic learning appear to hold the most promise for enabling students with learning disabilities to become more successful learners.

ACKNOWLEDGEMENTS

I am grateful to many people who have helped me in the preparation of this thesis:

Dr. Alan Bowd, my committee chairman, mentor, and advisor who supported me through numerous revisions;

Dr. Mary Clare Courtland and Dr. Dan Klassen, my committee members who ensured the epistemology and integrity of the subject matter;

The teachers and students who willingly worked with me during the research;

The Lakehead Board of Education for granting me an educational leave;

The students I have taught over the years who have instilled in me a desire to know more about learning disabilities;

My family who was so patient and supportive.

Thank you.

TABLES

Table	Page
3-1. Design..	39
4-1. Miscue Analysis.	53
4-2. CTBS.....	55
4-3. Gates-MacGinitis..	55
4-4. IAR..	57
4-5. Correlations between Control of Reinforcements and Reading Comprehension...	58
4-6. Correlations between Learned Helplessness and Reading Comprehension..	59

FIGURES

Figures	Page
2-1. Components of Metacognition..	13
4-1. CTBS.....	54
4-2. Gates-MacGinitie..	56

TABLE OF CONTENTS

	Page
List of Tables..	
List of Figures..	
Chapter	
Introduction.....	
Statement of Problem..	
Definitions of Terms.	
Significance of Study..	8
Review of Related Literature.	10
Metacognition.....	10
Metacognitive Instruction..	15
Reading Comprehension..	18
Learning Disabilities..	23
Instruction for Students with Learning Disabilities..	27
Attribution Theory.	30
Design of Study.	36
Participants..	36
Expectations..	38
Method..	39
Instruments.....	41
Qualitative Methods.	44

Procedures..	47
Results.....	. 51
Comprehension Gain..	. 52
Control of Reinforcements..	56
Qualitative Analysis..	. 59
Discussion and Conclusions..	63
Positive Effects of Metacognitive Training of Reading Comprehension.....	63
Negative Effects of External Control of Reinforcements.	68
Design Limitations..	72
Instructional Implications Emerging from the Study.	74
Conclusions..	76
Summary..	77
References..	81
Appendices	
A. Individual Interview..	..100
B. IAR..	.101
C. Group Interview.	..107
D. Transcript..	.109
E. Miscue Analysis..	..113
F. Comprehension Loss using Miscue Analysis.	.117
CTBS..	..118

'.	Gates-Macginitie..	..119
	IAR..	..120
	IAR Scores..	..121

CHAPTER 1

Introduction

Individuals with learning disabilities have been characterized as passive or inactive learners who do not engage in strategic efforts to promote effective learning (Torgesen, 1980). This inactivity has been identified as a problem with metacognition (Wong, 1979). Metacognition refers to knowledge of personal cognitive resources and regulation of this knowledge (Baker & Brown, 1984; Borkowski, Reid, & Kurtz, 1984). However, evidence indicates that the learning disabled can behave strategically if instructed to do so. For example, research shows that learning disabled students can be trained to identify important parts of text and learn to monitor their own reading comprehension (Bos & Filips, 1982; Graves, 1986; Palincsar, 1982; Wong & Jones, 1982). Metacognition research underscores the need and importance to incorporate metacognitive strategies in remedial programs.

In this thesis, the literature relating to metacognition, reading comprehension, and learning disabilities will be reviewed. The three areas of study

will be examined with the objective of establishing a theoretical and practical base for an examination of metacognitive strategies in the enhancement of scholastic achievement among students with learning disabilities.

Statement of the problem

In recent years, increasing emphasis has been placed on developing instructional programs for adolescents with learning disabilities. This study investigates the effectiveness of using metacognitive skill (a self-questioning strategy) to enhance reading comprehension for students with learning disabilities.

Expectations:

1) through explicit teaching, learning disabled students can be trained to employ self-questioning learning strategies to identify main ideas of a reading passage;

2) reading comprehension will be enhanced through metacognitive training;

3) students who perceive an external control of reinforcement will experience more difficulty using an intervention strategy.

4) instruction will be more extensive and prolonged than for students whose control is more internal.

Twenty students with learning disabilities participated in this pre-posttest design. Observational and interview methods supplemented the basic design.

During the intervention sessions the students were instructed in a metacognitive strategy, self-questioning. Using a reciprocal teaching methodology, students practised and refined this self-questioning technique.

Definitions of Terms

A child whose failure to learn is accompanied by emotional problems, may be the victim of a continuous cycle of failure and emotional reaction to the failure. In this cycle the failure to learn leads to adverse emotional responses—feelings of self-derision, poor ego perception, and anxiety, which augment the failure to learn syndrome. Remediation must find a way to reverse this cycle - to build feelings of self-worth, to increase confidence and self-concept, and to experience success (Lerner, 1976). The "learned helpless" have come to believe that they have little control over negative situations and thus become passive and accept failure as inevitable (Diener & Dweck, 1978, 1980).

Using the theoretical base of metacognition and attribution theory, the following terms are defined to set the parameters of this study.

1. Metacognition is defined across three dimensions: 1) conscious awareness of one's cognitive processes, cognitive strengths and weaknesses; 2) the match between one's cognitive resources and the task encountered; and 3)

self-regulation of behaviour (Flavell, 1979).

Metacognitive skills necessary for effective reading include: "predicting, checking, monitoring, reality testing, and coordination and control of deliberate attempts to study, learn, or solve problems" (Brown, 1980, p.454).

2. Learning Disability A learning disability is considered to be a disorder evident in both academic and social learning situations that involves one or more of the processes necessary for the proper use of spoken language or the symbols of communication, and that is characterized by a condition that:

a) is not primarily the result of:

- impairment of vision;
- impairment of hearing;
- physical handicap;
- mental retardation;
- primary emotional disturbance;
- cultural difference;

b) results in a significant discrepancy between academic achievement and assessed intellectual ability, with deficits in one or more of the following:

- receptive language (listening, reading);
- language processing (thinking,

conceptualizing, integrating);

expressive language (talking, spelling,
writing);

mathematical computations;

c) may be associated with one or more conditions
diagnosed as:

a perceptual handicap;

a brain injury;

minimal brain dysfunction;

dyslexia;

developmental aphasia (Ontario Ministry of
Education, 1984, p.16).

3. Reading Comprehension Following Irwin (1986),
reading comprehension is defined as:

The process of using one's own prior
experiences (reader context) and the writer's
cues (text context) to infer the author's
intended meaning. This process can involve
understanding and selectively recalling ideas in
individual sentences (microprocesses), inferring
relationships between clauses and/or sentences
(integrative processes), organizing ideas around
summarizing ideas (macroprocesses), and making
inferences not necessarily intended by the author
(elaborative processes). These processes work

together (interactive hypothesis) and can be controlled and adjusted by the reader as required by the reader's goal (metacognitive processes) and the total situation in which comprehension is taking place (situational context) (p. 9).

4. Internal- External Control of Reinforcement The degree to which individuals perceive that the reward follows from, or is contingent upon, their own behaviour or attribute versus the degree to which they feel the reward is controlled by forces outside of themselves and may occur independently of their own actions. If a person perceives that an event is contingent upon his/her own behaviour or relatively permanent characteristics, the belief is termed "internal control". If a person perceives that an event is the result of luck, chance, fate, an inability to understand the world, or the influence of powerful others, the belief is termed "external control" (Rotter, Chance, & Phares, 1972).

5. Self-Questioning Self-questioning is a technique which is used by the reader to improve reading comprehension through formulating relevant questions and locating answers.

6. Strategy A strategy is any organized sequence of processing activities that helps solve an intellectual task. Such strategies can be applied automatically, with

little reflective awareness or deliberate planning (Brown, 1980).

7. Inactive Learner Inactive learners typically have a passive or disorganized approach to learning which impedes their ability to execute task appropriate strategies (Torgesen, 1977).

8. Miscue An oral reading response that differs from the expected response (Goodman, 1973).

9. Reciprocal Teaching. Reciprocal teaching refers to an instructional activity that takes place in the form of a dialogue between teachers and students regarding segments of text. The dialogue is structured by the use of four strategies: summarizing, question generating, clarifying, and predicting. The teacher and students take turns assuming the role of teacher in leading this dialogue (David & Palincsar, 1988, p.1).

10. Learned Helplessness One believes that outcome has little or nothing to do with effort - with or without effort the result is the same. The child believes that he/she controls failures (since failure is seen to be a result of their own lack of ability) but not success (since success occurs with or without effort). The learned helpless take responsibility for failure but not for success (Dudley-Marling, Snider, & Traver, 1982).

11. Reinforcement Responsibility The degree to which

individuals feel responsible for their own actions in attaining the reinforcements, rewards, gratifications, or punishments, they receive.

12. Generalization of skill A term for arranging and designing learning resources to ensure that behavioural changes occurring at the point of instruction are sustained at other appropriate times and places (Page & Thomas, 1977, p.147).

13. Maintenance of Skill A skill designed or adequate to maintain a stable condition without providing reserves for growth, functional change, or healing effect (Gove, 1965).

Significance of the Study

The objectives of this study are to ascertain to what extent trained metacognitive skills can lead to improved reading comprehension and in what way motivational factors influence the success of intervention strategies. It is anticipated that the results of this study will lead to a better understanding of learning disabled students' ability to employ self-questioning techniques to enhance their own reading comprehension. Together with its theoretical significance, instructional implications of the study for teachers of students with learning disabilities will be explored.

The next chapter reviews the literature on metacognition and reading comprehension as it relates to students with learning disabilities.

CHAPTER 2

Review of Related Literature

Introduction

In this chapter, a brief review of the literature on metacognition is included. Studies incorporating metacognitive strategies as it relates to working with students with learning disabilities will then be reviewed. The review of literature will then focus upon metacognition and reading comprehension.

Metacognition

Because its origins lie in two distinct research traditions there is some confusion over the usage of the term metacognition.

Flavell (1979) introduced the theoretical concept of metacognition to explain the performance of young children in memory research experiments. Although these children improved recall after being instructed in the use of mnemonic strategies, recall deteriorated drastically in delayed posttests. Flavell postulated that young children lack awareness of variables that affect remembering - metacognition. Implicit in this use of the term

metacognition, then, is the view that control of cognitive processing is contingent upon one's metacognitive knowledge and the ability to reflect upon that knowledge.

Brown, who has done much of the work in the area of metacognition in reading, has suggested that there are in fact two components to consider in defining metacognition and describing metacognitive processes. The first component refers to the knowledge the individual possesses about his or her own cognitive processes. The second refers to the regulation of cognitive activity (Brown, 1978). This second use of metacognition is embedded in an information processing approach to thinking. Common to most information processing models is the notion that the activities of the system are guided by the operations of a central executive, the function of which is to oversee and guide problem-solving (Reeve & Brown, 1984). Executive control functions include "predicting, checking, monitoring, reality testing and coordination, and the control of deliberate attempts to study, learn or solve problems" (Brown, 1980, p.454).

An important difference between the two uses of the term metacognition is that one implies the conscious control of the thinking activity, whereas the other does not. In Flavell's view, young children may understand that a problem calls for action, but be unable to use a

problem-solving strategy. Metacognitive processes can only be effective, therefore, if an individual consciously controls them. Brown argues that it is the developing child's increasing ability to gain conscious control of, and to regulate, metacognitive processes that determines the growth of problem-solving skills (Reeve & Brown, 1984).

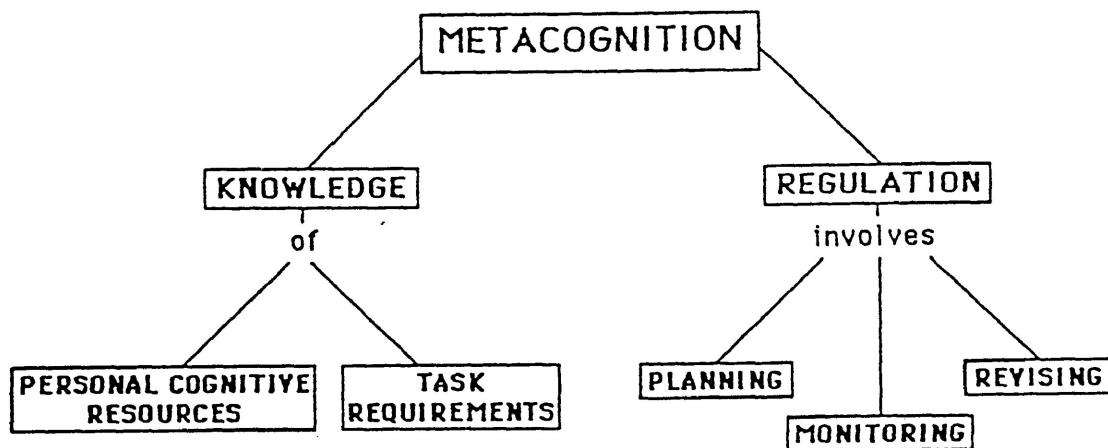
Young children, or any individuals who lack experience in a particular activity, are likely to have little awareness and control of the cognitive demands of a task. With maturity and experience, they become metacognitively more sophisticated. That is, they become increasingly more able to control and regulate metacognitive processes (Brown & DeLoache, 1978).

Figure 1 (Schmitt & Newby, 1986, p. 29) illustrates the components of metacognition. Metacognitive knowledge encompasses the learners awareness of personal strengths and weaknesses as well as the requirements for meeting the demands of different tasks. Planning, monitoring and revising comprise the regulatory component. Processing for the able student is carried out below the level of consciousness (Schmitt & Newby, 1986). In his analysis of competent performance, Glaser (1976) describes the difference between a novice and an expert. In contrast to the slow, awkward, deliberate actions of a novice, an expert's performance is covert and, most importantly,

automatic. For example, Afflerback and Johnston (1986) found that when a task is more difficult even expert readers de-automatize the process and consciously plan, monitor, and revise as a means to successful performance.

FIGURE 2-1

The Components of Metacognition



Brown and Smiley (1977) compared the metacognitive abilities of students of various ages in order to detect developmental trends. Students in the third, fifth and seventh grades as well as college freshmen rated the linguistic units of prose passages in terms of their importance to the structure and theme of the passages. The authors found a strong developmental trend with gradual

improvement in the sensitivity to detect the degree of importance of structural units emerging over the entire age range sampled.

Similar results were evident in the study done by Myers and Paris (1978) who investigated second and sixth grade children's metacognitions about strategy variables in reading. The establishment of specific goals for reading, the criteria used for determining if comprehension was adequate, and awareness of alternate methods for determining unknown information or reaching reading goals were identified as strategy variables. Differences between the two groups were significant in all areas. Grade two children were not sensitive to the need to use special strategies for different materials and goals. They reported few strategies or reasons for checking their own progress, and could name only a few resources for deciphering the meaning of unknown words or sentences. Those that were named tended to be external sources, such as other people, while the grade six students generated more internally oriented strategies. Myers and Paris concluded that grade six children were better aware of the existence of various reading strategies and were sensitive to when and how to use them.

In a later study, Paris and Myers (1981) theorized that a crucial difference between good and poor readers

might be their ability to select and use appropriate strategies for improving comprehension. They concluded that poor readers were less aware of the detrimental influences on comprehension of negative factors (such as watching television while reading) than good readers.

Reid and Hresko (1981) point out that the learning disabled often behave like younger, normal achievers in their nonstrategic approach to various tasks. Recent research indicates that children can acquire the necessary skills through relevant instruction and experience (Baker, 1982; Chan, Cole, & Barfett, 1987; Palincsar & Brown, 1987; Reid & Hresko, 1981; Schmitt & Newby, 1986; Seidenberg, 1986; and Wong & Jones, 1982).

The next section looks more closely at metacognitive instruction.

Metacognitive Instruction. Conscious self-regulation, which is necessary for the efficient use of metacognitive skills, can be taught. Training in general problem-solving principles has been successful (Campione & Brown, 1978; Belmont & Butterfield 1977; Palincsar & Brown, 1987; Paris, Newman & McVey 1982). As well, metacognition instruction has extended to areas including attention (Miller & Bigi, 1978), self-control (Meichenbaum & Asarnow, 1979), and reading comprehension (Bos & Filip, 1982; Capelli & Markman, 1982; Chan, Cole, & Barfett, 1987; Palincsar,

1982; Wong & Jones, 1982). Many of these studies have been conducted utilizing special populations. The self-control studies included children with attention disorders, while the studies on reading comprehension included students with learning disabilities.

Two important questions arise from the research done on metacognition: what can be done to ensure maintenance of skill; and how can instruction facilitate generalization of skill?

As Campione and Brown (1977) reasoned, maintenance tests are a more stringent measure of training effectiveness, although Wong (1987) argues that in unsuccessful studies, often, the participants were given insufficient training to attain mastery of the strategies prior to testing.

The most stringent of all tests is one of transferability (Campione & Brown, 1977). To acquire transferability and generalization is a real challenge. Meichenbaum (1988) has outlined the following guidelines to obtain generalization:

1. analyze what needs to be trained
2. determine if already in repertoire
3. select training tasks carefully
4. have child become collaborator
5. train at both cognitive and metacognitive

level

6. make feedback explicit and foster self-attribution for change
7. train and encourage generalization explicitly
8. use multiple trainers, settings, tasks, fade supports
9. build in relapse prevention
10. make length of training contingent upon performance NOI time. Include follow-through procedures (p. 4).

These suggestions are incorporated in self-control training which appears to be a promising method (Brown et al., 1981; Day, 1980; Brown, Campione, & Barclay, 1979). In self-control studies, the trainees are instructed in executive control functions (planning, checking, and monitoring) as well as specific strategy. Trained students are taught: "how to learn rather than only what to learn; and to behave like successful learners who spontaneously plan, check, and monitor themselves in their learning, performance, and problem-solving" (Wong, 1987, p. 230).

An important strand of metacognition research is its application to reading comprehension. In studies comparing effective and ineffective readers, the way in which students regulate their metacognitive processes and knowledge of personal cognitive resources are important

aspects of obtaining meaning from print. Referring back to Figure 1, knowledge of task requirements and regulation of monitoring, planning and revising are essential for optimal reading comprehension.

Reading Comprehension

According to Brown, Campione, and Day (1981), metacognition in reading involves four variables: text, task, strategies, and learner characteristics. Text refers to characteristics of the material that affect memory and comprehension, such as difficulty and structure. Task is simply the required accomplishment of the student. Strategies are the ways the learner goes about completing the task; learner characteristics are the ability, interest, and other variables that influence learning. The learner's metacognitive knowledge (about learner's characteristics, tasks, text, and cognitive strategies) interacts with metacognitive experiences to guide the selection of cognitive strategies for task performance (Flavell, 1979). Metacognitive knowledge enables the individual to choose, to modify, and to invent strategies to meet particular problems. In turn, successful outcome of problem solving provides feedback that enhances the individual's metacognitive knowledge about the particular strategy used and expands his/her metacognitive repertoire (Wong & Wong, 1986).

John Flavell (1976) stresses the "how, when, where" of information storage and retrieval. How includes strategies for storage and retrieval. Where includes a variety of storage and retrieval resources. When refers to the student's awareness of those situations that demand the conscious acquisition and storage of information. He suggests that children should be taught to:

1. Carefully examine task features to identify the problem (What am I expected to do?)
2. Search both internal and external sources for solution-relevant information and procedures (What information do I already have?)
3. Keep track of past solution efforts, their outcomes, and the information yielded, and use external records when appropriate (compare an existing problem to previous experience).
4. Actively remember to remember, monitor and update information, and use this information in problem solving (consciously utilize a strategy to assist memory, such as association, mnemonic devices, and mind mapping).

Studies of good-poor reader differences in text processing (Paris & Myers, 1981; Ryan, 1981) suggest that poor readers fail to attend systematically to text structure, tend not to monitor meaning while reading, fail to attend selectively to the most important information,

and do not discriminate effectively between useful and ineffective strategies. This profile suggests the need for instruction which will increase the learner's awareness of the purpose of reading, provide specific means of achieving meaning, and promote comprehension monitoring (Palincsar & Brown, 1987).

Self-monitoring of reading comprehension appears to be an automatic process engaged in by effective readers. When reading comprehension is proceeding easily the reader is rarely conscious of any form of self-monitoring. However, when a comprehension difficulty is encountered the competent reader adapts to the nature of the task by changing the reading rate or by self-questioning (Wong, 1987).

Poor readers tend not to self-monitor their state of comprehension and seem unaware when they fail to comprehend (Whimbey & Whimbey, 1975). Because of this they may benefit from explicit instruction in metacognitive skills. Applying metacognitive theory to self-questioning instructional research entails teaching the students to be sensitive to important parts of the text and to monitor their state of reading comprehension by asking questions (Wong, 1985). The student becomes actively involved in processing the text by posing questions and searching for answers. Self-questioning has several advantages:

It stimulates the student to anticipate questions that may be asked of content material. Through his/her experiences of formulating questions and locating answers, the student is better prepared for questions and tests of comprehension.

2. The actions of forming questions and searching for answers require that the student be actively involved with the passage being read. Rather than simply reading strings of words, the student must be alert and in continuous interaction with the material.

3. Questioning as one reads assists in maintaining interest and provides a purpose for reading further (University of Kansas Institute for Research in Learning Disabilities, 1980, p.1).

Self-questioning training increases the student's awareness of textual elements and provides specific steps for active learning, consequently leading to an improvement in reading comprehension (Wong & Jones, 1982).

One method of training students to self-question is by modelling the process. In a series of instructional studies, conducted principally by remedial reading teachers in their natural reading groups, Palincsar and Brown (1986,

1987) investigated instruction of four strategies: summarizing, question generating, clarifying, and predicting. The instructional procedure, referred to as reciprocal teaching, is a dialogue between the teacher and students. Using short segments from content area texts, the researchers modelled summarizing, questioning, clarifying, and predicting. The students, working in small groups of 5 to 15, then took turns as teacher, generating a single-sentence summary of the material, asking comprehension questions, clarifying difficult concepts, and making predictions about what would come next. Initially, the teacher initiated and sustained the dialogue, but gradually the teacher attempted to transfer more responsibility for the dialogue to the students while providing feedback and encouragement. Intervention took place over 20 school days. Participants demonstrated significant gains in their comprehension that maintained over time and generalized to improved classroom performance.

Heller (1986) suggests that to model metacognitive strategies students should form small discussion groups after an explanation of comprehension monitoring strategies is given. This gives the students immediate practice in modelling their own metacognitive strategies. Students take turns describing what they did in order to achieve

their purpose for reading. They then compare their concepts and answers with the teacher's and with one another, discuss similarities and differences, and ultimately decide which strategies seemed to lead to the best answer to the purpose question.

Metacognition also includes knowledge of the learner's personal cognitive resources. That is, "the learner is aware of personal strengths and weaknesses as well as the requirements of the task and has useful knowledge which enables him or her to predict how the two will interact for acceptable performance" (Schmitt & Newby, 1986, p.29). In special populations, such as the learning disabled, this is a crucial component for the success or failure of any intervention strategies.

Learning Disabilities

Learning disabled individuals are characterized by literacy achievement or development not concomitant with their assessed potential. The notion of an organic etiology of learning disabilities has a lengthy history. Hypothesized causes have included minimal brain damage (Strauss & Kephart, 1955), a maturational lag in general neurological development (Bender, 1957; Rabinovitch, 1962), a failure to establish cerebral dominance (Orton, 1937), and a failure to achieve certain stages of neurological development (Delcato, 1959). There have been problems

associated with measuring and assessing neurological deficits resulting in a declined in popularity in the neurological hypothesis.

Individuals with learning disabilities as a group have been characterized as heterogeneous - that is, these children display quite varied academic profiles in terms of patterns of strengths and weaknesses (Ryan, Short, & Weed, 1986). For example, academic disabilities include disabilities in reading, witing, arithmetic, and spelling. Developmental disabilities include disabilities in attention, perception memory, concept formation, and problem solving (Kirk & Chalfant, 1984). Heterogeneity exists because of the definitional inconsistencies, administrative/educational conventions and disagreement about etiological factors. However, a characteristic shared by students with learning disabilities, by definition, is the presence of a significant discrepancy between their assessed intellectual ability and their actual achievement (Ontario Ministry of Education, 1986; Hammill, Leigh, McNutt, & Larsen, 1987; Baker, 1982; and Brown & Palincsar, 1982). Torgesen (1977) has suggested that motivational factors and cognitive structures may interact to explain the low academic performance of learning disabled individuals. This analysis is consistent with the views of other researchers (Butkowsky & Willows,

1980; Ryan, Ledger, Short, & Weed, 1982).

An exclusionary factor is included in the definition to separate the learning disabled from slow learners, multi-handicapped, mentally retarded and students who have behavioral problems. However, in practice, the field of learning disabilities has gradually shifted from serving children with neurological difficulties to serving a variety of children with other problems whose only similarity is that they are experiencing difficulty in school (Torgesen, 1986). Chalfant (1989) recommends:

Care must be taken to differentiate children whose problems arise from an unfavorable environment, a mismatch between the educational environment and the individual characteristics of the child, poor teaching, and physical or psychological problems within the child ...Each year increasing numbers of students have been inappropriately identified as learning disabled. It is critical to the future of the field that the population in question be more clearly described and defined in order to differentiate between students with learning disabilities and students whose learning difficulties are due to other handicapping conditions, either within the students or within the educational environment

(p.395).

Torgesen (1982) has argued that many of the students that are identified learning disabled, fail to become actively involved in their own learning process. He proposes that the major learning barrier is that students with learning disabilities have an inactive learning style, rather than ability deficits. As inactive learners, these students lack awareness of their own cognitive processes, and they fail to use efficient, task-appropriate, learning strategies (Wong, 1980). An example is the failure of students with learning disabilities to apply metacognitive strategies to reading comprehension (Wong & Jones, 1982).

Research has indicated that learning disabled students' inability to use appropriate task strategies may be one of the key reasons for their poor academic progress (Brown, 1980; Haines & Torgesen, 1979; Torgesen & Goldman, 1977; and Wong, 1980). As passive learners they demonstrate a lack of fundamental information processing skills such as monitoring their own reading comprehension, re-reading when they fail to comprehend, or failing to read for meaning (Brown, Campione, & Day, 1981; Torgesen & Kail, 1980). Finally, students with learning disabilities have been cited as failing to use organized, goal-directed, cognitive strategies when approaching learning tasks (Torgesen, 1982).

Instruction for Students with Learning Disabilities.

Convincing evidence can be found in the literature that with proper instruction and practice, students with learning disabilities can be taught to become active participants in their own learning. Loper (1982) hypothesizes, "that such training would allow the learning disabled child to unleash critical unused abilities" (p.62).

In the study done by Chan, Cole, and Barfett (1987), 32 learning disabled students and 32 regular class children were matched on reading age and were randomly assigned to a general or specific instruction. The study was designed to investigate the effectiveness of providing explicit instruction in how to use a cross-referencing technique in evaluating internal inconsistency in a passage. In both types of instruction the students were alerted to the presence of embedded test errors. Subjects in the specific instruction condition were given demonstrations of how to monitor text for inconsistency and an explanation of why given sentences were inconsistent. In the general instruction condition, the task of monitoring text for inconsistency was demonstrated without an explanation of why given sentences were inconsistent.

The participants with learning disabilities in the specific instruction condition demonstrated significantly

higher levels of detection, identification, and comprehension performance than their counterparts in the general instruction condition. In contrast, the average readers performed similarly under the specific instruction and general instruction conditions. The students with learning disabilities, demonstrated lower performance levels than their regular class peers in the general instruction condition. The group's performance in the specific instruction condition was superior to that of the regular class subjects in the same condition.

Chan, Cole, and Barfett (1987) demonstrate that the students with learning disabilities exhibited an initial production deficit, but achieved higher levels of comprehension monitoring after receiving explicit instruction in how to apply appropriate strategies.

Bos and Filip (1982) support Torgesen's conceptualization of learning disabled students as inactive learners. Twenty learning disabled and 20 average achieving seventh graders read expository passages. The text included inconsistencies presented under a standard condition and a cued condition, in which students were cued to look for inconsistencies. Results indicated that average students spontaneously activated comprehension monitoring strategies noting the text inconsistencies regardless of the condition. When the learning disabled

students were specifically cued to look for text inconsistencies they were able to activate these strategies and detect the text confusion. These students had the requisite monitoring strategies in their cognitive repertoire, but they failed to apply them spontaneously and appropriately.

Comparable findings have been made by Wong and Jones (1982). Students with learning disabilities from grades eight and nine and normally achieving sixth graders participated. Students were taught a five-step self-questioning strategy to monitor their understanding of important textual units. Training substantially increased learning disabled adolescents' awareness of important textual units, as well as their ability to formulate good questions about target units. The authors further pointed out that the failure of training to enhance the performance of the normal achieving students highlights the inactive nature of the LD student's reading.

Persons with learning disabilities often experience frustration in social, physical and personal, as well as academic areas. A child whose failure to learn is accompanied by significant emotional difficulties, becomes the victim of a cycle of failure and emotional reaction to failure (Lerner, 1976). A perceived inability to overcome failure, resulting from inaccurate attributional patterns

and expectancies is referred to as "learned helplessness" (Hagen, Barclay & Newman, 1982). Persons experiencing learned helplessness are unable to break the cycle of failure and frustration because of the factors to which they attribute the causes of their difficulties.

Attribution Theory. According to Weiner's theory of motivation (1979) causal attributions are critical determinants of future expectancy, persistence, and various affective responses. Diener and Dweck (1978, 1980) propose that students with learning disabilities tend to see their successes and failures as determined by factors beyond their control. "The child who has had difficulty in learning may underestimate his or her abilities, attribute academic outcomes to reasons that are not necessarily accurate and subsequently expect to do poorly in future learning situations" (Hagen, Barclay, & Newman, 1982, p. 23). The students may develop characteristics of the "learned helpless, accepting responsibility for failures but not successes.

Many students with learning disabilities, are characterized by high rates of off-task behaviour, inattentiveness, poor concentration, and a lack of persistence, particularly when faced with difficult tasks. The experience of a large number of academic failures early in their school careers means that these students come to

doubt their intellectual abilities. They subsequently lessen their efforts, particularly when confronted with tasks perceived to be difficult. This increases the likelihood of continued failure which, in turn, strengthens the students' belief in a lack of ability to overcome their difficulties. When students do experience some success they are consequently less likely to take credit for it. Instead, their successes are likely to be attributed to "external" factors such as perceived ease of the task, the teacher's help, or luck (Licht, 1984). According to Attribution Theory the representations of what individuals think, feel, or believe about themselves are among the most powerful regulators of many important behaviours (Markus & Wurf, 1987).

The problems that students attempt to solve, the effort expended, persistence in the face of failure, and the thoughts and feelings experienced while engaging in behaviour are presumed to be determined by percepts of efficacy (Markus & Wurf, 1987). "Self-efficacy is hypothesized to influence choice of activities, effort expended, persistence, and task accomplishments" (Schunk & Cox, 1986, p. 201).

In a study of strategy training and attributional feedback, Schunk and Cox (1986) investigated how verbalization of subtraction with regrouping influenced

learning disabled students' self-efficacy and skillful performance. The manner in which effort-attribitional feedback affected achievement behaviour was also examined. Results showed that continuous verbalization led to higher self-efficacy, and more skillful performance. Providing effort feedback was more effective than not doing so in the promotion of these achievement behaviours. Effort attribution feedback links children's success with increased effort. "Because you worked hard, you got it right". Such feedback can promote students' achievement and positive perceptions of their capabilities and it is especially useful with children having learning problems (Licht & Kistner, 1986).

In a recent investigation, Schunk and Rice (1987) examined the provision of remedial readers with strategies and information designed to improve performance, influence their self-efficacy and develop comprehension skill. In two studies, students were given training to facilitate finding the main idea in prose passages. The results of these studies indicate that providing students with multiple sources of strategy value information can have important effects on their self-efficacy and comprehension skill. As Brown and her colleagues emphasize, cognitive-skills training needs to include instruction and practice in five areas. These are: applying a strategy,

training in self-regulated implementation, monitoring of strategy use, providing information on strategy value, and clarifying the range of tasks to which the strategy can be applied (Baker & Brown, 1984; Brown & DeLoache, 1979; Brown, Campione, & Day, 1981; Brown & Palincsar, 1982). Remedial students are unlikely to benefit significantly from minimal information indicating that strategy use improves performance (Schunk & Rice, 1987).

An individual who has not developed proficiency in basic skills and who has experienced learning difficulties for a significant period of time is likely to have strong negative feelings and beliefs about learning activities. The feelings may include anxiety, fear, frustration, and anger, and are usually accompanied by expectations of failure (Adelman & Taylor, 1985). Motivational factors such as these, can significantly limit the effectiveness of intervention strategies. Care must be taken to ensure optimal success by progressing in small steps, providing effort attribution feedback, and reinforcing the strategy value on a range of tasks to which the strategy can be applied. The student needs to experience success in order that the usefulness of metacognitive training can be realized.

The present investigation anticipated that by explicitly training students with learning disabilities to

incorporating a self-questioning strategy with a novel study, the students' reading comprehension could be enhanced. The self-questioning strategy would encourage Torgesen's "inactive learner" to become involved in his/her own learning.

Motivational factors may affect the degree of success for each student. As many have a poor self-concept, some of the students may feel that they are not able to help themselves. Past experiences with academic failure, perceived lack of ability, or an external control of reinforcements may contribute to a lack of motivation to employ metacognitive strategies. To motivate the student to put in the necessary effort, every attempt will be made to ensure that the student meets with success so that he/she will realize the value of using metacognitive strategies.

The following expectations underlie this study:

1) through explicit teaching, students with learning disabilities can be trained to employ self-questioning learning strategies to identify main ideas of a reading passage;

2) reading comprehension will be enhanced through metacognitive training as measured by:

- a) Miscue Analysis,
- b) Comprehension subtest of Canadian Tests

of Basic Skills, Form 3 and 4.

c) Comprehension subtest of Gates-MacGinitie Reading Test, Form 1 and 2,

3) students whose control of reinforcements is external, as measured by the Intellectual Achievement Responsibility Questionnaire, will experience more difficulty using an intervention strategy.

In the next chapter the design of the study will be discussed.

CHAPTER 3

Design of the Study

Included in this chapter is a description of the participants, the research design and the measures used in gathering the data.

Participants

The participants of this study were 20 members of three selected intact classes from three different schools operated by the Lakehead Board of Education, Thunder Bay, Ontario. The three classes received similar instruction during the intervention sessions at their home schools. These students have been identified as learning disabled according to the definition and general procedures outlined by the Ontario Ministry of Education (1984). A student is identified as learning disabled according to the following criteria:

- on an individual intelligence test, administered by qualified person, has at least average ability on one of the scales and shows evidence of a severe learning disability, and
- exhibits a significant discrepancy between expected achievement and actual academic

achievement as measured by an individual standardized test, and shows no evidence of other primary handicapping conditions...(Lakehead Board of Education, Section 2.5)

The Lakehead Board of Education operates three learning disabled classes at the Grade 6, 7, and 8 level. Participants were enrolled in these three segregated classes but were integrated into regular classes for many of their subjects.

After reading and discussing the proposal of the study, the classroom teacher decided whom would participate in the study. The selection of the students was left to the professional discretion of the classroom teacher as it was felt that the teacher knew what was best for the students. The rationale for excluding students was not questioned by the researcher. Using this criteria, twenty students were included in the study from a possible population of 34.

The research was conducted during a novel study which was considered to be part of the student's regular program in the segregated class. The results and information gathered were used simply to promote learning. For this reason no special parental permission was sought or deemed necessary by the schools' principals.

Mean chronological age was 14 years 2 months, SD=8.6

months, and range 12 years 7 months to 15 years 3 months. Ten students were enrolled in Grade 8, six in Grade 7, and 4 in Grade 6. Seventeen boys, and three girls participated in the study.

Most of the students (72%) lived in the city while the rest were rural residents. Most students were bussed to school.

Eighteen participants reported having siblings; one boy had a sibling also identified as learning disabled. The mean period of time since students have been identified as learning disabled is 1.97 years. Associated reported factors included allergies (5 students) and a speech problem (1 student).

Expectations

The following expectations underlie this study:

1) through explicit teaching, students with learning disabilities can be trained to employ self-questioning learning strategies to identify main ideas of a reading passage;

2) reading comprehension will be enhanced through metacognitive training as measured by:

- a) Miscue Analysis,
- b) Comprehension subtest of Canadian Tests of Basic Skills, Form 3 and 4.
- c) Comprehension subtest of Gates-MacGinitie

Reading Test, Form 1 and 2,

3) students whose control of reinforcements is external as measured by the Intellectual Achievement Responsibility Questionnaire, will experience more difficulty using an intervention strategy.

Method

Table 3-1 outlines the research design.

Table 3-1

	Design
<u>Pretest</u>	<u>Instruments/Measures</u> Gates-MacGinitie, Form 1 Comprehension - CTBS, Form 4 Miscue Analysis (Goodman, 1973) Group Interview Intellectual Achievement Questionnaire (IAR)
<u>Instructional Intervention</u>	<u>Procedures</u> Self-questioning training (Wong, Meichenbaum, Palinscar) Observation Ongoing Miscue Analysis
<u>Posttest</u>	<u>Instruments/Measures</u> Miscue Analysis Gates-MacGinitie, Form 2 Comprehension - CTBS Individual Interview

The one-group pretest-posttest design was used in this study. It involves three steps:

1) the administration of a pretest measure of the dependent variable;

2) the application of the experimental treatment

(independent variable);

3) administration of a posttest measuring the dependent variable again. Pretest and posttest scores are then compared to determine the effectiveness of the intervention strategy (Borg & Gall, 1983).

Semel and Wiig (1981) used this design to assess the effectiveness of an intervention strategy, Semel Auditory Processing Program (SAPP), with a group of learning disabled individuals. No control group was used because the school system did not permit differential services to children in the system. To offset this limitation, standardized and age referenced tests were used as pre- and post-training measures. The standardized samples were considered to be a substitute for a control group. The gains of the experimental group could be evaluated against estimated gains under normal nonexperimental conditions although children with learning disabilities would not be expected to make gains at the rate expected for non LD children.

As a pretest measure all participants were administered the appropriate level of Gates-MacGinitie Reading Test, Form 1 (1979) and the Comprehension Subtest of Canadian Tests of Basic Skills, Form 4 (1975). Both of the tests have parallel forms that can be used as a posttest measure. The CTBS raw scores are converted to

grade scores to compare pre and posttest scores. As posttests the Gates-MacGinitie Reading Test, Form 2 and the Comprehension Subtest of Canadian Tests of Basic Skills, Form 3, were administered to all participants.

Instruments

Gates-MacGinitie Reading Test. The Gates-MacGinitie Reading Test was selected because the Special Education Assessment Matrix (Lambert, 1981) commended this test as a device that is useful for screening and evaluating student progress. Also, it was recommended for ease of administering and scoring. Alternate-form reliability coefficients ranged from .81 to .89 for the comprehension subtest of Surveys D and E (parallel forms of the same test) for grades 4 to 8. The alternate-form reliability coefficient takes into account variations in a student's performance from one day to another and variations in the content of the test from one form to another. Concurrent validity coefficients for the correlation Survey D at grade five with four other standardized reading tests were .78 for Vocabulary and .80 for Comprehension (Gates, Kamons, Kowalski, MacGinitie & McKay, 1979). The Comprehension Test measures the student's ability to read complete prose passages with understanding. It contains 21 passages in which a total of 52 blank spaces have been introduced. For each blank space the student must decide which one of the

five completions best conforms to the meaning of the whole passage. The passages become increasingly difficult.

Canadian Tests of Basic Skills. The Canadian Tests of Basic Skills have been adapted from test materials which were originally designed by the staff of the College of Education at the University of Iowa. The Canadian project, started in the early 1960's, was normed for the Canadian population. King and Hieronymus (1975) report a split-half reliability of 0.92 for the Reading Comprehension subtest of the Canadian Basic Skills battery. As well, this test was selected for ease of administration and reliability.

The Canadian Test of Basic Skills (CTBS) selections vary in length from a few sentences to half a page. Each passage is followed by multiple choice questions designed to evaluate the pupil's grasp of the author's meaning, the significance of the ideas presented, and the ability to draw accurate conclusions. Students are required to answer 73 items in 55 minutes.

Intellectual Achievement Responsibility Questionnaire. Later, each student completed the Intellectual Achievement Responsibility Questionnaire (Appendix B) to ascertain the students' beliefs in their own control of reinforcements (Crandall, Katkovsky, & Crandall, 1965). Because this instrument was administered after the intervention sessions

started, there is no way of knowing if the training influenced the students' response to any of the questions.

The Intellectual Achievement Responsibility (IAR) Questionnaire attempts to measure beliefs in internal versus external reinforcement responsibility. It is aimed at assessing children's beliefs in reinforcement responsibility exclusively in intellectual-academic achievement situations. The student's IAR scale is composed of 34 forced-choice items which describe either positive or negative achievement. The IAR was constructed to give a total "I" (internal or self-) responsibility, and subscores for beliefs in internal responsibility for success (I+) and failure (I-). The scale was designed to sample an equal number of positive and negative events. For scoring and interpretation see Appendix B.

Test-retest reliability coefficients are .65 for total .47 for I+, and .69 for I- for 70 ninth-grade students. For younger children in grades 3, 4, and 5, the test-retest coefficient are .69 for the total I, .66 for I+, and .74 for I- (Crandall, Katkovsky, & Crandall, 1965). No significant sex differences were found for scale scores at the age levels reported. Split-half reliabilities are adequate for research purposes. For a random sample of 130 of the younger children, the correlation was .54 for I+ and .57 for I- after correction with the Spearman-Brown

Prophecy Formula. Similarly the correlations were .60 for both the I+ and I- subscores for a random sample of older children. The standard deviations, means and ranges for the IAR are given in Appendix J.

Qualitative Measures

It is important to discover how the participants think and feel about themselves, as well as observing the participants in the learning situation. For these reasons, qualitative data were also included in the study.

Interview. To complement test results, the participants were interviewed first in a group situation during the intervention sessions, and later individually.

In the group situation, an imaginary other, who has difficulty with reading comprehension, is used (Astor-Dubin et al, 1979). Students were requested to offer suggestions to help "Larry" with his problem (Appendix C). A transcript of one group interview is contained in Appendix D. Data were compiled on the following areas: feelings of being unable to comprehend what is read; awareness of coping strategies; and perceptions about learning disabilities. At the completion of all posttests, students were interviewed individually (Appendix A) to acquire background information about how long the students have been in a specialized class; and to determine the student's perceptions of learning difficulties, strengths, and the

effectiveness of the intervention training.

Observation. During the intervention sessions, the students were observed to ascertain if they were employing self-questioning techniques to monitor their own comprehension. Also, miscues were analyzed to determine if reading comprehension was improving.

Miscue Analysis. Miscue research involves a comparison of words appearing in the text with what the reader orally produces. Analysis of miscues provides information concerning the reader's strategies in processing language as he/she reads (Page, 1972). Assuming that the purpose of reading is comprehension or reconstructing meaning, miscue analysis shows that some conventionally identified oral reading errors are functionally acceptable.

Reading Miscue is a tool which can serve a variety of purposes. From the analysis of the miscues the following implications are generated:

1. Miscues which do not disrupt meaning help readers understand as they read. These are called high level miscues and suggest the readers are using proficient reading strategies.
2. Miscues which result in semantically acceptable sentences are high level miscues and suggest the readers are using proficient reading strategies.

3. Miscues which result in semantically unacceptable sentences but are self corrected reflect proficient use of reading strategies.

4. High level miscues and proficient use of reading strategies indicate that the readers are proficient in predicting as they read, and in confirming or disconfirming their predictions. They also imply that readers are comprehending as they read.

5. Miscues which disrupt meaning or are semantically unacceptable indicate that readers are inefficient and ineffective in their use of reading strategies (predicting, confirming, comprehending) such miscues are termed low level miscues (Goodman & Burke, 1972).

Beebe's (1980) research supports Goodman and Burke's model. She found that while substitution miscues generally detracted from comprehension, not all substitutions detracted equally. When each substitutions was coded into one of three categories: corrections; syntactically-semantically acceptable miscues; or syntactically-semantically unacceptable miscues, it was found that corrected and acceptable miscues added to the understanding of the passage. Only unacceptable miscues detracted from understanding. Further, it was found that the corrections and acceptable miscues were important common predictors of reading comprehension and retelling

ability.

Because miscue analysis measures comprehension, it is one indicator of the effectiveness of the training task. Improvement in reading comprehension, as measured by miscue analysis, is task specific. Students with learning disabilities, even when they have been taught a specific strategy, may fail to use this strategy in other situations. The task of transfer is therefore very important and the standardized measures used as posttests provide a better index of the intervention training procedure in situations where transfer of learning must take place.

Procedures

Pretesting. All tests and assessment procedures were carried out by the investigator. Administration of pretest and interviewing of students took one hour on each of two days. On the first day, the Gates-MacGinitie was given. The following day the Comprehension Subset of Canadian Tests of Basic Skills was administered. During a 20 minute session a group interview was conducted.

Instructional Sessions. The self-questioning techniques were developed while reading Hunter in the Dark by M. Hughes. This book was selected because of the Canadian content, high interest, low vocabulary nature of the book. Also, this book was winner of the 1983 Canada

Council Children's Literature Prize. Using the Lorge Formula (1973) for estimating difficulty of reading material Hunter in the Dark averages to be at a Grade 5.4 level.

A training procedure designed to foster comprehension was developed by Wong and Jones (1982) and employed with some adaptations in the present study. Participants used the following questions to monitor comprehension:

1. What are you studying this passage for? (So you can answer some questions you will be given later.)
2. Find the main idea/ideas in the paragraph and underline it/them.
3. Think of a question about the main idea you have underlined. Remember what a good question should be like. (Look at the prompt.)
4. Learn the answer to your question.
5. Always look back at the questions and answers to see how each successive question and answer provide you with more information (p. 231)

Initially, the responsibility for modelling the correct procedure was assumed by the researcher. After a week's instruction, the students followed the procedure, assuming more responsibility for their own learning. The self-instructional training regimen included the following

procedural steps:

1. An adult model performs a task while talking to him/herself out loud (cognitive modelling).
2. The child performs the same task under the direction of the model's instructions (overt, external guidance).
3. The child performs the task while instructing him/herself aloud (overt self-guidance).
4. The child whispers the instructions to him/herself as he goes through the task (faded, overt self-guidance).
5. The child performs the task while guiding his/her performance via inaudible or private speech or nonverbal self-direction (covert self-instruction) (Meichenbaum 1986, p.351).

Meichenbaum's self-instructional procedure and Wong's self-questioning training were adapted to employ a reciprocal teaching technique developed by Palincsar (1987). The self-questioning technique was modelled by the researcher. A chart illustrating good questions was on display where the students could easily refer to it. Gradually the students assumed more and more responsibility for their own learning over a six week period. They were encouraged to assume the role of teacher under the guidance of the researcher. The "teacher" directed the discussion

and asked questions to clarify, predict, and summarize the text.

The group was observed to determine the degree to which the metacognitive skills were being employed and the quality of questions asked. The training session took approximately 6 weeks. In two of the schools, training sessions took place for 30 minutes per day, five days a week. To accommodate the timetable, training sessions in one of the schools included 40 minutes four days a week. There were unavoidable interruptions (for example, track and field, and play days) during the training sessions. However these interruptions which are common during the month of June, did not compromise the duration and intensity of training. At completion of the sessions each group had the same amount of training time.

Posttesting. All participants completed Gates-MacGinitie Reading Test, Form 2, followed by the Comprehension Subtest of Canadian Basic Skills, Form 3, the next day. There was a follow-up individual interview, as well. The tests and interview took two hours of the participant's time to complete.

The investigator conducted all testing, teaching and interviewing.

The results of the study will be given in Chapter 4.

CHAPTER 4

Results

The purpose of this study was to investigate the effectiveness of using a metacognitive skill-self-questioning strategies to enhance reading comprehension for the learning disabled. It was anticipated:

1) through explicit teaching, students with learning disabilities can be trained to employ self-questioning learning strategies to identify main ideas of a reading passage;

2) reading comprehension will be enhanced through metacognitive training and measured by:

- a) Miscue Analysis,
- b) Canadian Tests of Basic Skills,
Form 3 and 4
- c) Gates-MacGinitie Reading Test,
Form 1 and 2,

3) students whose belief in their own control of reinforcements is external as measured by the Intellectual Achievement Responsibility Questionnaire, will experience more difficulty using an intervention strategy.

The findings are reported in relation to 5 variables:

- a) reading comprehension gain as measured by miscue analysis;
- b) reading comprehension gain as measured by Gates-MacGinitie;
- c) reading comprehension gain as measured by Canadian Tests of Basic Skills; and
- d) effects of students' beliefs in their own control of reinforcements, as indicated by the relationship between IAR scores and scores from:
 - i) Miscue Analysis,
 - ii) Canadian Tests of Basic Skills, Form 3 and 4,
 - iii) Gates-MacGinitie Reading Test, Form 1 and 2.
- e) perceived effectiveness of the training sessions as indicated by the individual interview and observation, during the training sessions.

Comprehension Gain

Comprehension gain is the difference between the pretest and posttest scores, or in the case of miscue analysis, the early and late scores.

Miscue Analysis. Goodman and Burke's Reading Miscue Inventory (RMI) may be used to generate three comprehension patterns:

- 1) no loss,
- 2) partial loss, and

3) loss of comprehension (Appendix E). Percentages were computed to determine comprehension as measured by Miscue Analysis. Ideally, the "no loss" percentages should be higher after the intervention sessions, indicating a greater understanding of the passage being read.

Several samples from the beginning of the novel were analyzed and averaged to give a pre score for each student. A post score was calculated by employing the same procedure on the last pages of the novel. Scores included no loss, partial loss, and loss of comprehension. Percentage are provided in (Appendix F). A t-test was conducted to determine whether there was a significant difference between mean scores of early and late scores (Table 4-1). The results of the t-test for "no comprehension loss" and "comprehension loss" are significant.

Table 4-1

Means, SD, t-Values and p for Miscue Analysis

	Early Scores		Late Scores		t	p
	M	SD	M	SD		
No Loss	30.4	16.67	47.3	21.33	3.988	.01
Partial Loss	22.9	14.21	19.6	13.06	-.616	N.S.
Loss	46.5	19.13	33.9	17.73	-3.382	.01

2. Canadian Tests of Basic Skills. Grade equivalents of the tests are illustrated by Figure 4.1 and are reported in Appendix G. The difference of pre and posttest scores of Canadian Tests of Basic Skills was 1.575 (Table 4-2).

Figure 4-1

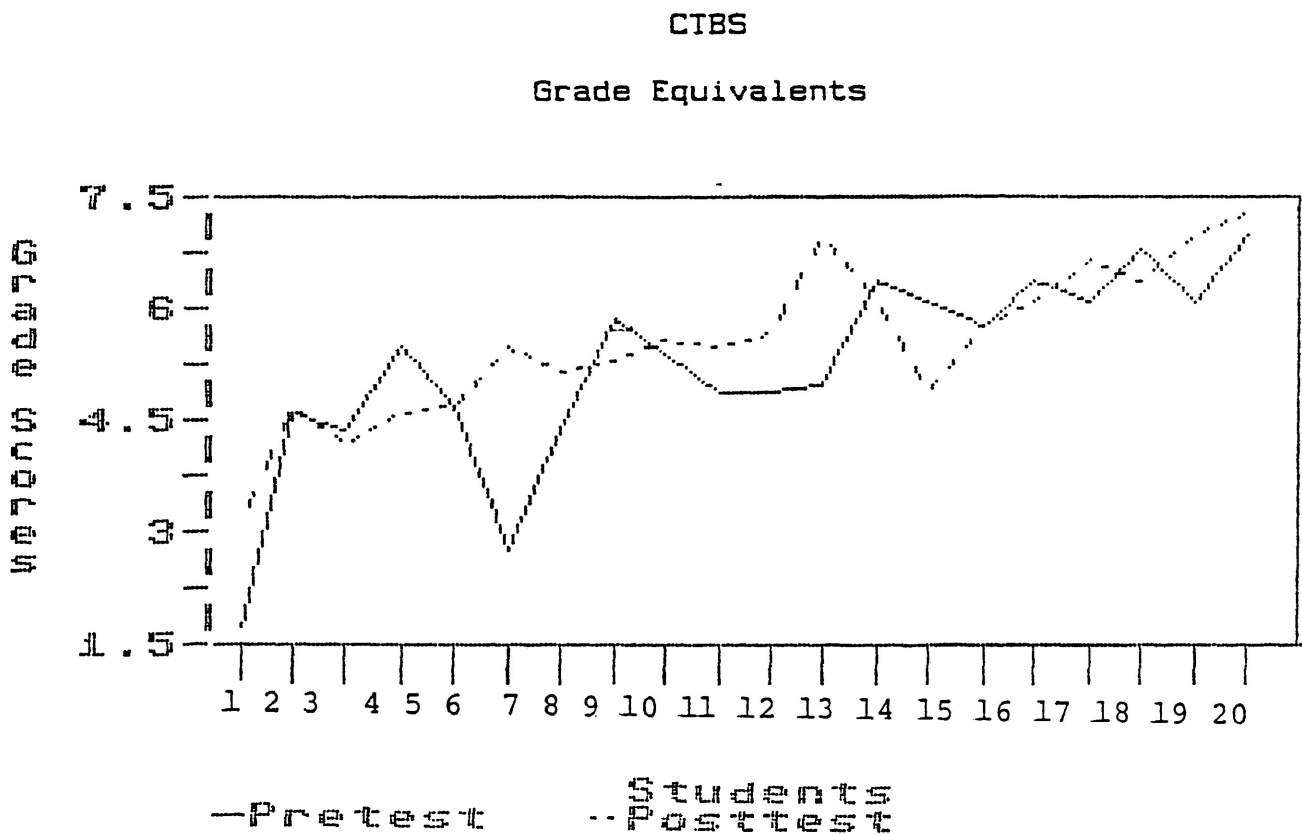


Table 4-2

Means, SD, t-Values and p for CTBS						
CTBS	Pretest		Posttest		t	p
	M	SD	M	SD		
	5.25	1.271	5.545	1.034	1.575	N.S.

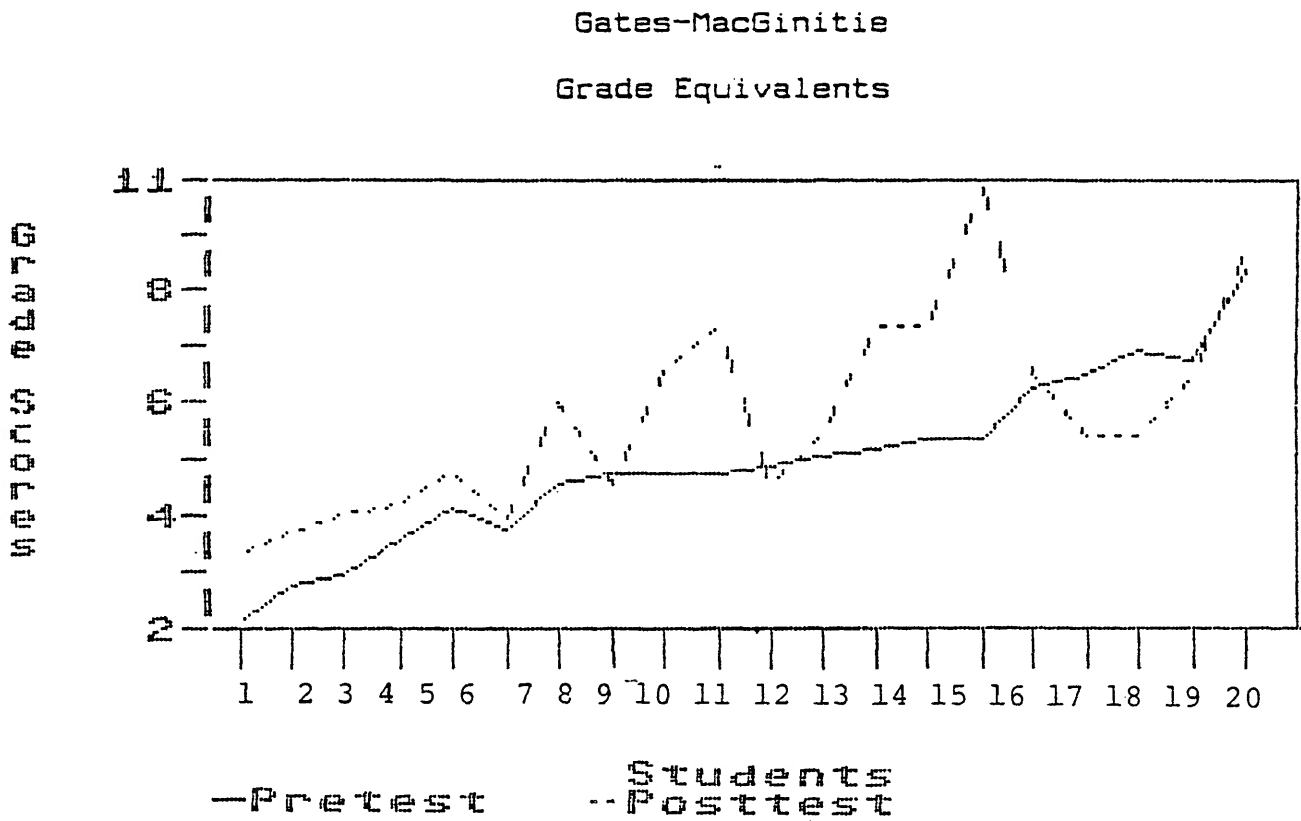
Overall, the CTBS scores showed a gain from pre to post scores, as anticipated, however the difference failed to achieve significance. Therefore the expectation that reading comprehension as measured by CTBS would be enhanced, was not confirmed.

3. Gates-MacGinitie. Test scores are provided in Appendix H and illustrated in Figure 4-2. The t-test for the difference between pre and posttest mean scores for Gates MacGinitie (Table 4-6) was 2.72. The difference was significant at the .05 level.

Table 4-3

Means, SD, t-Values, and p for Gates-MacGinitie						
	Pretest		Posttest		t	p
	M	SD	M	SD		
	5.335	1.677	6.28	1.934	2.72	.05

Figure 4-2



The results indicate that learning disabled participants' reading comprehension improved subsequent to training in metacognitive strategies.

Students' Belief in Their Own Control of Reinforcements

Scores for IAR are reported in Appendix I. A high score implies a perceived internal control of reinforcements; a belief that the individual, rather than other people, is responsible for their intellectual-academic successes and failures. Low scores

suggests a perceived external control of reinforcements; a belief that the individual has little control over rewards or punishments received. Because these students do not take responsibility for their actions they have little reason to modify their behaviour. For this reason, one of the expectations of this study was that students whose perceived control is external as measured by the Intellectual Achievement Responsibility Questionnaire, will experience more difficulty using an intervention strategy, thus resulting in depressed achievement.

The mean I score (Table 4-4) of the learning disabled students was lower than normal achieving students, indicating less internality than the norms (Appendix J).

Table 4-4

	Means and SD of IAR Scores		
	<u>I+</u>	<u>I-</u>	<u>Total I</u>
Mean	12.7	11.5	24.2
SD	2.00	2.80	3.90

Correlations between IAR scores and measures of academic achievement were investigated. Academic achievement was indicated by gain scores from: Miscue Analysis, Canadian Tests of Basic Skills, Form 3 and 4, and Gates-MacGinitie Reading Test, Form 1 and 2.

Table 4-5

	Correlations between		
	Reading Comprehension and IAR Scores		
		Gates	Miscues
	<u>CTBS</u>	<u>MacGinitie</u>	<u>No Loss</u>
IAR scores	-0.244	0.202	0.413*

*significant at .05 level

The correlations (Table 4-5) are -0.244 (CTBS) and 0.202 (Gates-MacGinitie) for this study, suggesting for these measures internal validity is not a predictor of success. However, the correlation for "no comprehension loss" (miscue analysis) is at the significant level.

Learned Helplessness. Learned helplessness occurs when one believes that outcome has little or nothing to do with effort - with or without effort the result is the same. Consequently, this belief can lead to behavior that is characterized by lack of persistence (Dudley-Marling, et al., 1982).

A subset (10 items) of the questions on the Intellectual Achievement Responsibility (IAR) questionnaire indicates the child's attributions of failure to lack of effort, that is the child thinks he/she failed because he/she didn't try hard enough.

Similar to a procedure developed by Diener & Dweck (1978), participants were divided at the mean into two

groups: those scoring 6 and below on the effort items were placed in the helpless group; and subjects scoring 7 and above were designed as mastery-oriented. Scores of the effort items and gain scores on CTBS, Gates-MacGinitie, and Miscue Analysis were compared using coefficients correlations. Correlations between no loss miscues and learned helplessness were statistically significant. No other significant relationships were observed. In this study learned helplessness, as measured by the IAR questionnaire was not an indicator of academic achievement.

Table 4-6

Correlations between				
Learned Helplessness and Reading Comprehension				
LH	Miscue Analysis		Gates	CTBS
	No Loss	Loss	MacGinitie	
	0.423*	-0.228	0.114	-0.145

*significant at .05 level

Qualitative Analysis

Individual Interview. Buchanan and Wolf (1986) report that students with learning disabilities often have inaccurate perceptions of their strengths and weaknesses, and have little understanding of the nature of their learning disabilities. Interviews with participants in the present study indicated, 53% of the students declared reading a learning problem; 29% mentioned other academic

areas (spelling, math, writing); and 18% didn't know what their learning problem was. When asked in what area they excelled 62.5% reported non-academic subjects (e.g. sports, fishing, computers). Other stated areas of excellence included reading, history, spelling and geography.

Observation.

Reading behaviours - At first the students were hesitant to read orally ("I don't like to read." "I can't read this. I make too many mistakes.") Miscue analysis was explained to the students emphasizing that many miscues were acceptable and corrections were important predictors of reading comprehension (Goodman & Burke, 1972). As time progressed most of the students wanted to read and expressed surprise at the words they were able to decode. ("Wow! I can't believe how well I'm reading.")

As some of the students were reading they frequently lost their spot, skipping over words or missing complete lines of the text. The use of a guide held below the line of the text being read helped correct this problem. One boy read with the book upside down as well as he read with the book right side up.

One of the boys, "Ryan", who scored at the 2.2 (Gates MacGinitie) grade level took a long time reading and made many decoding errors. [It took him five minutes to read a 117 word passage.] He could be heard and seen sounding out

words under his breath. When help was offered by a peer he replied, "I don't want anyone to help." He was impatient with others. "You might as well read then, if you're going to help me." "Would you be quiet Tom?" [Tom was hitting his shoe while Ryan was trying to sound out a word.] In spite of his difficulties he wanted to read each day. [Given the slow, laboured oral reading, Ryan's group was very supportive of his efforts, sitting quietly as Ryan laboured.] The tests indicate that he made a 1.3 (Gates MacGinitie) and 1.4 (CTBS) comprehension gain.

Another boy; "Alex", didn't want to be part of the research. "I feel like a guinea pig." "I want to go now. John [teacher of the day], dismiss the class early." "I don't like this [as the researcher was taking notes.] I feel like I'm on display." "I don't see how this is going to help me with my reading." Alex missed 11 of the 30 training sessions. He experienced a net decrease in reading comprehension. His score went from 5.1 to 4.5 (Gates macGinitie) and 5.9 to 5.3 (CTBS).

Self-questioning - To encourage students to use a self-questioning strategy, each student assumed the role of teacher, using a reciprocal teaching technique. Most questions were for clarification. ("What did he mean by covering up his back trail?" "What is a R.U?" "That's the author saying that - isn't it?" "What's he talking about?"

"What is a deadfall?")

Also, many "why" questions were asked. ("Why might he feel guilty?" "Why did he take sugar?" "Why did he leave?" "Why did Doug stop calling Mike?" "Why didn't he built a bridge or raft or something?")

The results of this study will be interpreted in the next chapter.

CHAPTER 5

Discussion and Conclusions

Positive Effects of MetacognitiveTraining on Reading Comprehension

Miscue Analysis. Examination of miscues made by the students indicated improvement in reading comprehension. The level of miscues confirm that students' comprehension can be improved using a self-questioning metacognitive strategy.

"Miscue research has led us away from a word focus to a comprehension focus" (Goodman, 1973, p.8). When a reader's miscues are analyzed, that person's preoccupation with meaning will be demonstrated in his/her miscues . because they tend to produce language which still makes sense. The comprehension score, expressed as a percentage of the total miscues made, is a measure of the quality of the reader's miscues (Appendix F). The emphasis is on getting meaning from print, rather than the frequency of errors made. Miscue analysis helps the teacher to gain insights into the ways in which the reader processes language as he or she interacts with print. The reader is viewed as a user of language attempting to make sense out of the information on the printed page. Frequent

questioning by the reciprocal teacher encouraged interaction of thoughts, ideas, and related personal experiences.

From the onset of the training sessions it was essential to set an atmosphere of acceptance. "Put-downs" of self or others were not tolerated. The investigator read to the students to model the process and illustrate the different level of miscues. The participant soon realized that the emphasis was placed on understanding the written word rather than counting errors. Monitoring his or her state of comprehension through self-questioning, the student was made aware of strategic behaviours that can result in successful comprehension. In this study, miscue analysis demonstrated that real improvement in reading comprehension took place.

Transfer of Learning. Metacognition is a broad construct whose definition suggests that metacognitive training will result in learning that will generalize to different situations. Indeed, Brown (1978) has suggested that one criterion for effective strategy training is the transfer of that strategy to tasks other than the training tasks. Students with learning disabilities who are trained in a metacognitive strategy that incorporates transfer principles should demonstrate higher levels of academic achievement. This is because the students can establish

their own internal criteria for learning, monitor their own progress in terms of these criteria, and act to satisfy their goals as readers (Hall, 1989).

Dissimilarities between the standardized tests could account for the differences in improvement. However in both tests, gains in comprehension demonstrated transfer of learning. As both the task and materials had changed, the students had to transfer their learning to a new situation. Tests of transfer to new materials are the most stringent measure of training effectiveness (Campione & Brown, 1977). As Wong states, "After all, if the benefits of self-questioning instruction cannot be maintained across time or transferred to similar prose despite adequate methodology, we should seriously consider abandoning this instructional strategy in research and in practice" (1985, p.245).

Gates-MacGinitie Reading Test. Significant gains were shown on the comprehension posttest scores of Gates-MacGinitie Test. The correct answers are to be selected from five alternate possibilities and written on the same sheet of paper. Students do not have to transfer from one sheet to another. The subtest is timed but abundant time is provided for most children to complete all of the passages. As students had adequate time to complete the test, time allotment did not interfere with learning.

For these reasons the Gates-MacGinitie Reading Test is considered more valid and special education teachers are advised to use it rather than Canadian Tests of Basic Skills.

CTBS. Reading comprehension as measured by CTBS indicated some improvement, however not at a statistically significant level. There are several possible reasons for this.

CTBS has a separate answer sheet. Students are required to fill in the correct corresponding dot to the question asked in the booklet. This activity increases the difficulty of the task, especially for students with learning disabilities. Students must be able to transfer the information correctly and monitor if they are filling in the proper place. Empirical evidence suggests that transfer is difficult, even for normal achieving students. Even though this is a constant factor for both pre and posttest scores, problems with transfer of information are compounded for students with learning problems.

Another possible reason for depressed achievement scores of CTBS is the time taken to complete the comprehension subtest and the length of the test passages. (One passage was 443 words.) Comments like, "Do we have to do the whole thing?", "I can't read all this!", were heard when the CTBS was administered. Students perceived that

the long passages would be more difficult. For students with a short term memory problem the lengthy passage would be more difficult.

Many (55%) of the students were unable to complete the test in the allotted time. Wong (1985) comments that by imposing a time limit on students, one has inadvertently increased the difficulty of the task demands. Students have not only to process the tasks, but have to do it quickly and efficiently. The cognitive demands of understanding a lengthy passage and generating questions are such that students run out of processing time. Until self-questioning becomes automatic, it actually takes longer to read a passage. Consequently, the student may fail to show improvement from the self-questioning training. Students should have been given sufficient processing time to complete the test. In her critique of CTBS, Gallivan (1985) suggests "adjustments in instructions or time limits may be introduced for students in special education settings, but these must be taken into account in interpretation of results" (p. 129).

It is more important to examine whether the students can comprehend rather than how long it takes to complete the task. In retrospect, extra time should have been given to allow all students time to complete both the pre and posttests. These criticisms call the validity of the CTBS

for this population into question.

Negative Effects of Perceived External Control of Reinforcements

Attribution theory implies that learning disabled students tend to see their successes and failures as caused by factors beyond their control (Diener & Dweck, 1978, 1980). "My brother ruined it for me. I'm tarred with the same brush." This comment was made by a student who was explaining why he was in a learning disabled class.

In the present investigation, however, results of the Intellectual Achievement Responsibility Questionnaire which purports to measure students' beliefs in their own control of reinforcements, indicates little relationship between gain scores (differences between pre and post scores) and total I scores.

There may be several reasons for this. The instrument may not have been sensitive enough (i.e. lack validity) in evaluating an individual's perceived control of intellectual-achievement outcomes. Also, the IAR scale asks a number of hypothetical questions. There may be a difference between situational measures and attributional tendencies (Cooley & Ayres, 1988). In other words, when the students are actually in a given situation they may well respond differently than what they say they would. Some of the questions may be beyond their experiences and

some of the given answers represent the way that students may well wish to behave.

Students with learning disabilities often have little understanding of the nature of their learning disabilities, and how these disabilities affect their lives (Buchanan and Wolf, 1986). During the personal interview, most of the students stated their learning problem involved reading, but several were unsure about the nature of their learning problems. When asked to identify areas in which the individual excelled, several students replied, "I'm not sure", or "I don't know"; when encouraged further to respond most mentioned non-academic activities.

Dudley-Marling, et al. (1982) suggest:

Some learning disabled children who retain a positive sense of competence may do so because success in areas other than an academic one weaken the stability of the ability factor...A child's prowess in gym class may encourage a healthier perspective from which to view [his/her] inadequacies in reading class...Emphasizing the real abilities learning disabled children possess should serve to weaken the ability factor and encourage generalization (p. 509).

Some of the students saw themselves as lacking

ability, a stable uncontrollable attribution (Covington, Spratt & Omelick, 1980). One student commented to another, "David, you're always putting yourself down...no one else is." This perception is linked to "learned helplessness", a maladaptive behaviour pattern in which students who repeatedly encounter failure become inactive learners and view themselves as failures in academic contexts (Diener & Dweck, 1978). Many students exhibited the signs of learned helplessness with comments like, "I'm just a dumb LD", "We wouldn't be in this class if we weren't dumb", "I don't know what to do - just mark it wrong", and "You try not to worry about it [not being able to do the work], but it's always there. No matter how hard you try - you fail". These personal beliefs could be important determiners of the reinforcing effects of many experiences. If, for example, the individual is convinced that she/he has little control over the rewards or punishments received, then there is little reason to modify behaviour. In the group interview when the participants were asked what advice they might give Larry, one student commented, "Don't read no more." Another student responded, "Drop out of school." Comments like these clearly indicate that the students feel they are out of control and avoidance is the best solution.

With perceptions such as these, probably more extensive training would be effective. If skills can be

divided into small steps that enable the learner to be successful, the students can realize that effort is an important ingredient to success. Encouragement and positive feedback are important if students are to become self-confident and responsible for their own behaviour and focus on monitoring their own comprehension. Situations must be devised that require effort but also ensure the possibility of success. For example, the reciprocal teacher, as well as the other participants must attend to the reading and be prepared to ask questions. The questions asked may request an opinion, predict an outcome or clarify. In all cases there should be lots of interaction and discussion. Look back strategies are encouraged when there is a dispute and immediate feedback is incorporated into this method.

During the intervention period, it became apparent that students must realize effort will result in success. The relationship between "no loss comprehension miscues" and "I-", "total I" and "learned helplessness" suggests that the students who produced a higher percentage of "no loss miscues" were those who became actively involved in their own learning and made the necessary effort to improve their reading comprehension. At the end of the study, one student commented, "I'm not dumb. I have the ability - I just have to work hard."

Although the qualitative observations support the study's expectations, the possibility that the investigator has recorded comments consistent with this interpretation because of personal involvement in the study must be recognized.

Design Limitations

Several limitations for the present study are recognized:

1. The sample is small because of limited availability of adolescents identified with learning disabilities in Thunder Bay. Generalizability of the findings is consequently limited.

2. The study did not employ a control group, and therefore should be considered a quasi-experiment.

3. Self-reporting is used in both interviews and IAR questionnaire. These methods are valid to the extent that self-perceptions are accurate and that participants are willing to report them honestly.

4. This investigation is limited by the validity of the IAR, Gates-MacGinitie Reading Test and CTBS for a specialized population such as adolescents with learning disabilities. All of these measures were normed using the general population. The CTBS was standardized to represent the Canadian school aged population and is used in many of the schools in Thunder Bay although it is not used to

diagnose learning disabilities.

The IAR was constructed specifically to measure the students' beliefs in their own control of reinforcements in scholastic rather than social situations. For example, a typical item reads "When you do well on a test at school, is it usually a) because you studied for it, or b) because the test was especially easy?" Because of this and its employment in other studies of students with learning disabilities it was used in determining the relationship between perceived internal-external control and academic success.

5. Bias in the perceptions of the investigator may have contributed to the recording of comments that support the study's expectations. However, it must be noted that all the comments were recorded before administration of the posttest, at a time when the results were not known to the investigator.

6. The training sessions should have been longer for many of the students, to ensure that the strategy became automatic before administering the posttest. Some of the students needed more time to practise the metacognitive strategies.

7. Empirical evidence suggests that the last weeks of the school year are not as productive for learning as are earlier periods. This is the period of time in which the

investigation took place. Nice weather and thoughts of summer vacation make it more difficult to get students to work.

8. Two of the students were reading above grade level. Being effective readers they should have been excluded from the study, however, their presence illustrates the heterogeneous grouping of students and inadequacies in the identification process. Research in learning disabilities is limited because of the diverse characteristics of students identified with learning disabilities.

Instructional Implications Emerging From the Study

Small group remedial reading instruction is widely employed in schools, and strategy training can easily be incorporated into regular comprehension instruction. The emphasis should be on "how" to learn rather than "what" to learn. For example, instead of asking students "What is the main idea of the story?" ask "How did you determine the main idea of the story."

The fact that students with learning disabilities often adopt counterproductive beliefs and expectations creates special challenges for planning suitable instruction. Feedback regarding effective expenditure of effort might be especially beneficial for students with learning disabilities, who often do not place sufficient emphasis on effort as a necessary condition for success.

Because of the apparent connection between motivational orientation and metacognitive development, students with learning disabilities should be taught not only the cognitive strategies needed to improve task performance but also how they can control achievement outcomes through their own efforts and abilities.

Reciprocal teaching is an effective way of incorporating self-questioning strategies for instruction of students with learning disabilities. The results of the reciprocal teaching programme employed in the present study indicate that with guided practice and continuous feedback students are able to maintain independent use of the strategies and show improvement on some measures of reading comprehension, as well as improvement in classroom performance. Skill acquisition is not complete until skills can be performed quickly and accurately in several different situations. To ensure automaticity, the teacher should provide opportunities for supervised practice. To encourage generalization, practice should occur in multiple situations. This metacognitive strategy must be integrated into the total programme.

With the demand and limited resources that a classroom teacher has to help students with learning problems, this metacognitive strategy would appear to be an inexpensive and efficient means to enhance students' comprehension

performance. Instructional practices such as reciprocal teaching and self-questioning, require a refocusing of attitudes toward teaching and learning with the teacher after relinquishing direct control of the classroom. Teachers must encourage students to become active constructors of meaning rather than passive participants in the instructional process. Perhaps the most important advantage of the metacognitive approach is that it transfers responsibility for reading comprehension success to the student.

Conclusions

The conclusions of this study may be summarized as follows:

1. Self-questioning metacognitive strategies can be used with students with learning disabilities to enhance reading comprehension. However, gains appear to depend in part upon motivational factors independent of ability.
2. Reciprocal teaching is one method of implementing a self-questioning strategy in a regular or remedial classroom.
3. Despite reported positive correlations between academic achievement and perceived internal control of reinforcements for students with learning disabilities and other students, the relationship as found in the present study is neither high nor consistent enough for educational

application.

Summary

This investigation supports the widespread expectation found in the literature that metacognitive strategies can enhance the reading comprehension of students with learning disabilities. Examination of qualitative data relating to the efforts of individual students indicates that those who experienced the most improvement were also more likely to put a lot of effort into their work.

Some of the students who did not make an improvement in reading comprehension were unable to transfer the metacognitive strategy used while reading Hunter in the Dark to a new situation. Salomon and Globerson (1987) propose that many failures to transfer learning can be accounted for by lack of mindfulness or sufficient practice to develop automaticity. They reason that individuals with learning disabilities do not perform, learn, or transfer knowledge consonant with their actual capabilities. Available skill and knowledge are often not used because of a lack of "mindfulness: a state of mind that is defined as the volitional, metacognitively guided employment on non-automatic, usual, effort-demanding process" (p. 625). In other words, if the strategy is not overlearned so that it becomes automatic, the student must make a conscious demanding effort to employ the strategy. Motivational,

attitudinal and cognitive factors correlate to determine if the strategy will be used.

"Mindfulness" and "mindlessness", are distinguished on the basis of controlled and automatic processes. Automatic processes are rapid and effortless, usually controlled by external cues associated through practice or by internally overlearned responses. Wong (1985) observes that insufficient training in self-questioning prior to administering a posttraining test is a problem in research. If a strategy is overlearned, the student will employ the strategy automatically. On the other hand, controlled processes are slow, deliberate, effort demanding cognitions which require the executive function of metacognition.

This effort demanding process is more likely to take place if the student has confidence in himself or herself and believes in the effectiveness of the procedure. Attribution theory suggests that a student's performance of a task is influenced by his or her perceptions of the causes of past behaviour. Researchers investigating attributions made by students in learning situations (Diener & Dweck, 1978; Butkowsky & Willows, 1980) have found that students who attribute performance to controllable factors (such as effort) maintain their effort in face of failure, while those who attribute performance to uncontrollable factors (such as luck, the task, the

teacher, ability) are likely to show deterioration of effort in the face of failure.

In the present study, through observation, discussion and interviewing of the participants, it became clear that all but two students were making significant efforts to learn. As one of two contrasting examples, Ryan, struggled with a task that was very difficult for him, resisted help with the decoding, asked many questions and often predicted outcomes, and put a lot of effort into the training sessions. After six years of school he was reading at the 1.7-2.2 grade level. After six weeks of this type of deliberate, laboured effort, he had made an improvement in reading comprehension of 1.3 (Gates-MacGinitie) and 1.4 (CTBS) grade level.

On the other hand, Alex could see little purpose for the intervention. He stated, "I can't see how this is supposed to help me" and "I don't like doing this". He refused to read on two occasions and was absent for eleven of the sessions. As a result of frequent absences and little effort, he actually scored lower on his post tests. Past experience with failure and lack of faith in the reading strategy produced a negative attitude. Working with the student's self concept so that the child's attributions change or realizing that the strategy is benefiting his/her peers' reading comprehension, may change

the unwilling student's attitude. Until the student's attitude changes, he/she will not be motivated to engage in the effort demanding process of using metacognitive strategies.

Students with learning disabilities can be helped to realize their full potential. Self-questioning strategies proved to enhance the students' reading comprehension. These students must be taught how to unleash untapped potential using metacognition to become self-directed learners.

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Appendix A

Individual Interview Questions

Students were encouraged to answer only the questions that they were comfortable answering.

1. Name:
2. Birth date:
3. Address:
4. Siblings:
5. What do you excel at?
6. Why do you think you are in a class for students with learning disabilities?
7. What are your learning difficulties?
8. Does any one else in your family have learning disabilities?
9. When did you find out that you had a learning disability? How long have you been in a special class?
10. What do you like to do in your spare time?
11. How do you feel about using metacognitive strategies to help with reading comprehension?

Appendix B

The Intellectual Achievement Responsibility Questionnaire

From: Crandall, Katkovsky, & Crandall. (1965).

Children's beliefs in their own control of reinforcements in Intellectual-Academic Achievement situations. Child Development, 36 (1), 90-108.

Method:

The children's IAR scale is composed of 34 forced-choice items. Each item stem describes either a positive or a negative achievement experience which routinely occurs in children's daily lives. This stem is followed by one alternative stating that the event was caused by the child and another stating that the event occurred because of the behavior of someone else in the child's immediate environment. The items are presented in Table 1. Internal alternatives are designated by an I. Positive-event items are indicated by a plus sign, and negative events by a minus sign following the I. A child's I+ score is obtained by summing all positive events for which he/she assumes credit, and his/her I- score is the total of all negative events for which he/she assumes

blame. The total I score is the sum of I+ and I- subscores.

TABLE 1
THE IAR SCALE

1. If a teacher passes you to the next grade, would it probably be
 - a. because she liked you, or
 - I + b. because of the work you did?
2. When you do well on a test at school, it is more likely to be
 - I + a. because you studied for it, or
 - b. because the test was especially easy?
3. When you have trouble understanding something in school, is it usually
 - a. because the teacher didn't explain it clearly, or
 - I - b. because you didn't listen carefully?
4. When you read a story and can't remember much of it, is it usually
 - a. because the story wasn't well written, or
 - I - b. because you weren't interested in the story?
5. Suppose your parents say you are doing well in school. Is this likely to happen
 - I + a. because your school work is good, or
 - b. because they are in a good mood?
6. Suppose you did better than usual in a subject at school. Would it probably happen
 - I + a. because you tried harder, or
 - b. because someone helped you?
7. When you lose at a game of cards or checkers, does it usually happen
 - a. because the other player is good at the game, or
 - I - b. because you don't play well?
8. Suppose a person doesn't think you are very bright or clever.
 - I - a. can you make him change his mind if you try to, or
 - b. are there some people who will think you're not very bright no matter what you do?
9. If you solve a puzzle quickly, is it
 - a. because it wasn't a very hard puzzle, or
 - I + b. because you worked on it carefully?
10. If a boy or girl tells you that you are dumb, is it more likely that they say that
 - a. because they are mad at you, or
 - I - b. because what you did really wasn't very bright?
11. Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen
 - I - a. because you didn't work hard enough, or
 - b. because you needed some help, and other people didn't give it to you?
12. When you learn something quickly in school, is it usually
 - I + a. because you paid close attention, or
 - b. because the teacher explained it clearly?

13. If a teacher says to you, "Your work is fine," is it
 I + a. something teachers usually say to encourage pupils, or
 b. because you did a good job?
14. When you find it hard to work arithmetic or math problems at school, is it
 I - a. because you didn't study well enough before you tried them, or
 b. because the teacher gave problems that were too hard?
15. When you forget something you heard in class, is it
 I - a. because the teacher didn't explain it very well, or
 b. because you didn't try very hard to remember?
16. Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen
 I + a. because she wasn't as particular as usual, or
 b. because you gave the best answer you could think of?
17. When you read a story and remember most of it, is it usually
 I + a. because you were interested in the story, or
 b. because the story was well written?
18. If your parents tell you you're acting silly and not thinking clearly, is it more likely to be
 I - a. because of something you did, or
 b. because they happen to be feeling cranky?
19. When you don't do well on a test at school, is it
 I - a. because the test was especially hard, or
 b. because you didn't study for it?
20. When you win at a game of cards or checkers, does it happen
 I + a. because you play real well, or
 b. because the other person doesn't play well?
21. If people think you're bright or clever, is it
 I + a. because they happen to like you, or
 b. because you usually act that way?
22. If a teacher didn't pass you to the next grade, would it probably be
 I - a. because she "had it in for you," or
 b. because your school work wasn't good enough?
23. Suppose you don't do as well as usual in a subject at school. Would this probably happen
 I - a. because you weren't as careful as usual, or
 b. because somebody bothered you and kept you from working?
24. If a boy or girl tells you that you are bright, is it usually
 I + a. because you thought up a good idea, or
 b. because they like you?
25. Suppose you became a famous teacher, scientist or doctor. Do you think this would happen
 I + a. because other people helped you when you needed it, or
 b. because you worked very hard?
26. Suppose your parents say you aren't doing well in your school work. Is this likely to happen more
 I - a. because your work isn't very good, or
 b. because they are feeling cranky?

Table 1-Continued

27. Suppose you are showing a friend how to play game and he has trouble with it. Would that happen
- a. because he wasn't able to understand how to play, or
 - I- b. because you couldn't explain it well?
28. When you find it easy to work arithmetic or math problems at school, it is usually
- a. because you tried hard to remember, or
 - b. because you studied your bookwell before you tried them?
29. When you remember something you heard in class, is it usually
- a. because you tried hard to remember, or
 - b. because the teacher explained it well?
30. If you can't work a puzzle, is it more likely to happen
- a. because you are not expecially good at working puzzles, or
 - b. because the instructions weren't written clearly enough?
31. If your parents tell you that you are bright or clever, is it more likely
- a. because they are feeling good, or

- I+ b. because of something you did?
32. Suppose you are explaining how to play a game to a friend and he learns quickly. Would that happen more often
- a. because you explained it well, or
 - b. because he was able to understand it?
33. Suppose you're not sure about the answer to a question your teacher asks you and the answer you give turns out to be wrong. It is likely to happen
- a. because she was more particular than usual, or
 - b. because you answered too quickly?
34. If a teacher says to you, "Try to do better," would it be
- a. because this is something she might say to get pupils to try harder, or
 - I- b. because your work wasn't as good as usual?

(p.95-97.)

Appendix C

Interviewing Children: The Imaginary Other

Tell the students that we'll begin by talking about a boy named Larry, and that they may be able to relate to some of his experiences. Ask them to pay close attention because we are very interested in their reactions, and any suggestions that they may have for Larry (Astor-Dubin et al., 1979).

"When Larry was 7 years old he was having problems at school. No matter how he tried he couldn't read. At first, he just couldn't remember what the words meant. Larry went to the SERT teacher for help. He tried hard and with the help of the teacher he could remember most words. As he got older he could read the story, but it didn't make any sense. When he is asked to answer questions from the story he just read, he never knows the answer."

Possible Follow-up Questions

How does Larry feel? Have you ever felt that way?

2. What advice would you give Larry?

"Sometimes Larry gets really frustrated. The words don't seem to make any sense. Besides, there's a lot of difficult words in the story and he doesn't know what they mean. He gets frustrated and doesn't do his work. Then he gets into trouble."

3. When Larry doesn't understand a word what could he do?

When he doesn't know the answer to the questions asked, what could he do?

5. Why do you think that Larry has so much trouble with his school work?

6. How can Larry be helped?

Appendix D

Transcript - Group III

"When Larry was 7 years old he was...answer."

How does Larry feel?

Joe: He feels depressed...sad.

Teacher: He feels depressed and sad.

Joe: He doesn't feel good.

Teacher: Have you ever felt that way?

Several: Yeah.

Teacher: Can you tell me more about feeling that way?

Jim: You feel that you're not as smart as some people.

Teacher: Just because you can't do the work..

Joe: Yeah.

Teacher: What advise would you give Larry?

Lorne: He could ask the teacher, or a friend.

Jim: ..or look it up in the dictionary.

Teacher: Look it up in the dictionary.

Lorne: They can just get some help.

Joe: Sure they do!

Jim: No, they don't.

Joe: Yes, they do.

"Sometimes Larry gets really frustrated...trouble."

Lorne: That happened last year...I was the teacher's pet.

Joe: Yeah, Lorne was teacher's pet and all the class hated him and punched him all the time [laughs].

Joe: Especially Jim [laughs].

Jim: We all teased him.

Joe: Who was in our class? Just me in Grade 7 last year
Wasn't it?

Jim: ..and Doris.

Teacher: But when Larry runs into problems with his school
work, what can he do?

Dean: He could ask for help from the teacher or other
friends.

Lorne: ..or your parents.

Teacher: Sure.

Jim: You could go to a friend's house after school.
That's if he's in the same class and do homework together.

Teacher: Good idea.

Troy: Or you can ask your brother or sister if they've
been in the same class to help.

Teacher: Yes, if you have an older sister or brother to
help you.

Joe: Or you can get your Dad's secretary to help.

Lorne: Yeah, he gets his Dad's secretary [laughs] to do
his homework. [All laugh.]

Teacher: When he doesn't know the answer to the questions
asked, what could he do?

Joe: Just say you couldn't understand the question.

Teacher: And are you going to leave it at that?

Joe: No...Say, "I don't understand the question. Please help me. Could you help me understand it?"

Teacher: Okay.

Jim: Are you going to do that at home?

Joe: Sure. I just asked now...You just talk to the teacher and say I don't understand it.

Teacher: Okay. When you're intergrated there must be times when you don't understand the work. What do you do?

Jim: The same thing everyone else does.

Lorne: I just do which way I think is right...And when it's marked - I know.

Teacher: When you get feedback, you know. Rather than go through the whole thing and possibly be wrong, could you not check it out first? To see if you're doing it right.

Joe: Yeah.

Jim: Do you have an example?

Teacher: Let's say it's Math and you not sure how to do equations.

Joe: Ask.

Jim: I go to the back and there's a line up of kids that don't know how to do it and he'll [the teacher] go to the board again and do some questions and you'll copy them down and look at them...And he'll help you.

Teacher: So you are asking for help when you need it.

Jim: It's not a problem. It's same for all kids.

Teacher: That's important Jim, and I'm glad that you brought that out. All students experience difficulty at times - not just students with learning disabilities. Why do you think Larry has so much trouble with his school work?

Shawn: Because he doesn't understand it.

Teacher: Why doesn't he understand it?

Shawn: Maybe he gets frustrated and doesn't try to get it done.

Teacher: How can Larry be helped?

Troy: Ask the teacher.

Joe: He can be tested.

Teacher: Okay. What can be done with the testing results?

Troy: He might go to the SERT teacher or..

Joe: He might be LD.

Jim: ..Or he might be put in another grade.

Teacher: Testing can determine his strengths so that they can be worked on. Is there any way else that Larry can be helped?

Shawn: Sure...at home.

Joe: His parents can help out.

Appendix E

Miscue Analysis

In answering the question, "Does this miscue change the meaning of the sentence?" if there is no change "N" is marked. If a change has occurred that is significant "Y" is marked. If the change in meaning is a minor shift in the author's focus without altering the basic intent, minimal change "P" is marked.

Using this criteria a sample of miscue analysis is given on the next pages. Errors are analyze using the following patterns of comprehension:

PATTERNS OF COMPREHENSION

Patterns which cause NO LOSS of Comprehension

6Y	+	8Y	+	9N
6Y	+	8P	+	9P
6Y	+	8P	+	9Y
6Y	+	8N	+	9Y
6N	+	8Y	+	9N
6N	+	8P	+	9N

6Y	+	8P	+	9N
6Y	+	8N	+	9N
6N	+	8N	+	9N
6Y	+	8Y	+	9P
6Y	+	8N	+	9P
6Y	+	8Y	+	9Y

Patterns which Cause PARTIAL LOSS of Comprehension

6N + 8P + 9P	6P + 8N + 9P
6N + 8Y + 9P	6P + 8P + 9P
6P + 8Y + 9N	6P + 8Y + 9P
6P + 8Y + 9Y	6P + 8P + 9N
6N + 8Y + 9Y	6P + 8N + 9N

Patterns which Cause LOSS of Comprehension

6N + 8N + 9P
6N + 8N + 9Y
6N + 8P + 9Y
6P + 8N + 9Y
6P + 8P + 9Y

Sample of Miscue Analysis

Even in the middle of being stunned and loving the car with a passion and ~~without~~ ^{without} a jump right in it and drive off at top speed, just to see what it would do, Mike felt rotten. He felt guilty at the anger he had so often felt against Dad, and knowing that he'd feel that way again before ~~very long~~. Then he felt doubly guilty at the way he was deceiving him about the hunting trip ~~too~~.

He'd like to have given the keys back, even while he was loving the car like mad, but how could he? His hands got sweeter and sweeter. He yipped them on his jeans and then opened the car door and slid into the driver's seat. After all, he couldn't stand there forever. The inside had that jumpy, velvet new car smell, metal and leather and plastic. He ran his eyes over the dash. Only forty kilometres on the odometer. There was a trip meter and even a tachometer . . .

He swallowed and slid the key into the ignition. Turned it. Just touched the gas pedal. It started like a bird. He looked up, and just for once knew ~~exactly what~~ ^{exactly what} would make Dad happy.

"Can I take you for a spin, Dad?"

Dad was grinning broadly. "You bet, son."

Mike eased the car down the driveway and turned right along the crescent. The streets had been swept clean of all the winter grunginess; the sand and dirt, lost overshoes and single mittens. The crabapples were bursting with white and red flowers, and there were tulips, red-and-yellow striped, in the garden next door.

He drove with conscious care, watching all the traffic sig-

nals, remembering to shoulder check ^{check} whenever he had to change lanes. Part of his mind was concentrating on impressing Dad. The other part was just bubbling with joy and pride at the performance of the Célècia. His very own brand-new car . . .

"They got onto the Yellowhead, and now he could relax a little. "Dad, thanks, it's great. It's the best thing that's ever happened to me."

"I'm glad." Dad's voice was different . . . a bit less sure of himself? "You . . . you mean such a lot to me, son, and it's so damn hard to tell you — y'know?"

Mike blinked ~~hard~~ ^{hard}, swallowed hard, concentrated on the road. "Yeah. It's the same with me, I guess. You know what I read the other day? People need four hugs a day just to keep going. Did you know that? Maybe . . ."

Dad laughed, kind of choked up. "I'm out of practise. And you were so prickly ~~hers~~ ^{hers} for a while . . ."

"I know. I was a jerk. A bit misèd up and . . . and mad. I know what I mean?"

"Yeah. Us too. We didn't handle it the best. Dr. Gage told us that. Made me kind of angry, him telling us about loving our own son. Afterwards I saw what he meant. But it's difficult to change your way of thinking when you get to my age."

"You're not that old, Dad."

"Don't you believe it, son."

Mike closed his eyes for a second and took a deep breath. His hands felt the power of the car as his foot touched the gas. The car chewed up the kilometres effortlessly.

"Hey, whoa there, Mike. Where are you off to, Alaska?"

Mike looked around and felt himself getting red. Without any conscious thought he'd turned off the Yellowhead onto Highway 43, heading for Grande Prairie and Dawson Creek and, incidentally, for the turn-off that led to the Swan Hills.

He eased off the gas. He'd almost given away the whole plan. And yet . . . maybe that wasn't ~~Atteff's~~ ^{Atteff's} bad idea. Dad had changed. He was trying to change more . . .

He checked the traffic, waited until the road was clear, and made a U-turn.

Miscue Analysis

Miscue Number	Reader	Text	CORRECTION 6	GRAMMATICAL ACCEPTABILITY 7	SEMANTIC ACCEPTABILITY 8	MEANING CHANGE 9	COMPREHENSION		
							No Loss	Partial Loss	Loss
	every	very	N		P	P		✓	
	give	given	N		P	Z	✓		
	slide	slid	N		P	Z	✓		
	slide	slid	N		P	N	✓		
	especially	exactly	N		Y	X	✓		
	check	check	N		N	Y			✓
	\$ concent	concentrating	N		N	Y			✓
	that's	it's	N		Y	N	✓		
	pickly	prickly	N		P	P		✓	
	and	a	N		P	N	✓		
	don't	didn't	N		Y	N	✓		
	so	the	N		N	Y			✓
	and	the	Y		N	N	✓		
	\$ Alas	Alaska	Y		N	N	✓		
	up	away	N		Y	P		✓	
	much	suck	N		P	P		✓	
	che	checked	Y		N	Y	✓		
	waiting	wanting	N		N	Y			✓
							10	4	4
							56%	22%	22%

Appendix F

Percentage of Comprehension Loss

Using Miscue Analysis

Students	Early Scores			Later Scores		
	No Loss	Partial Loss	Loss	No Loss	Partial Loss	Loss
	11	33	55	39	21	39
2	14	0	86	33	17	50
3	8	33	58	14	50	36
4	17	17	67	20	20	60
5	28	17	55	56	22	22
6	10	10	80	26	13	61
7	37	25	37	67	11	22
8	42	21	36	60	10	30
9	45	27	27	53	13	33
10	45	27	27	80	10	10
11	38	23	38	0	40	60
12	23	45	33	64	21	14
13	20	0	80	66	0	33
14	30	40	30	55	0	44
15	23	23	54	45	10	45
16	20	40	40	20	40	40
17	25	50	25	60	22	20
18	40	13	47	50	30	20
19	75	0	25	71	0	29
20	57	14	29	67	33	0

Appendix G

CTBS

Students	Pretest Grade Scores	Posttest Grade Scores
	1.7	3.1
2	4.5	4.7
3	4.4	4.2
4	5.5	4.6
5	4.7	4.7
6	2.8	4.7
7	4.4	5.5
8	5.9	5.3
9	5.4	5.6
10	4.9	5.5
11	4.9	5.7
12	5.0	7.0
13	6.4	6.1
14	6.1	4.9
15	5.8	5.8
16	6.4	6.1
17	6.1	6.7
18	6.8	6.4
19	6.1	7.0
20	7.0	7.3

Appendix H

Gates-MacGinitie

Students	Pretest Grade Scores	Posttest Grade Scores
	2.2	3.5
2	2.9	3.9
3	3.1	4.3
4	3.8	4.5
5	4.4	5.1
6	4.0	4.2
	4.9	6.5
8	5.1	4.9
9	5.1	7.2
10	5.1	8.1
11	5.3	4.9
12	5.5	5.9
13	5.6	8.1
14	5.8	8.1
15	5.8	10.9
16	6.8	7.1
17	7.1	5.9
18	7.6	5.9
19	7.4	7.0
20	9.2	9.6

Appendix I

IAR Scores

<u>Subjects</u>	<u>I+</u>	<u>I-</u>	<u>Total I</u>
1	11	5	16
2	15	15	30
3	11	8	19
4	12	8	20
5	12	13	25
6	11	9	20
	13	8	21
8	12	13	25
9	13	10	23
10	14	15	29
11	12	15	27
12	15	11	26
13	12	15	27
14	15	10	25
15	16	14	30
16	12	12	24
17	15	11	26
18	14	14	28
19	7	12	19
20	12	12	24
Mean	12.7	11.5	24.2
Range	7-15	5-15	16-29
SD	2.00	2.80	3.90

Appendix J
Means, Standard Deviations and Ranges
of IAR Scores

Crandall, Katkovsky, Crandall Study

Subjects & Grades	I+			I-			Total I		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
6	13.35	2.44	5-17	12.32	2.72	5-17	25.70	4.35	12-33
8	13.19	2.20	7-17	12.92	2.31	5-17	26.11	3.77	13-34

(Crandall, Katkovsky, Crandall, 1965, p. 100.)

Present Study

Subjects & Grades	I+			I-			Total I		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
6 - 8	12.7	2.00	7-15	11.5	2.8	5-15	24.2	3.90	16-29