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**THE EFFECTS OF RECIPROCAL TEACHING UPON YEAR  
6 STUDENTS' READING COMPREHENSION**

**BY**

**D.M. Rasmussen B. Arts.**

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of**

**Bachelor of Education with Honours**

**at the Faculty of Education, Edith Cowan University**

**Date of Submission: 19 June, 1997**

## USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

## Abstract

The purpose of this study was to investigate the effects of Reciprocal Teaching on the reading comprehension of Year 6 students. Forty-one Year 6 students from two metropolitan primary schools took part in the study. An experimental pre-test - post-test control group design was used. Subjects were matched according to the results of the Test of Reading Comprehension (TORCH) used as a pre-test. Matched pair-mates were randomly allocated to either treatment or control groups. After 14 sessions of training in Reciprocal Teaching, results of an analysis of covariance (ANCOVA) with teachers nested in groups, showed no statistically significant differences in reading comprehension between the treatment and control groups. Some naive comprehenders (students who appear to lack knowledge about the purposes and strategies of reading), however, showed improvements when their data were analysed individually.

## Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

- (i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- (ii) contain any material previously published or written by another person except where due reference is made in the text; or
- (iii) contain any defamatory material.

Signed

Date

19 June 1997

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## CHAPTER 1

### Introduction

#### Background

Reading is one of the basic ways of acquiring information in society today (Pinnell, Lyons, DeFord, Bryk & Seltzer, 1994; Spear-Swerling & Sternberg, 1994). It is a strategic meaning-getting process requiring awareness and control of complex processes. Gaining meaning from text is a product of adequate decoding skills and fluency, suitable text, overlap of prior knowledge and content, and strategies employed to enhance understanding and retention of the text, and prevention of comprehension failure (Herrmann, 1988).

In the past there have been a number of different theories regarding reading comprehension. Some reading specialists (e.g., Fries, 1962) believed that reading comprehension was an end product of decoding, postulating that if the reader could name the words, comprehension would automatically follow. Later researchers found it was still necessary for the reader to have the ability to decode in order to comprehend (Adams, 1990; Cooper, 1986; Spear-Swerling & Sternberg, 1994). Specialists reported that breaking reading into isolated skills would make it easier to teach reading

comprehension. This theory was rejected in favour of one that postulated that the interactive nature of skills could not be separated during reading and that learning individual skills does not necessarily result in effective comprehension of text (Cairney, 1990; Rosenshine, 1980; Vacca & Vacca, 1989). This research implied that comprehension results from the interaction of many skills.

Expert readers use skills to decode text, search for and construct meaning by relating the information in the text to information (i.e., knowledge, ideas, concepts) already possessed as a process for comprehending (Cooper, 1986). If comprehension has taken place, identification of the author's message is internalised, providing a mental home for the information in the text, or modifying an existing mental home in order to accommodate new information (Anderson & Pearson, 1984; Baker & Brown, 1984; Cooper, 1986; Vacca & Vacca, 1989).

Expert readers also keep track of their comprehension during reading by relating new information to existing information. If no relationship exists, then the expert reader re-reads or asks questions about the text in order to find a link between the new information and existing information. This is referred to as comprehension monitoring, something often not achieved by naive readers (Baker & Brown, 1984; Spear-Swerling & Sternberg, 1994).

Naive readers neither possess nor access skills that enable decoding or comprehension of text. Some naive

readers are suboptimal comprehenders. That is, they may possess adequate decoding skills and fluency but not make "efficient, routine use of strategies" necessary to comprehend and monitor their comprehension (Spear-Swerling & Sternberg, 1994, p. 95). These naive readers may not have any knowledge of comprehension strategies and comprehension monitoring strategies, and/or do not know when to employ them. Therefore, naive readers need to learn how to comprehend and how to monitor their comprehension (Braun, Rennie & Labercane, 1985). One successful procedure for improving comprehension and comprehension monitoring is Reciprocal Teaching, designed by Palincsar and Brown (1984) for the purpose of providing a structured procedure for naive comprehenders to use while reading.

#### Significance of Reciprocal Teaching

Reciprocal Teaching was developed for use with students who have adequate decoding fluency but poor comprehension. It was premised on two ideas: the first is that expert scaffolded instruction as outlined by Vygotsky (1978) as regular reading instruction did not assist students to develop higher-order comprehension strategies (Durkin, 1979; Lysynchuk, Pressley & Vye, 1990); and the second is that teaching is carried out with the expectation that students will succeed in learning (Mosenthal, Schwartz & MacIsaac, 1992; Palincsar & Brown, 1984). Durkin (1979) reported that generally, comprehension skills were measured



but did not appear to be taught. This prompted Palincsar and Brown (1984) to develop Reciprocal Teaching for students who experienced comprehension difficulties.

Reciprocal Teaching is a procedure that mimics naturally occurring guided learning, similar to the interactive mother-child activity that Vygotsky (1978) refers to as scaffolding. The Reciprocal Teaching procedure includes explanation, instruction, modelling, guided practice, praise and teacher judgement. Adults and students take turns assuming the role of the teacher. The teacher provides guided practice while transferring the responsibility to the learners, helping them learn how to monitor their own comprehension. The learners gradually internalise the procedure that the teacher models and become responsible for their own learning (Lysynchuk et al., 1990; Pullella, 1990). This is achieved through four strategies, each of which promotes the comprehension of text and comprehension monitoring (Herrmann, 1988; Mosenthal et al., 1992). These strategies are prediction, generating questions, summarising and clarification.

Reciprocal Teaching involves extensive teacher modelling of the above mentioned strategies. This procedure helps naive comprehenders develop comprehension strategies and monitor comprehension of text. The ultimate goal of Reciprocal Teaching is for all students to utilise comprehension strategies during independent study (Herrmann, 1988; Lysynchuk et al., 1990).

## Definition of Terms

Decoding. Letter recognition and the sounding and building of words. Translating printed words into a representation similar to oral language (Carnine, Silbert & Kameenui, 1990; Westwood, 1987).

Decoding fluency. Decoding not less than 80 words per minute with no more than two errors per minute when reading an age-appropriate passage.

### Reading comprehension: (Dependent Variable).

Understanding the written message the writer is sending through interaction with text (Packham, McEvedy & Smith, 1985). The Test of Reading Comprehension (Mossenson, Hill & Masters, 1987) was used to measure reading comprehension for this study.

Strategies. Systematic procedures that are utilised to promote knowledge acquisition and utilisation (Deshler & Schumaker, 1986). Learning strategies involve a small number of steps that provide a framework for organising information.

Reciprocal Teaching: (Independent Variable). A comprehension fostering and comprehension monitoring procedure for learning as outlined by Palincsar and Brown (1984). It includes the strategies of prediction, clarification, questioning and summarising.

Expert comprehenders. Readers who routinely employ strategies to make sense of written text (Helfedlt & Henk,

1990). These readers question and elaborate on their own knowledge and the content of the text, testing their degree of understanding (Palincsar & Brown, 1984). These students have age-appropriate decoding fluency (80 words per minute with no more than two errors) when reading an age-appropriate passage orally, and reading comprehension above the 25th percentile as measured by TORCH.

Naive comprehenders. Readers who appear to lack knowledge about the purposes and strategies of reading and when and where to employ the strategies (Short & Ryan, 1984). In this study, they had age-appropriate decoding fluency (80 words per minute with no more than two errors) when reading an age-appropriate passage orally, but performed below the 25th percentile on the comprehension pre-test.

Metacognition. The awareness of skills, strategies and resources needed to perform a task, and the ability to use self-regulatory mechanisms to ensure the successful completion of the task (Jenkins, Heliotis, Stein & Haynes, 1987).

Internalisation. The "internal reconstruction of an external operation", resulting in the development of higher mental functions (Vygotsky, 1978, p. 56). Readers learn and internalise strategies through the explicit instruction of strategies. These strategies are added to the readers' repertoire of skills and stored in their long-term memory for later retrieval.

Scaffolding. The support provided by an expert to a novice in order for the novice to complete a task. This support includes explanation, instruction, modelling, guided practice and praise. The support gradually diminishes as the task is mastered (Vygotsky, 1978).

### Theoretical Framework

This section outlines the theory and the major variables involved in this study. The variables will be further explained in the review of related literature in Chapter 2. Literature addressing the theory of learning that this study encompasses is reviewed. It is this theory that provides the foundation for the study. Throughout the study reference is made to this literature.

### Theory of Learning

This study is based on a cognitive learning theory that assumes that people are active in their own learning and that learning is the result of the individual's attempt to make sense of the world. Cognitive theorists postulate that people learn by organising new material and new information into coding systems. This model of learning will be referred to as the Information Processing Model.

The Information Processing Model of learning can be thought of as the acquisition of knowledge through an analysis of data from the environment, suggesting that

learning is linked to taking in, storing, retrieving and using information (Eggen & Kauchak, 1988). Information enters the sensory register from the environment and stays there for a short time. The learner selects, attends and organises parts of the information and ignores others because there is more information available than can enter the short-term memory. Selected information is transferred from the sensory register to the short-term memory, where it remains for approximately 20 seconds. In the short-term memory some information is processed further and some information is lost (Atkinson & Shiffrin, 1968; Gagne, 1985). Rehearsal can increase the amount of information to be processed and extend the time information can be held in the short-term memory. Rehearsal may involve repeating information over and over or relating the information to that retrieved from long-term memory (Klausmeier & Allen, 1978).

Effective information processors transform information into meaningful concepts. This is done by integrating new material with information already stored in long-term memory through the use of Executive Control processes. The concepts then are stored in long-term memory for later retrieval. This is illustrated in Figure 1. When a concept has been internalised or stored effectively, it can be retrieved automatically and generalised to other related concepts.

Executive Control processes influence attention and

selection of information to be entered into the short-term memory, the rehearsal of information in the short-term memory and determining how information is stored in the long-term memory, and the retrieval of information (Atkinson & Shiffrin, 1968; Gagne, 1985; Klausmeier & Allen, 1978). These processes help modulate the flow of information throughout the system. Use of the Executive Control processes and metacognitive skills enable the learner to process efficiently new information.

By utilising metacognitive skills the individual is able to plan actions, to select strategies, and to monitor and evaluate the effectiveness of these strategies. The ability to select strategies provides the individual with a procedure to process effectively information. Reciprocal Teaching focusses on the learner's Executive Control processes and provides learners with strategies that aid in the selection, organisation and integration of new information with that already stored in the long-term memory. Specific to this study is the development, retrieval and utilisation of strategies to facilitate processing of knowledge to enhance reading comprehension.

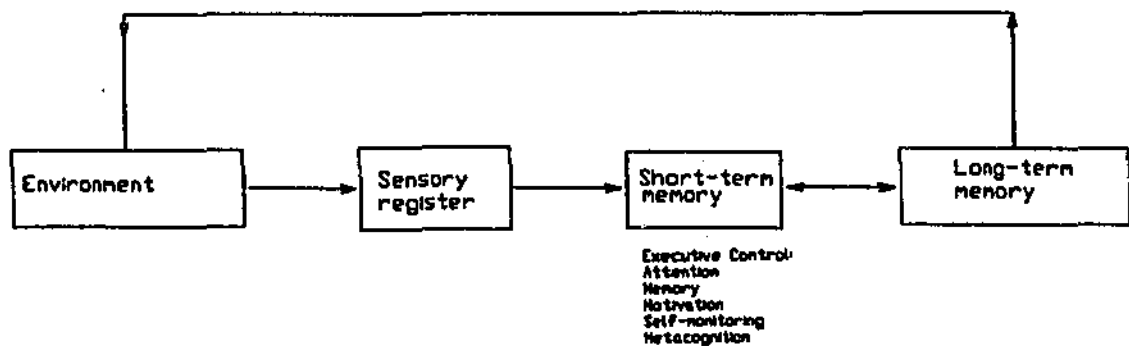


Figure 1. Information Processing Model  
(Howell, Fox & Morehead (1993), p. 23).

### Reading Comprehension

Reading comprehension is the result of effectively relating information in the short-term memory to concepts retrieved from the long-term memory. It involves interaction between text and strategies that readers draw upon and apply during reading (Herrmann, 1988). These strategies help students read for meaning and monitor their reading to ensure they understand the text provided. Expert and naive comprehenders differ in the quality and quantity of interaction with text and the strategies they utilise in comprehending and monitoring text.

Expert comprehenders acquire efficient and effective strategies through interaction with their environment. Expert comprehenders use metacognitive processes to access strategies that best fit their objectives, continually evaluate (monitor) the effectiveness of the strategy and select a new one if necessary. Expert comprehenders recognise when the text does not make sense. They slow down their rate of processing in order to clarify points of confusion, question and elaborate on self-knowledge and

examine the content of the text, therefore testing their degree of understanding. Students who comprehend know that the purpose of reading is to make sense of the text and understand the message the author is sending (Baker & Brown, 1984; Brown, 1980; Palincsar & Brown, 1984).

Naive comprehenders may know the purpose of reading but may not know how to go about understanding the author's message. They also may lack knowledge about the need to employ strategies or when to employ strategies. Comprehension may not be viewed as the goal of reading because all efforts may be focussed on decoding or simple comprehension skills. Overfocussing on decoding text consumes the short-term memory and reduces a student's opportunity to question understanding of a text (Braun et al., 1991; Carnine et al., 1990; Helfedlt & Henk, 1990; Spear-Swerling & Sternberg, 1994). Finally, naive comprehenders may fail to evaluate the appropriateness of chosen strategies and may not apply these strategies spontaneously (Short & Ryan, 1984).

Many students do not acquire effective comprehension strategies naturally. They need explicit instruction on how to be strategic readers, and how best to monitor their comprehension of text (Herrmann, 1988; Palincsar & Brown, 1984; Pearson & Dole, 1987). Enhancing metacognitive awareness and providing a systematic strategy may enable naive comprehenders to overcome obstacles preventing comprehension and help develop skills similar to those



utilised by expert comprehenders (Helfedlt & Henk, 1990; Short & Ryan, 1984).

### Conclusion

It may be necessary to provide naive comprehenders with skills that will enhance their interaction with text. These skills should include strategies that facilitate the processing of information into meaningful concepts and the retrieval of information when required. It is also important that naive comprehenders have metacognitive skills to retrieve and evaluate strategies facilitating comprehension monitoring.

### Conceptual Framework

Reciprocal Teaching, combined with effective instructional techniques and reading strategies, facilitates effective processing, storing and retrieving of information. Instruction should be planned carefully to facilitate a high degree of student success in the learning process (Carnine et al., 1990; Rosenshine, 1986). Fielding and Pearson (1994) suggested that a successful programme of comprehension instruction should include explicit instruction. Explicit instruction involves teacher modelling and explanation of strategies, guided practice, independent practice and the application of strategies to real life situations (Pearson & Dole, 1987; Rosenshine, 1986; Vacca & Vacca, 1989). This may enable readers to

internalise strategies and take on responsibility for their own learning. Naive comprehenders may require explicit instruction, as they are less likely to "invent effective strategies of their own" (Fielding & Pearson, 1994, p. 65). Instruction that incorporates scaffolding and expert modelling of strategies creates an environment that facilitates effective information processing and reading comprehension.

Effective processing of information is facilitated through the fostering of Executive Control processes. If students understand the purpose of reading and have a repertoire of strategies to assist processing, storage and retrieval of information, they are more likely to comprehend text successfully.

In Reciprocal Teaching comprehension is enhanced through the application of strategies designed to foster and monitor reading comprehension. Such strategies include making predictions which activates the retrieval of prior knowledge from the long-term memory and encourages links to be made to new information. Questioning makes readers ask themselves what questions a teacher would ask in a test or a discussion and how to pose the question. This requires readers to integrate Executive Control processes and several component skills. Readers must activate prior knowledge, access reading strategies and text information, rehearse new information and employ strategies activated to gain the information. Clarification requires the reader to

identify parts of the text that are not clear. Clarifying activates comprehension monitoring and may prompt readers to re-read text and search for relevant information or question other students. Summarising requires readers to apply strategies that will aid in the identification of the most important content of a text and to disregard irrelevant or detailed information. Interaction with others assists the processing of information by enabling students to share background knowledge and clarify elements of the text that are not understood.

Peer interaction and small-group work benefits students both cognitively and socially (Pigott, Fantuzzo & Clement, 1986). Those students who usually do not participate in whole-class discussions may feel more confident in contributing to a small-group discussion. This interaction and support from group members may increase the students' self-efficacy and the belief that they are able to comprehend text (Bandura, 1986). Students also have the opportunity to take on the role of group leader (Fielding & Pearson, 1994; Good & Brophy, 1991).

### Conclusion

Reciprocal Teaching combines variables that facilitate the effective processing of information to enhance reading comprehension. This procedure provides the explicit instruction of strategies that enable readers to link new information with existing information and monitor their comprehension of text. The utilisation of strategies to

foster comprehension and monitor comprehension is a necessary process in understanding the message the author is sending.

### Hypothesis

The purpose of this study was to determine if Reciprocal Teaching is a successful procedure for enhancing the reading comprehension skills of all students in naturally occurring classes. The cognitive theory of learning, the characteristics of reading comprehension and the instructional requirements for optimal reading comprehension suggest that the Reciprocal Teaching procedure provides strategies for students that will result in increased comprehension skills. These factors have led to the formulation of the research hypothesis for this study. Specifically, the questions in Table 1 will be addressed.

Table 1

Research questions

---

- 1 Do students generalise the Reciprocal Teaching procedure to narrative text?
  - 2 Are improvements in comprehension maintained three weeks after the completion of instruction?
  - 3 Do naive comprehenders show the same improvements in reading comprehension at the completion of the Reciprocal Teaching program as expert comprehenders?
-

### Research Hypothesis

The main research hypothesis was:

Year 6 students taught the Reciprocal Teaching procedure with expository text will demonstrate a statistically significant difference in reading comprehension as measured by the TORCH compared to students who receive regular reading instruction.

The null hypothesis was set as:

There will be no statistically significant difference in reading comprehension as measured by the TORCH of Year 6 students taught using the Reciprocal Teaching procedure with expository text and students who received regular reading instruction.

## CHAPTER 2

### Literature Review

This review will examine the literature pertaining to the Reciprocal Teaching reading comprehension procedure. The literature will be examined critically, with particular emphasis on outcomes, measures used and research methodology implemented. Prior to discussing Reciprocal Teaching, a brief review will address literature pertaining to reading comprehension, instruction that promotes student learning and acquisition of reading comprehension skills.

### General Review of Instruction

Reading is a strategic meaning-getting process requiring awareness and control of complex processes. Herrmann (1988) suggests that reading consists of decoding text and integrating information found in the text and prior knowledge to understand the author's message. How effectively the new information is integrated with existing information is dependent on the Executive Control processes that individual readers possess.

Executive Control processes include motivation for the reading task, attention given to the task and metacognition. Metacognition refers to the knowledge readers have about their own cognitive processes and how this knowledge is involved in controlling the cognitive activities that are carried out at specific times to

achieve the reading goal (Borkowski, Schneider & Pressley, 1989).

Metacognitive skills are seen as vital for all learning (Brown, 1980; Kameenui & Simmons, 1990). Metacognition includes planning actions, selecting strategies and monitoring and evaluating the effectiveness of strategies selected. Effective metacognition depends not only on adequate knowledge, but also on a level of awareness and control of knowledge (Braun et al., 1985; Kameenui & Simmons, 1990; Prawat, 1989).

Instruction for students' general cognitive learning should emphasise adopting an approach that enhances metacognitive skills, teaching students how to learn, rather than focussing on teaching content. Explicit instruction combined with expert guidance and support and the active involvement of students in the learning situation effectively enhance metacognition and learning (Rosenshine, 1986; Vygotsky, 1978).

Instruction that encourages students to be actively involved provides feedback and instruction about when and where strategies should be applied to successfully enhance learning. The manner in which strategies are presented to students is instrumental in the acquisition of the strategies (Deshler & Schumaker, 1993; Helfedlt & Henk, 1990; Mosenthal et al., 1992).

Rosenshine (1986) suggested a number of guidelines for effective instruction of new material. He proposed that new



material should be presented in small steps, instructors should continuously check for student understanding and elicit active and successful participation from all students. These guidelines for presenting instruction are particularly relevant for the teaching of reading comprehension and comprehension monitoring strategies. Expert modelling of specific strategies, teacher guidance and student practise in transferring strategies to new learning situations are elements missing from current comprehension instruction programmes (Deshler & Schumaker, 1993; Pearson & Dole, 1987).

Durkin (1979) suggested that many teachers neglect comprehension instruction because they do not know how to explain or identify comprehension as a cognitive process. Strategies for comprehending text are not taught and in many cases, teachers focus on lower-order skills (i.e., factual recall) rather than higher-order skills such as comprehension. Reading comprehension is assessed rather than taught in many classrooms (Durkin, 1979).

Many strategic behaviours of competent comprehenders are not explicitly taught (Herrmann, 1988), and some readers are able to discover independently the reasoning processes associated with strategic reading to construct meaning from text with little direction or assistance. Those readers who do not discover strategic reading processes independently are referred to as naive comprehenders.

Naive comprehenders often require explicitly taught reading strategies and application (Deshler & Schumaker, 1993; Hollingsworth & Woodward, 1993; Kameenui & Simmons, 1990). Comprehension strategy instruction for naive comprehenders was found to be effective in increasing comprehension of text (Borkowski et al., 1989; Fielding & Pearson, 1994).

Initially, comprehension instruction should be modelled to the students, and students should be provided with an explanation of the benefits of the strategy, followed by teacher-guided practice. This gives students the knowledge and practise necessary to successfully apply learning strategies (Deshler & Schumaker, 1986; Fielding & Pearson, 1994; Kameenui & Simmons, 1990; Pressley, Johnson, Symons, McGoldrick & Kurita, 1989). Reciprocal Teaching, as postulated by Palincsar and Brown (1984), meets these criteria.

Palincsar and Brown (1984) designed Reciprocal Teaching as a procedure for teaching naive comprehenders strategies for gaining knowledge from text. Reciprocal Teaching can be defined as "a dialogue between teachers and small groups of students for the purpose of jointly constructing meaning from text" (Palincsar, 1986, p. 119). Reciprocal Teaching includes teacher modelling of strategies to small groups of students and encourages active student involvement. This procedure provides a mechanism for students to add to their existing repertoire

of comprehension strategies, and, with the help of other students, take on increasingly more active responsibility for learning (Palincsar & Klenk, 1992). The Reciprocal Teaching procedure includes four strategies that promote the comprehension of text and comprehension monitoring: predicting, questioning, summarising and clarifying. While these individual strategies are common to other reading comprehension procedures, the combination of all four strategies is specific to Reciprocal Teaching.

### Prediction

Prediction requires readers to formulate and evaluate hypotheses about the text. Strategies for formulating predictions are effective in assisting readers to enhance learning. The more readers are able to predict what a particular text is about, the more likely they are to read it with understanding. To achieve this, readers are required to activate prior knowledge and relate it to the new knowledge found in the text. Readers are also encouraged by the teacher to use text structure (e.g., titles, headings, sub headings, pictures) as aids while formulating predictions (Bottomley & Osborn, 1993; Dermody, 1988). Incorrect predictions can be detected through comprehension monitoring while reading the text. The individual reader may recognise that the predictions are incorrect, or another member of the group may detect incorrect predictions. If the original prediction is rejected, a new prediction can be made and tested through

the reading of the text.

### Questioning

Generating questions requires readers to identify information that will make a good question as well as pose the question. Reciprocal Teaching initially requires students to pose questions to peers. This makes reading an active process and focusses readers' attention on the material being read (Davey & McBride, 1986; Gillespie, 1990). When readers generate questions, they may also generate answers that they expect are correct, based on their comprehension. If readers cannot answer their own questions, or if a different answer is given by a peer, a comprehension failure is indicated, requiring re-thinking. Davey and McBride (1986) found that by generating and answering questions, students individually or as a group can detect comprehension inadequacies and rectify them, assisting them to monitor their own comprehension.

Encouraging students to generate questions related to the text had a positive effect on the development of reading comprehension (Cohen, 1983; Davey & McBride, 1986; Helfeldt & Lalik, 1976). Cohen (1983) concluded that effective question generating strategies provide readers with an effective study strategy that improves information processing skills, reading comprehension and comprehension monitoring.

### Summarising

In formulating summaries, readers are required to

identify the key idea of each paragraph. Readers are encouraged to make use of headings and sub-headings when formulating summaries, because headings and sub-headings provide information about what is contained in the text. This encourages readers to attend to text, helping them to be aware of the structure of information within the text. Awareness of the use of headings and sub-headings also assists students when making predictions about the text. Readers are able to monitor their progress and become more aware of the processes necessary to comprehend text (Carr & Ogle, 1987; Rinehart, Stahl & Erickson, 1986).

Carnine, et al. (1990) successfully taught students to summarise, using a procedure that required students to identify the main idea of a paragraph by naming the different persons or things in a paragraph and describing their actions. Jenkins, et al. (1987) reported success in teaching learning-disabled students to summarise paragraphs of narrative text. Students were taught to ask themselves two questions, "'Who?" and "What's happening?" and to write down the most important person and the major event that occurred in each paragraph of text they read. If the students could not answer their own questions, they re-read the paragraph, thereby monitoring their comprehension. Carnine, et al. (1990), Jenkins, et al. (1987) and Rinehart, et al. (1986) suggested that the improved comprehension of students was the result of the summarising strategy training. They concluded that summarising improved

reading skills by heightening awareness of important information in texts and teaching readers to disregard unimportant information.

### Clarification

Clarifying requires readers to recognise and attend to parts of the text that do not make sense and to identify possible causes. For example, readers are taught to be perceptive and take steps to understand the text by re-reading or asking for help. Clarification enables students to identify and question any unfamiliar, unnecessary, distracting, ambiguous or inconsistent information contained in the text. These pieces of the text either can be questioned by the reader or discarded as being irrelevant. The questioning, discussion and reflection that take place both during and after reading is an opportunity for recognising and rectifying misconceptions. Clarification is, therefore, an important part of monitoring comprehension (Fielding & Pearson, 1994; Mosenthal, 1989; Ogle, 1989).

Four strategies (predicting, clarifying, questioning and summarising) were identified as those that activated and utilised background knowledge, focussed attention on the main points of the text and required self-monitoring of understanding and progress (Palincsar & Brown, 1984). That is, they were seen as promoting both reading comprehension and comprehension monitoring of text. These strategies, which encouraged readers to be actively involved, and

provided a supportive environment, were aimed at facilitating expert reading comprehension. These elements were combined to form the Reciprocal Teaching procedure proposed by Palincsar and Brown (1984) with the aim of assisting naive comprehenders.

### Reciprocal Teaching

This section will discuss the effectiveness of Reciprocal Teaching as reported in the literature. Methodological issues relevant to this study will also be presented in this section.

Research using either the Reciprocal Teaching procedure or an adapted procedure, reported improvements in a number of areas as a result of the Reciprocal Teaching procedure. Students' ability to predict, formulate higher-order questions, detect inconsistencies in text and formulate summaries showed marked improvements in reading comprehension test results (Marks, Pressley, Coley, Craig, Gardner, DePinto & Rose, 1993). Improvements in comprehension were found to be maintained over time, requiring minimal re-instruction to re-establish post-treatment levels. Naive comprehenders (who in this study were defined as having adequate decoding fluency but at least two years below average in reading comprehension) were found to receive the most benefit from this procedure because they received clear explanations and strategy

instruction to comprehend text (Pearson & Dole, 1987).

### Initial Research

A pilot study of Reciprocal Teaching was undertaken by Palincsar and Brown (1984) in which teachers worked individually with naive comprehenders, taking turns in questioning, generating summaries and predictions and clarifying text. Initially, the teachers modelled the strategies and gradually faded this assistance until the students assumed the role of dialogue leader. Each day the students were given a short passage of text to read and were required to answer ten comprehension questions from the text. These questions were formulated by the researcher and included a range of text-explicit (the answer is in the text), text-implicit (the answer must be inferred by combining segments of text) and script-implicit questions (the answer must be arrived at by considering information in the text and prior knowledge of the topic) (Palincsar & Brown, 1984, p. 130). Evaluation of these daily assessments showed an improvement from 15% accuracy to 85% accuracy, which was maintained after training was completed. After a six month delay, the students averaged 60% accuracy without help and, after one further session of Reciprocal Teaching, were able to achieve 85% accuracy once more (Palincsar & Brown, 1984, p. 125). This success encouraged the following further studies by Palincsar and Brown.

Study 1. Palincsar undertook a study using seventh



grade students who had age-appropriate decoding fluency (i.e., a rate of at least 80 wpm with two or less errors) but were performing at least two years below grade level in comprehension. These students were assigned to Reciprocal Teaching or control groups, each having two participants (i.e., two students per group). No information was provided as to how students were assigned to groups. Instruction was delivered by instructors selected by the researchers.

All texts were expository and covered a range of topics. The study was conducted over 20 sessions. During this time the researchers recorded, transcribed and scored all dialogues of the Reciprocal Teaching groups. As consistent in the pilot study, it was found that "unclear questions and detailed summaries predominated in the early sessions, while main idea questions and summaries in the students' own words were most common in the latter sessions" (p. 135). The study was considered successful because students "improved dramatically" (p. 144) in the daily comprehension questions. Four of the six students in the Reciprocal Teaching groups showed an average gain in reading comprehension age of 15 months as measured by the Gates-MacGintie Standardized Reading Test. One student did not improve in reading age, and another student gained two months in reading age.

Study 2. The second study replicated the first, except that classroom teachers, naturally occurring groups of students and a classroom setting were used in an effort to

approximate a normal instructional environment (i.e., to increase external validity). It was thought that this would more realistically indicate the significance of the intervention.

The instruction took place in a school setting, using larger, naturally occurring groups of students (i.e., average group size being 5 students). Seventh grade students were pretested and found have decoding fluency (i.e., reading at least 80 wpm on age-appropriate text with two or less errors), but their comprehension was at least two years delayed (Brown & Palincsar, 1985). Daily data of individual contributions to discussions were collected and recorded in order to ascertain changes in question types and summarising skills for the Reciprocal Teaching groups. Initially, the teacher modelled the appropriate activities, and the students were passive observers. As the intervention progressed, the students participated in the dialogue. The data collected over 20 sessions of 30 minutes showed that the students were more competent in providing paragraph summaries and focussed questions.

Students instructed to use Reciprocal Teaching showed an increase in reading age as measured by the Gates-MacGintie Standardized Test of Comprehension, averaging a 20 month gain, whereas control students gained an average of one month (Brown & Palincsar, 1985, p.27). Students maintained this improved level of performance on maintenance sessions and a follow-up session eight weeks

later.

### Related Studies

Gilroy and Moore (1988) replicated Palincsar and Brown's (1984) study in a New Zealand setting. Twenty-eight girls from three class levels (Standard 4, Form 1 and Form 2) were selected using the results of the Progressive Achievement Test in Reading Comprehension (PAT) (1969) and grouped according to these results. Ten girls were randomly selected for the experimental groups, nine for the average comparison control groups (students who achieved between the 45th and 65th percentile on the PAT (1969) pre-test) and nine for the above average comparison control group (students who achieved above the 85th percentile on the PAT (1969) pre-test) for class level. The intervention phase lasted for 21 days, and the maintenance phase occurred eleven weeks later. Each session was 20 to 25 minutes in duration. Gilroy and Moore also conducted daily assessments using researcher-constructed measures, which consisted of a passage ranging from 300 to 400 words in length and ten comprehension questions using a range of text-explicit, text-implicit and script-implicit questions. While no information was provided regarding the content validity of this assessment form, interrater reliability of the answers was reported as 98% (Gilroy & Moore, 1988, p. 44).

The daily assessments of comprehension showed statistically significant increases in accuracy in comprehension questions for the Reciprocal Teaching groups.

Control groups had only slight increases in accuracy. The students in the Reciprocal Teaching groups (except one) showed gains in reading age when post-tested using the PAT (1969). The Reciprocal Teaching subjects also maintained an "increased comprehension accuracy" eleven weeks after the intervention (Gilroy & Moore, 1988, p. 47), showing that the Reciprocal Teaching procedure may have been internalised and "improved the girls' metacognition of the reading task" (Gilroy & Moore, 1988, p. 47).

Dermody (1988) conducted a study investigating metacognitive strategy instruction using Reciprocal Teaching. Forty-one fourth grade students were divided into three categories. The students were classified using the Stanford Diagnostic Reading Test and the Wide Range Achievement Test and randomly assigned to either an experimental or control group for each category. The students were categorised as above-average comprehenders / decoders (Good/Good), below-average comprehension / above-average decoders (Poor/Good), and below-average comprehenders / decoders (Poor/Poor). The intervention lasted for 24 sessions of an unreported length involving three phases. In phase I the students were taught the individual strategies. In phase II the Reciprocal Teaching procedure was used, and Phase III involved the use of the Reciprocal Teaching procedure within the social studies content area. Dermody does not report the conditions used for the control group.

Results indicated that the experimental group Poor/Good performed "significantly better" on the post-test than did their control group (Dermody, 1988, p. 6). Dermody attributes these results to Reciprocal Teaching. An analysis of variance of gain scores for the three experimental groups indicated a statistically significant difference in gain scores on the standardised comprehension test for the Poor/Good group when compared to the other experimental groups of Good/Good, and Poor/Poor. Dermody (1988) concluded that the strategies and the procedure of Reciprocal Teaching improved the reading comprehension skills of readers with above-average decoding fluency and below-average comprehension skills. Dermody also reported that the subjects successfully transferred the Reciprocal Teaching procedure to the social studies content area, attaining positive results.

The studies conducted by Palincsar and Brown (1984), Gilroy and Moore (1988) and Dermody (1988) reported results in terms of gain scores. The use of gain scores when analysing results has limitations, one being that each subject does not have equal opportunity to gain in score (Gay, 1992). An appropriate analysis would use pre - post-test percentile gains (Lysynchuk et al., 1990, p. 478). Alternatively an analysis might consider the group's performance on a pre-test and conduct either an analysis of variance (ANOVA) or an analysis of co-variance (ANCOVA) using post-test scores (Gay, 1992). Lysynchuk et al. (1990)

used pre - post-test percentile gains when analysing the results of his study.

Lysynchuk et al. (1990) conducted a study of Reciprocal Teaching to evaluate this procedure using a true experimental design (i.e., random assignment to groups with the only differing variable between the Experiment and Control groups being the intervention, Reciprocal Teaching). Students ranging from 9-14 years old in Years 4 and 7, who were adequate or fluent decoders but poor comprehenders (assessed using the Metropolitan Achievement Test (1978) for Year 4 and the Gates-MacGintie Reading Test (1978) for Year 7) and not classified as learning-disabled, according to their classroom teachers, were selected for this study. Subjects were paired on the basis of pre-test scores with one pair-mate randomly assigned to either control or treatment groups ranging from 2 - 5 students in number (1990, p. 473).

The intervention lasted for 13 sessions of 30 minutes. Control groups received no strategy training but were given the passages to read while gaining interaction and exposure with the experimenter. Reciprocal Teaching students received instruction on the use of the strategies before the Reciprocal Teaching sessions commenced. Students were instructed on the benefits and applications of each individual strategy before they were put together as part of the Reciprocal Teaching procedure.

An analysis of students' pre- and post-test

percentile gain scores in standard comprehension showed that gains were confined to the Reciprocal Teaching group, consistent with the pilot study of Palincsar & Brown (1984). Lysynchuk et al. (1990) concluded that it would be very difficult to attribute the pre-training - post-training standardised comprehension gain to anything other than Reciprocal Teaching.

The studies mentioned above were conducted using students who were identified as naive comprehenders. Additional studies have used whole classes to study the effects of Reciprocal Teaching on the reading comprehension of all students.

#### Reciprocal Teaching with Whole Classes

Miller, Miller and Rosens' (1988) study included all students in the class, not just naive comprehenders. All students were used because the researchers believed that "all students could benefit" from this approach to learning (p. 184). Sixty-four seventh grade students were randomly assigned to three classes. One class was randomly assigned to Reciprocal Teaching while the other two classes served as control groups.

Twenty-six students in the Reciprocal Teaching class were randomly assigned to four instructional groups. The intervention was conducted for 16 sessions of 60 minutes. Each session consisted of the Reciprocal Teaching procedure followed by a ten-question multiple-choice comprehension test, in addition to student writing samples. The

comprehension tests were constructed by the researchers and included text-explicit and text-implicit questions. No information as to the reliability or the validity of these tests was provided by the researchers.

Results showed that the Reciprocal Teaching group performed significantly better in the comprehension tests and the writing samples than students taught in the traditional manner. The researcher did not investigate the differences in achievement between the expert and naive comprehenders. Miller et al. (1988) concluded that Reciprocal Teaching was a "promising approach to increase student interest, involvement and achievement in regular-education classrooms" (p. 185).

Pullella's (1990) study examined the improvements of students' general reading comprehension as a result of the Reciprocal Teaching procedure. The study also examined changes in levels of self-efficacy and reading self-concept as a result of the students' experience in implementing the strategies.

The subjects were 43 Year 7 students and 39 Year 6 students in three Western Australian classrooms. Each class contained students of varying levels of comprehension. The intervention consisted initially of 8 one-hour sessions that introduced the strategies (predicting, questioning, summarising and clarifying) individually and then collectively. Twenty-eight sessions of one hour followed this initial instruction. These sessions focussed on the



Reciprocal Teaching procedure and also included other areas of language instruction. The researcher who was the regular class teacher for one group held sessions explaining the Reciprocal Teaching procedure and its underlying beliefs to the other two teachers. These teachers also observed sessions conducted by the researcher. The researcher's class was taught to use the intervention first, while the other two classes acted as control groups. Then the remaining classes participated in the intervention and were taught by their regular classroom teachers.

Pullella (1990) measured improvements in general reading comprehension scores using TORCH, and individual strategies were assessed by measures constructed by the researcher for the study. Reliability of the researcher-constructed measures was reported as beyond 0.90 for each strategy (Pullella, 1990, p. 56). Pullella (1990) reported that improvements in general reading comprehension were not significant. Individually, there was no significant increase in the results of the assessment for the four strategies, but when combined as a total score an increase in scores was found. It was also found that the intervention influenced increases in self-efficacy for the predicting strategy and had positive influences on reading self-concept. Pullella (1990) concluded that Reciprocal Teaching was a successful procedure for enhancing reading comprehension and that the procedure could successfully be introduced to and utilised by classroom teachers with all

students.

Bottomley and Osborn (1993) conducted a study in which three classroom teachers implemented Reciprocal Teaching in a whole-class setting with fourth and fifth grade students. In this study, the teachers initially explained to the students why they were learning the strategies, in what situation the strategies would be useful, and how they were going to learn the strategies to aid future accessing of the strategies. The intervention lasted for 28 sessions of 20 minutes.

Researcher-constructed measures were used to assess students. First, students were asked to read a passage and answer a range of question types. Then, students were asked to "write a summary, generate questions aimed at the main idea of the text, indicate a need for clarification and predict what would happen next". Interrater reliability of these answers was reported as being 96% (1993, p. 7). Bottomley and Osborn (1993) concluded that results of this study provided supporting evidence for previous results regarding the effectiveness of Reciprocal Teaching.

#### Summary

Effective reading comprehension requires the utilisation of metacognitive processes to access strategies to comprehend text and to monitor comprehension. The instruction used to present strategies to students is instrumental in the acquisition of the strategies by the

students (Deshler & Schumaker, 1993; Helfedt & Henk, 1990; Mosenthal et al., 1992).

Those studies in which the experimenter initially explained to students why they were learning the strategies, in what situation the strategies would be useful and how they were going to learn the strategies, were more successful than studies in which students had no initial introduction to the strategies. Explicit instruction of the strategies was an integral element in the readers' acquisition of the Reciprocal Teaching procedure.

The Reciprocal Teaching procedure incorporates explicit strategy instruction in a supportive environment to facilitate the acquisition of strategies and improve reading comprehension. These instructional characteristics appear to be especially beneficial for naive comprehenders who may not have any knowledge of reading strategies or may not know when to access and employ them.

Reciprocal Teaching was found to be beneficial for naive comprehenders as students who received clear explanations or were shown a strategy to comprehend text improved their comprehension.

Miller et al. (1988) and Pullella (1990), through investigating the Reciprocal Teaching procedure also have found it to be an effective procedure for improving the reading comprehension of students in regular class settings. This suggests that the Reciprocal Teaching

procedure is successfully internalised by readers to become part of their repertoire of reading comprehension strategies. This internalisation should be evident by an improvement in the results of reading comprehension assessment measures. However, the type of test used to assess reading comprehension may produce differing results and have different implications because of the individual nature of each test.

### Critical Analysis of Measures

When considering the results and conclusions of a study, it is necessary to examine the measures used. The measures should be both valid and reliable. Generally, standardised tests have a high degree of reliability and validity (Gay, 1992).

Studies reviewed involving Reciprocal Teaching or an adapted procedure did not always use standardised tests of comprehension. Other forms of assessment included researcher-constructed tests. Some studies used a combination of researcher-constructed tests, written passages and standardised tests to assess results.

Researcher-constructed tests. Tests constructed specifically for a study may not be appropriate for drawing general conclusions. Tests should have a high degree of content validity and reliability in order for results to be generalisable. The researcher-constructed tests in reported studies commonly required students to read a passage and

answer comprehension questions. These tests included a combination of text explicit and text implicit questions and were given on a daily basis. Interrater reliability for these measures ranged from 95% to 98% for those studies that reported reliability (Bottomley & Osborn, 1993; Gilroy & Moore, 1988; Lysynchuk et al., 1990). Other measures included retelling or writing summaries of a short passage (Bottomley & Osborn, 1993; Lysynchuk et al., 1990). None of these studies offered information regarding the content validity of their measures. Therefore, generalisation of results from the studies using these measures with all students is limited.

The results may indicate that the subjects have improved on the individual strategies, but any improvement in general reading comprehension has not been measured. If a reading comprehension procedure is to be of any benefit to students, it must be suitable and accessible for use in other reading conditions. This generalisation shows that the students have internalised the strategies and accessed and applied them when needed. A better measure may be standardised tests, which require students to generalise the strategies.

Standardised measures. Standardised measures of general reading comprehension are a more reliable way of assessing the benefits of a reading comprehension procedure as well as having other benefits. Gilroy & Moore (1988) suggested that increases on standardised measures indicate

the readers' abilities to "generalise to a non-equivalent testing situation" (p. 47), indicating that readers internalised the strategies and retrieved them when needed. Pullella (1990) and Lysynchuk's studies (1990) utilised both constructed measures and standardised measures. Lysynchuk et al. (1990) focussed on using standardised measures of comprehension because educators are "familiar" (p. 470) with them. Lysynchuk et al. (1990) also proposed that information about the effects of Reciprocal Teaching on standardised test performance could also be helpful in making curriculum and instructional decisions. Standardised tests are a more appropriate means of assessing general reading comprehension and were used for this study as a pre- and post-test.

This study provides data on the effectiveness of Reciprocal Teaching for Western Australian students of varying comprehension abilities. The students' proficiency in mastering and maintaining the Reciprocal Teaching procedure was examined as well as their ability to generalise the procedure to other reading contexts. Of particular interest was the effectiveness of the explicit instruction in this strategic procedure for enhancing the reading comprehension of naive comprehenders.

## CHAPTER 3

### Method

This chapter describes the subjects selected and the research design utilised in this study. Pre-test and post-test measures and the procedures for the treatment and control groups are also detailed.

### Subjects

A convenience sample of 49 students from two metropolitan primary schools were selected to participate in this study. Both of the primary schools are administered by the Catholic Education Department and located in the northern suburbs of Perth.

### Design

An Experimental Pre-test - Post-test Control Group Design was used (Figure 2) (Gay, 1992, p. 324). Following a similar procedure used by Lysynchuk et al. (1990, p. 473) students from each classroom were paired according to the results of the Test of Reading Comprehension (TORCH) (Mossenson et al., 1987) and randomly assigned to either a treatment or control group. Pairing was used in order to equate the treatment and control groups (Gay, 1992, p. 316). Both treatment and control groups were divided by random assignment into groups of five or six, emulating classroom small-group work. Small groups were used because

this is a central feature of Reciprocal Teaching and it is recognised that this organisation encourages students to become actively engaged in the learning process (Fielding & Pearson, 1994; Good & Brophy, 1991; Pigott et al., 1986).

R	O	X1	O
R	O	X2	O

Symbols: R = random assignment of subjects to groups  
O = test, pre-test or post-test  
X1 = treatment (Reciprocal Teaching procedure)  
X2 = control (regular class instruction)

Figure 2. Representation of the Experimental Pre-test - Post-test Control Group Design.

(Gay, (1992), p. 324).

### Measures

A number of measures were used in order to address the research questions. These measures assessed reading comprehension, decoding fluency and maintenance and transfer of comprehension skills as assessed by a maze passage.

### Comprehension

Reading comprehension was measured using the Test of Reading Comprehension (TORCH). The TORCH was developed in



Western Australia in 1982 by the Curriculum and Research Branch of the Education Department of Western Australia. It was developed to measure the extent to which readers are able to obtain meaning from text (Mossenson et al., 1987).

Reliability was calculated by administering the test to a sample of students in Western Australian Government schools. The TORCH was recalibrated in 1984, again in Western Australian Government schools. Reliability reported in terms of Kuder-Richardson reliability coefficient (KR-20) was between 0.90 and 0.93 (1987, p. 24). This suggests a strong degree of internal consistency (Gay, 1992).

The TORCH measures eleven different comprehension tasks that are identifiable by individual scores. These tasks show students' abilities to identify the author's message and make meaning from text which is the goal of reading (Mossenson et al., 1987). The TORCH was judged as valid in measuring comprehension in this study.

#### Decoding fluency

Fluency of decoding was assessed because decoding is an essential pre-skill for making meaning from text (Cooper, 1986; Spear-Swerling & Sternberg, 1994), which is a prerequisite for the Reciprocal Teaching procedure (Palincsar & Brown, 1984). Students' decoding skills were assessed by collecting information on their decoding fluency on an age-appropriate passage of text. The text used for this was a passage of 261 words in length and appropriate for Year Six as measured by Fry's Readability

Estimate (see Appendix A for text). A fluent decoder was defined as decoding not less than "80 words per minute with no more than two error words per minute" when reading an age-appropriate passage orally (Palincsar & Brown, 1984, p. 127).

### Maze

A maze is a multiple-choice variation of a cloze test. Maze tests use passages ranging from 125 to 400 words in length. Every fifth word is deleted and a blank line is inserted in its place. The deleted word is written underneath the blank line along with two foils - one semantically and one syntactically similar (Parker, Hasbrouck & Tindal, 1992). Readers are required to select the correct word by using the information supplied in the text and write it in the space provided. (See Appendix B for sample of a maze used in this study).

The maze was used because it is an alternative measure of reading comprehension. Readers are required to use prior knowledge and read forward and backward to either confirm or reject their predictions. Successful completion requires readers to process entire sentences, rather than use their "memory, learning or oral language" (Guthrie, 1973, p. 296; Howell et al., 1993).

The maze passages used in this study ranged from 244 words to 278 words in length and had a readability estimate of Year Six as calculated by Fry's Readability Estimate. Students were given ten minutes to complete the passages

which were administered to the whole class.

A maze using expository text was administered to all students at the completion of intervention and three weeks after intervention. The results of the post-test expository maze and the expository maze administered three weeks after intervention tests were used to determine if students maintained comprehension over time. Students were also administered a maze using a narrative text at the completion of instruction to allow a comparison with the results of the expository maze to determine if students could transfer their comprehension skills to narrative text.

### Procedure

#### Pre-test

One week prior to the intervention, the researcher administered the TORCH to students as a whole class. The students were each given Form B4 of the TORCH and an answer sheet. Students were given 50 minutes in which to complete the test, as recommended in the test guidelines.

The decoding test was administered to each student individually by the researcher. The students read aloud a passage for one minute. The number of words read and miscues made by individual students was recorded. The miscues recorded included words inserted, deleted and mispronounced (with the exception of speech or language differences). A fluency score (words correct per minute)

and reading accuracy score (% of words correct) were calculated.

### Treatment

Some studies comprised of up to 28 treatment sessions (Pullella, 1990; Bottomley & Osborne, 1993) while others achieved statistically significant results using 13 to 16 sessions (Lysynchuk et al., 1990; Miller et al., 1988). Based on these results, 14 treatment sessions were used for this study. These instructional sessions took place prior to morning recess at one school and prior to the lunch break at the other school. Each session lasted for 25 minutes. Groups of students and an instructor were seated in a circle during each session. Attempts were made to standardise conditions by having all groups work in a classroom setting whenever possible. At times, however, some groups were required to work in resource rooms. During each session, each student was given their own copy of the text to read.

Instructors. A total of four instructors were used, including the researcher. Each instructor taught one Reciprocal Teaching group and one Control group. All instructors had a Bachelor of Arts (Primary Education) degree and were enrolled in the Bachelor of Education (Children with Special Needs) program. Prior to the commencement of intervention, each instructor was given background information on the Reciprocal Teaching procedure. Procedures for each session and scripts were

given to and explained to each instructor. (Refer to Appendix C for a sample script and text). The instructors were familiar with the Reciprocal Teaching procedure and were aware of their duties before the sessions commenced.

Reciprocal Teaching group sessions 1 to 4. For the first four sessions the instructor explained the strategies the students would be learning (i.e., prediction, generating questions, summarising and clarification), why they were learning these particular strategies and how they would go about learning the strategies. Throughout the sessions the instructor assumed the role of leader and modelled the strategies and procedures as illustrated in Table 2. The instructor-as- leader was responsible for initiating and sustaining the dialogue.

Reciprocal Teaching group sessions 5 to 7. The instructor-as-leader gradually transferred the responsibility of leader to the students while providing feedback and guidance. Steps 1 and 2 in Table 2 were repeated, but the instructor-as-leader invited a student to ask a question and evaluate the question type. Other students were then chosen to ask questions. Step 3 was repeated with the instructor-as-leader inviting a student to take over the role of leader to summarise the text. Another student was invited by the instructor-as-leader to clarify the text. Yet another student was invited to predict the next segment of text. Support was offered, if required, by the instructor.

Table 2

Reciprocal Teaching Method

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Step 1 Prediction: The leader uses the text title, pictures and prior experiences to make predictions about the text. Discuss predictions. Read first section of text.

Step 2 Question Generation: The leader asks questions about the first section of text and requires students to evaluate the question type (Right There, Think and Search, On My Own), and provide an answer.

Step 3 Summarising: The leader makes a brief summary of the first section. Students are invited to change or add to the summary.

Step 4 Clarification: Students are asked to identify words or parts of the text that are not understood. Students are encouraged to clarify these using context and picture clues.

Repeat until the text is completed.

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Reciprocal Teaching group sessions 8 to 14. In this final phase the students assumed the role of leader. The instructor initially selected a student to be leader for the first part of the text and to carry out steps 1 to 4 as shown in Table 2. The student then proceeded to act as leader for the remainder of the passage.

At all times the instructor made sure that accurate question types and answers were being formulated, adequate summaries and accurate clarifications were made by the students. If the student responses were not accurate, the

instructor asked for clarification and provided correction if needed.

Control group. The control groups received no strategy training. They read silently the same passage as the Reciprocal Teaching groups in the presence of an instructor who provided assistance with decoding and understanding of passage vocabulary when requested. The instructor also asked a number of scripted questions, which the students answered orally. (See Appendix D for sample text and Appendix E for sample questions). The questions included text-explicit and text-implicit questions. The students were able to discuss their answers amongst themselves if they wished to do so. This interaction with an instructor attempted to decrease threats to internal validity by exposing the control group to the same environment as the treatment group (Gay, 1992). In order to expose control groups to instructional time equal to that of the experimental groups, students in control groups engaged in silent reading.

Silent reading is a strategy in which readers engage in reading without interruption. This strategy may provide readers with an enjoyable break from academic learning while providing the opportunity to develop effective reading skills. Readers may gain experience in decoding text and making meaning from text selected personally through engaging in silent reading (Fielding & Pearson, 1994; Kefford, 1981; McKirdy, 1984; Sloan & Latham, 1981;

Spear-Swerling & Sternberg, 1994).

### Post-test

At the completion of the intervention, the researcher administered Form B6 of the TORCH to the treatment groups and the control groups. Students also completed two maze passages (one expository text and one narrative text) to ascertain if the Reciprocal Teaching training had transferred to narrative text. The post-tests were administered to the whole class by the researcher.

### Maintenance

Students were tested three weeks after the completion of the intervention to determine if they had maintained any benefits of the Reciprocal Teaching procedure. This was achieved by administering a maze passage using expository text. The results of this maze passage were compared to the expository maze completed during the post-test.

### Student Evaluation

At the completion of the intervention, six students were interviewed by the researcher. The purpose of this was to acquire some qualitative data regarding the students' attitudes toward, and utilisation of, Reciprocal Teaching. The students were required to state the strategies included in the Reciprocal Teaching procedure, the aspects they liked the most and least about the procedure, and whether or not they utilised the Reciprocal Teaching procedure while reading in other classes. Appendix F presents the



questions that were asked of the students.

### Fidelity of Instruction

Fidelity of instruction was controlled by providing scripted lessons to all instructors. To check if instructors followed the scripted lessons, an independent observer attended randomly selected sessions. The independent observer had qualifications of a Bachelor of Arts (Primary Education) degree and was required to follow the script and make a judgement as to the adherence to the script by each instructor. The observer concluded that the instructors were following the scripts as presented to the instructors.

## CHAPTER 4

### Results

This chapter presents the results of the pre- and post-tests used in this study and the statistical analysis undertaken to interpret the results.

### Subjects

Initially 49 students were selected to take part in the study. One student in the Reciprocal Teaching (R.T.) group was not present at the time of pre-testing and was not included in the final analysis. One student in the Control group did not answer any questions on the pre-test and was not included in the final analysis. During the intervention two students in the R.T. group and one student in the Control group did not attend a minimum of 12 sessions. Their data were not therefore included.

One student in the R.T. group and two students in the Control group were not post-tested due to sickness at the time the post-test was administered and were not included in the final analysis. As a result, the final analysis was conducted on 20 students in the Control group and the R.T. group was reduced to 21 students.

### Analysis of Reading Comprehension Scores

Table 3 presents pre-test - post-test data from the TORCH. It summarises the mean scores of the R.T. group and the Control group subjects.

Table 3

Summary of TORCH Pre-test and Post-test Scores for the R.T. and Control Groups

Group	Number	Pre-test Mean	Post-test Mean
R.T.	21	50.571	51.048
Control	20	50.850	51.600

An analysis of co-variance (ANCOVA) with the pre-test scores as the covariate and the post-test as the dependent variable with the teachers nested in groups was calculated to determine if there was a statistically significant difference between the R.T. group and the Control group. No significant difference was detected between the R.T. group and the Control group. Therefore the null hypothesis has failed to be rejected. Table 4 presents a summary of effects.

Table 4

Summary of Effects Using ANCOVA with Teachers Nested in Groups

Effect	DF	MS	F	p
Group	1	0.343	0.011	0.916
Teacher	6	47.872	1.572	0.187

An analysis of co-variance (ANCOVA) of the post-test scores with the pre-test scores as the covariate without teachers nested in groups was also calculated including all subjects. Again no significant difference was detected ( $F(1,39) = .0179, p > .05$ ). A one-way analysis of variance (ANOVA) of post-test scores was calculated which also showed no significant difference. Table 5 illustrates these results.

Table 5

Analysis of Variance of Post-test Scores

Source	SS	DF	MS	F	p
Between groups	3.13	1	3.13	0.027	0.87
Within groups	4545.75	39	116.56		

Analysis of Maze Scores for Transfer to Narrative Text

Table 6 presents the mean scores for the maze passages used to determine transfer of the Reciprocal Teaching procedure to narrative text for both groups. The scores from the post-test expository and narrative mazes are compared. These data show that both groups' scores decreased slightly. These scores were analysed using a one-way ANOVA the results of which are shown in Table 7. Some students were absent when the maze passage was administered, their data were not therefore included.

Table 6

Summary of Maze Scores for Transfer to Narrative Text for  
the R.T. and Control Groups

Group	Number	Expository Maze Mean (%)	Narrative Maze Mean (%)
R.T.	19	91.447	91.289
Control	20	90.789	88.442

Table 7

Analysis of Variance for Transfer to Narrative Text

Source	SS	df	MS	F	p
Between groups	77.02	1	77.02	0.970	0.331
Within groups	2859.14	36	79.42		

Analysis of Scores for Maintenance of the Reciprocal  
Teaching Procedure

Table 8 presents the mean scores for the maze passages used to determine if improvements in comprehension were maintained three weeks after the completion of instruction. These data show that the mean scores for both groups showed little change.

Table 8

Summary of Maze Scores for Maintenance of the Reciprocal Teaching Procedure for the R.T. and Control Groups

Group	Number	Expository Maze Mean (%)	Maintenance Maze Mean (%)
R.T.	19	91.447	91.800
Control	20	90.789	91.000

The scores of the R.T. and the Control groups for the maintenance maze were compared using a one-way ANOVA. The results of this analysis is shown in Table 9. No significant difference was found ( $F(1,37) = 0.069, p > .05$ ).

Table 9

Analysis of Variance for Maintenance of Comprehension Skills for the R.T. and Control Groups

Source	SS	df	ms	F	p
Between groups	6.24	1	6.24	0.069	0.794
Within groups	3355.20	37	90.68		

### Benefits for Naive Comprehenders

Because an insufficient number of students fall into the naive comprehender category in the Reciprocal Teaching and Control groups, an analysis of variance could not be conducted. The naive comprehenders in the Reciprocal Teaching group and the Control group were analysed individually.

Two of the four students in the Reciprocal Teaching group who achieved below the 25th percentile in the TORCH pre-test showed improvements in their percentile ranks in the post-test of the TORCH. The changes are shown in Table 10.

Table 10

#### Changes in Percentile Ranks on TORCH for Naive Comprehenders in the Reciprocal Teaching Group

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Student	Pre-test Percentile	Post-test Percentile
1	11	42
2	20	49
3	20	23
4	5	0

---

A percentile change in the lower percentile ranks requires a larger gain in raw score than a change in rank at or around the mean (Mossenson et al., 1987). The change in rank for students 1 and 2 indicates that these students have improved in their reading comprehension as measured by TORCH.

The naive comprehenders who received Reciprocal Teaching showed changes in pre - post-test TORCH scores. Two students improved their TORCH scores, one stayed the same and one student decreased in score. These results are illustrated in Table 11.

Table 11

TORCH Pre-test and Post-test Scores for Naive Comprehenders in the Reciprocal Teaching Group

Student	TORCH Pre-test	TORCH Post-test
1	40	47
2	43	48
3	43	43
4	31	23



Students 1 and 2 both answered more questions on the post-test than on the pre-test. Analysis of questions answered by these students showed they answered more questions of a higher level of difficulty on the post-test, resulting in higher TORCH scores.

The TORCH scores for student 3 did not change from pre-test to post-test. An analysis of the questions answered by student 3 showed that this student did not answer any questions that required a higher level of comprehension on the post-test.

Student 4 answered two questions to achieve a pre-test TORCH score of 31, but answered no questions on the post-test. This may indicate that the student did not comprehend the passage sufficiently to answer any questions. However, this may not be a true indication of reading comprehension ability, but may be a result of other motivational factors. Some naive comprehenders in the Control group also showed similar improvements.

Table 12 presents changes in TORCH score and percentile ranks for students in the Control groups who were identified as naive comprehenders. The increases in both score and rank show that these students' reading comprehension has improved as measured by TORCH.

Table 12

Changes in Scores and Percentile Ranks on TORCH for Naive Comprehenders in the Control Group

Student	Pre-test		Post-test	
	Score	Percentile	Score	Percentile
1	43	20	48	49
2	38	4	41	14
3	43	20	53	71

An analysis of the number of questions and level of difficulty of the questions answered showed that students 1 and 3 answered more questions and that these questions were of a higher level of difficulty on the post-test, resulting in higher TORCH scores. Student 2 answered the same number of questions in both the pre-test and the post-test but the level of difficulty of the questions answered were higher in the post-test.

## CHAPTER 5

### Discussion

This chapter discusses the findings of the study, with reference to the theory and the findings of previous studies. The benefits of Reciprocal Teaching for enhancing the reading comprehension of students, naive comprehenders in particular, is discussed with reference to the results of this study. Additional aspects of the Reciprocal Teaching procedure are mentioned with attention to the students' own expectations, motivation and involvement in the small-group work. The perceived limitations of this study are also discussed.

### The Relationship Between the Reciprocal Teaching Procedure and

#### Improvements in Reading Comprehension

The results of this study failed to reject the null hypothesis, showing no statistically significant difference in the comprehension scores between the Year 6 students who were taught the Reciprocal Teaching procedure and those who received regular reading comprehension instruction. This indicated that knowledge of the Reciprocal Teaching procedure does not lead to statistically significant increases in reading comprehension for students from an intact regular school class as compared to regular class instruction when assessed using the results of a

standardised test of reading comprehension.

Pullella (1990) also reported that improvements in reading comprehension due to Reciprocal Teaching when measured by a standardised comprehension test were not significant. The present study, like that of Pullella (1990), measured reading comprehension for all students in a regular class but found no statistically significant improvements due to the Reciprocal Teaching procedure. Lysynchuk et al. (1990), Gilroy and Moore (1988) and Dermody (1988), in contrast, reported significant gains in reading comprehension when using standardised tests. This may be due to the nature of the standardised test used.

Measures. The standardised test of reading comprehension used in this study (TORCH) measured several levels of reading comprehension but may not have been sensitive enough to measure changes of a small scale. The forms selected for the pre- and post-tests differed in the level of comprehension questions they contained. Four of the 22 questions in the pre-test required a lower level of comprehension than the lowest level question in the post-test. This suggests that the post-test may not have been sensitive enough to measure scores at the lower end of the scale, resulting in a floor effect of the scores. No other related studies have reported such floor effect problems.

Standardised tests provide a convenient and objective means of assessment. Other factors, however, also affect performance. The manner in which a standardised test is

conducted (e.g., controlled conditions, individualised or group administration) may be unfamiliar to students. Testing is often a highly anxious activity for students to be engaged in. Overanxious students may consume much of their short-term memory capacity with worry, using cognitive resources that could be put to better use in the application of strategies and other knowledge (Borkowski et al., 1989). This anxiety affects students' performance on the test. Therefore standardised test results may not be a true representation of students' abilities.

If the Reciprocal Teaching procedure had been successfully learned and added to students' Executive Control processes, students would access and retrieve the strategies and apply them while reading. This may have resulted in improved reading comprehension.

#### Accessing the Reciprocal Teaching procedure

When a procedure is learned, it is internalised to become a component of the readers' Executive Control processes, resulting in automatic access to the strategies, which are retrieved and used during reading. While the results of this study indicate that training in the Reciprocal Teaching procedure does not result in significant increases in comprehension, students were able to recall the individual strategies that form the procedure from their long-term memories.

When asked to relate the steps used in the procedure, four out of six students could remember three of the four

strategies. The most commonly missed strategy was clarification. The term "clarification" was unfamiliar to the students and was commonly referred to as "classification" throughout the intervention. Although the label of the strategy was misidentified, all students were able to correctly describe the purpose and features of the clarification strategy. This indicated that the students had knowledge of the strategies that form the Reciprocal Teaching procedure. However, the ability to name the strategies does not indicate that students have strategic procedural knowledge enabling them to access the Reciprocal Teaching procedure sufficiently to enable appropriate application.

The results of the TORCH showed no statistically significant differences in the reading comprehension scores of those students who were taught the Reciprocal Teaching procedure and those who received regular class instruction. This may indicate that the students did not learn the strategies that are included in the Reciprocal Teaching procedure sufficiently to enable them to automatically access and utilise the strategies to comprehend text. Extended guided practice using the Reciprocal Teaching procedure may provide the rehearsal necessary for the strategies to form part of the students' Executive Control processes. Alternatively the students may have known, but chose not to use the strategies.

#### Generalisation of the Reciprocal Teaching Procedure

The ability to generalise a procedure to suit other reading requirements is an indication of efficiently processed information facilitated through the application of strategies.

Readers should be able to use their metacognitive skills to access and transfer the strategies imparted in the Reciprocal Teaching procedure to situations other than those in which they have been instructed. Effective generalisation of a strategy or procedure is evidence that the procedure has formed a part of students' Executive Control processes aiding in the effective processing of information. Palincsar and Brown (1984) and Dermody (1988) found that readers were able to access and transfer their skills to successfully improve their comprehension of expository text in social studies and science. Research question 1 asked if readers could generalise from expository text to narrative text.

Generalisation was assessed by comparing the results of an expository maze passage and a narrative maze passage. No significant difference was found between the Reciprocal Teaching group and the control group. The students did not seem to use the Reciprocal Teaching strategies for either text type. This suggested that students' knowledge of the Reciprocal Teaching procedure did not aid in their comprehension of expository text or narrative text.

Palincsar and Brown (1984) and Dermody (1988) introduced the Reciprocal Teaching procedure using

expository text and tested transfer using expository text from curriculum areas. They found that the Reciprocal Teaching procedure was successfully transferred to content area text. Their success may be due to the students' prior knowledge of the text content or structure. The structure of most expository texts is similar in that they often contain headings and sub-headings. Headings indicate the content of the text and aid in formulating predictions. These headings are not often found in narrative text. Students may also possess and be able to retrieve large amounts of prior knowledge relating to the content in the new text. This prior knowledge may enable students to more accurately select relevant information and to rehearse and transfer relevant parts of it to their long-term memories. While the results of this study showed that the students did not successfully generalise the Reciprocal Teaching procedure from expository text to narrative text, certain aspects of the procedure were apparently being employed by some students.

Students reported that they made more of an effort to clarify unclear parts of the text as a result of their involvement in Reciprocal Teaching activities. A number of the students read ahead in the text to see if that helped clarify unclear parts, others asked peers or teachers or referred to reference materials. One student revealed that she generalised the procedure to suit her reading requirements. She reported that she used prediction in her



recreational reading, and as a result of the intervention she enjoys reading ahead to confirm or reject her predictions. These students verified the utilisation of metacognitive skills to facilitate comprehension.

These anecdotes illustrate that some readers were employing metacognitive skills while reading in order to efficiently process information and comprehend text with new material. Prior knowledge is retrieved from the long-term memory and enhanced through prediction and group discussion. Incoming information is selected and organised through questioning, summarising and clarification, related to the retrieved information and translated and stored as meaningful concepts.

#### Rehearsal of the Reciprocal Teaching procedure

One explanation as to why the Reciprocal Teaching procedure might not have been mastered in this study might have been due to insufficient practise. The strategies may not have been rehearsed sufficiently for students to form Executive Control strategies for automatic retrieval when needed. This may suggest that the length of the sessions was insufficient or that the length of the study was too short, or a combination of both. Further practise using the Reciprocal Teaching procedure may facilitate the learning of these strategies.

Palincsar and Brown (1984) recommended 20 sessions for students to master the Reciprocal Teaching procedure. Other studies have used more sessions, and still others have used

less than 20 sessions. Lysynchuk et al. (1990) achieved successful results after 13 sessions, and Miller et al. (1988) achieved successful results after 16 sessions. The duration of the sessions varies between studies. Some sessions have lasted for 60 minutes, while others lasted for 20 minutes. The longer sessions usually included daily assessments or other language activities (Miller et al., 1988; Pullella, 1990).

### Self-efficacy

Strategies and knowledge about the strategies do not necessarily guarantee the effective processing of text (Borkowski et al., 1989). Readers' attitudes and beliefs of self-efficacy also influence information processing. Self-efficacy is the readers' belief that they can perform the behaviours required to produce desired outcomes (Bandura, 1986). If students do not have confidence in their abilities to learn and to use the strategies in the Reciprocal Teaching procedure, their lack of confidence may prevent their ability to access and utilise the procedure. Readers may have knowledge of the strategies but may not know when to use them.

It may be beneficial to teach students to generalise the Reciprocal Teaching procedure to other text genres. Further sessions using a range of curriculum materials would be beneficial in illustrating to students appropriate applications of the strategies and the areas in which the

strategies can be used to assist efficient access and encourage generalisation.

### Maintenance

Research question 2 investigated the students' ability to maintain improved levels of comprehension three weeks after the conclusion of the intervention. The research of Palincsar and Brown (1984) and Gilroy and Moore (1988) reported that students successfully maintained improvements in comprehension after periods ranging from eight weeks to six months after the completion of the interventions. The results of this study found no significant differences between the Reciprocal Teaching and control groups in the results of the maintenance maze. This may imply that the students who were taught the Reciprocal Teaching procedure did not retrieve and apply the strategies while completing the maze. One explanation for this may be that the students were not proficient in using the procedure. Proficiency occurs gradually and requires practise in using the strategies (Howell et al., 1993).

### Benefits to Naive Comprehenders

Research question 3 of this study sought to examine the benefits of Reciprocal Teaching to naive comprehenders. The Reciprocal Teaching procedure does not appear to have been beneficial to the group of students as a whole but the results support the findings of Palincsar and Brown (1984),

Dermody (1988), Lysynchuk et al. (1990) and Gilroy and Moore (1988) in that Reciprocal Teaching improved the reading comprehension skills of two out of four naive comprehenders. Naive comprehenders were identified as those readers who could adequately decode text but were poor comprehenders. Naive comprehenders in this study were able to decode a minimum of 80 words per minute with no more than two errors, but performed below the 25th percentile on the comprehension pre-test. These readers may lack strategies that enhance interaction with text or may fail to spontaneously apply them while reading. This study found that two naive comprehenders who received the Reciprocal Teaching procedure improved in reading comprehension as measured by TORCH. Improvements in reading comprehension was also found to have been achieved by naive comprehenders in the control groups.

It would seem that expert comprehenders already possess efficient information processing skills. These readers have a repertoire of strategies that they spontaneously apply during interaction with text. They possess the knowledge and skills that Reciprocal Teaching provided, making further instruction redundant. Reciprocal Teaching may not equip expert comprehenders with a procedure to build on or add to their repertoire of skills to improve their comprehension. Therefore, Reciprocal Teaching may not teach higher-order comprehension skills.

Students were encouraged to generate questions that

included text-implicit and text-explicit questions. The question-generating activity required students to identify the question type when providing an answer. When other members of the group disagreed with the answer or the question type, a discussion followed where students justified their answers. This activity aimed to encourage higher levels of comprehension as suggested by Durkin (1979). It appears, however, that this procedure may only be suitable for providing the foundations of reading comprehension for those students who may not acquire them through interaction with the environment. This was the objective of Palincsar and Brown (1984) when designing the Reciprocal Teaching procedure.

Palincsar and Brown (1984) proposed that Reciprocal Teaching would provide a strategic procedure for readers who lacked effective reading comprehension and metacognitive skills. The procedure would give these readers a step-by-step procedure to use when reading text that would include comprehension fostering and comprehension monitoring strategies.

Reciprocal Teaching aims to provide naive comprehenders with a method to effectively take in, store and retrieve information. The strategies in the procedure are designed to help naive comprehenders to transform the new information into meaningful concepts by selecting important information, disregarding the unimportant information and integrating the new information with prior

knowledge. The strategies should also enable naive comprehenders to monitor their comprehension while reading. This should result in naive comprehender's active interaction with text in order to comprehend text. Reciprocal Teaching should provide naive comprehenders with a strategic procedure to apply when reading, whereas previously, they may not have had a procedure to use or may not have known when to use it. Since expert comprehenders already have the knowledge and skills hence the instruction is possibly redundant.

### Qualitative Results

#### Student Involvement

The regular teacher of one classroom remarked upon the high level of involvement of all the students in the Reciprocal Teaching group. Students who were usually reluctant to answer questions in class were enthusiastic to take part in Reciprocal Teaching activities. Research has shown that the amount of time students are "actively engaged in learning is positively associated with achievement" (Morgan & Jensen, 1988, p. 20). This teacher valued the Reciprocal Teaching procedure and planned to incorporate it into future comprehension activities.

#### Small-Group Work

All of the students interviewed reported that they

enjoyed the opportunity to act as teacher and question their peers. Others said they enjoyed working in small groups and felt more confident when generating and answering questions, making predictions and formulating summaries. Research suggested that participation in a small group focussed on learning had an impact on individual students' learning (Fielding & Pearson, 1994; Miller et al., 1988). Small-group work provides some students with the support, or scaffolding, needed to facilitate effective processing of information. If students are not able to draw upon their own prior knowledge, they can benefit from sharing other students' prior knowledge. The group work during the Reciprocal Teaching procedure also enables students to check their own predictions, questions and summaries with other group members. This enables discussions in which students can justify their predictions, questions and summaries. These activities are an integral part of processing information for storage and later retrieval.

One disadvantage was the students' different rates of reading in each group. Fast readers did not like waiting for slower readers to finish reading the text. Slower readers were aware of this fact and compensated accordingly. One student was observed reading the assigned portion of text until he could see that the other members of the group had finished reading and stopped reading with them. Peer pressure affects the efficiency and

effectiveness of the procedure. The range of ability levels in each group in this study was a result of randomly assigning students to groups. However, other studies that included all the members of a class in the intervention and had groups of mixed ability have not reported this to be a disadvantage (Bottomley & Osborn, 1993; Miller et al., 1988; Püllella, 1990).

### Motivation

The text passages used in this study were varied and covered a range of topics. This appealed to the students, as they reported they were motivated to read the text. Motivation is important for all readers, especially naive readers, as increased motivation is likely to result in increased levels of reading practise (Spear-Swerling & Sternberg, 1994). Motivation directs the reader's attention to the task at hand and affects their willingness to complete a task. Motivation is also a component of students' Executive Control processes, making it a highly desirable characteristic of learning. Therefore, increased motivation facilitates effective processing of information and ultimately increased learning.

### Limitations of the Study

The effect of the limitations of this study needed consideration. Uncontrolled variables decrease the validity of the study, which compromises the results obtained, the generalisations made and conclusions drawn. Generalisation



of results regarding reading comprehension research is desirable because it enables the conclusions and implications made from a small sample to be applied to and benefit a larger population. This study endeavoured to maximise population and ecological validity. This was achieved by using naturally occurring groups of students in classroom settings. The combination of random assignment and the presence of a pre-test and a control group maximised internal validity. Random assignment controlled for regression and selection factors; pre-test controlled for mortality; randomisation and the control group controlled for maturation; and the control group controlled for history, testing and instrumentation (Gay, 1992). However, some of these factors and others affected the validity of this study.

#### Environment

The artificial environment in the classroom created due to experimenter effects, teacher and instructional technique, as well as the effects of the subjects being involved in a study (Hawthorne Effect) were a source for decreasing validity (Gay, 1992). All attempts were made to minimise these variables by exposing each subject to equal instructional time and conditions. Each instructor conducted both a control and experimental group to eliminate any bias due to experimenter effects (Gay, 1992).

#### Length of Study

This study was conducted over 14 sessions of 25

minutes. This may not have been sufficient to enable the students to learn the strategies and internalise the procedure. Increased or longer sessions may have produced statistically significant results. Palincsar and Brown (1984) suggested 20 sessions were required to obtain significant results. Lysynchuk et al. (1990) however, obtained statistically significant results after 13 sessions of 30 minutes in length.

#### Instrumentation

Despite the reported suitability of the TORCH forms used for Year 6 reading comprehension levels, one form did not prove appropriate for this study. The form used as a post-test was not sensitive enough at the lower level of achievement, resulting in a possible floor effect. It may have been effective if the forms had been administered in the reverse order, the less sensitive used as the pre-test. However, this may have resulted in bias in the other direction.

The TORCH was also found not to be an ideal measure for assessing reading comprehension, as the students did not appear at ease when using the test. This resulted in high levels of anxiety in some students possibly decreasing their motivation and expectations to complete the test successfully. The effects on test performance due to anxiety or low self-efficacy may have increased errors in test results. An alternative standardised test or a researcher-constructed test with reported reliability may

have produced different results.

### Generalisation of Results

A representative example of students covering the full range of the school population would be required before conclusions could be drawn about the benefits of Reciprocal Teaching on Year 6 students' reading comprehension in Western Australian schools. This study used only a small sample of Year 6 students from similar socio-economic backgrounds. This sample does not permit the results to be generalised to other year levels or socio-economic groups.

### Conclusion

This study added to the literature on Reciprocal Teaching. The Reciprocal Teaching procedure has benefits which aid in increased learning. An increased level of involvement and academic engaged time of the naive comprehenders was observed and students appeared to enjoy working cooperatively with peers in small groups.

The results of this study indicated that a knowledge of strategies does not necessarily lead to the accessing and utilisation of the strategies to enhance reading comprehension. Other factors affect the acquisition, accessing and utilisation of strategies. Readers' attitudes and beliefs of self-efficacy also influence the processing of information. Sufficient rehearsal of strategies is also necessary in order to form part of the students' Executive

Control strategies (Klausmeier & Allen, 1978). Increased instructional time, including instruction in generalising to other genres, may aid in the effective acquisition, accessing, generalisation and transfer of skills when needed.

Current literature emphasises the need to provide instruction that enables naive comprehenders to acquire basic skills to comprehend text (Pressley & Rankin, 1994). Explicit strategy instruction is an efficient means of enabling naive comprehenders to improve their comprehension skills. Reciprocal Teaching is a procedure that provides some naive comprehenders with strategies to activate while reading, fostering comprehension and comprehension monitoring of text. In using these strategies skillfully and interacting with peers, some naive comprehenders appear to read more strategically.

Reading comprehension is a complex process requiring skills (e.g., decoding, monitoring) and strategies, but also incorporates other elements (e.g., motivation, goals). Interactions between these elements may provide increased information about how to facilitate the development of reading comprehension skills.

#### Implications for Further Research

Future studies examining Reciprocal Teaching may consider the limitations found in this study. Classroom teachers trained to implement sessions may decrease experimenter effects leading to more valid results.

Classroom teachers could be explicitly trained to implement the Reciprocal Teaching procedure to their own students. This would require careful control to ensure fidelity of instruction. The use of classroom teachers may also facilitate an increase in the number and length of intervention sessions.

An increase in the length and number of the intervention sessions is suggested. This study comprised of 14 sessions of 25 minutes. Further sessions would enable the students to become more familiar with the procedure and the strategies included in the procedure. A more sensitive assessment instrument that allows for a wide score range may also be considered.

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## Appendix A

### Text Used to Assess Decoding Fluency

#### Saturn Rising

Yes, that's perfectly true. I met Morris Perlman when I was about twenty-eight. I met thousands of people in those days, from presidents downward.

When we got back from Saturn, everybody wanted to see us, and about half our crew took off on lecture tours. I've always enjoyed talking, but some of my colleagues said they'd rather go to Pluto than face another audience. Some of them did.

My beat was the Midwest. The first time I ran into Mr Perlman - no one ever called him anything else, certainly never Morris - was in Chicago. The agency always booked me into good, but not too luxurious hotels, that suited me. I liked to stay in place where I could come and go as I pleased.

It's all a long time ago now, but I must have been lecturing at the University. I was having breakfast in the coffee shop when a slightly built, middle-aged man dropped into the seat on the other side of the table. He nodded a polite good morning, then gave a start of surprise as he recognised me. (Of course he'd planned the encounter, but I didn't know it at the time.)

"This is a pleasure!" he said. "I was at your lecture last night. How I envied you!"

I gave a rather forced smile. I'm never very sociable at

breakfast, and I'd learned to be on my guard against cranks, bores and enthusiasts. Mr Perlman, however, was not a bore - though he was certainly an enthusiast, and I suppose you could call him a crank.

## Appendix B

### Example of a Maze Test

#### Soapmaking

Soap was first made from animal fats, oils, and the lye from burnt wood ashes.

The ancient Romans may have been the first people to use what we call soap. There was a place \_\_\_\_\_ outside the city of \_\_\_\_\_. There animals were killed \_\_\_\_\_ burned as sacrifices to \_\_\_\_\_ gods. When it rained, \_\_\_\_\_ fat from the animals \_\_\_\_\_ the burnt wood ashes \_\_\_\_\_ carried downhill to a \_\_\_\_\_. Many people washed their \_\_\_\_\_ at that riverbank. They \_\_\_\_\_ It was easier to \_\_\_\_\_ their clothes clean there.

\_\_\_\_\_ centuries passed before crude \_\_\_\_\_ cakes were made and \_\_\_\_\_. By that time, someone \_\_\_\_\_ thought of adding perfume \_\_\_\_\_ soap. Usually, only the \_\_\_\_\_ could afford to buy \_\_\_\_\_ soap cakes.

Soap was \_\_\_\_\_ in America too. Settlers \_\_\_\_\_ fat and grease from \_\_\_\_\_ and boiled them with \_\_\_\_\_ ashes. Bacon grease, tallow \_\_\_\_\_ sheep, and lard all \_\_\_\_\_ their way into that \_\_\_\_\_ bar of soap.

Later \_\_\_\_\_ became a big business. \_\_\_\_\_ different plant oils were \_\_\_\_\_ to be used in \_\_\_\_\_. Coconut oil, palm oil, \_\_\_\_\_ cottonseed oil were added \_\_\_\_\_ improve the soap.

Today \_\_\_\_\_ large companies are our \_\_\_\_\_ soapmakers. Each company makes \_\_\_\_\_ different kinds of soap. \_\_\_\_\_ as soap for doing \_\_\_\_\_ soap for dishwashing, soap \_\_\_\_\_ bathing, and soap for \_\_\_\_\_. All the companies advertise \_\_\_\_\_ each company says their \_\_\_\_\_ are the best. Millions of pounds of soap are sold every year. What would great-grandmother think of that?

## Appendix C

### Sample Script for Reciprocal Teaching Group

#### STEP 1

##### Predicting:

##### A Procedure

- \* Use titles, pictures and prior knowledge to make predictions.
- \* Ask group to discuss your predictions.
- \* Ask group to read first half of the text.
- \* Discuss the leader's predictions.

##### B Discussion

Leader: (Direct children to title)

The title of this story is "The First Horses." I predict that this story is about what the first horses were like. How did I predict that? (Discussion of the title). Are there any other clues, other than the title which would help you predict what the story would be about? (Discuss the lack of picture).

Read the first part of the story to see if my prediction is correct. (All read silently).

Was my prediction correct? (Discuss the prediction).

## STEP 2

### Questioning

#### A Procedure

- \* Ask a few questions; Right there, Think and Search, On My Own.
- \* Ask group to evaluate the question type.
- \* Ask group to answer question and discuss answer.

#### B Discussion

Leader:

I have a question for you. Tell me what kind of question I asked and give me a reasonable answer. (Repeat this process for the questions below).

Right there: What was another name for Eohippus?

Think and Search: Why did the feet of Eohippus become better adapted to running?

On My Own: What kind of life did Eohippus have?

(Choose students to ask questions and evaluate the question types. Make sure that all three question types are asked).

## STEP 3

### Summarising:

#### A Procedure

- \* Summarise what the group has read. Be brief and cover main points only.
- \* Ask group to change or add to your summary.

## B Discussion

Leader:

Who would like to be the leader for summarising? I'll help you if you get stuck. (Choose a leader). (Student summarises story read so far).

Would any like to change or add to my summary?

## STEP 4

### Clarifying:

#### A Procedure

- \* Ask the group to identify words and phrases that they are not familiar with.
- \* Ask the group to help work them out by using context and picture clues.

## B Discussion

Leader:

Who would like to be the leader for clarifying? (Student asks group for points or words that need clarifying).

Now we need a leader to take over the final predicting step before we read the next part. (Choose a student).

## STEP 1

### Predicting:

#### A Procedure

- \* Predict what you think the next segment is about.

- \* Discuss the predictions with the group.
- \* Ask the group to read the rest of the text.
- \* After reading, discuss prediction.

## B Discussion

Leader:

(Student predicts the next part of the story). Does anyone want to change or add to my prediction? Let's see if my prediction was correct. (All read silently).

## STEP 2

### Questioning:

#### A Procedure

- \* Ask a few questions; Right there, Think and Search, On My Own.
- \* Ask group to evaluate the question type.
- \* Ask group to answer question and discuss answer.

#### B Discussion

Leader:

I have a question for you. Tell me what kind of question I asked and give me a reasonable answer. (Repeat this process for the questions below).

Right there: When did the first true horse appear on Earth?

Think and Search: In what century did Przewalski find the remains of the horses?

On My Own: How did Equus come to be in different parts of



the world?

(Choose students to ask questions and evaluate the question types. Make sure that all three question types are asked).

### STEP 3

#### Summarising:

##### A Procedure

- \* Summarise what has been read.
- \* Be brief and cover main points only.
- \* Ask group to change or add to your summary.

##### B Discussion

Leader:

Who would like to be the leader for summarising? I'll help you if you get stuck. (Choose a leader). (Student summarises story read so far).

Would any like to change or add to my summary?

### STEP 4

#### Clarifying:

##### A Procedure

- \* Ask the group to identify words and phrases that they are not familiar with.
- \* Ask the group to help work them out by using context and picture clues.

B Discussion

Leader:

Who would like to be the leader for clarifying? (Student asks group for points or words that need clarifying).

## Appendix D

### Sample Text for Both Groups

#### "The First Horses"

Some scientists believe that horses have been on the earth for more than fifty million years. By studying fossils, scientists have some ideas about what these first horses may have been like.

#### Eohippus

Scientists believe that more than fifty million years ago, an animal that resembles the horse lived in North America. They call this animal Eohippus or "dawn horse". Eohippus looked very different from the horse today. It was only about twelve inches high and was about as big as a fox. Eohippus had four toes on each front foot and three toes on each hind foot. Its feet had large pads similar to a dog's feet. The Eohippus had a snout-like nose, an arched back, a stubby mane, and a wispy tail.

The Eohippus lived in a world very different from our own. During that ancient time, the climate was very wet. Great swamps and forests with huge ferns and other green plants covered much of the earth.

Eohippus was not a meat-eater like a fox or a dog. Remains of Eohippus' teeth indicate they were good for biting and crushing soft plants and fruits. So, Eohippus probably grazed, eating leaves, berries, and fruits in the forest and swamps.

Staying alive was a challenge for the Eohippus since many meat-eating animals preyed upon the small horses. Eohippus escaped death by running from its predators. Only the fastest runners survived the large meat-eaters of North America.

Some scientists say that over many millions of years, the body of the Eohippus changed as it adapted to its environment. Since only the fastest runners survived to mate and bear offspring, the body of Eohippus became larger and its legs longer. Its feet became better adapted to running. The side toes disappeared and the middle toes became larger, resembling a hoof.

#### The Early Equus

The first true horse may have appeared on the earth about three million years ago, Scientists call the horse, along with the modern horse, Equus. The first animal known as Equus was larger than Eohippus and looked much like the modern pony. Equus had a full tail, a long mane, and hard hooves. Its teeth were also different from the Eohippus, allowing Equus to chew grass.

Over time, the Equus or true horse was found throughout many parts of the world. Due to different climates and environments, each Equus developed differently. For example, the Equus living in a cold climate developed a stocky body and a shaggy coat. The Equus that lived in hot climates, however, developed a slender body and greater running speed.

The only true wild horse on the earth today is called Przewalski's (puhr zeh VAHL skihz) horse. It was named after a Russian explorer who first found the remains of these horses in central Asia in the late 1800s. Przewalski's horses are an endangered species, and less than a hundred still live in the wild. About 150 live in zoos.

Archer, A., & Gleason, M. (1989). Skills for school success. MA: Curriculum Associates. p. 63.

## Appendix E

### Sample Questions for Control Group

1. What was another name for Eohippus?
2. What were Eohippus' teeth good for?
3. When did the first true horse appear on Earth?
4. What is the name of the modern horse?
5. Why did the feet of Eohippus become better adapted to running?
6. How do scientists know that Eohippus was not a meat eater?
7. In what century did Przewalski find the remains of the horse?
8. What clues lead you to believe that Equus was very adaptable?
9. What kind of a life did Eohippus have?
10. What makes you think that Eohippus really existed?
11. Why do you think Przewalski's horses are an endangered species?
12. How did Equus come to be in different parts of the world?

## Appendix F

### Questions Asked at the Completion of Intervention

- 1                   Name the strategies in the Reciprocal Teaching procedure.
  
- 2                   What did you like the most about these strategies?
  
- 3                   What did you like the least about these strategies?
  
- 4                   How do you think these strategies help your reading now?