STRATEGY INSTRUCTION, METACOGNITIVE TRAINING AND ATTRIBUTION RETRAINING: A COMBINED APPROACH FOR REMEDIATING SECONDARY STUDENTS' READING COMPREHENSION DIFFICULTIES.

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ABSTRACT

Students who adequately decode but have difficulty comprehending what they read, often possess a limited range of comprehension strategies. Furthermore, they often lack the metacognitive knowledge to use these strategies effectively. These two factors limit the likelihood of students experiencing success on a range of academic activities. As a consequence these students often develop dysfunctional attributional beliefs which also negatively impact on future learning.

In the present study, 39 students with comprehension difficulties participated in an intervention programme comparing the effects of strategy-plus-attribution training, strategy-only training, and no training conditions on reading comprehension.

The results revealed no significant improvement in students' reading comprehension. However, there was a significant improvement in students' use of comprehension strategies. A number of reasons have been suggested, which could explain why the increased use of strategies did not translate into improvements in reading comprehension. In light of these suggestions, several recommendations have been made regarding the future development and implementation of reading comprehension intervention programmes.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The disparity between the reading demands of most curriculum areas and reading skills possessed by a number of students entering high school is a problem concerning many secondary teachers. This situation is further exacerbated by the fact that the reading demands continue to increase as students progress through the secondary school system. However there is not necessarily the accompanying skill development to keep pace with these demands; particularly as the teaching of reading as a subject is discontinued once students leave the primary school system. The gap between what poor readers can do and what they are required to do simply widens; a situation Stanovich (1986) has termed the Matthew effect. In this instance less skilled readers are unable to acquire the range of concepts or vocabulary to expand their knowledge base to the level of their more able peers, thus further limiting their performance in most subject areas (Snider, 1989).

Given this worsening situation it is understandable that many poor readers come to the conclusion that they lack ability. Attributing failure to lack of ability has been found to lead to decrements in future performance as poor readers expect failure and therefore see little reason for persisting at a task (Butowsky & Willows, 1980).

One solution has been to provide poor readers with simplified texts. However while this may have some benefits for those who have problems decoding it is unlikely to assist those who decode adequately but have difficulty comprehending what they read (Ryder & Hughes, 1985). In fact all it may do is to further reinforce these students' beliefs in their lack of ability. Furthermore, this approach simply treats the symptoms and not the cause. At some point these students must learn to cope efficiently and effectively with

more difficult texts (Brown, Armbruster & Baker, 1986), in order to function as independent learners inside and outside the school system.

Another more satisfactory solution has been to provide remedial help for those with reading problems. However this a very limited resource in many secondary schools and therefore must be carefully targeted to remediate the wide range of reading difficulties found within the reading disabled population. Included within this population is a group of students who decode adequately but have difficulty comprehending (Hare & Borchardt,1985; Palincsar & Brown,1986; Pohl, 1983; Watson & Clay, 1975). This particular group often goes undetected because their reading difficulties are not as obvious as those who struggle to decode print. Furthermore, while research has shown that comprehension skills develop independently of decoding skills (Golinkoff & Rosinski, 1976; Isakson & Miller, 1976; Smiley, Oakley, Worthen, Campione, & Brown, 1977),it is often assumed that comprehension skills develop automatically when students learn to decode (Santos, 1989). This assumption has led some secondary teachers to conclude that the students concerned are simply being lazy or are not trying hard enough. Such assumptions rarely lead to students receiving appropriate help.

Current research suggests that students, who decode adequately but have difficulty comprehending, would benefit from an intervention programme that teaches comprehension strategies, enhances metacognitive awareness and reshapes causal attributions (e.g., Borkowski, Weyhing, & Carr, 1988; Cross & Paris, 1988; Ellis, Lenz & Sabornie, 1987; Licht, 1983; Palincsar & Ransom, 1988; Paris & Oka, 1989; Pintrich, 1987, Ryan, Short & Weed, 1986; Short & Weissberg-Benchell, 1989; Schunk, 1989; Symons, Synder, Cariglia-Bull & Pressley, 1989; Wiens, 1983; Winograd & Smith, 1987). Such an approach is the synthesis of diverse strands of research into the areas of reading comprehension, strategy instruction, metacognition and motivational variables that influence academic achievement.

In the area of reading comprehension, there have been significant changes in the way in which the reading process is viewed. Reading is now perceived as a dynamic interactive process in which the reader uses background knowledge and reading strategies to help construct a meaningful interpretation of the text in order to meet the demands of the task at hand (Mangano, Palmer & Goetz, 1982; Myers & Paris, 1978; Samuels, 1983; Valencia & Pearson, 1988).

In conjunction with these changes, there has been considerable interest in the types of strategies skilled readers employ when attempting to comprehend a text. This information has subsequently been used to develop strategy training programmes for less skilled readers (e.g.,Alley & Deshler, 1979; Paris, Lipson, & Wixson, 1983). However the educational gains from early strategy training programmes proved to be disappointing as maintenance over time and generalisation across settings rarely occurred (Baker & Brown, 1984).

Analysing the reasons why such programmes proved to be ineffective led to the realisation that for students to take an active role in their own learning they needed to be informed of not only what strategies are helpful when comprehending a text (declarative knowledge), but also how such strategies are used (procedural knowledge) and when and why various strategies should be used (conditional knowledge) to accomplish different reading tasks (Brown & Palincsar, 1982; Paris, Cross & Lipson, 1984). This knowledge has been termed "metacognition," with the terms metacomprehension or comprehension monitoring being used to denote metacognitive knowledge explicitly used in the comprehension process (Baker & Brown, 1984; Brown & Palincsar, 1982; Wagoner, 1983). It has been found such knowledge allows the reader to reflect on what strategies s/he possesses, what strategies could be useful in achieving the task at hand, how to coordinate these strategies and monitor their effectiveness in meeting the demands of the task (Baker & Brown, 1984). Such knowledge is believed to empower the learner, allowing her/him to be in control of the learning process (Paris & Winograd, 1990).

Research has shown however that poor readers not only employ a limited range of comprehension strategies, but also display limited metacognitive control over those strategies they do use, when compared to their more able peers (Baker & Brown, 1984). Recognising the importance of metacognition in the learning process and the poor comprehension monitoring skills exhibited by less skilled readers, a number of researchers have strongly advocated the inclusion of a metacognitive component in strategy training programmes designed to assist poor readers (e.g., Babbs & Moe, 1983; Brown et al., 1986; Baumann & Schmitt, 1986; Borkowski, Weyhing & Carr, 1988; Mangano, Palmer & Goetz, 1982; Paris, Lipson & Wixson, 1983; St. George, van Kraayenoord & Chapman, 1985; Wong & Jones, 1982).

However it has become apparent that while strategy training and enhancement of metacognitive knowledge are essential ingredients of an intervention programme, they are not sufficient to guarantee that strategies acquired by poor readers will be maintained or transferred into other learning situations (e.g., Borkowski, Weyhing & Turner, 1986; Ellis, Lenz & Sabornie, 1987; Reeve & Brown, 1985; Ryan, Short & Weed, 1986; Short & Weissberg-Benchell, 1989; Yussen, 1985).
Ultimately a student must have the desire or will to want to use the skills acquired during strategy training, in other learning situations, for strategy training to be considered truly effective (Palincsar & Ransom, 1988; Winograd & Smith, 1987).

An examination of the issue of achievement motivation has lead to the realisation that accumulated experiences of failure can have a detrimental effect on subsequent learning as students come to believe that they not only lack the ability to succeed, but also have little control over the learning outcome (Butowsky & Willows, 1980; Dweck & Reppucci, 1973; Weiner, 1979). One approach advocated to remotivate students with reading difficulties, is to alter their attributional beliefs while training them in the effective use of a range of reading comprehension strategies (Borkowski, Carr,

Rellinger & Pressley, 1990; Paris & Winograd, 1990; Short & Weissberg-Benchell, 1989).

Although theoretically the combination of reading comprehension strategies, metacognitive training and attribution retraining should produce long term changes in the reading comprehension of those students who adequately decode but have difficulty comprehending, research into the use of this type of intervention programme is still in its infancy. With the overall aim of developing an effective remediation programme, the purpose of the present study was to determine if an intervention programme involving strategy training, metacognitive training, and attribution retraining would be successful in significantly improving the reading comprehension of Third and Fourth Form students who have problems comprehending texts that they can adequately decode.

CHAPTER II

REVIEW OF LITERATURE AND RESEARCH

The following account attempts to clarify why a number of researchers are currently advocating that strategy training, metacognitive training and attribution retraining components should be included in intervention programmes aimed at helping poor comprehenders. In addition there will also be an examination of issues relating to the implementation of such a programme.

Reading Comprehension

Significant changes have occurred in the way in which reading comprehension is now viewed (Robinson, Faraone, Hittleman, & Unruh, 1990; Pearson & Gallagher, 1983; Samuels, 1983). While these concepts are not entirely new (Robinson et al., 1990; Myers & Paris, 1978) their rediscovery has been attributed largely to the shift in psychology from a behaviourist to a cognitive focus on learning (Orasanu & Penney, 1986; Pearson & Gallagher, 1983; Samuels, 1983). As Samuels (1983) points out, the act of reading, until recently, was perceived as a one way process from writer to reader, with the reader's task to render a literal interpretation of the text. Such a simplistic view placed the reader in a passive role and focused predominantly on the products of the reading process (Collins & Smith, 1980) without recognising any of the external or internal variables which strongly influence the reader's interpretation of the text (Idol, 1988; Samuels, 1983). This view has naturally influenced the way in which reading was and perhaps is still taught, with an over emphasis on the acquisition of a set of separate skills and little or no emphasis on the integration or orchestration of these skills. This perception of the teaching of reading comprehension is cynically described by Valencia and Pearson (1987, p.728): "The 'reader' moves along an assembly line picking up a new part (new skill) at each station. When all the parts are in place we

have a reader ready to tackle real reading. Or do we?"

In contrast, current descriptions of the reading process emphasise the active role of the reader in constructing meaning from the text (e.g., Mangano, Palmer & Goetz, 1982; Orasanu, & Penney, 1986; Samuels, 1983; Valencia & Pearson, 1987). Furthermore, it is recognised that a large number of internal and external factors influence the way in which a text is interpreted. These include such things as the size, style and legibility of the print, readability level of the text, purpose(s) for which the material is being read, the reader's prior knowledge, the reader's cognitive resources and the climate of the instructional environment (Samuels, 1983). This recognition reflects the realisation that reading is an interactive and complex process that goes beyond a mechanical translation of the printed word (Orasanu & Penney, 1986; Myers & Paris, 1978). As Myers and Paris (1978, P. 680) state, "Reading is a complex behaviour that involves interactions among perceptual processes, cognitive skills, and metacognitive knowledge."

The reconceptualisation of reading has resulted in much research activity into the processes involved in the act of comprehending a text and how these processes can be best developed or enhanced by teachers (e.g., Alvermann, 1988; Alley & Deshler, 1979; Christenson, Ysseldyke, & Thurlow, 1989; Recht & Leslie, 1988; Stevens, 1988). While later sections provide a detailed discussion on these findings and their implications for the instruction of reading comprehension, Robinson et al. (1990) provide a good overview of the changes that have begun to emerge as a result of the way in which reading is now perceived. These include:

1. A movement from instruction involving external teacher control over student comprehension to internal student control, reflected in the recent interest in helping students gain self control over their own reading comprehension strategies.

2.   An instructional change from drill on the *what* of comprehension (e.g., using worksheets to practise getting the main idea) to learning about the *how* and *why* of comprehension (e.g., learning how to make inferences while reading).

3.   A focus on the integration and flexible use of a range of comprehension strategies (a holistic and dynamic process) rather than just on the acquisition of a set of subskills.

4.   A change in instructional emphasis from little direct teaching to specific and direct teaching followed by supervised and independent practice.

The changes highlighted by Robinson et al. (1990) are however evolving and have yet to make their impact on the way in which comprehension is taught in many classrooms. For example, Durkin's (1978-1979) findings, from an investigation of 40 intermediate grade teachers' approach to teaching reading comprehension, revealed that less than 50 of the 17,997 minutes of observations (0.25%) involved any comprehension instruction. Not surprisingly the observations revealed the predominant focus was on the products of reading rather than processes that can assist a student to gain meaning from the material being read.

Given the excessive emphasis on products at the expense of the processes of reading and the little time devoted to actually instructing students how to comprehend, it is understandable that a significant proportion of students enter high school with higher oral scores than comprehension scores. The existence of this situation in New Zealand has been confirmed by Pohl (1983) and Watson and Clay (1975). As Pohl (1983, p. 1) states, "By this age many children could verbalise accurately without necessarily comprehending."

The fact that a significant number of students have reached the Third Form with adequate decoding skills but have difficulty understanding what they

read, is of considerable concern. These students are ill-equipped to meet the challenge of the increase in reading demands encountered in most subject areas as they progress through the secondary system. Furthermore, with the focus on content at secondary school and the naive assumption that students acquire all the necessary reading skills by Form 2 (Watson & Clay, 1975), reading instruction as a subject is discontinued when students leave primary school.

Students who are unable to fully comprehend what they read become increasingly disadvantaged (Stanovich, 1986). In comparison to their peers who decode at the same level, these students' opportunities to expand their knowledge base are restricted, as they are unable to glean as much information from what they read (Pohl, 1983). As a consequence these students then have a limited knowledge base to draw on to help them comprehend new information, thus further limiting future opportunities to learn.

The importance of prior knowledge in the comprehension process has been well established (e.g., Pressley, Symons, Snyder, & Cariglia-Bull, 1989; Recht & Leslie,1988; Snider, 1989; Wilson & Anderson, 1986). For example a study was undertaken by Recht and Leslie (1988) on the effects of prior knowledge on junior high school students' ability to recall and summarise information read about baseball. The results from this study revealed that those students who possessed a good background knowledge of baseball, irrespective of whether they were of high or low ability, recalled more information and incorporated more important ideas in their summaries. In this instance able readers with a limited knowledge of baseball fared no better than poor readers with a limited knowledge of baseball. This finding has led Recht and Leslie (1988, p. 19) to conclude that "It appears therefore that knowledge of a content domain is a powerful determinant of the amount and quality of information recalled."

Clearly difficulties arising from comprehension problems experienced on entry into Form 3 are likely to compound, affecting a student's future ability to master the content of different subject areas in the secondary system. Given that poor comprehenders could be increasingly academically disadvantaged by their inability to fully understand what they can decode, it would seem wise to intervene as soon as possible. However, within the New Zealand secondary system there are limited resources available to assist those with reading difficulties. It is therefore essential that any intervention programmes implemented are effective in remediating comprehension problems. Research findings would suggest focusing on comprehension processes rather than the products of comprehension is a good starting point (Collins & Smith, 1980; Durkin, 1978-1979; Nolte & Singer, 1985).

Strategy Instruction

In examining comprehension processes that may be amenable to remediation researchers have focused their attention on strategy training (e.g., Brown & Palincsar, 1982; Pearson, 1985; Pressley et al., 1989; Swanson, 1989). Much of the impetus to develop strategy training programmes has come from research findings which have repeatedly confirmed that poor comprehenders spontaneously employ far fewer appropriate comprehension strategies when compared to their more able peers (e.g., Di Vesta, Hayward, & Orlando,1979; Forrest & Waller, 1979; Golinkoff & Rosinski, 1976).

Research into skilled and less skilled readers' use of comprehension strategies has revealed a number of important differences that have influenced the development of strategy training programmes. For example, research has shown that poor readers at sixth, seventh, and eighth grade are less efficient in their use of context to facilitate comprehension (Di Vesta, Hayward, & Orlando, 1979; Garner & Reis, 1981), are less likely to adjust their reading strategies when reading for different purposes (Forrest & Waller, 1979; Myers & Paris, 1978), and are less willing to seek help when they encounter a

difficulty they cannot resolve (Zimmerman & Pons, 1986).

Of considerable concern is the lack of comprehension monitoring exhibited by poor comprehenders (e.g.,August, Flavell, & Cliff, 1984; Garner, 1981; Markman, 1979, Wong & Jones, 1982). Unless readers are aware that they do not comprehend they are unlikely to employ appropriate 'fix-up' strategies to remedy the situation (Wong & Jones, 1982).Although there are a number of possible reasons for poor readers not monitoring their comprehension and thus remedying any comprehension breakdowns that occur (Oka & Paris, 1987), one factor believed to influence comprehension monitoring and subsequent use of 'fix-up strategies, is the perception students hold of the reading process. It would appear a number of poor comprehenders perceive reading as a decoding process rather than a meaning getting process (Garner, 1981) and thus have the illusion of comprehension if they decode all the words accurately (Zabrucky, Moore, & Ratner, 1985). As it has been pointed out the use of a lexical standard rather than a semantic standard for evaluating comprehension is unlikely to result in students employing strategies to assist their comprehension (Garner, 1981; Zabrucky et al., 1985). Thus to increase the likelihood that appropriate strategies will be used to correct problems, strategy training must emphasise that reading is a meaning getting process (Garner, 1981).

Collins and Smith (1980) have identified a range of 'fix-up' strategies that can assist readers to cope with comprehension failures ranging from local word-level failures to global text-level failures. They suggest the following strategies in order of the least disruptive to the most disruptive in the reading process (pp. 9-11):

1. Ignore and read on. If the word or passage is not critical to understanding, then the most effective action is to ignore.

2. Suspend judgment. This is a wait and see strategy that should be applied when the reader thinks the failure will be clarified

later. For example, new words or general principals are often explained in subsequent text.

3. Form a tentative hypothesis. Here the reader tries to figure out from the context what a word, sentence, or passage means. The hypothesis may be a partial hypothesis or a quite specific hypothesis. It acts as a pending question (Collins, Brown, Morgan, & Brewer, 1977) that the reader tests as he or she continues reading.

4. Reread the current sentence(s). If the reader cannot form a tentative hypothesis, then it often helps to reread the current sentence or sentences, looking for a revised interpretation that would clarify the problem.

5. Reread the previous context. If there is a contradiction with some earlier piece of the text or the reader is overloaded with too many pending questions, then jumping back and rereading is the most effective strategy.

6. Going to an expert source. The most disruptive action the reader can take is to go to an outside source, such as a teacher, parent, dictionary, or other book. But this is sometimes required, for example when a word is repeatedly used and the reader cannot figure out what it means, or when a whole section of text does not make sense.

Other research supports the training of these 'fix-up' strategies. For example, Baker (1979, cited in Pitts, 1983) found that mature readers when confronted with textual confusions, reread the passage, read on, made hypotheses, and ignored words or sections they considered unimportant. Di Vesta, Hayward, and Orlando (1979) found that while good readers scanned subsequent text for clarification poor readers did not. Similarly, Garner and Reis (1981) found that good readers reread previous sections of the text more often than poor readers when seeking clarification or confirmation. In addition, Zimmerman and Pons (1986) found that one of the marked differences between high and

low achievers was the former's willingness to seek help from adults or peers.

Another corrective strategy that also has a role to play in aiding comprehension is <u>changing the rate of reading</u>. Drawing on Burmeister's (1978) findings that many readers are inflexible in their reading rate, Pitts (1983) has suggested that if not enough text is sampled, comprehension may suffer. He has recommended teaching students to slow down their reading rate on text they are finding difficult as this will allow them to take in more graphophonic, semantic, and syntactic clues.

While the strategies listed so far are important tools for correcting problems once a breakdown in comprehension has been detected, it would seem sensible to go beyond reactive type strategies to also teach proactive strategies that readers can employ to maximise their comprehension. Such strategies can be invoked before reading the body of the text, while reading, and when answering comprehension questions.

Prior to reading the body of the text it has been recommended by a number of researchers that students are taught to activate any relevant prior knowledge to help them understand what they read (Babbs & Moe, 1983; Mangano, Palmer, & Goetz, 1982; Schmitt & Baumann, 1986; Weinstein, 1988), as this is something poor readers do not do with any regularity (Pearson & Gallagher,1983). Weinstein (1988) has suggested that accessing relevant background knowledge serves two functions; firstly it helps with understanding the new material about to be read, and secondly it helps to prepare for new learning by instantiating relevant schemata while providing guidelines for checking the accuracy of new knowledge. To activate prior knowledge Mangango et al. (1982) and Schmitt and Baumann (1986) recommend students be taught to read the title or subheadings and examine any accompanying pictures, diagrams or graphs. Similarly, previewing any accompanying questions can also assist in activating prior knowledge, while

simultaneously providing an indication of the main focus of the material to be read.

Teaching students to stop every now and again while reading in order to summarise what they have read so far, has also been recommended (Mangano et al., 1982; Schmitt & Baumann, 1983). This procedure encourages the active processing of what has been read, and can alert readers to a possible breakdown in their understanding. Although pausing regularly could be considered quite disruptive, it may be necessary to teach poor comprehenders to do this on longer passages, especially expository material, so they are able to integrate the information more successfully.

Summarisation is also recommended at the conclusion of reading the passage for the same reasons (Mangano et al., 1982; Schmitt and Baumann, 1983). One strategy recommended for aiding the summarisation process on narrative passages is that of the 'five W's and the H' (a modification of Short and Ryan's (1984) story grammar training). This strategy helps readers by getting them to ask themselves questions such as:

1. Who was the main character(s)?
2. Where did the action take place?
3. When did the action take place?
4. What happened?
5. Why did it happen?
6. How did it end?

Another strategy which can assist the summarisation process is <u>visual imagery</u> (Levin, 1973). However, its usefulness is limited to descriptive material.

In addition to summarising a passage, students need to be taught strategies to assist them in answering any accompanying comprehension questions. This is necessary, because although they may have understood the passage, poor comprehenders may find it difficult to know how to successfully tackle inference questions or multiple choice questions for example (Poindexter &

Prescott, 1986; Pressley & Ghatala, 1988). Unless less skilled readers are taught these types of strategies they may come to believe that they are failures, because they cannot master the products of comprehension which are regularly used by secondary teachers to evaluate a student's comprehension of a section of text. Such beliefs have been found to hinder future performance on similar tasks (Dweck & Reppucci, 1973).

Teaching students about different question types and the strategies to answer these, has been advocated by several researchers (e.g., Davey, 1989; Fitzgerald, 1983; Hahn, 1985 Hansen & Hubbard, 1984; Poindexter & Prescott, 1986; Valencia & Pearson, 1987). Raphael, (1982), for example has suggested teaching students to differentiate between three different question types: (a) Right There ('on the line'), (b) Think and Search ('between the lines'), and (c) On My Own ('beyond the lines'). When teaching students to recognise different question types, students can be taught that certain strategies will be helpful with each question type. This will also help them realise that not all answers are explicitly stated in the text (Hahn, 1985).

When answering 'Right There' questions, students can be trained to use the key word skimming method (Sanford, Bishop, Gillespie, & Crosby, 1973) to locate information and then to reread the surrounding text to find the answer (Davey, 1989). If answering 'Think and Search' type questions, students can be taught to reread sections for clues and to use these to make up their own answer because the answer will not be right there for them to copy out (Dewitz, Carr, & Patberg, 1987). If answering 'On My Own' type questions, students need to realise that they go beyond the text for their answers; using either their own background knowledge, or seeking information from an outside source such as an encyclopedia or a teacher (Hahn, 1985; Poindexter & Prescott, 1986).

The latter two question types, 'Think and Search' and 'On My Own,' require students to use inferential skills. This is an area that has been identified as

problematical for poor readers. For example, Davey (1989) found poor readers did in fact look back through a passage for an answer; however if they could not find an acceptable answer instead of 'going to their head', they tended to copy out inappropriate segments of text or not provide any answer.

Hansen and Hubbard (1984) suggest that poor readers have trouble with inferential questions because they do not have the background experiences to draw upon. They also suggest that poor readers may have had little practice at answering inferential questions because teachers tend to focus on literal questions when working poor readers. It is also possible that poor readers lack the confidence to state an answer that does not explicitly come from the text, fearing it may be incorrect. Whatever the reason, it is important that poor comprehenders learn to make inferences, because this is a comprehension skill increasingly required by students as they progress through the secondary system; for example doing a character analysis after reading a novel in English.

Students also need to be taught how to go about answering multiple choice questions because these are frequently used to assess understanding (Davey, 1989; Pressley & Ghatala, 1988). They need to be aware that they have a greater chance of getting the correct answer if they take their time to eliminate the one or two distractors that cannot be true by checking back in the text. Furthermore, students need to be taught that although two distractors may seem correct, one of the two will be a better answer. To decide which is the most suitable, students then need to recheck the text carefully and/or think about why one distractor is a better choice than another. Teaching students to use a methodical approach may prevent them from relying on the 'eenie meenie minee mo' approach when answering multiple choice questions.

While it has been relatively easy to identify strategies that can improve the comprehension of poor readers, training students to use these efficiently,

flexibly, and consistently has proved to be a more difficult task (Duffy & Roehler, 1989). Early attempts at strategy training were most disappointing. Rarely did students continue to use the strategies once training ceased, nor did they transfer these strategies in to other learning situations (Baker & Brown, 1984; Borkowski, Day, Saenz, Dietmeyer, Estrada, & Groteluschen, in press). As Borkowski et al. (in press, p.2) state, "Although positive effects during strategy instruction were relatively easy to produce, performance gains were generally small, transient and restricted to tasks similar to those encountered during training."

Seeking reasons for the lack of maintenance and lack of generalisation of strategies, Brown and Palincsar (1982) concluded that strategy instruction must go beyond teaching students what strategies to use (i.e., blind training). It must also teach students why they should use particular strategies, how to apply and adapt these strategies, and under what conditions these are likely to be most useful (i.e., informed training). This missing component has been termed metacognition (Baker & Brown, 1984).

Metacognitive Training

Metacognition, while not a new concept (Brown et al., 1986) has provoked much interest in recent years (e.g., Baker & Brown, 1984; Holbrook, 1986; Pitts, 1983; Spring, 1985; Wong, 1987). Although it has not been clearly or uniformly defined (Baker & Brown, 1984; Paris & Lindauer, 1982) definitions of metacognition usually encompass two concepts; knowledge about cognition and the regulation of cognitive activity (Baker & Brown, 1984). These two aspects have been well captured in Forrest and Waller's (1981, p.2) definition:

> ... metacognition is a construct which refers to what a person
> knows about his/her cognition (in the sense of being consciously
> aware of the process, and further of being able to tell you about
> them in some way), and his/her ability to control these

cognitions (in the sense of planning cognitive activities, choosing among alternative activities).

Elaborating further on the first aspect, that of knowledge about cognition, Paris, Lipson, and Wixson (1983) have identified three types of metacognitive knowledge that students must possess as a prerequisite to effective strategy use. These are (a) declarative knowledge, (b) procedural knowledge, and (c) conditional knowledge. Declarative knowledge involves "knowing that," for example, the keyword skimming strategy can be useful when trying to locate information quickly. Procedural knowledge refers to "knowing how," for example, to use the keyword skimming strategy to locate information. Lastly, conditional knowledge refers to "knowing when, why and where" a strategy could best be used to accomplish a particular goal; for example, keyword skimming is a quick method of locating information in many instances, but only careful rereading of surrounding text will determine if indeed the information is what is required. As indicated from this example, conditional knowledge also includes knowledge of a strategy's limitations.

In addition to the problems surrounding the definition of metacognition, there are also problems differentiating between metacognitive strategies and cognitive strategies (St George, van Kraayenoord, & Chapman, 1985). Flavell (1979) has attempted to delineate the two by suggesting that cognitive strategies are invoked to make cognitive progress, while metacognitive strategies are used to monitor this progress. Drawing on this distinction, deBettencourt (1987, p. 26) has suggested that there are "two types of strategy training: (a) cognitive training involving instruction in task-specific strategies, and (b) metacognitive training focusing on instruction in techniques to monitor and appraise this progress." It is this distinction that is being made here; between the cognitive strategy training suggested in the previous section and the metacognitive training required to ensure students are aware of when, why, where, and how to use these cognitive strategies. An analogy that describes this distinction well is that of a craftsman being provided with the

appropriate tools (cognitive strategies), but in order to do a job skilfully and efficiently, s/he must be trained in how, why, when, and where to use each of the' tools (i.e., metacognitive training) (Paris & Winograd, 1990).

The sub area within metacognition that particularly relates to reading comprehension has been termed metacomprehension or comprehension monitoring (Weinstein, 1988). In describing the comprehension monitoring process, Weinstein (1988, p. 294) states that, "Operationally, comprehension monitoring involves establishing learning goals, assessing the degree to which these goals are being met, and, if necessary, modifying the strategies being used to facilitate goal attainment." This operational definition goes beyond the more narrow definition used by many researchers (e.g., Garner & Reis, 1981; Wong & Jones, 1982), which seems to confine comprehension monitoring to the evaluation of one's comprehension on an on going basis and the use of appropriate fix-up strategies to correct any comprehension difficulties. Weinstein's definition encompasses this reactive aspect of comprehension monitoring, but also includes a more proactive response to the comprehension process. The assumption here is that the reader, in addition to deploying corrective strategies, also employs other strategies, such as activating background knowledge to maximise her/his understanding of what is being read.

The inclusion of metacomprehension training within strategy training programmes has been strongly advocated as research findings indicate that poor readers, while capable of acquiring strategies, seem unable to deploy these in a flexible and efficient manner (Swanson, 1989). Torgesen (1979, p. 22) sums up the situation well when he states, "Rather than being limited in their 'capacity' to learn to read, many reading disabled children may experience difficulty in the 'management' of their capacities." It is believed such training will increase the likelihood of strategies being maintained and transferred into other learning situations (Baker & Brown, 1984). If this can be achieved then such training places the student actively in control of the

learning situation, and in doing so brings the student a step closer to being independent (Babbs & Moe, 1983; Ellis, Deshler, & Schumaker, 1989).

It is not only this aspect of students taking responsibility for the knowledge about and control of their own learning that is so appealing about the metacognitive approach, it is also the fact that it assumes the teacher is responsible for developing or fostering that ability (Babbs & Moe, 1983). As Wong (1987, p. 191) points out, any gains made in remediation "will be context bound and teacher bound" without metacognitive training.

In recognising the importance of the teacher's role in developing students' declarative, procedural and conditional knowledge about useful comprehension strategies, a considerable amount of research has gone into ascertaining how teachers can best incorporate metacognitive training into strategy training programmes (e.g., Brown & Palincsar, 1982; deBettencourt, 1987; Duffy & Roehler, 1989; Ellis et al., 1987; Paris et al., 1984; Spring, 1985; Symons et al., 1989). Pressley, Snyder, and Cariglia-Bull (cited in Symons et al., 1989) have carried out an analysis of various approaches to teaching strategies, ranging from very indirect approaches, like discovery learning, to multicomponent, direct approaches. They concluded from the available research that the direct approach was most likely to produce accurate knowledge of strategies.

Widespread support for the use of a direct approach to strategy instruction is reflected in current research (e.g., Brown & Palincsar, 1982; Dansereau, 1985; Duffy & Roehler, 1987; Ellis et al., 1987; Gersten, Woodward, & Darch, 1986; Paris et al., 1984; Spring, 1985). While there are a number of variations on the same theme, several features stand out as being very important when employing such an approach to teach students useful comprehension strategies and the associated procedural and conditional knowledge necessary for them to use these strategies effectively and independently.

Duffy et al. (1986) have incorporated these features into their direct explanation model of instruction. They suggest that strategy instruction will be most effective when the teacher (a) explains what strategy is being taught and why it is useful, (b) models its use, (c) provides opportunities for students to practise using the strategy, (d) provides corrective feedback when necessary, and (e) encourages students to transfer the newly acquired strategies into other learning situations. Such a combination of procedures is believed to maximise students' opportunities to gain the necessary declarative, procedural, and conditional knowledge required for independent strategy use (Duffy et al., 1986; Paris, Cross, & Lipson, 1984).

A closer examination of some of these instructional features has highlighted a number of important points. Modelling for example, involves more than teaching students a series of steps on how to use a strategy; it involves making invisible reasoning processes visible to the learner (Duffy, Roehler, & Herrmann, 1988). This is achieved by the teacher using a think aloud process, in which the teacher verbalises the thinking processes s/he uses when using a particular strategy (Short & Weissberg-Benchell, 1989). Duffy and Roehler (1989) suggest that the "mental modelling" of a strategy helps reduce the ambiguity associated with learning a new strategy as it explicitly demonstrates how, when, where, and why a particular strategy can be useful.

In relation to the modelling of strategies, Dansereau (1985) has recommended that teachers use a gestalt rather than a building block approach. From previous experience, Dansereau has found that many students never acquire the desired terminal behaviour with a building block approach. Alternatively, Dansereau has suggested that teachers firstly communicate the gestalt of the strategy and then concentrate on the details required by the students to enable them to use the strategy properly.

As suggested above, feedback has been identified as an important part of the instructional process. When providing explicit feedback the teacher assists the

learner to remediate any problems or misunderstandings that may inhibit the effective application of the strategy in the future (Dansereau, 1985). However the way in which feedback is delivered has come under close scrutiny by a number of researchers (e.g., Duffy & Roehler, 1987; Ellis et al., 1987; Herrmann, 1988; Paris et al., 1984; Schunk & Cox, 1986; Stone, 1989).

In light of research findings on metacomprehension training programmes undertaken by Duffy, Roehler, and colleagues (1986, 1987), Duffy and Roehler (1987) recommend that feedback should involve "responsive elaboration." They reached this conclusion after examining the results of four different studies in which teachers were trained to use a direct instructional approach to strategy training to improve the reading comprehension of poor readers (Duffy et al., 1987). Although the instructional approach stressed the need for explicit explanation to help students understand and utilise reading strategies properly, only the fourth study was successful in improving reading comprehension. An analysis of the classroom transcripts revealed that the most successful teachers not only gave explicit explanations, but they also "generated spontaneous explanations throughout the lesson, elaborating in response to students restructured understandings of the teacher's model or demonstration" (Duffy et al., 1987).

In discussing the responsive elaboration process further, Duffy and Roehler (1987) point out that two important events occur during this process. Firstly, the teacher assesses the student's understanding of how to use the strategy by careful questioning. If misunderstandings are evident the teacher then provides additional explanation to help students restructure their understandings. In summarising this process Duffy and Roehler (1987, p.517) state:

> Both the teacher and the students actively mediate. The teacher mediates student responses to decide what to say next; students mediate the teacher's elaborations to decide how to modify their understandings. It is a collaborative adventure.

Using a mediated approach to assist students to acquire appropriate strategies has also been advocated by a number of other researchers (e.g., Brown & Palincsar, 1982; Paris & Oka, 1989; Reeve & Brown, 1985; Stone, 1989). For example, Palincsar and Brown (1986) have successfully demonstrated such an approach in their reciprocal teaching programme, which involved teaching comprehension strategies to poor readers by getting students to take turns at being the 'teacher.' In this programme, after having the comprehension strategies modeled, students were gradually expected to take responsibility for using the strategies when in the role of a teacher. Their mastery of the strategies was brought about by the teacher providing 'cognitive scaffolding' (i.e., responsive elaboration).

The effectiveness of using a mediated learning approach when providing feedback, has been attributed to the fact that it is a socially interactive approach to learning; an approach that is believed will "naturally" lead to the development of self regulatory activity in learners (Reeve & Brown, 1985). This assumption is based on Vygotsky's (1978) hypothesis that children gradually gain conscious control of their cognitive processing (i.e. metacognition) through their social interaction with adults (Reeve & Brown, 1985). It is believed that during social interaction, the adult provides scaffolded assistance which is gradually diminished as the learner masters the task at hand (Reeve & Brown, 1985).

As suggested earlier, another feature considered to be important in the direct instructional approach is that of practice. Concern over problems relating to maintenance and generalisation has led the researchers stressing the need for extended practice (Symons et al., 1989). If students are to use strategies automatically and efficiently, coordinate several strategies needed to achieve a task, and adapt strategies to meet differing task demands, then they need to do more than acquire strategy knowledge (Reynolds, Wade, Trathen, & Lapan, 1989). They need extended practice on a wide variety of ecologically valid tasks, as this will give teachers the opportunity to provide corrective

feedback, while allowing students the time to master a strategy to the point of automaticity (Pressley et al., 1989). Furthermore, this type of practice will provide students with first hand experience as to the benefits, limitations, and adaptability of the strategies they have been taught on tasks they meet everyday in the classroom (Valencia & Pearson, 1987).

Evidence of the need for extended practice has come from Duffy and Roehler (1989), who point to the findings from one of their earlier studies on reading strategy training (Duffy et al., 1987). They discovered that while teachers provided highly explicit explanations in October, it was not until February that students displayed significant metacognitive awareness of lesson content. A similar conclusion has been reached by Symons et al. (1989, p. 11) who state, "While it is true that some particular strategies can be taught relatively quickly, the teaching of many strategies so that they are used generally and effectively in a coordinated manner requires a lot of instruction and practice."

In addition to explicit instruction, modelling, responsive feedback, and extensive practise, self-instructional training has been advocated by several researchers (e.g., Borkowski et al., 1989; Goldman, 1989; Graham & Harris, 1989: Short & Ryan, 1984), as a way of helping students take responsibility for their own learning processes. It is believed that providing students with a set of guidelines will help students to monitor their use of appropriate strategies and that in time these prompts will be internalised, hereby aiding the transfer of control for strategic behaviour from the teacher to the student (Borkowski et al., 1989). The transference of responsibility is critical. If this does not occur the teacher remains in control of determining what strategies should be used and the monitoring of those strategies (Ellis et al., 1989).

Another aspect of the self-instructional process is that of self-evaluation. As Paris and Oka (1989, p. 39) state, "Students must be actively engaged in appraising and managing their own reading." Johnston (1987) suggests that this is critical if students are to become independent. While also

recommending self-evaluation, Ellis et al. (1987) suggest that teachers should encourage students to self-evaluate before providing reinforcement or corrective feedback. Further support for this process has come from Pressley et al. (1989), who maintain that motivation is heightened when students chart, monitor, and evaluate their own progress.

Not only has research shown that metacognitive knowledge is an essential prerequisite if students are to become competent strategy users, it has also shown how best to impart this knowledge (e.g., Baker & Brown, 1984; Borkowski et al., 1989; Brown & Palincsar, 1982; Duffy et al., 1986; Ellis et al., 1987; Paris et al., 1983; Pressley et al., 1989). However, it has become increasingly clear that maintenance and generalisation does not automatically follow from a combination of cognitive and metacognitive strategy training (Borkowski et al., in press). Yet it is the ability to maintain, transfer and generalise strategies that allows a learner to perform successfully and autonomously. It is critical that intervention programmes be developed to maximise the likelihood that students will eventually acquire and use a range of comprehension strategies of their own volition. This is necessary because there are limited resources available to assist students with comprehension difficulties, and there is the probability that the learning difficulties will compound without appropriate intervention.

In questioning why students who have received thorough training on appropriate strategies and have been provided with extensive practise, do not necessarily use these strategies beyond the instructional context in which they were taught, several researchers have concluded that students with learning difficulties lack the motivation to employ these new strategies in other situations (e.g., Borkowski et al, 1989; Ellis et al., 1987; Oka & Paris, 1987; Palincsar & Ransom, 1988; Short & Weissberg-Benchell, 1989). Borkowski et al. (1988, p. 51) sum up the situation well when they state that strategy training "in isolation from motivational histories, is an ineffective method of instruction for students with lengthy records of poor self-esteem and negative

attributional beliefs about the importance of personal control." As Palincsar and Ransom (1988, p. 785) point out "Motivation or will to learn is an important issue in that effective strategy use necessitates both will and skill."

The importance of motivation in the learning process has been confirmed in recent research findings. It has been found that motivational processes significantly affect how well students use existing skills and knowledge, how efficiently they master new knowledge and skills, and how successfully they transfer these skills and knowledge into different learning situations (Borkowski et al., 1989; Dweck, 1986). A recognition that motivation may be the missing ingredient from the success formula for the active and autonomous use of strategies, has led to a search for viable methods to permanently alter maladaptive motivational patterns (e.g.,Borkowski et al., 1988: Short & Ryan, 1984). One such method is attribution retraining.

Attribution Retraining

Attribution retraining has evolved from research into the attributions that individuals make regarding the causes of their or others' successes or failures in achievement settings (Weiner, 1979). Researchers have found that individuals tend to attribute success or failure mainly to ability, effort, task difficulty, or luck, and that these causal attributions can significantly influence future behaviour (Dweck & Reppucci, 1973; Weiner, 1979).

The impact of these attributions on future performance appears to be determined by the degree of control an individual believes s\he possesses over the outcome (Anderson & Jennings, 1980; Andrews & Debus, 1978). For example, ability is usually considered a stable internal attribution over which the individual has little control, whereas effort is usually perceived as an unstable internal attribution over which the individual has considerable control (Ames & Ames, 1981). Thus, within the attribution theory framework, attributing failure to a lack of effort is believed to be a more positive or

adaptive response to failure than attributions to lack of ability because effort is perceived as something emanating from the individual that can be altered at will (Ames & Ames, 1981).

Attribution retraining programmes have been developed in an effort to reshape maladaptive attribution responses that have been found to interfere with the learning process (Craske, 1988) For example, research has shown that students who attribute their failures to a lack of ability often become demotivated and unwilling to expend effort on a task on which they believe they are likely to fail (e.g., Andrews & Debus, 1978; Butowsky & Willows, 1980: Dweck & Reppucci, 1973) As a consequence, their subsequent performance deteriorates and this in turn reinforces their belief in their lack of ability (Licht, 1983).

One factor common to many attribution retraining programmes is the emphasis on effort (Licht, 1983). In studies where students have been taught to attribute their failures to insufficient effort they have shown increased task persistence and improvements in academic performance when confronted with difficulty. However, students in control groups who did not receive any attribution retraining, showed no improvement in the responses to failure (Licht, 1983).

The importance of task persistence has been stressed by Butkowsky and Willows (1980). Their examination of students with reading difficulties revealed that lack of persistence in the face of difficulty was a self defeating behaviour that helped maintain low self concept. As they point out, if students do not persist long enough at a task they will never discover that they can succeed.

One method of promoting effort attributions has been through effort feedback given by teachers. Schunk and Cox (1986) found that providing effort feedback promoted achievement behaviours. In particular they found that

effort feedback given in the first half of training enhanced effort attributions. If this feedback is to be effective though, it needs to be linked with past or current performance, rather than simply imploring the student to try harder. For example, it appears that statements such as "You've been working hard", give students reason to believe they may be successful (Schunk, 1982).

However, unless teachers are careful in their feedback they may simply reinforce many students' beliefs about their lack of ability. For instance, Schunk (1989) warns that continual use of effort feedback may lead students to doubt their ability, especially if they have shown improved use of skills and strategic behaviour. In a similar vein, Grimes (1981) warns that indiscriminately telling students to try harder is not good for students who put forward supreme effort and still fail as they have no choice but to conclude that they lack ability. Praise for poor work may also lead students to reach the same conclusion (Licht & Kistner,1986).

While there is no doubt that the role of effort is a vital component of any attributional retraining programme, concern has been expressed that in stressing effort alone, students may simply have their original negative attributional beliefs reinforced with even more detrimental consequences (Anderson & Jennings, 1980; Covington & Omelich, 1979; Licht, 1983; Reid & Borkowski, 1987; Schunk & Cox, 1986). Such a situation is likely to occur if a student confronts a task for which increased effort alone will not lead to success. As a result the student may be forced to conclude that his\her learning difficulties are truly insurmountable because, even with increased effort, failure still occurred (Covington & Omelich, 1979; Licht, 1983). Furthermore, failure under these circumstances can lead a student to decrease his\her efforts and possibly become "learned helpless." Learned helplessness has been found to occur when student are unable to see any connection between effort and outcome (Dweck, 1975).

It has been suggested that in addition to stressing insufficient effort, attribution retraining needs to teach students that their failure may also be the result of inefficient strategies (Licht, 1983). As Schunk and Cox (1986, p.207) state, "No amount of effort feedback will promote self-efficacy and skills if students do not understand how to apply a task strategy. Effort feedback is useful as an adjunct to a sound instructional programme".

In acknowledging the inherent problems of only attributing failure to insufficient effort, Anderson and Jennings (1980) found that encouraging students to attribute failure to inefficient strategies resulted in improved motivation. Those subjects who were induced to attribute failure to ineffective strategies, believed that their performance would improve with practice, whereas those induced to attribute failure to insufficient ability and those who had received no attributional manipulation, believed that improvement was unlikely to result from further practice. Furthermore, the former group's expectancies for future success was almost as high as the group who had been led to believe that their initial attempts were successful. From this Anderson and Jennings (1980, p. 404) concluded that, "Attributing failure to inappropriate strategies allows the individual to react more adaptively to failure".

While other evidence has come to light that indicates there is a definite need to include attributions to inefficient strategies in attribution retraining programmes, Licht (1983) warns that stressing inefficient strategies alone could lead students to try a succession of strategies without applying the necessary effort needed to ensure any of them were successful in solving a task. Thus, it would appear that to maximise the effectiveness of attribution retraining programmes, students need to be taught to not only attribute their failures to insufficient effort, but also at times to inefficient strategies. Anderson and Jennings (1980) believe that both are essential, as effort is the energising component while the use of strategies is the directing component in the learning process.

In addition to altering students' poor motivation patterns by changing their attributions to failure, a number of other approaches have been suggested to help counteract these negative attributions. One that has considerable merit involves changing the way in which students view failure (Butkowsky & Willows, 1980). It has been suggested students need to be taught how to analyse their failures for information that may help them succeed on similar tasks in the future (Borkowski et al., 1989). In doing so it may help students view failure as a learning opportunity rather than as a message of personal incompetence.

The importance of teaching students to cope with failure constructively has been highlighted in Dweck's (1975) study in which one group of students experienced "success only" situations. When confronted with failure this group showed substantial decrements in performance. Dweck and others (see Licht, 1983 for review) have found that in addition to experiencing success, students need to be exposed to a certain amount of failure over varying intervals. Some failure experiences appears to be a necessary component of attribution retraining if students are to learn how to deal with failure constructively and if they are to ever see proof that increased effort and application of appropriate strategies enhances their performance.

Another approach proposed for altering negative attributions involves changing students' beliefs about intelligence. Research has shown that students who possess an incremental theory of intelligence (i.e., see intelligence as malleable) believe that the harder you try the more you will learn and therefore the more intelligent you will become. On the other hand, students who hold an entity theory of intelligence (i.e., see intelligence as fixed) tend to view the need for sustained effort as indicative of low ability and consequently are less inclined to exert themselves when attempting a difficult task.

In addition to earlier suggestions for attribution retraining programmes, Aponik and Dembo (1983) maintain that students need to be trained to use task analysis, as perceived difficulty levels were found to have a significant impact on students' causal attributions. It is felt that task analysis may help students realise that many tasks are not as difficult as they may first appear, and by analysing a task they can determine whether increased effort alone or increased effort plus an alternative strategy is needed (Shelton, Anastopoulos, & Linde, 1985).

Another factor believed to impact on attribution patterns is that of goal structures (Ames & Ames, 1981). In a competitive goal structure, where performance goals are salient, students' achievements are continually being evaluated against their peers (Ames & Ames, 1984). As a consequence, students are constantly forced to focus on their ability or lack of it (Ames & Ames, 1984). Under these conditions the effectiveness of attribution retraining is likely to be undermined. As Ames and Archer (1988, p. 265) state, "Interventions aimed at modifying attributions and the training of strategies, may not have lasting effects if the classroom does not support the targeted outcomes of the intervention."

Alternatively, it has been recommended that teachers focus on an individualistic goal structure because this encourages students to develop a task mastery orientation (Ames & Ames, 1981; Ames & Archer, 1988). Such an orientation allows students to measure their performance against their previous performances, while focusing their efforts on acquiring the necessary skills and strategies needed to master the task at hand (Ames & Ames, 1981). Under these conditions, effort is perceived as the route to mastering a task rather than ability (Ames & Ames, 1981), and as suggested earlier effort attributions assist in the maintenance of adaptive motivational patterns (Weiner, 1979).

The duration of attribution retraining is also of critical importance. Programmes of short duration (e.g., Thomas & Pashley's (1982) retraining programme spanned a five week period) have not been particularly effective. However, this is not surprising when one considers that these negative attributions are likely to have become entrenched after prolonged exposure to failure. In recommending that attribution retraining be intensive, prolonged and consistent, Borkowski et al.(1986, p. 135) reiterate this point when they state, "Since these beliefs result from repeated failure experiences that occur over long periods of time, there will be a considerable price to pay in time and effort to reshape self-defeating attributions."

Lastly, in examining the issues related to the development of attribution retraining programmes, Borkowski et al. (1989) point out that if used as a stand alone programme, attribution retraining is likely to be of limited value. Short and Ryan's (1984) study highlights this point. They found students, who received only attribution training, did not make the gains in comprehension evident in the groups who received the strategy training component.

Furthermore, encouraging students to attribute failure to inefficient strategies and/or insufficient effort has the potential to be counterproductive if students are not simultaneously taught the necessary cognitive and metacognitive strategies to meet the demands of the task at hand. As Borkowski et al. (1989) warn, on its own, attribution retraining could lead to a lowering of confidence and self esteem if students are faced with situations in which effort alone will not guarantee success.

Strategy, Metacognitive, and Attribution Training
Combined

In the belief that the combined impact of the three types of training will enhance the possibility of maintenance and the generalisation of newly acquired strategies, researchers are currently recommending that strategy, metacognitive and attribution training be integrated within intervention programmes for students with reading difficulties (e.g., Carr & Borkowski, 1989; Licht & Kistner, 1986; Paris & Oka, 1989; Short & Weissberg-Benchell, 1989).

Other evidence has come to light recently that provides additional support for the use of a combined approach. Wagner, Spratt, Gal, and Paris (1989) in their extensive study of Moroccan children, have highlighted the relationship between causal attributions, metacognition and reading performance. In this study they measured the beliefs (metacognitive knowledge of reading skills and strategies, causal attributions and conceptions of good readers) and reading performance from one cohort of 350 first-grade children over a five year period, and another cohort of 464 fifth grade children over a 3 year period. They found that, "Metacognitive and causal attribution measures predicted significant portions of variance of subsequent reading achievement beyond the effects of background variables and cognitive skills" (1989, p. 283). In their conclusion, Wagner et al. (1989, p. 292) state that "It is increasingly clear that children's beliefs, metacognition and reading become interconnected as children progress through school and acquire literacy."

While it has been widely recognised that a "triple alliance" (Short & Weissenberg-Benchell, 1989) holds considerable promise in ameliorating reading problems, so far there are very few studies which have specifically examined strategy training combined with metacognitive and attribution training. Furthermore, although theory supports the use of a combined approach, the results to date are inconclusive. For example Short and Ryan

(1984) found that, while there was a dramatic improvement in the comprehension levels of the grade 4 poor readers who received story grammar training, strategy-plus-attribution training was only minimally more effective than strategy training alone. On the other hand, Carr and Borkowski (1989) found the strategy-plus-attribution group of grade 3, 4, and 5 underachievers showed significant gains in their use of reading comprehension strategies, recall, reading grades and attributional beliefs when compared to the strategy-only group.

Like the two previous studies cited, the specific aim of the present study was to ascertain whether strategy (cognitive and metacognitive) plus attribution training is more effective in improving reading comprehension than strategy training alone.

Other Issues

A review of recent literature has highlighted a number of other issues that need clarifying. For example it has been suggested that group instruction can potentially be more effective than one-on-one instruction (Ellis et al., 1987; Paris et al., 1984). Archer (1983, cited in Ellis et al., 1987) has suggested four reasons why group instruction is preferable:

(a) Students receive more instructional time than if taught one-on-one.

(b) Students have been found to have a far higher rate of academic engagement during instruction than when involved in independent work sessions.

(c) In group situations students are required to use critical school behaviours such as listening to others' responses.

(d) The quality of instruction tends to be higher as teachers are usually better prepared and organised than when teaching an individual student.

Furthermore, group settings provide an opportunity for the students to share with one another their firsthand experiences of using particular strategies (Paris et al., 1984). This situation also allows them to evaluate how their views match their peers' (Paris et al., 1984). In addition, misconceptions can be resolved by listening to others or by listening to the teacher provide corrective feedback to another student (Paris et al., 1984).

However, in recommending group instruction, it must be pointed out that group instruction does not preclude the use of an individualised approach. Pearson (1985, p. 737) clarifies this situation when he states, "True individualization has never meant instruction is *delivered* individually, only that progress is *monitored* individually."

Mention also should be made of the use of analogies and metaphors during instruction to help students grasp the ideas being presented. This teaching technique was found to be very effective in the "informed Strategies for Learning" (ISL) programme (Paris et al., 1984) because it helped students to discuss abstract skills such as comprehension monitoring.

Lysynchuk, Pressley, d'Ailly, Smith and Cake (1989), in their review of 37 reading comprehension strategy instruction programmes, also raise two important points. One recommendation is that those students in the control group should be led to believe that they are in an experimental condition so as to prevent Hawthorne effects (Campbell & Stanley, 1966). The other recommendation is that those students in the control group receive the same training materials, otherwise experimental differences could be due to either the comprehension instruction or to differential exposure to materials. A similar case could also be made for ensuring the control group receive the same time with an instructor as the experimental group(s).

Valencia and Pearson (1987) have also presented a strong case for selecting assessment measures that test the orchestration of reading skills rather than

the separate enabling skills students have been taught. As they point out, these enabling skills are only useful to the degree that they assist students to construct meaning from the text. They argue that to measure a student's progress by the acquisition of these skills diverts the focus away from what is critical - a student's ability to apply and adapt knowledge and skills to many new situations. Thus, if the goal is comprehension, then this is what should be measured, not the strategies that have been taught to help students achieve that goal.

Summary and Hypotheses

The aim in this study has been to provide those secondary students who decode adequately but who have comprehension problems, with an effective remediation programme that would enhance their comprehension and in turn assist them to become independent learners. However, for any intervention programme to be truly effective students must maintain what they have been taught and transfer this learning into new situations. Unless this occurs, remediation has been ineffective and limited resources have been wasted.

An examination of current research literature has revealed that strategy instruction, metacognitive training, and attribution retraining each have a valuable contribution to make in the process of enhancing the comprehension of those students with reading comprehension difficulties. However, if used in isolation from one another, the long term effects have proven to be minimal (e.g., Borkowski et al., 1988; Licht, 1983; Paris et al., 1983). As a consequence, several researchers are now advocating that all three components be combined in intervention programmes in order to maximise the likelihood that maintenance and generalisation will occur.

The concept of a combined approach appears to be theoretically sound and worthy of further investigation. Furthermore, this approach is appealing because it "does not deny individual differences in present skills and

knowledge or in native ability or aptitude. It does suggest however that the use and growth of that ability can be appreciably influenced " through this method (Dweck, 1986, p. 1046). However, before implementing an intervention programme of this nature a number of important factors have had to be considered.

Firstly, it was necessary to establish what strategies were most likely to be useful in enhancing comprehension. Bearing in mind the reading demands of various subject areas at the secondary level the following strategies were chosen:

(a) Prereading strategies; thinking about the title, examining diagrams, pictures or graphs, scanning the questions for further clues and an idea of the tasks to be completed.

(b) During reading strategies; pausing regularly to summarise, visual imagery.

(c) Fix-up strategies; ignore and read on, suspend judgement, form a tentative hypothesis, reread the current sentence(s), reread previous context, change rate of reading, go to an expert source.

(d) Postreading strategies; summarising including the 'five W's and the H.'

(e) Question answering strategies; identifying different question types (Right There, Think and Search, On My Own), keyword skimming, rereading surrounding text, eliminating incorrect distractors in multiple choice questions.

However, it is also recognised that if students are to ever realise that they need to learn these strategies, time must be spent encouraging students to view the reading as a meaning-getting process, rather than a decoding activity.

Secondly, given the importance of metacognitive knowledge in influencing strategic behaviour, it was necessary to find effective methods of conveying the appropriate declarative, procedural, and conditional knowledge. Based on research recommendations it was decided to use a direct approach which

included the following components:

    (a)   Explicit explanation about what strategy is being taught and why it is useful.

    (b)   Mental modelling of the strategy using a gestalt approach.

    (c)   Feedback involving a responsive elaboration.

    (d)   Extensive practice on a wide variety of ecologically valid tasks. This also includes guidelines to prompt strategic awareness and strategic behaviour.

    (e)   Opportunities to engage in self-evaluation.

In addition, it was decided to include prompts, in the form of a guidesheet, to assist students to internalise appropriate strategic behaviour and to enhance metacognitive awareness. Furthermore, it was decided that the strategies-plus-attribution group should also be provided with opportunities (via the guidesheet) to self-evaluate task difficulty, amount of effort expended, and degree of success.

To enhance the likelihood of maintenance and generalisation of the strategies being taught, researchers have recommended reshaping dysfunctional attributional patterns because these have been found to interfere with the independent use of strategies. A review of recent literature has highlighted several methods to reshape attributions that can be readily incorporated into strategy instruction. The following were selected. They involved encouraging students to:

    (a)   Develop an incremental theory of intelligence.

    (b)   Perceive failure as an opportunity to gather valuable information to aid future performance.

    (c)   Recognise the need for effort.

    (d)   Attribute failure to lack of effort and/or ineffective strategies rather than a lack of ability.

    (e)   Use a task analysis to help them realise what effort is required, and what aspects they can easily manage.

In light of concerns about the goal structure (Ames & Ames, 1984) possibly impeding attributional changes, it was also decided to focus on task mastery in a non-competitive environment.

In addition to these considerations, the criticisms voiced by Lysynchuk et al. (1989) of other comprehension strategy training programmes were also borne in mind. In this instance, it was decided to convince the control group they were part of an experimental condition and to expose them to the same instructional materials and same time with the instructor. Similarly, Valencia and Pearson's (1988) concern about the assessment of reading comprehension versus the assessment of specific strategies, was also noted when selecting reading comprehension tests.

With the intention of finding an effective method to assist students with comprehension difficulties, one aim of the present study was to determine if strategy training (cognitive and metacognitive) did improve the reading comprehension of those students who adequately decoded but had comprehension difficulties. Accordingly it was hypothesized that:

1.1   Students who received the strategy training component would demonstrate an increased awareness and greater use of reading comprehension strategies when compared to those students in the control group.

1.2   Students who received the strategy training component would show a significant improvement in their reading comprehension when compared to those students in the control group.

The other aim was to determine if the combination of strategy training and attribution training is a more effective method of improving the reading comprehension of poor comprehenders than strategy training alone.

Accordingly it was hypothesized that:

    2.1   Students who received strategy-plus-attribution training would show a significant improvement in their reading comprehension when compared to those students in the strategy-only training group.

CHAPTER III

METHOD

Sample

Forty five students with reading difficulties were selected from the third and fourth forms of a local high school to participate in the intervention programme. However only 39 students completed the programme: two students transferred to other schools, three students were absent for extended periods of time, and one student withdrew because of a personality clash with another student in the group. Of those selected, 19 (48.7%) were third formers and 14 (35.8%) were of Maori descent. The sample consisted of 23 (59.0%) males and 16 (41.0%) females. The participants ranged in age from 13.1 years to 15.2 years (mean age = 13.10 years) at the time of selection.

Sample Selection

The first step in the selection process involved identifying students who performed poorly on the Progressive Achievement Tests (PAT) of Reading Comprehension and Reading Vocabulary (Reid & Elley, 1991). These tests are routinely administered to all third and fourth formers at the beginning of the school year.

Initially 105 students were identified using the criteria adopted by van Kraayenoord, (1986):

(a)   a PAT Reading Comprehension score equal to or less than the 16th percentile.

(b)   or a PAT Reading Comprehension score equal to or less than the 19th percentile and a PAT Reading Vocabulary score equal to or less than the 16th percentile.

These criteria were chosen as both are equivalent to one standard deviation below the age-corrected national mean and represent an achievement discrepancy of approximately two years at the high school level (van Kraayenoord, 1986; Walsh, 1979, cited in van Kraayenoord, 1986).

Before the pool of students with reading difficulties underwent further screening, nine students were eliminated because they spoke English as a second language, or were experiencing major social/emotional problems, or possessed a major handicapping condition.

Although the comprehension PAT results indicate students have difficulty comprehending, the results do not distinguish between those who have problems comprehending because they cannot decode enough text to understand what they read, and those students who decode adequately but have poorly developed comprehension skills. In order to separate those students whose decoding skills were satisfactory but who have difficulty comprehending, from those students whose decoding skills are very weak, the remaining 96 students were tested on a set of graded passages from An Informal Prose Reading Test (Henderson, 1986) (refer to Instruments section). This step was necessary as research suggests that the latter group of students are unlikely to benefit from a programme that focuses solely on comprehension, because it is assumed that most of their cognitive capacity is being utilised to decipher print. As a consequence, few cognitive resources are available to comprehend the textual propositions they are encountering (Samuels, 1983).

After reading the graded passages from An Informal Prose Reading Test, 45 students were selected to participate in the intervention programme. Students were selected on the basis that they were able to accurately (i.e., achieve at least 95% accuracy) read a passage that had a reading age of no less than two years below their chronological age (refer to the Instruments section for an explanation of the criteria used in selection process).

The results from this assessment would suggest that these students' poor PAT scores were the result of problems with comprehension rather than problems with decoding. This assumption was supported by the fact that the students selected were unable to correctly answer 75% of the questions attached to the most difficult passage they could successfully decode (i.e., decode with at least 95% accuracy); in spite of reading the passage twice. A comprehension score of 75% has been widely used in informal reading inventories (Pikulski, 1990) and in research (e.g., Pflaum & Pascarella, 1980 cited in van Kraayenoord, 1986; van Kraayenoord, 1986) as the demarcation between adequate and inadequate comprehension.

The final step in the selection procedure involved obtaining written permission from parents allowing their children to participate in the intervention programme.

Design

After selection and pretesting procedures were completed, students were assigned to one of three groups:

(1)   Strategy-plus-attribution training group (n=13)
(2)   Strategy-only training group (n=12)
(3)   Control group (n=14).

While ideally students should be randomly assigned to treatment and non-treatment groups this was not feasible because these students were being withdrawn from 16 different core classes. Furthermore they were only able to be withdrawn at certain times because of timetable constraints. Under the circumstances it was decided to allocate class lots of students to one of the three groups, trying where possible to maintain a balance between third and fourth form students. For instance, one group consisted of two third form classes (n=7) and three fourth form classes (n=7), while another consisted of

four third form classes (n=7) and two fourth form classes (n=6). After assignment to group one, two or three, an independent person randomly assigned the type of treatment to each group.

Once assigned to a group, students were then timetabled to participate in the programme for two one hour sessions each week for 14 weeks. Because of timetabling difficulties the three groups were split for instructional purposes into smaller groups. These groups ranged in size from three to seven students. All groups were taught by the same instructor, with the strategy-only group and the strategy-plus-attribution group being trained by the direct instruction method. On the other hand, the control group received no training but was given the same materials as the two treatment groups.

Within a week of completing the programme post-testing was undertaken.

Instruments

Selection Test

An Informal Prose Reading Test.

While there are a number of informal reading inventories available, this particular test (Henderson, 1986) was chosen for three reasons:

(a) According to the local reading resource teacher for the area (Skelsey, J. personal communication, March 15, 1991) students were unlikely to have been previously tested on these passages.

(b) These passages were graded; that is, assigned a reading age based on their level of difficulty using the Noun Frequency Method (Elley & Croft, 1975). The same method was used to grade the PAT Reading Comprehension passages.

(c) These passages used vocabulary, spelling and subject matter that are more familiar to New Zealand students than informal reading inventories developed outside New Zealand.

The titles of the passages used, the number of words in each passage, and the reading age assigned to each passage are listed in Table 1 below.

Table 1

Oral Reading Passages, Number of

Words Per Passage and the Reading Age of Each Passage

Passage	Number of Words	Reading Age
The Harrier Hawk	140	9 - 10 years
Christmas Dinner 1851	194	10 - 11 years
Moa Hunters	207	11 - 12 years
The Lisbon Earthquake	220	12 - 13 years
The Parthenon	175	13 - 15 years
Something Unheard Of	268	15+ years

The accuracy level for the reading of each passage was calculated using the formula adopted by van Kraayenoord (1986):

$$\frac{number\ of\ words\ per\ passage\ -\ uncorrected\ errors}{number\ of\ words\ per\ passage} x100$$

This formula gives the percentage of words accurately read from the total number of words in the passage. Ninety-five percent (an average of one error in every 20 words) is generally considered the cut-off point between accurate and inaccurate reading (e.g., Nicholson, 1982; Schell, 1988; Snider, 1989) and is widely used as an estimate of a student's instructional reading level (e.g., LARIC, 1983; Pikulski, 1990; Pohl, 1983, van Kraayenoord, 1986). According to Johns (1981, cited in van Kraayenoord, 1986) a score of 95% or above indicates that a student is able to read without any observable symptoms of

difficulty, such as finger pointing, and is able to decode most unknown words using contextual clues, phonics and/or other strategies.

Reading Comprehension Measures

Tests of Reading Comprehension.

TORCH (Mossenson, Hill & Masters, 1987a) comprises of a series of graded passages, ranging from approximately 200 to 900 words in length. Accompanying each passage is a cloze type comprehension exercise. This test was selected for a number of reasons. First and foremost, cloze test results have been found to closely relate to performance on standardised reading tests such as the Stanford Achievement tests subtest of Reading Comprehension (Gardner, Rudman, Karlsen & Merwin, 1982, 1983, cited in Fuchs, Fuchs & Maxwell, 1988; Deno, Mirkin & Chiang, 1982; Fuchs, Fuchs & Maxwell, 1988). Secondly, the cloze tests accompanying the TORCH passages are designed to probe a variety of distinct comprehension tasks. According to the TORCH Manual (Mossenson, Hill & Masters, 1987b, p. 2), when answering test items readers are being tested on their ability to do the following:

Provide the subject of the story when given multiple references.

Complete sentences copied verbatim from the text.

Complete very simple rewordings.

Complete rephrased sentences.

Connect pronouns with previously mentioned nouns.

Connect ideas separated in the text.

Provide a detail in the presence of distracting ideas.

Provide a detail in the presence of competing answers.

Provide evidence of having understood the motive underlying a series of actions.

Reconstruct the writer's general message from specific statements.

Infer emotion from a few scattered clues and from the writer's tone.

Mossenson et al. (1987b) have suggested that this test format allows readers

to demonstrate the depth and breadth of meaning that they are able to glean from the text.

Another reason for using this particular test is that while it has been extensively trialled and widely used in Australia, it has had little use in New Zealand. Furthermore, the TORCH test format allows the reader to produce his/her own reconstruction of the author's intended message rather than being forced into a very narrow response pattern. This approach to testing is in line with changes in the way in which reading is now perceived. As Samuels (1983, p. 261) states, "Today we consider that under certain conditions numerous interpretations of a text are possible and, consequently, there may be several correct answers to a question."

Recognising that text may be interpreted in different ways by students, has resulted in the authors supplying a range of acceptable and unacceptable responses in the TORCH Manual (Mossenson et al., 1987b). For example, listed below are the acceptable and unacceptable responses for item 9 of 'Iceberg towing' (p. 72):

Acceptable Answers	Unacceptable Answers
make a profit	save money
a great deal of money	the future
cash in	economise
wealth	provide water
raise money	solve water problems
an eye to profits	

In addition to providing an extensive scoring key for each test, the Manual also provides alternative ways of converting the results. However, in this instance only the raw scores were considered necessary.

Pretesting: For pretesting purposes, three passages were chosen; 'The Accident' (TORCH passage A8, pp. 14-15), 'The Cats' (TORCH passage A7,

pp. 12-13), and 'Iceberg Towing' (TORCH passage B4, pp. 6-7). However only 'The Cats' and 'Iceberg Towing' were actually used to measure student's comprehension. 'The Accident' was used to familiarise students with this type of format which differed markedly from the multiple choice or question-answer format typically used to test comprehension.

Posttesting: Two further tests were selected from the TORCH for posttesting purposes; 'The Swamp-creature' (TORCH passage B2, pp.2-3), and 'The Killer Smog of London' (TORCH passage B6, pp.10-11) the two pretest passages, one was fiction and one nonfiction.

Recall Procedure.

In addition to using the TORCH, it was decided to use the recall procedure to test students' reading comprehension. This assessment technique requires the student to read a passage in a set time limit and then, upon removal of the passage, to write as much as he/she can recall of the passage within a specified time limit. As Fuchs, Fuchs and Maxwell (1988) note, this has become an increasingly popular method for assessing reading comprehension. In their review of informal measures of reading comprehension they found that over half of the investigations using at least one reading comprehension measure in the Reading Research Quarterly from Winter 1984 to Summer 1986 employed the recall procedure.

In evaluating the validity of the recall procedure, Fuchs et al. (1988) found that written recalls produced stronger correlations with the criterion reading comprehension test, the Reading Comprehension subtest of the Stanford Achievement Tests (Gardner et al., 1982, 1983, cited in Fuchs et al., 1988) than oral recalls, even when used to assess the comprehension of students with learning difficulties. Furthermore, in their evaluation they found that the written recall method correlated significantly with the criterion reading comprehension test (.70).

Each recall was scored by counting the total number of words written about each passage. This scoring method has been found to be a good indicator of comprehension when compared to other scoring methods, such as the total number of content words or idea units (Fuchs et al., 1988). It is important to note that although this scoring method was used, students were not informed as to how these tests would be marked so as to avoid the problem of students becoming deliberately wordy and thus distracting them from the task of recalling as much of the passage as they could remember.

Pretesting: Two passages were selected for pretesting purposes. One passage was 'My First Pay-packet' (Nelisi, L., 1990) and was approximately 900 words in length. The other passage 'Feeding Puff' (TORCH passage B1, p. 1) 200 to 900 words in length. Efforts were made to choose passages which students were unlikely to have read previously, or that would not be too familiar in content, or too predictable. This was to avoid the effects of prior knowledge on passage recall.

Posttesting: Two further passages were selected From the TORCH passages for posttesting purposes; 'A Horse of Her Own' (TORCH passage B3, pp. 4-5) (approximately 900 words in length), and 'I Want to be Andy' (TORCH passage B7, pp.12-13) (approximately 800 words in length).

Progressive Achievement Test of Comprehension.

It was decided to include a standardised reading comprehension test as another measure of students' reading comprehension. As the test results from Form A of the Progressive Achievement Test of Reading Comprehension (Reid & Elley, 1991) had been used to select students, Form B was chosen as a posttest. This would then allow a comparison of test results.

Comprehension Test.

This test, administered by English teachers to all third and fourth classes, was included to assess whether students transferred the newly acquired strategies

to the classroom situation. The test comprised of several comprehension exercises taken from a number of sources (Cooper, 1977, pp. 66 & 68; Howard, 1982, pp. 34 & 102; Liddle, 1977a, p. 94-95).

Metacomprehension Strategy Measures

Metacomprehension Strategy Index.

The Metacomprehension Strategy Index (M.S.I.) is a 25-item, four option multiple choice questionnaire. It was developed by Schmitt (1988, cited in Schmitt, 1990) to evaluate middle and upper elementary students' awareness of prereading, during reading and postreading metacomprehension strategies for reading narrative prose. To improve the face validity of this questionnaire for secondary school students, minor modifications were made to the wording. The alterations acknowledged not only narrative prose reading, but also textbook reading. For example, in item 2(A), instead of 'Look at the pictures to see what the story is about', now reads 'Look at the pictures or diagrams to see what the chapter is about'.

Taped Concurrent Interviews.

While it is useful to measure students' knowledge of metacomprehension strategies to ascertain their strategy awareness levels, it has been noted that strategy knowledge does not necessarily equate to strategy usage (Swanson, 1989).

However, while acknowledging this problem, considerable debate has arisen over how to effectively measure students' use of strategies (e.g., Ericsson & Simon, 1980; Hare & Smith, 1982; Meichenbaum et al., 1985; Meyers & Lytle, 1986; Nisbett & Wilson, 1977; Sternberg, 1985). Although this problem has not been satisfactorily resolved, one of the methods advocated is that of verbal reporting (e.g., Ericsson & Simon, 1980; Meichenbaum et al., 1985; Meyers & Lytle, 1986). Research seems to support the use of concurrent reporting in preference to retrospective reporting as being a more reliable measure of

students' strategy usage (Ericsson & Simon, 1980). While there is greater support for the 'think aloud' concurrent procedure (e.g., Hare & Smith, 1982; Meichenbaum et al., 1985; Meyers & Lytle, 1986), the verbal reticence of the students in this study indicated that the structured approach of a concurrent interview would yield more information about what strategies students use to comprehend written material.

For the purposes of the pretest and posttest interviews, short passages were chosen so as not to make the task of reading and answering the accompanying questions appear too daunting. Furthermore, passages were selected that were typical of the type of comprehension exercises frequently used in most English classrooms at the third and fourth form level. However the passages were on unfamiliar topics. This was an important consideration as prior knowledge could negate the need for students to employ a range of strategies when attempting to comprehend the passage and answer the accompanying questions.

The taped responses were coded by calculating the number of different strategies used by each student before they began reading, while they were reading, and when they were answering the questions that accompanied the passage.

Pretesting: 'The World's Largest Ant' (Howard, 1982b) was selected for the pretest interview. Because the extract lacked a title it was given the title 'The World's Largest Ant'. The questions were also modified. For example, a 'beyond the lines' question ('What differences can you think of between a bullant and the ants we find in our gardens or homes?') was added. The question 'Explain what this passage is mainly about in 3 sentences' was also included to probe how students summarised what they read (see Appendix A).

Posttesting: Another passage in similar length and style was chosen from 'Practise your English: Book 3 (Howard, 1982a). The extract was given the

title 'Opal Mining' (see Appendix B) and a set of questions was developed along similar lines to those which accompanied 'The World's Largest Ant'.

Attribution Measures

Intellectual Achievement Responsibility Scale.

The IAR scale was developed by Crandall, Katkowsky, and Crandall (1965) to examine what degree individuals provide internal or external rationales for various hypothetical positive and negative situations. The IAR has been widely used as an attribution measure (e.g., Hill & Hill, 1982; Kistner, Osborne, & Le Verrier, 1988; Luchow, Crowl, & Khan, 1985; Rogers & Sakolfske, 1985). While it was generally considered a suitable device to measure students' sense of internal control (locus of causality, Weiner, 1979) items 1 and 22 were deleted as being inappropriate in the New Zealand education system. Responses on the IAR were scored in the internal direction on the IAR-success and the IAR-failure subscales.

Causal Attribution Rating Scales.

As the IAR is a general attribution measure it was decided to also employ an attribution measure specifically related to reading. Tollefson et al. (1982), for example, found students responded differently to the IAR and a task-specific attribution measure. Two causal attribution scales developed by van Kraayenoord (1986) were selected. These were the Causal Attribution Rating Scale for Failure and the Causal Attribution Rating Scale for Success.

For this study, the wording on item 13 was altered to read 'strategies' instead of 'special tricks' and the method of scoring was modified. Instead of a choice of 1 to 7 students were given only four choices; YES! (very true), yes (sometimes true), no (often not true) and NO! (never true). In order to gain an internality score, each item was assigned one point for the most external response moving up to four points for the most internal response. For example, with item 8; "When I do well in reading its because the teacher is in

a good mood"..., 'YES!' would score 1 point, 'yes' would score 2 points, 'no' would score 3, and 'NO!' would score 4 points.

Postprogramme Interview

It was considered important to assess students' perceptions of the programme, as it was assumed that if students believed the intervention programme was of little value to them personally, they would be less inclined to actively apply their newly-acquired knowledge in the normal classroom. Under the circumstances it would be pointless advocating an approach that students perceived as a waste of time.

It was decided to do a taped interview rather than get students to fill out a questionnaire, as an interview situation allows statements to be probed more fully. It was also decided to use this opportunity to ascertain how many students had been given specialised help for their reading in the past.

Procedure

(a)   Administration of Selection Test: An Informal Reading Prose Test

Before commencing any testing it was explained to each student that students were being selected from the school to participate in a reading research programme. In order to decide who should participate in the programme, students were being asked to read some passages aloud and then answer some questions.

When presented with the initial passage from An Informal Reading Prose Test (Henderson, 1986) students were told that the passages ranged from fairly easy to quite difficult. It was also explained that these passages would be taped while they were being read so the passages could be checked later. Students were also informed of the procedure they were to follow; after

reading a passage aloud, they were to reread the passage silently and then answer six to eight questions about the passage. It was also stressed several times that they could take as long as they wished to silently reread each passage. Efforts were taken to put the students at ease and to acknowledge that reading aloud can cause stress.

Each student was tested individually. As a student read a passage aloud, all reading errors were noted on a copy of the passage. The information was then used to determine whether a student should progress to a more difficult level or return to class. The tape recordings were used later for verification purposes.

The passages were presented in the order listed in Table 1. An easier passage, 'The Harrier Hawk', was presented first to help counteract the effects of initial nervousness. This was considered important as the students being tested were not necessarily competent decoders. Once a student had completed all the passages, or experienced considerable difficulty decoding, he\she was thanked for his\her cooperation and told that he\she would be notified if they were required for the research programme.

(b) **Administration of Pretest**

A pretesting programme was undertaken during the last three weeks of Term one and in the first week of Term two. This time frame was considered advisable in order to minimise disruption to regular classroom work and to reduce the level of test anxiety. The pretests were administered in the following order:

Term 1.

Session 1: 'The Accident' (TORCH)

Session 2: 'The Cats' (TORCH)

Session 3: 'Iceberg Towing' (TORCH) and IAR

Session 4:   'My First Pay-packet' and 'Feeding Puff' (recall tests)

Session 5:   Causal Attribution Rating Scale for Failure, taped concurrent interview and M.S.I.

Term 2.

Session 6:   Causal Attribution Rating Scale for Success.

However, before any tests were administered all the students met for a briefing session. During this session it was explained that they would be doing a number of tests before the programme started and at the end of the programme. It was explained that pre- and posttesting were necessary to determine how much their reading comprehension had improved. The following is a description of how each test was administered:

TORCH.

All three TORCH passages, 'The Accident' (TORCH, passage A8, pp. 14-15), 'The Cats' (TORCH, passage A7, pp. 12-13), and 'Iceberg Towing' (TORCH, passage B4, pp. 6-7), were administered to students in a group setting. The standardised format set out in the TORCH Manual (Mossenson et al., 1987b, pp. 6-9) was adhered to when administering each test. Students were also presented with a set of guidelines from the test booklets which stated such things as, "If you spell a word wrongly it does not mean the answer will be marked wrong," and "Often the words you want for your answer are not in the book, so feel free to use your own words." Following the instructions in the TORCH Manual (Mossenson et al., 1987b), it was made clear to students that they could take as long as they wished to do each test as there was no time limit.

Recall Test.

The recall tests were also administered in a group setting. These tests had strict time limits imposed on both the reading of the passages and the written recall. These time limits had been worked out by establishing how long it took another group of less able readers to read through the passages twice and to

write a reasonable amount on each passage.

Before administering 'My First Pay-packet' (Nelisi, 1990) students were told they had 10 minutes to read the passage as many times as they wished and that at the end of 10 minutes the passage would be removed. They were then to write as much as they could remember about the story in 15 minutes. After completing the first recall test, the second passage 'Feeding Puff' (TORCH, passage B1, p. 1) was given to students and the initial set of instructions was repeated.

Taped Concurrent Interview.

Students were taped individually in an area where minimal disruption was likely to occur. However before being presented with the passage, each student was told that the purpose of the exercise was to find out what sorts of steps they took when they were reading and answering questions, and why they took these steps. To demonstrate the type of responses required, a mathematical analogy was used. The students were presented with a maths problem in the format $(87 + 15) - 32 + (8 \times 5)$ and asked what steps they would take to solve this problem. As they explained how they would tackle the problem, further questions were asked. For instance, when they said they would add 87 and 15 together they were asked how they would do it on paper. Usually they stated they would use a vertical layout in preference to a horizontal layout. They were then asked why they used that approach. At no point were the students expected to solve the problem itself, however they were expected to explain the sequence in which they would do it and why they would use that sequence and particular procedures.

Following this example it was explained to students that they would be asked to do the same type of things with a reading comprehension exercise. At this point they were given a copy of 'The World's Largest Ant'. They were asked:

> "What is the first thing you do when a teacher gives you something to read and a set of questions to answer?"

After the student responded, he/she was told to do whatever he/she had just mentioned, and if appropriate asked why he/she took that step. For example, if a student mentioned reading the title he/she was asked "Why?" When a student stated the first/next step taken was to read the passage he/she was instructed to do this aloud. At the end of the passage or when a student experienced difficulty (the passage included a number of difficult words), the student was asked:

> "What sorts of things do you do when you have trouble understanding the meaning of a word or sentence?" (Myers & Paris, 1978)

When an answer was given he/she was probed further for additional strategies with:

> "What other things do you normally do when you have problems understanding the meaning of a word or sentence?"

If a student responded initially with statements such as "Look it up in the dictionary" or "Ask the teacher" he/she was questioned further with:

> "Is that what you normally do?"

This was done to encourage the students not to give answers they believed the investigator wanted to hear or what they thought they should be doing.

Students were also closely questioned as to how they worked out answers to questions. A student for example would be asked to answer question three and then to explain what steps he/she took to work out the answer.

Before concluding the exercise, the student was asked if he/she was given a similar exercise in class or for homework and had problems understanding it or doing the questions what sorts of things did he/she normally do.

It is important to note that while these interviews followed a pattern where students were questioned about the steps they took and how or why they did particular things when reading or answering questions, it was not possible to follow a strict sequence of questions as the questions asked were tailored to the way in which each student chose to respond to the previous question.

Metacomprehension Strategy Index.

In an effort not to influence students' responses to the taped concurrent interview, this questionnaire was administered after students had completed the taped interview. When administering the M.S.I. the directions stated on the top of each questionnaire were read aloud. Students' attention was drawn to the fact that they were being asked what they should do <u>before</u> they began reading in the first section, what they should do <u>while</u> they were reading in the second section, and what they should do when they had <u>finished</u> reading in the last section. Students were encouraged to take their time as there was no set time limit for completion, and to ask for assistance in decoding any unfamiliar words.

Intellectual Achievement Responsibility Scale.

This questionnaire was administered after students had completed the TORCH passage, 'Iceberg Towing'. It was explained to students that there were no right or wrong answers and that they were simply to tick A or B, depending on which one of them seemed more true. Once again it was stressed that there was no time limit for completion.

Causal Attribution Rating Scales.

The questionnaire on Causal Attribution Rating Scale for Failure was given to students prior to undertaking the taped concurrent interview. It was carefully explained that there were no correct or incorrect answers and that they were to take their time circling the answers that best explained why they did poorly on some reading tasks. It was also explained what the 'YES!', 'yes', 'no', 'NO!' meant, although this was already stated on the questionnaire above each column.

The questionnaire for success was administered two weeks later so students would not be influenced by their responses to the previous questionnaire on failure. This questionnaire was presented to students with the same explanation as for the failure questionnaire, except that it was stressed that

they were to circle answers that best explained why they did well on some reading tasks.

(c) Administration of Posttests

Posttesting began a week after the intervention programme had concluded. The posttests were administered over a three week period in the following order:

Session 1.   'The Swamp Creature' (TORCH) and the Causal Attribution Scale for Success.

Session 2.   'The Killer Smog of London' (TORCH) and the IAR.

Session 3.   'A Horse of Her Own' and 'I Want to be Andy' (recall tests).

Session 4.   PAT (comprehension).

Session 5.   Taped concurrent interview, postprogramme interview, M.S.I, and Causal Attribution Scale for Failure.

Two weeks after these tests had been administered English teachers administered the comprehension test.

The TORCH, recall tests, IAR, M.S.I., taped concurrent interview and both Causal Attribution Rating Scales were administered following the same administration procedures used for the pretests. The PAT was administered using the standardised format set out in the Teacher's Manual (Reid & Elley, 1991).

Comprehension Test.

Before the English teachers gave the comprehension test a meeting was held to go over administration and marking procedures. It was emphasised that students must not be told who had set the test so generalisation to the classroom could be measured.

Postprogramme Interview.

The postprogramme interview was conducted straight after the taped concurrent interview. Before being interviewed it was explained to students that it was necessary to find out how useful they believed their programme had been so recommendations could be made to other teachers (the students were originally told that each group would undergo a different trial programme to work out which intervention programme was the most successful at improving students' comprehension). It was strongly emphasised that honest answers were required, and that if they believed their programme had been of no help, they should state this. They were also advised that they would be asked whether they had received any other remedial help during their time at school. Students were asked the following questions:

1.   "Have you ever had any extra help at primary school or intermediate for your reading?"

If the student answered "yes" s/he was questioned further about that assistance. After reiterating the need for honest answers the student was then asked:

2.   "Has this programme in any way helped your reading?"

If the student answered "no" the interview was concluded at that point. If the student answered "yes" s/he was questioned on how it had helped her/him. The student was also asked:

3.   "Have you found things you have learnt in this programme helpful in other subject areas?"

If the answer was affirmative the student was questioned further about where it had proved useful.

Intervention Programme

A variety of reading material was used from different subject areas to help students realise that comprehension work is not confined just to English classes. Difficulty levels were also borne in mind when choosing particular comprehension tasks. Although challenging exercises were selected so as to encourage students to use a range of strategies (Fitzgerald, 1983) and apply effort, it was recognised that students must experience some degree of success to believe strategies are helpful (Borkowski et al., 1990).

Throughout every session responsive elaboration was used to clarify problems regarding the use of particular strategies. However, it is not possible within the confines of this report to convey the dynamic interchange that occurred during each session. It must also be added that statements such as "It was pointed out...", and "It was emphasised...", are often the culmination of a discussion rather than a didactic approach to teaching strategies and attributions.

During the programme students were regularly questioned as to whether they were using the strategies in other subject areas. In doing so students were reminded that the purpose of teaching them strategies was to help them better understand what they read in other classes. In addition it must be emphasised that, although sessions may have focused on particular strategies, there was a constant emphasis on all the strategies taught.

As with the strategy component of the programme, it is not possible to convey the way in which attribution retraining was interwoven with strategy training. Every effort was made to stress the interconnectivity between effort and the use of appropriate strategies to aid comprehension.

Introductory Session

A meeting was held to explain the purpose of the programme, how it was to operate, and to give out timetables. In response to queries about why they had been selected, it was explained to the students that although they read well (in a decoding sense), they appeared to have difficulty fully understanding what they read. It was explained that their participation in this programme should improve their reading comprehension and in turn help them with their schoolwork in the future.

Students were informed they had been split into three groups and that each group would be taught by a different teaching method to see which method helped students the most. However at this stage no explanation was given as to what type of treatment each group was to receive.

Session 1

Control group.

During the first meeting with members of the control group, students were informed that research has shown that prior knowledge is very important in helping understand what you read. To elaborate on this point further, it was explained that their minds were like filing cabinets and that inside these "filing cabinets" were a large number of "files" on different subjects. Following from this statement was a discussion on the variety of files different students were likely to have in their filing cabinets. This was achieved by having each student talk about sports they played, their hobbies, and subjects they enjoyed. Comparisons were then made between the quantity of information on different students had in their filing cabinet on subjects such as rugby league, skateboarding or knowledge of the Maori language. The point was then made that having this information helped them understand more when reading about a game of rugby league, or reading something written in Maori, or reading a skateboarding magazine.

To further illustrate this point, the students were asked to explain what was in their files on restaurants. After each student offered an explanation of what they knew about restaurants (e.g., ordering process, arrangement of a menu, things they liked eating at restaurants, their favourite restaurants, waiters and waitresses serving them, and paying the bill) they were asked what was in their file on trigonometry. When it was established they possessed no prior knowledge on trigonometry, it was explained that prior knowledge is very important in helping us to understand what we see, hear, read, and do.

After emphasising the importance of prior knowledge, students were told that the focus of the reading programme for their group was the expansion of their prior knowledge and that every effort was going to be made to open up new files in their filing cabinets by getting them to read about a wide variety of topics.

In the following sessions, students in this group were exposed to the same materials as the treatment groups. However, it must be noted that on occasions this group was required to answer questions about a passage they had read, rather than practise a particular strategy. For example, when given newspaper articles on which the two treatment groups were practising the "5 W's and the H" summarisation strategy, the control group answered a set of questions instead. Before commencing any work, an explanation was always given about the topic and the questions they were expected to answer. When help with questions was requested by a student, assistance was always given. This however, did not involve any explanation or prompting about the strategies they could use to go about solving the problem themselves. Content rather than processes was the key focus of each session.

Strategy-only training group.

The first session began with a discussion of what sports each student played. After eliciting this information, several students were asked what sorts of things they did if an opponent was coming towards them and they had the

ball. Following this discussion, the point was made that they had a choice of moves or strategies and that the one they chose to use would depend on their judgement of the situation. A comparison was then made between using strategies in sport helping you play better and using strategies in reading to help you comprehend better.

Students were then asked if the strategies they used in sport developed automatically. They concluded that this was not the case. Rather, they learnt these through training and repeated practice. To further emphasise this point students were individually questioned about which subjects they enjoyed, if they were better at these subjects now than when they first began doing the subjects and if so why. The general consensus was that they had been taught skills/techniques/strategies in subjects such as art, Maori, clothing, woodwork and mathematics that helped them become more competent. It was also agreed that with practice these skills/ techniques/strategies had improved. The point was strongly made that the aim of this programme was to teach them various strategies so they would better understand what they read.

To help illustrate another point, students were asked to remember their first attempts at riding a bicycle and what things they needed to worry about. After establishing that they needed to concentrate on peddling, steering and maintaining their balance, and how difficult it had been to coordinate all three without falling off, the students were asked if they needed to worry about these things when they got on a bicycle now. They readily agreed that no concentration was now required as it had become automatic. Students were reminded of how clumsy and awkward they felt when they first attempted to ride a bicycle. It was made clear they would probably find the strategies they would be taught would seem difficult or awkward to use initially because they were new. However, it was explained with practice they would feel more comfortable using these new strategies.

65

After focusing on the fact that they were to be taught a variety of reading comprehension strategies, reference was made to the concurrent interview exercise which required them to explain the steps they used to help understand a passage and to answer questions. It was then explained that they were to listen to a passage, "The Plants That Escaped" (Liddle, 1977b, pp. 68-69) and work out what steps were taken by the instructor. Before proceeding however, it was made clear that while observing the steps taken by the instructor, the students in effect would be observing the reading process in slow motion. Furthermore it was explained that the instructor would be thinking her thoughts aloud so they could see the thought processes used.

Firstly, the title was read and comments made about plants such as old man's beard and blackberries growing out of control. Next, the illustration was examined and it was noted that the picture showed plants in water. Comments were then made about plants clogging waterways and lakes in places like Rotorua. The questions were then scanned and comments made about the types of questions to be answered (one word answers and multiple choice). A further examination of the questions led the instructor to note that there was mention made of the fact that the plant was from a tropical country, that it was causing problems, and that different solutions had been tried. A prediction was then made as to what the passage was likely to be about.

At this point, the instructor began to read the passage aloud, stopping to question the meaning of unfamiliar words. Guesses were made about what these words might mean from clues in the sentence or prior knowledge. In some instances judgement was suspended until other sentences had been read, in case the meaning was clarified at a later stage in the passage.

The following "conversation" is an example of how the think aloud process was used to model some strategies that can be used when dealing with an unfamiliar word:

"Visitors to the New Orleans Cotton Exposition"....

"I wonder what a Cotton Exposition is? Perhaps its like an Expo.... like the one that was in Brisbane in 1988.... (activating prior knowledge).... *"of 1884"*. Well maybe its not like an Expo because this was over a hundred years ago. I'll see if the rest of the sentence explains it.... *"saw a new tropical plant that had been brought from Venezuela."* "Venezuela is in South America. The rest of the sentence does not give me any clues so I had better read on further."

The rest of the paragraph was read, and also the next, which mentioned the word *Exposition*, but there was insufficient information to work out its meaning. The instructor commented on this and read on. Eventually the instructor concluded that the meaning could not be found in the passage. However this did not seem important as the passage was not about the Exposition. Later in discussion with pupils it was pointed out that it is necessary to constantly make decisions. One of these decisions may be to ignore a word and that in some circumstances that is a legitimate decision if a word's meaning does not appear to be critical when trying to understand a passage.

At the end of each paragraph, a brief overview was given about the information contained in the paragraph. A fuller summary was also given at the end of the passage. The questions were completed in a similar manner by constantly revealing the thought processes used to answer various questions. For example:

> Question 1. *"The new tropical plant was brought to New Orleans from (a) Venezuela, (b) Victoria, (c) Vancouver, (d) Virginia.*

"I remember reading the word Venezuela but I will scan the passage to check if I am correct."

"Ah, there is Venezuela. I'll read that sentence again to be sure. *"Visitors to the New Orleans Cotton Exposition of 1884 saw a new*

tropical plant that had been brought from Venezuela." So I am right - it is Venezuela."

In instances where answers could not be directly located in the passage, the answer was thought through. For example:

Question 6. *"On the whole the article tells about (a) difficulty in controlling a troublesome plant."*

"This seems true but I had better check the others to be sure."

"(b) a Cotton Exposition in New Orleans in 1884."

"It does mention this, but only briefly. It's more about plants than the Exposition."

"(c) poisons and dredges used to kill certain plants."

"Yes, it does mention this but only in one sentence so that cannot be what the whole article is about. I think (a) is the best answer."

At the completion of the think-aloud process, students were questioned as to what steps were taken and why each step was taken. After identifying the prereading steps (i.e., reading the title and commenting on it, looking at the illustration and adding to earlier comments, and scanning questions for information) students suggested that these steps were taken to get an idea of what the passage might contain. At this point, the concept of prior knowledge and how predicting helped open up the files in our filing cabinets was explained to the group. This statement was followed by an abbreviated version of the explanation given to the control group (see above).

A discussion then followed about strategies that were used to make sense of the passage. Students were able to identify such things as sentences being reread, looking ahead for further clues, and using prior knowledge to work out the meaning of a word. The discussion was continued with students identifying the other strategies used by the instructor when she finished reading the passage and when answering the questions. While students had no difficulty explaining what they observed, additional explanations were required

to clarify the purpose or benefits of using particular strategies. Brief mention was also made of the three question types:

(a) 'On the lines', where the answer is in the passage.

(b) 'Between the lines', where you need to be a detective and search for clues.

(c) 'Beyond the lines', where you to use your knowledge from your filing cabinet or to get the information from other sources such as a teacher or an encyclopaedia.

Students were shown examples of each of these from the passage.

Strategy-plus-attribution training group.

The same format was used with this group. However, reference was made to the concept of ability when discussing which subjects, sports or hobbies they were good at. Each student was asked how they came to be good at playing the guitar, art, skateboarding, or doing mathematics, for example. Invariably, students reached the conclusion that it was through practice and learning more about the subject, sport or hobby. The point was made that this was also the case with good readers; they too had learnt to use different skills/strategies and practised these. Furthermore, able readers put in effort when they found something was difficult to understand. It was stressed that effort is a very important component in the reading comprehension process.

Session 2

Strategy-only training group.

Drawing on a suggestion from Fitzgerald (1983), a pack of cards and an incomplete set of instructions were presented to students. The students were then instructed to play the game. A number of students realised this was impossible. At this point a discussion was held on what additional information would be required before the game could be played properly. This situation was then used to illustrate that it is important to constantly monitor/check your reading. This is necessary to work out what you know, what you do not

know, and what you need to know. It was also emphasised that you need to think about what you are reading - not just say the words.

To encourage students to think about what they are reading, they were given a mystery story, 'Faces' (Dunbar & Royston, 1988, pp. 127-130). However, they were only presented with one of the ten sections of the story at a time. These sections were handed out in sequential order and at the end of each section students were required to; summarise what they already knew, list what they did not know, state what other information was needed to make sense of the story, and predict what might happen next. They were reminded to think of the story in terms of the title.

Strategy-plus-attribution training group.

The same activities were undertaken with this group but with the added emphasis of putting effort into the work and not giving up if something seemed difficult.

Session 3

Strategy-only training group.

Two passages were examined; 'Death by Fire' (Grayland, cited in Hill, 1982, pp. 11-13) and 'Failures' (Pile, cited in Hill, 1982, pp. 20-21). Before proceeding with either passage students were directed to look at the titles and predict what each passage was about. By comparing the titles of both passages they were able to see that using the strategy of reading the title first to make a prediction about a passage was more useful with 'Death by Fire' than with 'Failures'. This point was made to help students realise strategies are useful in some circumstances but not in others.

Following the examination of the titles students scanned the questions for what further information could be gathered about the passages. After working through that strategy students then took turns reading two or three paragraphs using a think-aloud process which they had observed being modelled the

previous session. The students were expected to summarise the section they had read and deal with any unknown words by rereading the sentence, reading ahead, or activating prior knowledge.

Once the questions were completed it was pointed out that scanning the questions first was helpful. It not only gave clues as to the content of the passage, but also gave an indication of the types of things they needed to focus on. In addition the three question types were reviewed. Each question was then categorised as being on the lines, between the lines, or beyond the lines. Some questions were then reworked. For example students were asked to go back through 'Death by Fire' and to be like detectives searching for as many pieces of evidence or clues as they could find for Question Three ("What evidence is there in the passage that the hospital made some arrangements to deal with the fire?"). The point was made that to answer this type of question all that was required was to reread carefully and thoughtfully. Furthermore their answers had revealed they were capable of doing this.

Strategy-plus-attribution training group.
Students in this group covered the same work as the strategy-only group. The aim at this stage was to familiarise students with the various strategies available to them so that in later sessions more emphasis could be placed on strategic effort.

Sessions 4 and 5

Strategy-only training group.
To illustrate that comprehension is required in other subject areas, students were given a map of Antarctica (Mastering Maps, 1987, p.20) on which they had to locate places using grid references. They also had to find the grid references of particular places.

After completing this brief exercise the students were given 'Antarctic Adventurer' (Saxby, 1983, pp. 46-53). As this was a long passage it was decided to continue this in Session 5. Students were assigned sections of the passage to read. When a student finished reading a section the students asked one another questions. The instructor also participated, asking and being asked questions. The emphasis throughout this activity was on careful reading, rereading, and skimming to find information to answer questions.

After working through the passage, students were questioned as to whether they believed they had understood the extract better because they had stopped to think about what questions to ask and reread to find answers. They were also asked what types of questions had mainly been asked. The general consensus being that the majority of questions were on the line type questions.

Strategy-plus-attribution training group.

When students were given the map of Antarctica they were directed to do a task analysis. It was explained that a task analysis involved skimming the questions to determine what was required of them, and to assess the difficulty level of the work. It was also explained that a task analysis informs you of what work is required, the amount of effort likely to be needed, and what parts to do first (i.e., the questions perceived as easiest).

On completion of the map activity they were asked to estimate how many questions they believed they had answered correctly. After marking the work, each student was asked to comment on whether they had underestimated or overestimated. The majority had underestimated and the point was made that they can do well if they think about what they are reading, concentrate on the task, and use strategies to help them.

The 'Antarctic Adventurer' was also read by this group and handled in the same manner as with the previous group except that emphasis was placed on concentrating and thinking about what they were reading.

Session 6

Strategy-only training group.

Students, when given the passage 'Platyhogs and Hypergrunions' (Dunbar & Royston, 1988, pp. 91-92) were introduced to the concept of visualising. It was explained that it can be a useful strategy when trying to make sense of what is being read. Examples of previous passages were used to illustrate the fact that this strategy would work well on some passages. However it was also made clear that it may be of limited use on other passages.

Students were given the task of reading the passage and drawing a platyhog and a hypergrunion. They were informed that a helpful strategy would be to make brief notes about each character before drawing it. This was modelled on a small section of the passage. After finishing their drawings students then marked one another's drawings for accuracy (e.g., the hypergrunion had a long pointed tail). Once the marking was completed a discussion took place on the similarities between all of the drawings. The point was made that visualisation can be a useful and sound strategy to use, particularly on descriptive passages.

Strategy-plus-attribution training group.

On being given the passage and having the visualisation strategy explained to them, the students were asked what strategy could they use to help them with this task. It was pointed out that the information about the two creatures was scattered through the passage and there was also a lot of irrelevant detail. Several students suggested making notes and this was then modelled with a section of the passage. The activity was then continued as with the previous group. Comment was made at the end of the session about how well they had obviously concentrated on reading the passage and that the combination of effort and good strategy use had produced excellent results.

Session 7

Strategy-only training group.

This session began with several examples of how sentences could be quite meaningless until placed in a larger context. For example, the sentence, "The wrinkles grew larger with time", would be interpreted differently when placed in either of these contexts:

    (a)   "At the corner of his eyes, little wrinkles, like light pencil tracings, stretched outward in a fan shape. *The wrinkles became larger as time passed.* He was showing signs of old age."

    (b)   "Millions of years ago, when the earth's crust was softer in this region, there must have been a force that pushed the flat ground into ridges and giant wrinkles. *The wrinkles became larger as time passed.* Eventually these hills were formed, and trees grew over them to make the forests you see today" (Sanford et al., 1973, p. 8).

Other examples were also given in which students had to decide if the sentence could stand alone or needed to be placed in a larger context to determine its meaning. In concluding this exercise the point was made that using context is an important strategy in helping understand what is being read. Students were reminded that using context can involve reading ahead or rereading sections in order to gather more information.

Students continued the session reading 'Mrs Reily - Our Neighbour' (Dunbar & Royston, 1988, pp. 40-41). After a review of the three question types, they were then asked to work in pairs constructing two 'between the lines' questions and four 'on the lines' questions. These were then handed to another pair to be answered. Further clarification of the three sentence types occurred during and after sentences were constructed.

Strategy-plus-attribution training group.

The same programme was followed as above with additional emphasis on using effort plus strategies to read the passage and answer the questions.

Session 8

Strategy-only training group.

A guidesheet was formulated to help students focus on strategies for comprehending text (see Appendix C). Emphasis was placed on using strategies:

(a) Before beginning to read the text (e.g., thinking about what the title could mean, skimming questions for hints as to what the passage is about).

(b) Fix-up strategies used while reading the text (e.g., rereading sentences, reading on further for clarification).

(c) Strategies that are helpful after the text has been read (e.g., summarising, skimming to locate information to answer questions).

Using an extract, 'The Old Old Earth' (Liddle, 1977, pp. 78-79), the instructor then demonstrated how to fill in sections of the guidesheet.

Strategy-plus-attribution training group.

Students in this group were also presented with a similar guidesheet (see Appendix D). In addition to those sections listed on the strategies-only group's sheet there were three other questions.

1. 'What is my task here?' This was included to encourage students to undertake task analysis.

2. 'To do this task did I put in enough effort?' This was aimed at getting students to evaluate their effort level.

3. 'I think I read the passage and answered the questions (a) very well, (b) fairly well, and (c) poorly. This was included to get

students to evaluate their performance in terms of effort and strategy usage <u>before</u> their answers were marked.

It was intended that the answer to the latter question would become the basis for discussion. This discussion would be directed at helping students make the connection between effort, strategic behaviour and level of achievement attained. For example if a student had anticipated doing well but instead had done poorly, the discussion could then focus on the need for more effort or different strategies. As with the previous group, this guideline sheet was worked through step by step by the instructor using 'The Old Old Earth' comprehension exercise.

Session 9

Strategy-only training group.

To help reinforce the usefulness of skimming as a strategy for locating information students underwent a timed skimming exercise (Cooper, 1987, pp. 18-19) in which they had to see how quickly they were able to match a list of activities (e.g., skiing, watching television) with a series of paragraphs. Before proceeding, however, two examples were worked through first to demonstrate what was required when using this strategy.

After completing this task students were asked to read the same paragraphs at normal speed so they could answer a number of questions. They were also asked to indicate when they had finished reading. The times were compared, with the latter exercise taking two to three times longer. This became the basis for a discussion on where, why and when skimming can be useful. Its limitations were also highlighted. The point was made that it was not a substitute for careful reading. To elaborate on this statement it was explained that skimming can be used to locate information that could be useful in answering particular questions, but that only careful rereading would determine if that was the information required.

Following this activity students were presented with a comprehension exercise 'The Golden Fleece' (Richards, 1981, p. 90). Before beginning this students were asked to locate the names of several characters by skimming the passage as quickly as they could. Once again the effectiveness of this strategy for locating information was emphasised. The point was also made that skimming was not a substitute for reading carefully. This was demonstrated by the fact that, while they had successfully located information, they were unable to explain anything about the passage without reading from beginning to end. After this discussion students went on to read the passage and answer the questions, filling in sections of their guidesheets as they proceeded through the exercise. Any additional support or prompting required on how to use the guidesheet was given when needed.

Strategy-plus-attribution training group.

The same format was followed with this group, although additional emphasis was placed on task analysis and on applying effort while working.

Session 10

Strategy-only training group.

The session began with students doing an activity on identifying the main ideas contained within a number of paragraphs (Cooper, 1987, pp. 51-54). Initially students observed one example being modelled and then worked through two other examples as a group. In a discussion following this initial activity students were required to defend their answers with evidence from the passages. Furthermore, it was explained that while some information in a paragraph may be new or interesting to them as readers this may not be what the paragraph was mainly about.

For the remainder of the session students worked through a comprehension exercise entitled 'The River Nile Floods' (Cooper, 1987, pp. 61-62) and filled out their guidesheets.

<u>Strategy-plus-attribution training group</u>.

Students worked through the same activities using their guidesheets. Emphasis was placed once again on effort, task analysis and evaluating their own performance.

Session 11

<u>Strategy-only training group</u>.

On being given the passage 'Antarctica - The Last Continent' by Ian Cameron (Brownie, 1984, pp. 72-74) students were told there were a number of difficult words in the passage. However, they were also told that with careful rereading of sentences surrounding each unknown word, it was possible in most instances to make 'good guesses' about what the word might mean from the context clues provided. The passage was read aloud first by the instructor, who then modelled one example using the think-aloud process. Two other examples were worked through by the group using the same strategy. The students then tackled the remainder of the unknown words individually.

In a post-activity discussion it was noted that rereading or reading ahead to work out the meanings of unknown words was useful in all but one instance (there were no context clues for the meaning of 'indigenous'). It was also explained that alternatively they could ask someone for help, use a dictionary, or ignore the word if they believed the word's meaning was not critical to understanding a section of the text. Following this discussion students worked on various comprehension activities which accompanied the passage.

<u>Strategy-plus-attribution training group</u>.

After students practised rereading to find context clues to work out the meanings of unknown words they were asked to do a task analysis. They were asked to list the six comprehension activities in order, from the one they perceived to be the easiest - to the one they considered to be the most difficult. Before starting this work a survey was taken on what order each

student had listed the activities to illustrate the fact that we each perceive things differently. Students were then encouraged to do the activities in the order they had listed. It was emphasised that by reviewing sections of the passage to answer those questions they considered easy, they would find they were able to pick up more information to answer those questions they initially considered difficult. Once again it was stressed that effort and the use of various strategies would help them succeed in doing the task.

Session 12

Strategy-only training group.

The aim of this session was to have students read 'The Flight of Apollo 13' (Dunbar & Royston, 1988, pp. 30-33) carefully, and to use context clues to determine where a misplaced paragraph belonged. In addition they were asked to work out the sentence order of two other paragraphs which each contained four sentences that were out of logical sequence. After finishing this exercise students were then required to construct suitable questions to match each of the answers listed at the end of the passage.

Once this activity had been completed a group discussion took place. During this students gave their reasons for placing the paragraph in a particular place in the extract and for putting the sentences in the correct order. They also decided if the questions constructed by others were appropriate for the answers given.

Strategy-plus-attribution training group.

While this group completed the same activities they firstly determined in what order they believed they should tackle the task. Strategically based effort was also emphasised.

Sessions 13 and 14

Strategy-only training group.

Using their guidesheets students read 'Children at Work' (Stories From The Spring, 1979, pp. 59-62) and 'The Bigfoot' (Hunt, 1983, pp. 28-29), after which they answered the questions that followed each extract. While no particular emphasis was placed on any one strategy during these two sessions, students were reminded of the usefulness and importance of various strategies. Discussions took place at the end of each session to review what strategies students found useful and instances where they had used these strategies.

Strategy-plus-attribution training group.

The same format was followed with this group. However task analysis, effort and self-evaluation of performance were emphasised during these sessions.

Session 15

Strategy-only training group.

To refresh students' memories after the three week term break, a review was undertaken of the various strategies that had been taught. After this students read a short extract about oil (Cooper, 1977, p. 30) and then decided if the five statements which accompanied the passage were true, false, or that the information was not included in the passage. Students were instructed to carefully read to find clues to support their answers. Following this they completed another comprehension exercise entitled 'The Exploding Star' (Liddle, 1977, pp. 170-171) and at the same time filled in the various sections of their guidesheets.

Strategy-plus-attribution training group.

While reviewing strategies, the value of doing a task analysis to determine how much effort is necessary to complete the task successfully, was stressed. When given the first activity students were asked to work out what they

needed to do and how best they could go about this task. They were then questioned on their decisions. The group then proceeded to work through the same material as the previous group and also filled in their guidesheets. Before their work was marked they each estimated how many they had answered correctly. Generally, students underestimated how well they had done. The session was concluded by emphasising that they had all done well on an exercise that was quite difficult and that this success could be attributed to the use of strategies and the application of effort.

Session 16

Strategy-only training group.

Students began the session with a warm-up activity to remind them that they should think about what they are reading. The activity involved reading a short extract and deciding if the accompanying statements were true, false or not mentioned in the extract (Cooper, 1977, p. 29). After this task was completed the instructor read through a passage on mosquitoes (Cooper, 1977, p. 12). Using a think-aloud process the instructor briefly summarised each of the five paragraph. Students were then required to answer questions about the passage. Following this task students were questioned on whether they believed the summarising of each paragraph had helped them locate information quickly and answer the questions more successfully. They readily agreed that summarising each paragraph had helped. Furthermore it was agreed that using this strategy added very little time to the overall time needed to read the passage.

The students then summarised each of the eight paragraphs in 'Food at sea' (Cooper, 1987, pp. 56-57). During this exercise earlier comments about the usefulness of this summarising were re-emphasised.

Once this work was finished students were asked to skim the six questions which accompanied 'The Dolphin' (Cooper, 1987, pp. 23-24) and list the

various things they needed to focus on while reading the passage. After reading the passage they completed the questions. A discussion was then held on the usefulness of skimming questions first as they usually highlight information contained in the passage. It was emphasised that this information helped prepare you for what you were about to read and also helped you to focus on the 'answers' in the passage.

Another important point was made that does not appear to have occurred to many students ; that is, questions are usually written in the same order as the information is located in the passage. For example, the answer to the first question is usually found at the beginning of a passage, while the answer to the last question is usually found near the end of a passage. 'The Dolphin' extract was also used to highlight this point.

Strategy-plus-attribution training group.

Students in this group covered the same work as the strategies-only training group. However time was also spent discussing the fact that effort meant trying hard, concentrating on the task at hand and thinking about what is being read. The discussion also focused on how task analysis helps to determine how much effort is going to be needed to read and do various activities and what strategies are likely to be useful.

Sessions 17 and 18

Strategy-only training group.

Students were introduced to the '5 W's and the H' strategy to help them summarise and to check they have understood narrative-type passages. This strategy involved students asking themselves the following questions:

      (1)   Who is/are the main character/s?

      (2)   What happened?

      (3)   Where did it happen?

      (4)   When did it happen?

(5) Why did it happen?

(6) How did it end?

The strategy was initially introduced with the following example:

> Mr Smith (who) had an accident (what) on State Highway One (where) yesterday afternoon (when). He had skidded on a patch of oil and ran into a fence (why) but was fortunately rescued by the driver of the car following him (how).

The strategy was then modelled by the instructor on a story about Edith Cavell (Pelowich, Hayes & Rush, 1986, pp. 24-26). Although the '5 W's and the H' were identified in the story, a summary was also written to demonstrate how it can be used. This stated:

> Edith Cavell (who) was in charge of the nurses in a Belgian hospital (where) during World War 1 (when). She was arrested (what) for helping 200 English, French and Belgian soldiers escape (why). She was shot by a firing squad (how).

Another story, 'Superman to the Rescue' (Stewart, 1987), was used to model the strategy at the beginning of the second session. While modelling this strategy on both passages various other strategies were also highlighted, such as reading the title to activate prior knowledge.

Students then practised the '5 W's and the H' on five or six short stories that they selected from either The CHP Book of Amazing Rescues (Stewart & Pelowich, 1987) or The Hayes Book of Acts of Courage (Pelowich, Hayes, & Rush, 1986). Additional information on using this strategy was given when needed. However, the degree of assistance required lessened over the two sessions as students became more proficient in using this strategy.

Several discussions arose during the two sessions. One area discussed was how the '5 W's and the H' strategy could be modified for subjects such as science,

by ignoring the 'who' or 'how' for example. Another point discussed was how the strategy of reading the title varied in its usefulness. It was noted that the usefulness of the title depended on what could be gleaned from the title and what was already stored in one's filing cabinet. When doing the work, some students also questioned aspects of stories they did not understand. These queries led to them being questioned as to how <u>they</u> could resolve the problem. Interestingly, during these sessions, students began recommending stories to one another.

Strategy-plus-attribution training group.

While the same programme was followed there was an additional emphasis placed on strategic effort. Students perceptions of easy and difficult also came up for discussion when some students began searching for the shortest stories. When questioned as to why they were focusing on the length of the stories, they commented that short stories were easier. These comments led to a discussion on whether 'short' equated to work being easy, with students agreeing that their perceptions of 'short' being easy and 'long' being difficult were not necessarily true. This matter was discussed again at the end of the second session. By this stage many students were able to give examples of longer stories that they had found easier and more interesting than some of the shorter stories they had read.

Session 19

Strategy-only training group.

Students were given further practice on using the '5 W's and the H' strategy on a variety of newspaper articles. However, it was stressed to students that in some instances they would need to modify this strategy by choosing to ignore those questions for which they could not find an answer. For example, one article described a fund raising effort that was to happen in five days time and so the 'How' question could not be answered.

Strategy-plus-attribution training group.

The same programme was repeated with this group, although two additional points were stressed. Firstly doing your best has nothing to do with how well your neighbour does; what matters is that you have tried your hardest and used strategies to help you. Secondly, initially when we try something new we are not particularly good at it but with practice we usually improve. Examples of learning to ride a bike or tie shoelaces were given. At the conclusion of the session students were then asked to comment on their improvement in using the '5 W's and the H' strategy over three sessions. The majority concluded that they had improved.

Session 20

Strategy-only training group.

Students read 'What are Volcanic Mountains?' (Rosen, 1977, pp. 133-138) and completed several comprehension activities which accompanied the passage (short answer questions, a cloze exercise, matching terms and their definitions and a true/false exercise).

In light of Alvermann's (1988) comments that poor comprehenders often perceive the need to reread as a negative behaviour, it was explained to the group that it was unlikely that they would be able to take in all the information at once. It was therefore stressed that they would need to skim to locate information, reread to check whether the information is correct, and find clues to prove or disprove the true/false statements. It was also added that the instructor had had to do exactly those things when working through this exercise because it had not been possible to take in all the information on the first reading. Students were also reminded to use fix-up strategies when reading the extract.

Strategy-plus-attribution training group.

Once again the same format was used with this group. Before beginning the activity however students were asked to undertake a task analysis to ascertain what was required of them and to estimate the amount of effort that may be needed to do the task. It was also reiterated that doing well on such an activity was not a matter of being 'brainy', but of strategic-effort. Interestingly one student started to complain that it was going to be difficult because it was long. Before anything could be said by the instructor two other students immediately replied that length had nothing to do with how difficult the work would be.

Students were asked to estimate how many they had done correctly prior to it being marked. It was interesting to note that most estimated a high mark and achieved that or slightly more. However, they also commented that they had found sections of the work difficult. These comments were then used to make the point that although it was difficult they had done well because they used effort and strategies.

Session 21 and 22

Strategy-only training group.

A variety of science textbooks were used to demonstrate to students that each textbook has its own style and that when given a textbook to use they should take a few minutes to familiarise themselves with the layout of the textbook. For example, three of the books had review sections at the end of each chapter. The importance of examining headings and subheadings was also stressed as these, like titles, usually indicate the focus of each section. A chapter on photosynthesis from one book and a chapter on electricity from another book were used to reinforce these and other points (e.g., the importance of reading a diagram as carefully as you would read text).

Over the remainder of this and the following session students worked on two science comprehension exercises, 'What is a Plant Cell?' and 'Why Does the Body Need Minerals?' (Rosen, 1976, pp. 67-72 & 137-144). Both of these comprehension exercises contained short answer type questions, cloze exercises, matching terms with definitions, and true/false statements. As in session 20, students were encouraged to use a range of strategies to help them locate information, such as using a key word from a question to help skim through the text to find an answer (two examples of this were modelled), and using headings to locate particular areas where information would most likely be found (two examples of this strategy were also modelled).

At the end of the sessions students' use of strategies was discussed, especially those strategies used to locate information. The point was also made that while a number of words in the extract may have been difficult to pronounce (e.g., goitre, potassium, cellulose) they had still understood the meanings of these words and consequently scored well on both exercises. They were encouraged not to be put off reading when confronted with unknown/difficult words. Instead, they should spend time trying to understand the meaning of a word if it seemed important. Mention was also made of the fact that adults

often read words they cannot pronounce, but that they spend time working out their meanings so they can understand what they read. However, it was added that just like adults they could choose to ignore words that they considered unimportant.

Strategy-plus-attribution training group.

This group received the same programme as the previous group. As in past sessions they were requested to do a task analysis and encouraged to tackle those sections/questions they considered easiest first. They were also encouraged to apply effort. After completing their work they again estimated the number they believed they had answered correctly. When the work was marked, a discussion took place along similar lines to previous sessions about how they found it difficult and yet had succeeded through good use of strategies and effort. Examples from their own lives (e.g., drama, art, playing the guitar) were used to illustrate the fact that they had not been instantly 'good' at these activities; instead they had learnt the skills, practised them, and put in a great deal of effort to improve their performance. As a result they had succeeded at doing these things better. It was then pointed out that the same had happened with their reading; their comprehension had improved because of learning strategies, practising these and applying the necessary effort. In addition to this students were reminded that they were in control and responsible for their own learning.

Sessions 23, 24, and 25

Strategy-only training group.

A variety of cloze reading passages from Strangely True (Mueser, 1980) were given to students in this group. They were allowed to select the passages they wished to do. After completing a passage they answered the questions that followed. While students were again encouraged to use a range of strategies, they were particularly encouraged to reread and read ahead for context clues (semantic and syntactic) to help them to determine which word they should

use. The story 'Ghost in the Moonlight' was modelled to illustrate this point. Furthermore it was emphasised that these were the same strategies they used to work out the meanings of unknown words in other extracts. Listening to a number verbalise their thoughts as they worked through some of the passages indicated that they were using context clues to reason what made the most sense. A post-activity discussion confirmed that this was indeed happening.

Strategy-plus-attribution training group.

As students worked through the cloze exercises they were encouraged to leave sections they found difficult and to return to these later. It was stressed that they would make errors by initially selecting a word that seemed suitable but later find it should go elsewhere, just as the instructor had done when originally working out the answers. The point was made that errors, just like errors that they made in any comprehension work, were simply a signal that they needed to re-examine the question, their answer, or reread the relevant section in the passage. It was emphasised that errors were not 'bad' as we can learn from our errors.

At the conclusion of each session students were asked to estimate the number that they believed they had completed correctly. Once again these estimates were high and quite accurate. Students also acknowledged that these exercises were difficult but recognised they had worked well and therefore had scored well.

Session 26

Strategy-only training group.

Students were asked to read 'Brighton Pier' (Cooper, 1987, pp. 21-23), answer the questions in section A, and decide if the statements in section B were true, false or were not mentioned in the extract. In addition they were also asked to complete a modified version (see Appendix E) of the guidesheet they had used in earlier sessions. It was a simplified version of the previous

guidesheet aimed at helping them to further internalise appropriate self-instructional questions when reading texts in class (e.g., Before I start reading what clues can I get from the title, pictures and questions?). The new format was explained and two questions were used in section A to model once again how taking a key word(s) from a question can be used to guide one to information when skimming. Another question was used to illustrate the fact that while the idea of using a key word works well in many instances, it does not work in all situations. The point was reiterated that one is free to try a strategy that is likely to work, but if it doesn't another strategy can then be used.

In a subsequent discussion an analogy was used to emphasise the idea of preparing oneself before beginning to read. To introduce the analogy students were questioned as to whether they usually read the blurb in the TV guide before watching a movie. After agreeing that they normally did this, it was pointed out that in doing so they were preparing themselves to watch a movie and this is just what they were doing when they read the title, looked at pictures, and skimmed the questions. After the extract was read and the guidesheet filled out another discussion was held on what strategies individuals had used to help them better comprehend.

Strategy-plus-attribution training group.

This group also received a modified version of the guidesheet they had previously been using. The session followed the same lines as that of the strategies-only training group. As in other sessions students estimated the number of answers they would get correct. A post-activity discussion was held on these estimates and these were compared to their actual marks, amount of effort they believed they had expended, and the difficulty level of the task. Once again students generally concluded that the task had been difficult and yet had estimated they would do well. It was noted, that except in one instance, all had done well. The student who had done poorly commented (without prompting), "I didn't do very well because I don't think I put enough

effort in". This comment was made before the discussion was held on difficulty levels, effort and strategy use.

Session 27

Strategy-only training group.

Students read 'Parker-Hamilton' (Dunbar & Royston, 1988, pp. 23-27), answered the accompanying questions and filled out their guidesheets. A review of various strategies and their usefulness, was carried out after the work was completed.

Strategy-plus-attribution training group.

This group followed the same format. The focus in this session was on being 'brainy' versus strategic effort. Time was also spent on what useful information can be gained from errors.

Session 28

Strategy-only training group.

A discussion was held on why it is worthwhile using strategies before, during and after reading a passage. Students then read 'A Maori Childhood' (Stirling, cited in Hill, 1982, pp. 7-8), answered the accompanying questions and filled in the guidesheet. When this work was completed students used a series of clues to locate the leader of a spy ring on a map of Europe (Mastering Maps, 1987, p. 48). As on other occasions it was emphasised that people use different combinations of strategies to achieve the same goal.

Strategy-plus-attribution training group.

Students followed the same format as the strategy-only training group but with additional emphasis on strategic effort and learning from one's mistakes.

Data Analysis

The hypotheses in this study were tested by means of a one-way analysis of variance (ANOVA) with repeated measures. There were three groups (strategy-plus-attribution, strategy-only, control) and two testing occasions (pre, post). The reason for using this statistical procedure was to explore Group by Time interaction effects. Such a procedure allows the researcher to determine whether or not the experimental groups made statistically significant improvements on the dependent measures, following the intervention phase.

CHAPTER IV

RESULTS

Selection Test Results

Students' chronological ages and reading ages (calculated using the Elley Noun Frequency Method), of the passages from An Informal Prose Reading Test (Henderson, 1986), were compared. Each student's reading age was determined on the basis of the most difficult passage that s/he could decode with at least 95% accuracy. The comparison between the chronological ages and the reading ages revealed that 15.38% (n=6) were decoding one to two years above their chronological age, while 51.28% (n=20) were decoding at, or slightly above (up to a year) their chronological age. Another 15.38% (n=6) were decoding slightly below (within a year) their chronological age, with the remaining 15.38% (n=6) decoding one to two years below their chronological age. The majority of the students therefore, were decoding at or above their chronological age.

Each student's ability to answer the comprehension questions accompanying their most difficult passage was also assessed. As shown in Figure 1, no student was able to satisfactorily comprehend (i.e. correctly answer 75% of the questions) the most difficult passage that they could adequately decode. In fact 69.23% (n=27) were unable to correctly answer even 50% of the questions asked, despite reading the passage twice. These results indicate a disjunction between students' decoding abilities and their comprehension abilities.

Figure 1
Comprehension Results
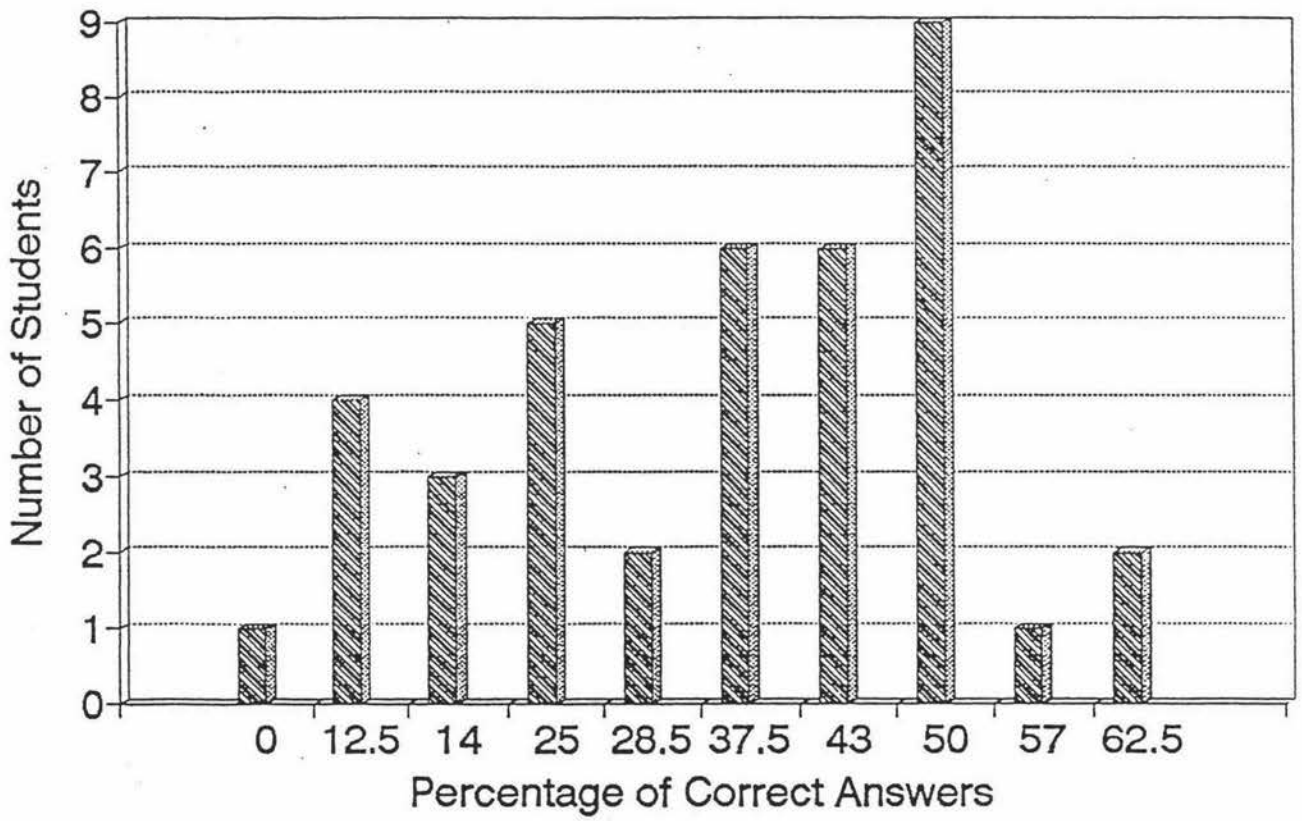
Comprehension Test Results

TORCH

The summary of ANOVA data for the TORCH scores is presented in Table 2 and the means and standard deviations are listed in Table 3. It should be noted that the raw scores were converted to T scores to facilitate the interpretation of data in a more meaningful manner. No significant main effects were evident for either Group or Time. Nor was there a significant Group x Time interaction effect. Thus on the basis of the TORCH scores there is no evidence of an improvement in the comprehension levels of either of the experimental groups.

Table 2

Summary ANOVA for TORCH Scores

	F	df	p
Group	0.15	2,36	.86
Time	0.13	1,36	.72
Group x Time	0.20	2,36	.82

Table 3

Pretest and Posttest Means and Standard

Deviations for TORCH

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	52.12	8.83	50.58	9.10
Strategy-only	49.36	11.24	50.36	13.36
Control	50.52	8.31	49.16	7.97

Recall Tests

Recall test results were also converted to T scores to allow the data to be interpreted in a more meaningful way. As shown in the summary of ANOVA data in Table 4, there were no significant main effects for either Group or Time. Furthermore there was no significant Group x Time interaction effect. The means and standard deviations for each group are set out in Table 5. As is evident from the results, neither of the experimental group's comprehension performance improved from pretesting to posttesting.

Table 4

Summary ANOVA for Recall Scores

	F	df	p
Group	1.13	2,36	.33
Time	0.17	1,36	.68
Group x Time	0.05	2,36	.95

Table 5

Pretest and Posttest Means and Standard

Deviations for Recall Tests

Group	Pretest		Posttest	
	M	SD	M	SD
Strategy-plus-Attribution	53.16	9.89	53.20	12.51
Strategy-only	50.27	9.32	49.49	7.26
Control	48.32	10.83	47.46	9.26

PAT Comprehension

As with the previous two comprehension test, the raw scores from the pre- and posttests were converted to T scores to ensure the data could be more meaningfully interpreted. ANOVA data for PAT Reading Comprehension scores are presented in Table 6. There were no significant main effects for either Group or Time, and there was no significant Group x Time interaction effect. However, there was a slight change in scores following the intervention phase. As shown in Table 7, the strategy-plus-attribution group showed a slight improvement in their PAT comprehension scores, while the control group showed a slight decrease. These results would appear to indicate that the combined programme (strategy-plus-attribution training) was marginally more effective than the strategy-only training. The decrease in the control group's results would seem to suggest that simply reading passages and doing comprehension exercises could be counterproductive.

Table 6

Summary ANOVA for PAT Comprehension Scores

	F	df	p
Group	0.27	2,36	.77
Time	0.01	1,36	.91
Group x Time	2.82	2,36	.07

Table 7

Pretest and Posttest Means and Standard

Deviations for PAT Comprehension Scores

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	47.56	4.40	53.58	8.90
Strategy-only	51.23	6.55	50.33	11.18
Control	50.86	16.10	46.39	9.30

Comprehension Test

The comprehension scores for the comprehension test administered to all Third and Fourth Form students at the conclusion of the intervention programme, were analysed by means of a one way ANOVA (see Table 8). The means and standard deviations for the three groups are listed in Table 9. The results indicate there was no significant differences in the comprehension scores between the three groups.

Table 8

Summary ANOVA for Posttest Comprehension Scores

	F	df	p
Group	0.09	2,35	.91

Table 9

Pretest and Posttest Means and Standard
Deviations for Comprehension Test

	Posttest	

Group	M	SD
Strategy-plus-Attribution	28.61	9.10
Strategy-only	27.42	9.55
Control	27.54	5.61

Strategy Measures

Metacomprehension Strategy Index Results

The summary of ANOVA data for the Metacomprehension Strategy Index
(M.S.I.) results is presented in Table 10, while the means and standard
deviations are listed in Table 11. Although there were significant main effects
for Group and Time, there was no significant interaction effect for Group x
Time. The results indicate that all three groups more than doubled their
metacomprehension strategy knowledge; a trend in the right direction.

Table 10

Summary ANOVA for M.S.I. Scores

	F	df	p
Group	5.65	2,36	.01
Time	99.36	1,36	.00
Group x Time	2.20	2,36	.13

Table 11

Pretest and Posttest Means and Standard

Deviations for M.S.I.

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	5.92	2.56	14.61	4.68
Strategy-only	4.33	2.84	13.42	3.34
Control	4.57	3.94	10.07	1.81

Strategy Usage Results

ANOVA data for the concurrent interviews (see Table 12) indicate significant main effects for Group and Time. More importantly, there was a significant Group x Time interaction effect, with both the strategy-only and the strategy-plus-attribution training groups showing a significant improvement in their use of strategies. The means (see Table 13) of both experimental groups from pretesting to posttesting nearly doubled, while the means of the control group showed only a minimal increase.

Table 12

Summary ANOVA for Strategy Usage

	F	df	p
Group	5.51	2,36	.01
Time	57.62	1,36	.00
Group x Time	10.79	2,36	.00

Table 13

Pretest and Posttest Means and Standard

Deviations for Strategy Usage

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	4.85	1.72	8.92	1.93
Strategy-only	4.50	1.62	8.42	2.11
Control	5.07	1.68	5.50	1.28

Results of Attribution Measures

Causal Attribution Rating Scale for Success

From the ANOVA data presented in Table 14 there is evidence of a significant main effect for Group on the Causal Attribution Rating Scale for Success. However there is no significant main effect for Time, nor a significant Group x Time interaction effect. The significant Group effect is due to the overall differences in scores over both testing occasions. As the means in

Table 15 indicate, the strategy-plus-attribution group were generally more internal in their success attributions, whereas the control group was relatively external. The slight increase in scores (more internal) for the strategy-plus-attribution group, and the slight decrease in scores (more external) for the control group did not result in a significant interaction effect.

Table 14

Summary ANOVA for Success Attributions

	F	df	p
Group	3.46	2,36	.04
Time	0.09	1,36	.77
Group x Time	2.54	2,36	.09

Table 15

Pretest and Posttest Means and Standard Deviations
for Success Attributions

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	48.77	5.36	51.77	4.97
Strategy-only	48.58	2.84	48.08	4.12
Control	47.00	5.04	45.29	6.28

Causal Attribution Rating Scale for Failure

ANOVA data for the Causal Attribution Scale for Failure are presented in Table 16. While there is no significant main effect for Group or a significant Group x Time interaction effect, there is a significant Time effect. The means listed in Table 17, indicate that all three groups' internality scores for failure decreased over time.

Table 16

Summary ANOVA for Failure Attributions

	F	df	p
Group	0.75	2,36	.48
Time	8.81	1,36	.01
Group x Time	0.74	2,36	.49

Table 17

Pretest and Posttest Means and Standard Deviations
for Failure Attributions

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	49.85	3.89	48.77	4.75
Strategy-only	48.75	3.77	46.33	4.01
Control	49.79	4.48	46.50	5.08

103

IAR - Success

The ANOVA data (see Table 18) indicate that there was a significant main effect for Time, but not for Group on the IAR subscale for success. There was no evidence of a significant interaction effect for Group x Time. From the means shown in Table 19 it would appear all three groups' internality scores increased over time for success.

Table 18

Summary ANOVA for IAR - Success

	F	df	p
Group	0.23	2,36	.80
Time	6.92	1,36	.01
Group x Time	0.55	2,36	.58

Table 19

Pretest and Posttest Means and Standard
Deviations for IAR - Success

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	10.85	2.19	11.61	3.12
Strategy-only	9.91	2.31	11.08	2.87
Control	10.07	3.77	12.07	4.34

IAR - Failure

A similar pattern of results emerged from the ANOVA data (see Table 20) on the IAR subscale for failure. As with the subscale for success, there was a significant main effect for Time, but not for Group. Also there was no significant Group x Time interaction effect. The results indicate an increase in the internality scores for failure for all three groups from pretesting to posttesting.

Table 20

Summary ANOVA for IAR - Failure

	F	df	p
Group	0.83	2,36	.44
Time	6.55	1,36	.01
Group x Time	0.31	2,36	.73

Table 21

Pretest and Posttest Means and Standard Deviations for IAR - Failure

	Pretest		Posttest	
Group	M	SD	M	SD
Strategy-plus-Attribution	9.07	1.98	10.38	2.02
Strategy-only	8.50	1.17	9.08	2.02
Control	8.64	2.65	9.57	2.74

Postprogramme Interview Data

Previous help with reading

Students were asked whether they had been given extra help with their reading (i.e. placed in remedial programmes) at any time during their schooling. Of the 39 students who completed the intervention programme, 16 (41.02%) recalled being given specialised help for reading. One student first received help at the junior level, while another eight began receiving additional help at some time between Standard 1 and Standard 4. Four students did not participate in any remedial programmes until they were in Form 1 or Form 2, while the remaining three students were offered remedial help for the first time, at high school level. Of the 16 students who were given extra help, only four could recall the additional reading help being offered at more than one year level.

This information raises a number of important points. Firstly the majority of students have not received any consistent or specialised help in the past for their comprehension problems. It is possible that their problems were recognised, but because of limited resources they were unable to be given additional help. Alternatively, if decoding levels were used as the main/sole criteria for admission into a remedial reading programme these students may not have been deemed to be in need of extra help.

Of those who did receive help, only one student was given extra assistance in the early stages of his/her schooling, suggesting once again that there may have been too much emphasis on decoding skills when determining who should receive additional reading assistance, or that resources were very limited. Either of these reasons may also account for the limited number of students who were given help at more than one year level.

Further to these results, only five of the 45 students originally selected for this intervention programme would have been eligible to receive extra help

through the remedial reading programme offered at the high school. Because of limited resources, only those with considerable decoding difficulties were able to be given additional help for their reading problems.

Students' reactions to the programme

The students were each asked whether the intervention programme they received (each group, including the control group, believed they were receiving a different programme) had helped their reading. Of the control group, 50% (n=7) believed their programme had improved their reading, 28.6% (n=4) said it had been of some help, while the remaining 21.4% (n=3) stated it had been of no help. Seventy-five percent (n=9) of the strategy-only group found their programme helpful, with the remaining 25% (n=3) claiming it had been of some help. In comparison 84.61% (n=11) of the strategy-plus-attribution group stated their programme had improved their reading, while 15.38% (n=2) believed it had been of some help. No students in either of the experimental groups claimed the programme had been of no help.

Those students who stated that the intervention programme had been of benefit, were asked to explain how it had benefitted them. They were asked to support their statements, where possible, with examples (refer to Appendix G for students' statements). The strategy-plus-attribution group provided the most detailed information and cited many more examples of how the programme had assisted them than either of the other groups. However the strategy-only group was closer in quantity of positive comments to the strategy-plus-attribution group than the control group. These statements would appear to support each group's perceptions of the effectiveness of the intervention programme. Overall it would appear that students in the strategy-plus-attribution group found their programme to be more helpful than the other two groups, while the control group perceived very few benefits from their programme.

CHAPTER V

DISCUSSION

The test results did not support the prediction that students who received the strategy training component would show a significant improvement in their reading comprehension when compared to those in the control group. Similarly there was no support for the hypothesis that students who received strategy-plus-attribution training would show a significant improvement in their reading comprehension when compared to those students who received strategy-only training. The PAT results however, indicate that a combined programme (strategy and attribution training) was marginally more effective than strategy-only training.

However, there was support for the prediction that strategy training would lead to increased awareness and use of strategies. This increase in metacognition was evident in the results from the taped concurrent interviews, as students from both experimental groups displayed a significant increase in the number of strategies they employed when compared to the number used by the control group. It appears however, that this improvement was not reflected in improved comprehension skills.

When questioned as to whether they believed that the intervention programme had helped their comprehension, students from both experimental groups agreed it had and in doing so cited a range of strategies they had found useful. In addition, they all gave examples of how these strategies had assisted their comprehension, and listed subjects in which comprehension strategies had proven helpful (e.g., "In science I now think about what is being written on the blackboard. Never used to - just copied it down", and, "In maths I didn't know this answer so skimmed back through my book for one like it - didn't do that before"). In comparison, the control group provided very few examples of how they had benefitted from their 'treatment.' For

those who believed the programme had been of some value, there was a tendency to claim that it had assisted them to read aloud and/or read faster.

An examination of the results has highlighted two critical questions. Firstly, why did students in the experimental groups demonstrate a marked improvement in their use of strategies, and readily identify situations where strategic behaviour had proven beneficial, but not show a significant improvement in their comprehension test results? Secondly why did the results of strategy-plus attribution training appear no more successful than strategy-only training? While there are a number of possible answers to both of these questions the discussion will initially focus on the first question.

One possible explanation is that the data gathered from the concurrent interviews and the postprogramme interviews did not translate into reading behaviour. Students may have reported what they believed they should be doing rather than what they were doing. Nesbitt and Wilson (1977) have argued that verbal reports of cognitive activities do not necessarily coincide with actual behaviour. Yet close observation of reading behaviours during the concurrent interviews tended to match what students were reporting. For example, students were invariably observed (e.g., eye movements and finger pointing) skimming and rereading sections before they reported that this is what they had done. If there appeared to be any discrepancy between what they did and what they said, this was questioned.

Test anxiety could also account for the discrepancy between students' reports of strategy use and comprehension test results (Bryan, Sonnefeld, & Grabowski, 1983). Bryan et al.(1983) have noted that test anxiety is lessened when task formality is reduced. Test anxiety could explain the discrepancy as the interviews were conducted on an individual and less formalised basis, while the comprehension tests were administered on a group basis with standard testing procedures.

Observations during the comprehension tests also support the possibility that test anxiety affected the results. For example, despite being told numerous times that they could take as long as they wished to complete the TORCH tests, students still tended to rush through the tests. Even on the PAT, over half the students completed this test well within the time limit. Similarly, many students finished the recall tasks with time to spare in both the reading and the written recall of the passages. In addition, the majority of students voiced their displeasure at the prospect of being tested prior to both the pre- and posttesting sessions.

Bryan et al. (1983) make the point that low achievers are more prone to test anxiety than high achievers and that test anxiety is associated with depressed intellectual performance. However, while test anxiety may depress performance one could also argue that familiarity with the test format in the posttest situation and familiarity with the examiner would lessen this to some degree, thus allowing instructional differences to be reflected in test results.

A more feasible explanation lies in the difference between acquiring a strategy and using it effectively. Reynolds, Wade, Trathen, and Lapan (1989) for example, argue that strategies can be used with differing degrees of effectiveness. As they state, "There seems to be an implicit assumption that if students say they are using a strategy or exhibit behaviours that are seen as reflecting a strategy, then they must be using the strategy effectively" (1989, p. 175). The distinction between acquisition and sophisticated strategy use is made by Haring and Eaton (1978). They identify four levels of skill learning. These are:

      (a)   Acquisition. This is the process whereby the student acquires the mechanics of a strategy and learns how to use it to solve a problem.

      (b)   Proficiency. This refers to the stage of learning where the student internalises the strategy and can apply it rapidly and efficiently in problem-solving situations.

(c) Generalisation. This is the point where the student is able to apply the strategy in new situations.

(d) Adaptation. This is the level at which the student is able to modify the strategy in order to make an appropriate response.

The degree of practice required to help students become sophisticated strategy users appears to be a critical factor (e.g., Duffy & Roehler, 1989; Licht, 1983; Symons et al., 1989). Given that Duffy and Roehler (1989) found it took from October to February for any significant changes in strategic behaviour to occur, it is possible that the present study was too short. A number of constraints however, predetermined the length and intensity of the intervention programme.

Another factor influencing the effectiveness of the training programme, was absenteeism. During the course of the programme a significant number of students were absent on occasions, mainly because of ill health or involvement in a considerable number of extra curricular activities which happened to coincide with the programme. Although truancy could also account for absenteeism in four cases (e.g., one student with a history of absenteeism was away for 25 days during the 14 weeks of the programme). Thus in some instances student did not receive sufficient practise to enable them to successfully master particular strategies.

However, it is not only practice using individual strategies that is required for sophisticated strategy use, but also practice in coordinating a number of strategies. As Duffy and Roehler (1989) point out, strategies are seldom applied singly. They give the example of using context clues with a phonics strategy to work out the meaning of an unknown word. Similarly, skimming and rereading are often used in conjunction to find information.

All the comprehension tests administered in this study required students to coordinate a number of strategies and apply these rapidly and efficiently. In

comparison the concurrent interview did not demand the same level of strategy orchestration. Nor did it require strategies to be applied with the same level of efficiency. In essence, it measured the acquisition of strategies rather than the effectiveness of strategy use. In light of the differences between the level of strategy proficiency being measured in the concurrent and comprehension tests, and the length of the programme, it may have been wise to include some in between measures of strategy use.

While it appears that the length and intensity of this intervention programme may have been insufficient to bring about the needed transformation from novice to expert strategy users (Swanson, 1989), it is likely that a number of other factors also influenced the final outcome. The present programme may have been overly ambitious in attempting to teach so many strategies. For example Borkowski, Weyhing, and Carr (1988) focused on teaching only summarisation strategies with attribution retraining. Through their intervention programme they were able to achieve the desired goals of maintenance and generalisation, in addition to altering domain-specific attributions.

The point about teaching a few strategies well rather than teaching several superficially, was also made by Pressley et al. (1989) in their review of strategy instruction. Although this is a valid criticism of the current study, it was felt at the time of designing the programme that students would need to learn a number of strategies if they were to cope successfully with many classroom reading comprehension tasks. For example, it was decided that students needed to acquire question answering strategies, as it is the products of comprehension that are invariably used by teachers and students to measure success on comprehension tasks in secondary classrooms.

The sensitivity of the comprehension tests may also account for the difference between students' strategy use during the concurrent interviews and the lack of evidence of strategy use in the test results. It is possible the comprehension

tests were too global in nature or too insensitive to pick up changes in strategy use.

Another factor influencing strategy use is the effort involved in mastering or using a strategy (Pressley et al., 1989). Although students were advised that they may find using strategies an awkward and frustrating experience initially, it is possible some may have decided that the effort required to successfully master particular strategies was not worth the trouble. For example, learning how to skim requires much less effort than learning how to summarise. As Pressley et al. (1989) point, out even good strategy users decide at times that the potential benefits of using a strategy are not worth the effort involved.

Related to this problem is the issue of task involvement. If students are going to put in the necessary effort to master particular strategies they must perceive the strategies "as useful means to desired ends that have personal significance and utility" (Paris & Jacobs, 1984, p. 2091). It is possible that some students did not see the significance of mastering certain strategies, in spite of careful explanations about the importance of each strategy. For example, students at the junior level in secondary schools are rarely required to summarise and therefore some students may have decided there was little point in mastering this strategy; despite being informed that it can be a very useful strategy to evaluate one's comprehension of a passage.

In a broader context, students' deep seated attitudes to reading may have hindered the successful mastery and efficient use of a number of strategies. It is likely that many students in this programme believe reading to be an onerous and unpleasant task. For example students regularly passed comments about not enjoying reading or never reading at home. Also many became overly concerned about the length of passages they were given to read. If given a choice of passages students would often use length as the main criteria for selecting a passage to read. Complaints about the task being difficult (prior to a passage being read) often arose if a passage was more than a page

in length, despite attempts to convince students that length did not necessarily equate to difficulty levels. It appears a more intensive and extensive attribution retraining programme would be needed to counteract some students' inherent dislike of reading. Under the circumstances students who do not enjoy reading would be less inclined to expend the necessary effort to acquire more complex strategies.

Another factor that may have had an impact on the test results is a lack of prior knowledge (e.g., Short & Weissberg-Benchell, 1989; Snider, 1989; Wade, 1990). As Wade (1990, p. 450) states, background knowledge "plays an enormous role in comprehension." Recht and Leslie's (1988) study cited earlier makes this point clearly. They found that good reading ability did not compensate for lack of prior knowledge.

A lack of prior knowledge was observed to have a marked effect on students' ability to answer questions correctly during the concurrent interviews. For example, many students in the experimental groups used skimming and rereading strategies to locate information, but then often answered incorrectly because they lacked the necessary background knowledge (e.g., when asked what country was famous for its diamond mines, students would often give New South Wales as an answer because they believed it was a country). In light of this observation it is possible that students used strategies correctly, but scored poorly on the comprehension tests because of insufficient prior knowledge.

Scoring poorly on the comprehension tests may have also been the result of decoding problems. As Snider (1989, p. 87) states, "The ability to decode both rapidly and accurately is a prerequisite to comprehension." While all the students received the same pre- and posttest comprehension exercises, there was a considerable gap between the least able and most able readers (their reading ages ranged from 11-12 years to 15+ years). It is quite possible the poorer decoders in the study found some of the passages difficult. As a result,

their attention may have been directed at decoding rather than comprehending.

From the plausible explanations offered for the discrepancy between students reports of strategy use and test results, it would seem likely that the number of strategies combined with the duration of the programme had the most impact. Given the number of strategies to be mastered, the programme may have been too short for students to become competent strategy users. From the interviews it would appear that students in both experimental groups had acquired a number of those strategies taught during the programme. However, it would also appear they had not received enough practice to enable them to successfully coordinate, apply and adapt these strategies to meet the demands of the comprehension tests.

In searching for answers to the second question, it is possible that the duration and intensity of the programme were largely responsible for the lack of difference between the results from the strategy-plus-attribution training group and the strategy-only training group. Given that students' dysfunctional attributional beliefs have evolved over a long period of time in response to repeated failure (Borkowski et al., 1986), it is perhaps not surprising that attribution retraining did not have a marked impact in the short term. When one considers that students were receiving attribution retraining for only two of the 25 hours that they were in class, it would also be reasonable to assume the effects from the training may have been eroded or even negated by other classroom experiences. Ames and Archer (1988, p. 265) echo these concerns when they state, "Interventions aimed at modifying attributions and training of strategies, may not have lasting effects if the classroom does not support the targeted outcomes of the intervention."

In addition to the lack of intensity and the possibility of other classroom experiences negatively impacting on attribution retraining, it is likely that the intervention programme was too short to bring about the anticipated

attributional changes. As Borkowski et al. (1986, p. 135) state, "Attribution retraining needs to be intensive, prolonged and consistent in order to combat the debilitating negative beliefs about self efficacy."

While it seems most likely that the intervention programme was insufficient in length and intensity to alter attributional beliefs sufficiently for there to be any change in students' comprehension, it is also possible that the effects of strategy-plus attribution training may be slow to appear. With independent practice at applying strategies in other situations students may achieve a degree of success they had been unable to achieve previously. Realising success is within their control may encourage them to expend more effort in using strategies on other tasks and in turn increase the likelihood that students will emphasise strategically based effort over ability when evaluating their own performances. These attributions would in turn lead to an increase in effort and strategic behaviour on future tasks. Borkowski et al. (in press, p. 13) have termed this process "a reciprocal bidirectional chain of events." However further evaluation would be required to determine if this has happened.

Another factor that could have undermined the effectiveness of attribution retraining is that of family attitudes. If a student is unmotivated to learn because his/her family places little value on academic achievement then attribution retraining is likely to be a futile exercise (Licht & Kistner, 1986). According to Licht and Kistner (1986) a desire to learn is an important prerequisite for attribution training to be successful. In the case of three students in the strategy-plus-attribution group a lack of desire to learn or interest in school may well have negatively impacted on attribution retraining (a history of truancy in one instance, and serious incidents of misbehaviour in other classes in the remaining two instances).

While it has been possible to identify a number of factors that may have inhibited the programme's effectiveness, it is difficult to determine their degree of influence.

Conclusion

As indicated, there is a range of factors that may have prevented the intervention programme from positively influencing students' reading comprehension. However while the results of the present study did not conclusively demonstrate that a combined approach is effective, there are a number of indications that suggest this approach should not be abandoned. For example, the PAT results, while not significant, were moving in the right direction. Extended training could have possibly brought these results up to the level of significance.

The concurrent interviews also revealed a significant improvement in strategy use. Once again, extending the duration of the programme may have led to increased proficiency using particular strategies and skill in coordinating a number of these strategies. Furthermore, students' perceptions of the programme provide additional support for advocating such an approach not be dismissed. This is reflected in the postprogramme interviews in which nearly all students in the experimental groups stated that the programme had been very helpful with the remaining few stating it had been of some help. Although no students from these two groups were negative about the programme, nearly a quarter of the control group (who believed they were an experimental group) felt their 'treatment' had not led to improvements in their comprehension.

Borkowski et al. (1990) have noted that others have found modification of reading achievement difficult to accomplish. However, the success achieved by Borkowski et al. (1988) and Carr and Borkowski (1989), using the combined approach of strategy training (cognitive and metacognitive) plus attribution retraining, provides the impetus to continue pursuing such an approach. For example, in the latter study, strategy-plus-attribution training proved far more effective in improving strategy use, recall, reading grades, and attributional beliefs, than strategy-only training.

However, while advocating that the combined approach used in the present study not be abandoned, it is also recommended that it be modified, refined, intensified and extended. This will be necessary if such a programme is to achieve the desired objective; that is to improve the comprehension levels of those students who have difficulty comprehending but can adequately decode what they read.

Educational Implications

In reviewing aspects of the present study a number of important points have come to light. For example, when selecting students to participate in the intervention programme it became apparent teachers need to be thorough when using informal reading inventories to assess students' reading levels. While this type of assessment should involve evaluating both decoding and comprehension skills, teachers tend to focus mainly on the decoding level because it allows them to identify a student's reading age. Although not directly relevant, it is worth noting that reading ages are often perceived by teachers as being a fairly accurate measure of a student's reading ability. However, reading ages can vary greatly depending on which readability formula is used to evaluate a passage.

From this study it would appear that by secondary level decoding levels are not necessarily an indication of comprehension ability. While administering the informal reading inventory to the 96 students who had scored poorly on the PAT comprehension test, it was evident that a number of students could decode far better than they could comprehend. However, it was also apparent that a significant number of students could comprehend far more than would have been expected given their poor decoding skills. One student, for example, averaged one error for every seven words read, but was able to correctly answer six out of eight comprehension questions.

With limited resources available to assist poor readers it is important that a student's decoding and comprehension levels are both considered when determining who will receive remedial help. If the evaluation procedures only focus on decoding then it is possible that students who decode adequately but have difficulty comprehending will be unfairly disadvantaged. This may have been the case with the students in the intervention programme. As indicated in the results, the majority had never received any additional help with their reading.

In relation to evaluation, a task mastery approach (individualistic) seemed preferable to a performance (competitive) oriented approach. A task mastery approach encourages students to focus on their own achievements in relation to their past performance, whereas a performance oriented approach encourages students to compare their performance with others (Ames & Archer, 1988). For students with learning difficulties, there seems to be considerable merit in focusing their attention away from how they measure up against their peers and refocusing it on acquiring important skills.

With the focus on task mastery and throughout the programme, it appeared that students were increasingly focused on their own performance. Furthermore they seemed to become less interested in comparing their performance to those of others in the group. Two comments highlight this change of focus. Towards the end of the programme one student flicked back through his book and said " I've really improved haven't I." Another student on completing her work (before the work was marked) announced to the group, "I've got all of these right."

Although there is only anecdotal evidence from this study to support a task mastery approach, Ames and Archer's (1988) research also endorses this approach. They found in situations where students believed mastery goals were salient, that students reported using more effective strategies, preferring challenging tasks and having stronger beliefs that success follows from one's efforts. By adopting a task mastery approach teachers can encourage students

to focus on getting better rather than being the best (Borkowski et al.,in press).

An analysis of the concurrent and postprogramme interviews also highlighted points of educational interest. During the pre- and postconcurrent interviews, it was apparent that students' lack of background knowledge hindered their comprehension. Teachers need to be aware that background knowledge is a critical factor in a student's ability to answer questions, particularly inferential questions.

From students' comments during the postprogramme interview it would appear that they found most strategies helpful, especially rereading and skimming. However, no one mentioned summarisation or visualisation. It was surprising the number of students who commented that they never used to reread or slow their reading down. Perhaps teachers need to take the opportunity to encourage students to reread and alter their reading speed.

Using a group approach rather than a one-on-one approach also appeared to have considerable merit. Group discussions highlighted the fact not everyone used the same strategies to complete a task. Students also raised important points that were then discussed by the group. In the process, problems were clarified. On occasions, when a problem resurfaced another student would restate comments made on previous occasions by the instructor. Furthermore students assisted one another by reminding each other to use particular strategies. In this instance group dynamics proved valuable.

Lastly comes a plea for teachers to take time to explain, demonstrate and reinforce the use of strategies to aid comprehension. While the approach used in the present study was not as successful as hoped, students' comments in the postprogramme interview indicated they perceived the majority of strategies to be useful. These comments were markedly different to those of the control group whose programme primarily focused on the products of comprehension.

The approach used on the control group is typical of the way in which comprehension is taught in many classrooms (Durkin, 1978-1979). While help was provided when requested, this type of assistance did not help students to develop or use their own skills to solve problems. Of those students who perceived this programme as beneficial, very few indicated they believed it had improved their comprehension. The comments mainly focused on improvements in their oral reading and on being able to read faster. The traditional type of approach to teaching comprehension appears to have little to recommend it; not only in terms of research findings, but also from the students' point of view.

Suggestions For Further Research

The present programme while providing very few answers has raised a number of important questions that only further research can clarify. As indicated, there is a need to determine whether extending the training will help students become proficient strategy users. Research could be undertaken to determine if strategy-plus-attribution training is more effective if delivered in intensified bursts rather than gradually (e.g., two hours per week as was done in this study).

Further investigation is also required to determine if the number of strategies taught were in fact too many. Perhaps some could be eliminated or taught at a later stage once the easier strategies have been mastered.

While suggesting a task mastery approach be used,there is definitely a need for more research to verify its effectiveness. The same must also be said of group instruction verses one-on-one instruction. It is possible transcripts of lessons would be one way of gathering the necessary data.

Another component of the programme that warrants further investigation is the use of guidesheets. The guidesheets appeared to help focus students'

attention on the strategies they were using, encourage self evaluation and provide valuable material for group discussions. However empirical evidence is required to confirm these observations.

During the concurrent interviews the majority of students said if they had difficulties they asked the teacher or another class member for help. It would be interesting to compare how often poor readers do ask for assistance in comparison to more able readers. Zimmerman and Pons's (1986) research findings would suggest there is a marked difference, with high achieving students asking for far more assistance than low achieving students.

In connection with students' asking for help, it would also be interesting to compare teachers' responses to requests for assistance. It is possible that teachers provide more self-help instruction to able readers, which probably enhances strategy development. On the other hand they possibly provide 'complete' answers for less able readers, believing that these students are incapable of solving some of the problems with only a few clues or prompts. If these speculations are correct then teachers would inadvertently be encouraging poor readers to be dependent rather than independent.

Undoubtedly there are a number of other aspects of this study that warrant further investigation. However of most immediate concern is the need to ascertain if the effects of strategy-plus-attribution training become more apparent with time. The author intends to retest students in the months ahead to determine if there have been any changes in comprehension levels and attributions, that could be attributed to the intervention programme.

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APPENDIX A

THE WORLD'S LARGEST ANT

The largest ant in the world is a Queensland bullant. It measures three and a half centimetres in length and possesses a poisonous sting. It is unwise to disturb a bullant's nest unless you are prepared for the fierce aggressiveness of these insects. When attacking, the bullant clings to the victim's flesh by the jaws, thus gaining leverage to drive the sting home. This is achieved by bending the abdomen down between the legs. The sting is not barbed, like that of a bee, but is smooth and polished and can be used many times until the poison sac is empty.

Many people have become ill after being stung. In Queensland, several years ago, a little girl fell from a tree on a bullant nest. She was paralysed, having fractured her spinal cord. When found by a search party, she was covered with bullants which had inflicted many stings. The poor girl died from the poison soon after admission to hospital.

1.   Explain what this passage is mainly about in 3 sentences.
2.   How does the bullant cling to its victim?
3.   How is the bullant's sting different to a bee's sting?
4.   Why did the little girl die instead of becoming ill like others who have been stung by bullants?
5.   What differences can you think of between a bullant and the ants we find in our gardens or houses?
6.   Complete each sentence by choosing words from the box.

abdomen	paralysed	thirty	sac
forty	barbed	jaws	fierce
gland	smooth	ill	

1.   A bullant can be _____ millimetres long.

2.   A bullant is described as being _____.

3.   The sting from a bullant comes from its _____.

4.   The poison is stored in a _____.

5.   You can become _____ after one sting from a bullant.

6.   Its sting is _____.

APPENDIX B

OPAL MINING

For millions of years opal stones have slept down in the blackness of the earth. Then, when exposed to the light by man, they flash and glimmer like an advancing bushfire. The secret of their colours has long baffled scientists who have tried to create opals artificially. Even though they know that the gems consist of silica and water the task has never been accomplished.

There is only one place in the world where black opals are mined. That is at Lightning Ridge in New South Wales. When this new variety was first discovered the gem merchants refused to believe it was real. Now these beautiful flashing black stones are sold all over the world.

Men who prospect for and mine opals must have strong characters. They have to be prepared to work in lonely trackless country under the blazing sun. The opal field is difficult to locate. Minerals such as gold or tin leave traces near the surface. Seldom does this occur where opals are found.

A.

1. Where are black opals mined?
2. What are opals made of?
3. What have scientists tried to do?
4. How is mining for opals different compared to mining for tin or gold?
5. Why do you think the men who mine opals must have strong characters?
6. Australia is famous for its opals. What country is famous for its diamond mines?

B.

Which statements are true and which are false?

1. Opals are not found anywhere but New South Wales.
2. Scientists have tried to make opals.
3. Opal stones have been created millions of years ago.
4. Black opals are only sold in Australia.
5. It is easy to find opals from traces left near the surface.
6. An opal is formed from silica and water.
7. An opal is a gemstone.
8. Opals are found in cool climates.

APPENDIX C

Guidesheet for Strategy-Only Group

1. What clues can I get from:
   a) the title?
   b) the pictures?
   c) the questions?

2. Did I have trouble understanding the meaning of some words or sections of this passage?

3. When I had a problem I:
   a) reread the sentence.
   b) read on further for clues.
   c) asked for help.
   d) looked in a dictionary.
   e) ignored the word or section.
   f) slowed my reading down.

4. The passage was mainly about:

5. An example of reading:
   a) On the line was ....
   b) Between the lines was ....
   c) Beyond the lines was ....

6. Name 4 strategies that were helpful in doing this task.

APPENDIX D

Guidesheet for Strategy-Plus-Attribution Group

1. What is my task here?

2. What clues can I get from:

   a) the title?

   b) the pictures?

   c) the questions?

3. Did I have trouble understanding the meaning of some words or sections of this passage?

4. When I had a problem I:

   a) reread the sentence.

   b) read on further for clues.

   c) asked for help.

   d) looked in a dictionary.

   e) ignored the word or section.

   f) slowed my reading down.

5. The passage was mainly about:

6. An example of reading:

   a) On the line was ....

   b) Between the lines was ....

   c) Beyond the lines was ....

7. To do this task did I put in enough effort?

8. Name strategies that were helpful.

9. I think I read the passage and answered the questions:

   a) very well

   b) fairly well

   c) poorly

APPENDIX E

Modified Guidesheet for Strategy-Only Group

1. Before I start reading what clues can I get from the title, pictures and questions?

2. While I was reading I used these 'fix-up' strategies:
   (a) reread the sentence
   (b) read on further for clues
   (c) guessed the meaning of a word
   (d) slowed down my reading
   (e) ignored a word or section
   (f) got outside help (e.g., a person or dictionary)

3. The passage was mainly about:

4. When answering questions I found these strategies were helpful:
   (a) skimming
   (b) rereading sections carefully
   (c) finding clues and thinking about my answer
   (d) summarising sections
   (e) putting things into my own words
   (f) using information from my mind
   (g) getting help
   (h) ....
   (i) ....

APPENDIX F

<u>Modified Guidesheet for Strategy-Plus-Attribution Group</u>

1. What is my task here?

2. Does it look easy, okay or difficult?

3. Before I start reading what clues can I get from the title, pictures and questions?

4. While I was reading I used these 'fix-up' strategies:

    (a) reread the sentence

    (b) read on further for clues

    (c) guessed the meaning of a word

    (d) slowed down my reading

    (e) ignored a word or section

    (f) got outside help (e.g., a person or dictionary)

5. The passage was mainly about:

6. When answering questions I found these strategies were helpful:

    (a) skimming

    (b) rereading sections carefully

    (c) finding clues and thinking about the answer

    (d) putting things into my own words

    (e) getting help

    (f) summarising sections

    (g) using information from my mind

    (h) doing the questions in the order I found easiest

    (i) ....

    (j) ....

7. Did I put in enough effort?

8. I think I read the passage and answered the questions:

    (a) very well

    (b) fairly well

    (c) poorly

9. Why?

APPENDIX G

Students' Comments

Strategy-Plus-Attribution Group.

1. Learning to understand some hard words, learning what to do before reading and what to do if something's hard, look for hints before start reading. In maths I didn't know this answer and skimmed back through my book for a similar problem -didn't do that before.

2. Understanding more what I read, I know fix-up strategies and use them. Understand work better in English and social studies. Get heaps better marks.

3. Think harder, try harder. It's easier using strategies. Better marks and better understanding in English and social studies.

4. Read passage and questions better, reread and skim -didn't do this before. Understanding more in English and social studies.

5. Understanding more words, taking time to read questions and story and answering them properly.

6. Helped me to answer questions easier and better. Work seems easier in English and social studies.

7. Covered some of work before we did it in English, e.g., 5 W's and H. Getting strategies and using them. Understanding better and getting better marks in English.

8. If I don't understand I reread - didn't do this before. Now do easiest questions first, reread sentences for clues, slow reading down. In science I now think about what's being written on the blackboard. Never used to. Just copied it down. Better understanding in subjects.

9. Reading better, don't take as long, more confident. It's helped me in English heaps. Getting better marks, greater concentration. Helped in science reading textbooks, and in typing reading instructions and worksheets.

10. Reading title for clues, working out what have to do, rereading sentences if I didn't know a word. Making me understand more.

11. Reread if stuck - didn't usually do this before. Reread questions, skim, reread carefully.

12. Easier to understand work and getting better marks in English. Reread things and take my time - didn't do that before.

Strategy-Only Group.

1. Reading more, finding questions easier to answer, understand better in English and social studies.

2. Read title and questions first - never did this before.

3. Reread, skim, read questions first. In social Studies reread questions if I don't understand them.

4. Pronounce words properly, answer worksheets properly. How to read stories and make sense. It's good in English and social studies. Answer questions right instead of giving up, getting better marks.

5. Understanding more because of the things we've been doing.

6. With story writing (the student had brought along a story to show me on a previous occasion, and told me then that the programme had helped his story writing). Quicker and better at answering questions.

7. It has because I never slowed down or reread. When read title I never thought about it. Better marks in maths and science.

8. Reading quicker and more clearly, picking up answers more easily.

9.	I know what to do when I get stuck. I use strategies now.

10.	Yes it has. Can't say in English because I'm with you two periods of English. Skimming, using filing cabinet, rereading, know you can look things up. In maths going back over questions.

11.	Now I reread and think about things and try harder. In English better marks. Science remember things easier and reread questions more carefully.

12.	Before I left questions out and didn't reread or skim but I do now and it helps.

Control Group.

1.	Can read aloud better.

2.	I had trouble understanding words but this has helped. In science we did volcanoes and we'd done it with you first.

3.	Reading silently and reading aloud.

4.	No help.

5.	English especially as we read aloud a lot in English. Think about what I'm reading, taking more knowledge to my reading.

6.	I can keep up and answer questions, most are right.

7.	Read more, do questions better.

8.	Read faster, better understanding. Better marks in English and social studies.

9.	Understanding, answering questions in full.

10.	A little bit - reading more.

11.	Not really.

12.	No help.

13.	A little bit - understanding a bit better.

14.	Doing better in class writing sentences and all that.