THE COMPARATIVE EFFECTIVENESS OF DIDACTIC TEACHING AND
SELF-INSTRUCTIONAL TRAINING OF A QUESTION-ANSWERING STRATEGY IN
ENHANCING READING COMPREHENSION

by

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The Comparative Effectiveness of Didactic Teaching And Self-Instructional Training Of A Question-Answering Strategy In Enhancing Reading Comprehension

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Abstract

A total of 45 poor and 45 average readers from grades five and six participated in this study which compared the effectiveness of didactic teaching and self-instructional training of a question-answering strategy in improving reading comprehension. The ninety subjects were assigned to one of three conditions -- didactic teaching, self-instructional training or control. Students in the didactic teaching and self-instruction conditions received instruction in a strategy which emphasised the appropriate use of text or knowledge base information to answer comprehension test questions. The strategy used the mnemonics "Here", "Hidden" and "In my Head" to indicate question-answer relationships that were text explicit, text implicit or script implicit. In addition to strategy training, students in the self-instruction condition learned three self-questions which were designed to guide their strategy use by focusing attention on the task ("How will I answer this question?"), providing a basis for question category decisions ("What type of question is this?") and reminding students to check their answers ("Is my answer correct"). Students in the control group worked on the same comprehension passages and related questions as the students in the other conditions but were not trained to use a question-answer relationship strategy. Overall, the results showed an increase in the reading comprehension performance of the students in the training conditions. Of the two teaching
techniques, self-instructional training was most successful in enhancing comprehension performance for both the poor and average readers. The effect of the training program on the students' comprehension scores illustrates both the usefulness of reading strategies based on question-answer relationships, and the applicability of self-instruction as a technique for use with both average and poor readers.
Last year, I missed saying a final goodbye to my dear grandfather by being here in Canada. I want to dedicate this work with love to the memory of John David Nielsen (1906-1985). He would have been proud of me. He was of us all.
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The principals, teachers and students of the Coquitlam schools where I collected my data also deserve acknowledgement. Their ready co-operation made this research a very positive experience for me. Thanks also to Dr Jupian Leung for his patient assistance and advice with the statistical analyses used in this study.
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I. Introduction

The meaning-giving and meaning-getting processes of comprehension are at the heart of reading. Yet, of all aspects of reading, comprehension is the least adequately explained and, as a result, the hardest to teach (Mason, 1984). For many years, in fact, comprehension was considered not only hard to teach but essentially unteachable. It was thought that students learned how to comprehend by participating in the reading experiences and practice exercises the teacher structured for them and not, as it is now thought, through active involvement with their own learning.

Classroom observation studies by Durkin (1978-79) and Mason (1981) have documented the state of reading comprehension instruction in the schools. After observing 2 775 minutes of instruction in 24 fourth grade classes, Durkin described reading instruction as vague, activity dominated and assessment based. She found that the teacher's main activity during instruction was asking questions, and that less than 1 percent of total reading time was devoted to doing or saying "something to help children understand or work out the meaning of more than a single isolated word" (Durkin, 1978, p. 8). In general, it appears that teachers spend little time teaching comprehension skills (Durkin, 1978-79; Mason, 1981). These findings suggest a clear need for better reading comprehension instruction.

Studies like Durkin (1978-79) and Mason (1981) have contributed to the
current research emphasis on comprehension and instruction. In fact, this area of research is now one of the most active areas of investigation in psychology (Meyers & Rice, 1977; Freedle, 1978). Such a strong research focus has stemmed from a reconceptualization of reading comprehension as an active, constructive process of generating meaning rather than merely the acquisition of meaning from text (cf. Wittrock, 1984; Flesch 1955). Moreover, from this perspective strategies for enhancing reading comprehension and dealing with comprehension breakdowns have been successfully devised (e.g. Brown, Campione & Day, 1981; Raphael & McKinney, 1982; Wong & Jones, 1982).

It is within the context of changing comprehension research that the study described by this thesis examined two areas of current interest—the explicit teaching of comprehension processes and the effectiveness of different methods used to teach these processes. Specifically, the study investigated whether teaching students a strategy to help them answer questions after reading a passage, would improve their comprehension performance. The study compared the effectiveness of didactic teaching of the strategy with training by self-instruction, a method which is designed to increase students' active participation with and monitoring of their own learning. In the following sections, question-answering strategies and self-instructional training are briefly discussed and the hypotheses for the study are stated.
Question-Answering

Question asking and answering are pervasive tasks in schools (Guzak, 1961; Durkin, 1978-79). For this reason, the area has intuitive appeal for applied research. Question-answering is also of particular relevance for students in the intermediate grades. At this level, students are required to work more independently in reading lessons, to complete research projects in various subject areas, and generally, to answer different types of questions after reading some text as part of their school work. It is thought that students from grades five and six have progressed from "learning to read" to "reading to learn" and are now at a level where content subjects are being taken seriously (Durkin, 1978-79, p. 489).

Many poorer readers, however, appear to lack a suitable strategy for answering comprehension questions after reading a passage (Gavelek & Raphael, 1982; Ryan, Ledger, Short & Weed, 1982). One explanation for their difficulty may be that poorer readers have difficulty locating the appropriate source of information (i.e. either the text or the students' own knowledge base) to answer the questions they are asked. Poorer students may overrely on the text and not use other information from their knowledge base to answer questions when it is necessary or they may trust their general knowledge and memory too completely and fail to use the text when it is appropriate (Raphael, 1985).

In recent years, Raphael and her colleagues have addressed this possible
area of difficulty for poor readers. In a series of studies students were taught to be aware of the different sources of information available for answering questions after a passage (e.g. Raphael, 1981; Raphael & McKinney, 1982; Gavelek & Raphael, 1982). Students were trained to identify question-answer relationships on the basis of where the answers to questions are found (e.g. in the text or in the student's knowledge base). The results of instruction in these text-explicit, text-implicit and script-implicit question-answer relationships (QAR's) have been encouraging. The reading performance of younger, reading delayed, less able and average students has been consistently improved by QAR training programs.

The strategy used with intermediate grade students in this study is based on Raphael's work. How the strategy differs will be explained in Chapter 2.

Raphael's research on question-answer relationships provides the basis for the first hypothesis to be tested:

1. That students trained in a question-answering strategy will perform better on reading comprehension tasks than students not taught a question-answering strategy.

Self-Instructional Training

The study described by this thesis was designed not only to examine the effect of a question-answering strategy on reading comprehension performance, but also to investigate the comparative effectiveness of methods
of teaching the comprehension strategy to poor and average students in the intermediate grades. One technique for teaching strategies—self-instructional training—has recently garnered an increasing amount of interest and support among researchers because of its apparent suitability for teaching complex tasks to learners (Harris, 1982; Johnston & Whitman, in press; Ryan, Ledger, Short & Weed, 1982; Wong, 1985).

Self-instruction provides a relevant framework for strategy training by integrating a specific sequence of steps with self-monitoring instructions. Through the stages of self-instructional training—(a) modelling of appropriate strategy use by an adult who "thinks aloud" in completing the targeted task; (b) overt guidance by the adult as the student performs the task; (c) faded self guidance as the student "thinks" through the task requirements, first aloud, then (d) in a whisper; and finally (e) covert self-instruction—students learn to mediate their own behavior with appropriate inner speech (Meichenbaum, 1977).

Self-instruction has been used successfully to enhance academic performance in arithmetic (Johnston, Whitman & Johnson, 1980), reading (Wilson, 1979), and writing (Graham & Harris, 1986; Ryan, Weed & Short, 1985). In general, recent research indicates that self-instructional training is particularly useful in improving the performance of poorer students on complex tasks (Ryan, Weed and Short, 1985; Johnston & Whitman, in press). Because question-answering is a complex task, it was considered that self-instruction
would be useful for teaching QAR's and particularly useful for poorer readers included in the study.

To test whether self-instruction is indeed a superior method of teaching question-answer relationships, it was compared to didactic teaching of the strategy. Didactic teaching is the most common method used in schools and as such represents an ecologically valid comparison group for self-instructional training. Some recent studies by Schleser, Meyers, Cohen & Thackway (1983) and Smith & Lovitt (1975) have also compared self-instruction and didactic teaching for these reasons.

On the basis of current research which attests to (a) the effectiveness of self-instructional training as a technique for teaching complex skills and (b) the particular appropriateness of this method for instructing poorer students, it was hypothesised:

2. That students taught a question-answering strategy through self-instructional training will perform better on reading comprehension tasks than students taught the same strategy by didactic teaching methods.

3. That the effects of self-instructional training on poor readers taught a question-answering strategy will be greater than for average students taught by the same method.
II. Review of Literature

Chapter II is divided into two sections. In the first section, the literature related to the research questions stated in the introduction will be reviewed. First, to provide background for the current study, the need for improvement in reading comprehension instruction is discussed and the influence of cognitive psychology on comprehension interventions outlined. Next, the research on teaching question-answer relationships (QARs) will be described. This is an important review section because the reading comprehension strategy developed for this study (the 3H strategy) is based on previous QAR training. Finally, as one instructional condition for the 3H strategy combines aspects of metacognition and self-instructional training, relevant literature from these areas will be reviewed. The second section explains how the strategy and training methods used in the 3H reading comprehension program differ from previous teaching of question-answer relationships.

SECTION 1

Reading Comprehension Instruction

"Ask three different reading authorities to give you a definition of reading, and the chances are high that you will receive three different definitions" (Rubin, 1982, p. 6). This comment illustrates the difficulty researchers have had in defining the complex cognitive process of reading. Descriptions of what reading "is" range from the simple sounding out of written symbols (e.g. Flesch,
1955) to the more complicated idea of reading as the meaningful interaction that takes place between the reader and printed matter (Ruddell, 1978). Currently, the view that reading is a meaning-giving and meaning-getting process is most widely accepted and the focus of much research activity (Freedle, 1977; Strickland, 1978). From this perspective, comprehension processes or the "effort after meaning" (Dewey, 1938) are vital.

Despite the current research interest in comprehension, "helping pupils derive meaning from the printed page still remains a formidable challenge for classroom teachers" (Strickland, 1979, p. iv). Some of the difficulties related to comprehension instruction appear to stem from the complexity of reading comprehension itself (Mason, 1984; Pearson, 1982), and from the lack of clear descriptions of instructional techniques (Kendall & Mason, 1982). While research has continued to explore and describe comprehension processes in recent years, experts have provided few useful guidelines for the practitioner on how to teach reading comprehension (Mason, 1984). In fact, it is only in the last five years that much attention has turned to considering how to teach comprehension processes in the classroom (Jenkins & Heliotis, 1981).

Previously, comprehension was treated mainly as a product of reading, and perhaps measured through students' responses to test questions or practised at various levels of difficulty according to hierarchies of comprehension skills (e.g. Barrett, 1976).
The challenge of improving classroom comprehension instruction has only recently received concentrated attention from reading researchers. There are two main reasons for the current emphasis. First, data has been collected in the schools which shows a clear need for better comprehension instruction. Second, the framework of cognitive psychology has given new energy and direction to intervention studies in reading. The first of these reasons will now be discussed.

In a major observational study, Durkin (1978-79) observed 24 fourth grade classrooms for 2 775 minutes and found that less than one percent of the total time allocated for reading was spent on comprehension instruction. Similarly, Mason (1981) observed ten third grade classes and ten fourth grade classes and found that during reading only one percent of the time was spent interpreting text information. These studies suggest that there is very little actual instruction in how to understand text or work out the meaning of words in the classroom.

Further, typical reading lessons were observed by Durkin (1978-79) to consist of worksheet activities from basal manuals which assessed the student's understanding of previous reading assignments. Teachers were portrayed as assignment givers and interrogators who spent only a small fraction of their time doing or saying "something to help children understand or work out the meaning of more than a single isolated word" (Durkin, 1978-79, p.
As an additional indication of the state of current comprehension instruction, the exercise suggested by Pearson and Johnson (1978) in *Teaching Reading Comprehension* is informative with regard to reading textbooks. Pearson and Johnson invite their readers to "Pick up any two methods texts. Turn to the comprehension chapter of each...[and] compare them" (p. 2). Both Durkin's (1971) *Helping Them to Read* and Rubin's (1982) *Diagnosis and Correction in Reading Instruction* state that one of the main purposes of reading is to help students obtain meaning from text. There are, however, few suggestions in these textbooks which would help teach the skills needed to obtain meaning. In fact, the content of the reading comprehension chapters testifies to the confusion and redundancy in the use of terms, skill hierarchies and suggested activities that is noted by Pearson and Johnson (1978). Likewise, the chapters continue the tradition of placing "emphasis on word recognition [and very basic comprehension activities] while paying lip service to the importance of comprehension" complained of by Duffy, Roehler and Mason (1984, p. 3).

Clearly, there is a need to improve reading comprehension instruction. This need is now being addressed, at least in part. Recent interest in teaching how to comprehend has precipitated not only from studies which have revealed the disturbing state of comprehension instruction in the schools, however, but also
from the impact of the active processing model of cognitive psychology on reading and reading research. The effect of cognitive psychology on comprehension instruction is briefly discussed below.

Under the rubric of cognitive psychology, reading is perceived as a complex, interactive process (Rumelhart, 1977; Stanovich, 1980), one in which a reader varies his/her effort and involvement with the text according to a number of interrelated factors. These factors include: purpose (What do I have to do with the information once I have read it?), familiarity (How much do I already know about this topic?), interest and motivation (How much do I care about learning this subject or reading this story?), and discourse type and complexity (How much do I already know about this particular type of text?) (Pearson, 1984, p. 223). This cognitive perspective on reading combines both content and process factors. It emphasises the student's role in actively processing content information (e.g. by making decisions about how quickly to read the text depending on the purpose for reading). One of the basic tenets of cognitive psychology is that learners should be actively involved with their own learning (Reid & Hresko, 1981; Wittrock, 1980).

Comprehension instruction influenced by cognitive psychology is very different from that observed by Durkin (1978-79) and Mason (1981). The respective roles and responsibilities of the teacher and the student are underscored (Wittrock, 1980). In comprehension instruction this means that
the teacher is responsible for providing direct explicit instruction of reading processes, while the student is responsible for involvement with the text and active processing of information. Jenkins & Heliotis (1981) have described involvement in comprehension processes for readers as when they actively construct a relevant context for interpreting text, by activating existing knowledge to interact with textual cues and, thereby, create meaning for a given passage (p. 36).

In line with the cognitive perspective within instructional research, Raphael and her colleagues have investigated teaching question-answer relationships as a way of improving active reading comprehension performance (e.g. Raphael & Pearson, 1980; Raphael & McKinney, 1983; Raphael & Pearson, 1985). In the next part of this review, the major studies conducted by Raphael et al. will be described in some detail to illustrate the scope and applicability of question-answer relationship training. It is considered important to place Raphael's work in context because the question-answering system used in her studies is the basis of the comprehension strategy developed for this thesis research.

**Question-Answer Relationships**

Written comprehension questions are a routine part of the classroom environment. In reading instruction, these tasks are used frequently by teachers (Durkin, 1978-79; Guzak, 1967) and have demonstrated the ability to
promote comprehension of reading passages by focusing the student's attention on important concepts and details in the text (Anderson & Biddle, 1975; Rickards & Hatcher, 1978). In addition to instructional uses, questions which relate to either formal tasks (e.g. standardized tests) or informal tasks (e.g. class tests; informal reading inventories) are the primary method of assessing students' reading comprehension ability (Raphael & Gavelek, 1984). On the basis of students' responses to questions they are often labelled either good or poor readers, and may be admitted to special classes, given extra reading help or admitted to an enrichment program.

Responding appropriately to comprehension questions is important in all grades for the reasons mentioned above, but, it is especially important for students in intermediate grades. At this level students are no longer learning to read, but reading to learn. Their work in the content areas is being taken more seriously (Durkin, 1978-79) and research projects which involve answering questions are a regular part of instruction.

With so much emphasis on question-answering tasks, it is important to provide a planful way of approaching this comprehension activity, particularly for less skilled readers who may lack an appropriate strategy for answering comprehension questions (Gavelek & Raphael, 1982). In recent years, Raphael and her colleagues have conducted a series of studies which now provide a framework for teaching students how to answer comprehension questions after
a passage. Their training program involves sensitizing students to the sources of information that are available for responding to most questions.

Raphael’s training program is based on Pearson and Johnson’s (1978) taxonomy of question-answer relationships. Questions are not classified in isolation under this taxonomy but in relation to the sources of information used to answer them. In broad terms, the sources are either (a) the text or (b) the reader’s background knowledge. Within these locations, Pearson and Johnson divide their question-answer relationships (QARs) into three distinct categories (text-explicit, text-implicit and script-implicit) which describe the interaction between the text, the question and the reader’s knowledge base. These categories of question-answer relationships are discussed below.

Text-explicit QARs refer to questions and answers that are found directly in the text. These questions and answers are both derived from a single sentence. Text-implicit QARs have questions and answers that are inferred from information found across different sentences, paragraphs or pages. All the necessary information is provided by the text but the reader has to integrate it appropriately. Script-implicit QARs refer to questions which are responded to with information from the reader’s knowledge base. The answer may be related to the topic of the passage but is not derivable from the text.

Raphael and her colleagues taught students about QARs to help them locate information to answer questions after reading a passage. Their program of
question-answer relationship research was conducted in three parts: a demonstration study, training studies and instructional studies (Raphael & Gavelek, 1984). Some of this research will now be described.

The demonstration study (Raphael and Pearson, 1980) investigated the differences in the use of question-answering strategies among fourth, sixth and eighth grade students of above average, average and below average ability. Students were introduced to the three QAR categories in a brief ten minute session. They then read two passages and answered and identified the QAR for eighteen comprehension questions. Results showed that the ability to use the QARs differentiated between skilled and less skilled readers and between readers of different grade levels (Gavelek and Raphael, 1982).

A training study by Raphael (1981) was designed to enhance students' comprehension by teaching specific strategies for question-answering based on QARs. For training purposes, Pearson & Johnson's question-answer relationship categories were paraphrased to make the terms easier for students to remember. Text-explicit QARs were called "Right Here", text-implicit QARs were termed "Think and Search", and script-implicit QARs labelled "On My Own". Initial lessons introduced the conceptual framework of QARs and provided practice on easy materials. QAR tasks became progressively more complex over the training sessions.

The subjects in Raphael's initial training study were 20 average ability
students from grades four, six and eight, and 20 average and high ability students from grade six. Following training, students were compared to a control group who had received a brief orientation to QARs. Results from Raphael (1981) showed that, as predicted, high ability students outperformed low ability students and older students performed at a slightly higher level than younger ones. However, the most interesting results were found when comparing treatment and control groups. The performance of trained students of low ability was comparable to that of control students of average ability, while the performance of trained average ability students was comparable to that of high ability students without training. The study concluded that QAR training was successful in improving the reading comprehension of poor and average students, but did not significantly increase the performance of high ability students, probably because of their suitable strategy use prior to treatment.

Two instructional studies by Raphael & Wonnacott (1981) and Raphael & McKinney (1983) tested the feasibility of implementing a QAR program in the classroom. Eleven teachers and their 135 grade four students participated in Raphael and Wonnacott's (1981) study. An important purpose of this research was to examine the level of inservice training necessary for teachers to use QARs in their classrooms. One group of teachers was provided with inservice about QARs, supplied with materials and given feedback at the end of their
lessons. A second group of teachers received inservice but no materials. Instead, an emphasis was placed on creating appropriate QAR materials from classroom resources. The third group of teachers was given all the materials provided for the first group but received no inservice. A fourth group received no instruction prior to testing.

The results showed no differences in the students' performance between the groups which had received inservice. The training was effective whether the teachers used the materials provided or constructed their own. On comprehension performance there was no difference between high ability students regardless of treatment. However, there was an improvement for average students compared to their untrained peers and an even greater improvement in reading comprehension performance for trained versus untrained below average students. Raphael & Wonnacott concluded from this study that training effects of QARs vary as a function of students' reading ability with effects gradually increasing from high to average to poor readers.

In Raphael and McKinney's (1983) study, 217 students of low, average and high ability took part in a ten week QAR program. The teachers whose classes were allocated to the training condition received a half day inservice program on QARs. After this orientation to question-answer relationships, these teachers and their classes worked through three booklets of introductory, training and maintenance QAR material during their reading lessons. Grade five
and eight students from training and control conditions then completed test passages on two consecutive days. On the first day, all students read the passage and answered eighteen questions with no prompting to think of or use QARs. On the second day, the control students received an orientation to QARs before reading the passage and answering the comprehension questions.

In general, training increased comprehension performance. Average and low ability students were most responsive, especially with regard to the more difficult implicit question types. However, eighth grade students in the control group given a brief orientation to question-answer relationships performed just as well as those who had been fully trained. In general, high ability and older students did not benefit as much from training possibly because of their "already well developed skills in implementing various strategies" (Raphael & McKinney, 1983, p. 84).

In summary, Raphael et al.'s studies demonstrated that question-answer relationship training consistently improved the comprehension performance of average and poor readers. Older and high achieving students did not benefit as much from training because they appeared to have already developed strategies to answer comprehension test questions. In addition, QARs have proven to be an effective technique for use in the classroom with as little as half a day inservice to teachers.

Although generally successful, there are some limitations to
question-answer relationship research. These caveats will be discussed when reasons for changing parts of Raphael's training procedure are discussed. The main theoretical aspects of question-answer relationships which pertain to the present study will now be addressed.

Just as it is important to acknowledge that question-answer relationship research has been successful in practical settings, it is also important to explore theoretical reasons for favourable results in improving reading comprehension. As a comprehension strategy, the QAR program has its theoretical underpinnings in cognitive psychology. The ties to cognitive theory are evident in the active nature of teaching and learning during training (i.e. the teacher is responsible for teaching a direct comprehension process which can help the student answer questions, while students are responsible for learning the strategy and using it appropriately). Specifically, in QAR programs students are taught to be more aware of the relationship between questions and the sources of information available for answering them. They use this knowledge to categorize comprehension question-answer relationships and identify appropriate ways of responding to them.

The type of active participation in learning described above has frequently been equated with the application of metacognitive skills—the executive processes of knowing about and regulating learning (Brown, 1980). Raphael's research has concentrated on the awareness aspect of metacognition by
enhancing students' knowledge of question-answer relationships. In one experimental condition of the current study, however, QAR strategy training has been adapted to teach students the executive components of strategy use and regulation more directly. Metacognition provides the theoretical basis for the direct teaching of these processes while self-instructional training has been selected as the procedural route for teaching the regulation of strategy use. Related literature from metacognition and self-instructional training will now be reviewed.

Metacognition

The concept of metacognition refers to knowing about cognition as well as self-monitoring and regulating cognition for particular purposes. Flavell (1976) first used the concept of metacognition in his memory research, to explain young children's failure to generalize mnemonic strategies. He defined it as "one's knowledge concerning one's own cognitive processes and products or anything related to them" (p 232).

Forrest-Pressley and Waller's (1984) definitions of cognition and metacognition can clarify the construct of metacognition further. In their terms, cognition refers to the actual processes and strategies that are used by a learner. For example, when a child remembers something or decodes a word, memory processes and decoding strategies per se are involved. In contrast, Forrest-Pressley & Waller (1984) describe metacognition as a higher-order
construct consisting of two interrelated parts. First, it refers to what a person knows about his or her own cognitions. Metacognition implies conscious awareness of cognitive processes. Secondly, metacognition refers to the control or monitoring of cognitive processes, so that it is possible to choose among alternatives, plan, monitor and change activities for a particular purpose.

The academic area to which the concept of metacognition is most applicable is reading (Hallahan, Kaufman & Lloyd, 1985). Brown (1980) first applied the construct of metacognition to this area and underscored its importance in efficient reading and effective studying. She outlined how good readers use executive processes which "involve predicting, checking/self-monitoring, reality testing, coordinating and control of deliberate attempts to solve problems or to study and learn" (P454). In general, while a good reader is planful, actively involved in his/her reading and able to use appropriate strategies to remedy comprehension breakdowns, the young or poor reader is deficient in many metacomprehension strategies (Forest-Pressley & Waller, 1984). Recently, Hallahan, Kaufman and Lloyd (1985) reviewed a number of studies (e.g. Anderson, 1980; Baker & Anderson, 1982; Bos & Filip, 1982; Brown, 1980; Forrest & Waller, 1981; Paris & Meyers, 1981; Wong & Jones, 1982) on aspects of metacognition. They concluded that poor readers have difficulty in using the following metacognitive skills -- clarifying the purpose
of reading, focusing attention on important parts of passages, monitoring the level of their own comprehension, rereading and scanning ahead, and consulting external sources for assistance when it is appropriate (p. 90).

Of these identified areas of weakness, question-answer relationship training relates directly to the skills of focusing on important parts of the passage and consulting external sources. Because QAR strategies can improve students' awareness of these metacognitive skills, the research conducted by Raphael and her colleagues can be aligned to the metacognitive perspective. In the research reports which describe question-answer relationship studies, links are made between metacognition and QAR training in two other ways. Firstly, the connection is forged by underscoring the active role of the learner in using the QAR strategy (Gavelek & Raphael, 1982; Raphael and Pearson, 1985). Secondly, it is directly stated and emphasized that "knowledge of the relationship between comprehension questions and the sources of information for answering them constitute a particularly valuable metacognitive skill" (Raphael & McKinney, 1983, p. 68).

Several intervention programs, similar to QAR training, have also concentrated on the student's awareness of metacognitive skills and enhanced the comprehension of poor readers (e.g. Andre & Anderson, 1979; Schumaker, Deschler, Alley, Warner & Denton, 1982). However, other successful training programs have combined the awareness aspect of metacognition with its
regulation component through developing the students' ability to self-monitor. Wong and Jones (1982) and Palincsar (1982) both incorporated the full focus of metacognition in their training regimes. Each of these studies used some form of self-questioning procedure to blend the awareness and regulation aspects of metacognition with strategy use.

For example, Palincsar (1982) taught poor comprehenders from grades 6-8, a reciprocal questioning strategy to improve their learning and performance in social studies. She trained predicting, questioning, summarizing and clarifying strategies through the following steps:

1. The adult teacher called the students' attention to the title of the passage and asked for predictions based on it.

2. The teacher assigned a segment of the passage to be read (usually a paragraph) and assigned a student to the role of "teacher" for that section of the passage.

3. After the group had read the assigned segment silently, the "teacher" proceeded to first ask a question, then summarize what had been read. S/he offered a prediction or clarification when appropriate.

4. The adult teacher provided the guidance necessary for the student "teacher" to complete the preceding activities through a variety of techniques: prompting, "What question do you think a teacher might ask?"; instruction, "Remember a summary doesn't include a lot of detail";
modifying the activity, “If you’re having a hard time thinking of a question, why don’t you summarize first?” and by soliciting the help of other students, “Who can help us out with this one?”

5. The remaining members of the group were given the opportunity to comment on and add to that segment.

6. The adult teacher provided praise and feedback specific to the student teacher’s performance. For example, “You asked that question well. You made it very clear what information you wanted”; “That was interesting information but I would call it detail. Can you think of the most important information in the paragraph? Information that the passage would not make sense without?”; “Excellent prediction let’s see if you’re right.” After this feedback adult teachers modelled any activity that they felt needed improvement: “A question I would have asked would be . . .”; “I would summarize by saying . . .”; “Did anyone else find that statement unclear?”

Clearly, this training procedure combines both cognitive and metacognitive processes. A content area reading comprehension strategy is taught while the student is involved in self-checking and self-evaluation. Palincsar’s program resulted in positive effects on students’ comprehension performance during intervention, maintenance and follow-up testing.

Similarly, Wong and Jones (1982) trained learning disabled (LD) and non-learning disabled students to monitor their comprehension through a five
step self-questioning procedure. The strategy's five steps focused on setting a purpose for reading, identifying the main idea in the paragraph, changing the identified information into questions and creating an integrated review of the passage at the end of the reading assignment. Results of the study showed that training substantially increased learning disabled students' awareness of important textual units as well as their ability to formulate good questions involving those units. Overall, the strategy facilitated the reading comprehension of the poorer students. Training did not substantially increase non-LD students' awareness of important text or reading comprehension, however.

Palincsar (1982) and Wong and Jones (1982) provide examples of successful interventions which concentrate on both the awareness and regulatory aspects of metacognition. This equal focus is evident in much current research. The inclusion of the regulation component of metacognition in interventions is particularly important for poorer students, some of whom may be suspected of having learning disabilities. Research has indicated that learning disabled students often lack self-monitoring skills (e.g. Gerber, 1982; Wong, 1982), therefore, the inclusion of regulation components in interventions becomes even more important when teaching the high risk students typically found in low reading groups. Poor readers need to improve not only academic skills, but also awareness of their own cognitive processes and the purpose of their own
actions. In relation to these needs the relevance of self-regulation is evident. To improve the skills of poor students, particularly those with problems severe enough to suggest some form of learning disability, to the extent that they can function autonomously as normally-achieving students can, a self-monitoring component should be included in intervention programs (Wong, 1985).

Although Raphael and her colleagues have interpreted their research from a metacognitive perspective, they have not included the direct teaching of self-monitoring skills in their program. On the basis of the research findings and reasons outlined above, the present study incorporates a self-monitoring component in QAR training.

To reiterate, the current study has a twofold purpose. One, it investigates whether a strategy similar to Raphael's QAR training will be effective for intermediate grade students. Two, it examines whether self-instructional training, used to teach the executive components of strategy awareness and self-regulation more directly, will be more effective in improving reading comprehension than a program of didactic teaching as used in previous QAR programs.

In designing self-regulation components for training programs, researchers have found approaches from cognitive behavior modification especially useful (Meichenbaum, 1977; Meichenbaum & Asarnow, 1978). Self-instructional training has been considered a particularly effective technique. In the next
section, the use of self-instructional training in intervention research will be examined and the reasons for choosing self-instruction to provide the routine for teaching self-monitoring skills in this study will be explained.

Self-Instructional Training

Cognitive behavior modification (CBM) has emerged as a promising technique for enhancing the learning potential of exceptional students (Harris, 1982; Meichenbaum, 1977). This approach is particularly appealing because it addresses two important problems for poor learners—self-regulation of strategy use and motivation (Ryan, Weed & Short, 1985).

Whether termed self-instruction, self-monitoring, verbal mediation, cognitive control, cognitive structuring, or problem solving, CBM approaches share three major characteristics (Hallahan, Kneedler & Lloyd, 1983). First, the training programs provide direct instruction in a particular strategy. The objectives of training are specified, the relevance of the strategy is explained and the techniques to be employed are stated and modelled for the student. Second, the use of verbalization is an essential component of cognitive behavior modification interventions. Overt speech is faded to covert (internal) speech as the student becomes more familiar with the strategy steps. Third, the student is considered an active participant in the learning process. S/he is responsible for many aspects of the program such as self-evaluation and self-reinforcement (Harris, 1982).
Of all CBM approaches, self-instructional training is a particularly relevant method for the present study. This is because self-instruction provides a useful framework for teaching poorer students complex skills "by integrating specific strategy training with metacognitive/monitoring instructions" (Ryan, Weed & Short, 1985, p. 10-11). Specifically, in this thesis, self-instruction can help guide QAR strategy use while providing self-monitoring instructions about strategy use.

Self-instructional training was first used by Meichenbaum and Goodman (1971) to develop self-control in impulsive children. The training steps used in their initial study have become a model for subsequent self-instructional interventions. The five steps are:

1. An instructor models appropriate inner speech by "thinking out loud" while performing a task.
2. The student performs the same task under the direct, verbal guidance of the instructor.
3. The student performs the task while instructing her/himself aloud.
4. The student whispers the instructions as s/he performs the task.
5. The student performs the task while guiding his/her behavior using silent inner speech.

During these sequential training steps the instructor models six basic types
of self statements for the child (Harris, 1982; Meichenbaum, 1977). Examples of each type of verbalization are: (a) problem definition, "What do I have to do?"; (b) attention focusing, "I have to read carefully to make sure I understand the passage and the questions"; (c) response guidance, "I will use my question-answering strategy to help me. I'll consider each QAR before I decide which is really right"; (d) self-reinforcement, "Good work! I tried hard!"; (e) self-evaluation, "Am I following the strategy? Did I check my answer?"; and (f) coping behaviors and error correction, "This question is hard . . . but that's OK. I'll use the strategy and try hard. I can check my answer and if it doesn't work, I can read the question again and maybe the passage."

These verbalizations can be categorized further as either task-approach or task-specific statements. Task-approach statements are aimed at developing general strategies that are relevant for various situations and tasks. "Did I check my work?" or "What do I have to do here?" are examples of task-approach statements. Task-specific statements, are as their name suggests, relevant only to specific tasks, for example, (when answering comprehension questions using a QAR strategy) "Where will I find the answer to this question? First I have to check the text . . . ." Various studies suggest that a combination of the two levels of statements may be most effective (Harris, 1982). Overall, the steps and statements of self-instruction outlined above are thought to promote strategy learning "by providing a general framework for problem solving, by
providing feedback, and by inducing self-control over the entire process" (Ryan, Weed & Short, 1985, p. 11).

Self-instruction, however, is not a cure-all for the academic problems of poorer learners. There are limitations to self-instructional training and situations where its application is not appropriate. For example, self-instruction can not compensate for basic skill deficits in areas such as decoding accuracy, automaticity of preskill knowledge and memory (Perfetti & Lesgold, 1978). Additionally, in their review of literature on active learning styles, Ryan, Weed and Short (1985) conclude that older and higher-achieving students do not seem to benefit greatly from self-instruction because they have already developed appropriate strategies of their own for many academic tasks. These personal strategies appear to interfere with the specific self-questioning steps of self-instructional training. Schunk (1986) agrees that self-verbalization may not improve performance when students can otherwise handle the demands of the task.

Another consideration in self-instruction interventions is the significant amount of time and energy it takes to implement effective programs (Hallahan, Kneedler & Lloyd, 1983). Self-instruction may not be suitable to use as a technique for improving some simple academic skills because of these requirements. The teacher should be aware of the time and energy demands involved before choosing to employ self-instructional training, otherwise there
is a danger that self-instruction may not prove cost effective in terms of the amount of time needed to train students and the end results of training (Evangelisti, Whitman & Johnston, 1985; Graham, 1983).

Whether all the steps of self-instruction are necessary or actually used by the student is another question which arises in relation to self-instructional interventions. At present evidence about the critical components of self-instruction is lacking (Schunk, 1986). Although there have been some studies which have investigated the importance of different parts of the self-instructional model (e.g. self-verbalization, modelling, self-reinforcement), there is no clear indication as to what really mediates effective training (Wong, 1985). Data concerning the importance of verbal control or mediation of behaviour is still accruing, but there is some indication that this may not be a sufficient, or perhaps necessary, component of successful self-instructional interventions (Hallahan, Kneedler & Lloyd, 1983). To elaborate, Hallahan, Kneedler and Lloyd (1983) point out, it is easy to assert that students are covertly guiding their behavior through self-instruction, but "this is akin to saying, 'I see 11 lavender elephants outside my window.' One can hardly prove this statement to be untrue" (p. 221). These comments underscore the importance of building direct measures of strategy use into the evaluation of self-instruction interventions. Without some indication that the student is actually using the trained strategy (e.g. overt verbalization,
self-report data, recall of the strategy steps), claims that performance improvements are attributable to researchers' programs become weak. Direct measures in self-instruction interventions can also provide important information about how learners modify strategies over time (Wong, 1985).

Despite its restrictions, self-instruction has proven useful in many applications. Research has indicated some general situations where self-instructional training is an appropriate choice for remediation. It seems most effective when the content of instruction is complex and the students are less able, but fluent with the necessary preskills required for the task to be trained (Johnston and Whitman, in press; Evangelisti, Whitman & Johnston, 1985).

In relation to specific academic areas previous research suggests that self-instructional training has been useful in improving some aspects of arithmetic (Johnston, Whitman & Johnson, 1980; Johnston & Whitman, in press), reading (Wilson, 1979; Bommarito & Meichenbaum, 1978); and writing (Ryan, Weed & Short, 1985; Kosiewicz, Hallahan, Lloyd and Graves, 1982). In addition, some studies have found self-instructional training to be more effective than didactic instruction for teaching academic skills (Schleser, Meyers, Cohen & Thackwray, 1983; Smith & Lovitt, 1975; Thackwray, Meyers, Schleser and Cohen, 1985).

These sets of findings, concerning the application of self-instruction to
academic areas, and the performance of this technique in comparison to didactic teaching are important for two main reasons. Firstly, they illustrate the utility of self-instruction as a technique for training strategy use. Secondly, the results challenge the idea that traditional didactic methods of instruction are most effective for teaching academic skills. In terms of the current study, the findings present a rationale for using self-instruction in the area of reading comprehension. They also provide a basis on which to predict that QAR training through self-instruction will be more successful than didactic teaching, particularly for poor readers.

To summarize, self-instruction was chosen as the procedural route used to incorporate metacognitive self-regulating components into QAR training for four reasons. First, the use of self-instruction has been successful in enhancing academic skill performance in areas like reading comprehension (Bommarito & Meichenbaum, 1978). Secondly, several studies have compared the effectiveness of self-instructional training with traditional didactic teaching methods of instruction (Schlesser, Meyers, Cohen & Thackwray, 1983; Thackwray Meyers, Schleser and Cohen, 1985). Following this trend and because QARs have been instructed through didactic teaching in previous studies, self-instruction appears to be an appropriate contrast group to test the hypothesis that teaching metacognitive skills more directly will enhance reading comprehension. Thirdly, self-instruction has been found most cost
effective and successful in training complex skills (Johnston & Whitman, in press). Answering reading comprehension questions is a complex skill, therefore, self-instruction should be an appropriate technique for instruction. Lastly, studies which have used self-instruction indicate that this method is successful in teaching poor students. Since poorer readers who lack reading comprehension strategies constitute an important target population for QAR remediation, again, self-instructional training seems an appropriate teaching method.

SECTION 2

The 3H reading comprehension strategy was used to teach question-answer relationships in this study. This strategy is based on Raphael et al’s previous research on QARs. However, some changes have been made to the original training programs to clarify the question-answering strategy and incorporate suggestions from classroom teachers. Exactly how the strategy and training methods used in the 3H reading comprehension program differs from Raphael’s previous research is explained below. However, before turning to the 3H strategy, it is important to acknowledge the general limitations of QAR research.

Limitations of QAR Research

The text-explicit, text-implicit, script-implicit taxonomy of question types, upon which QAR strategies are based, is fairly comprehensive. But it
does not, as Pearson and Johnson (1978) recognise, address the affective and evaluative aspects of comprehension very satisfactorily. This is an important point because, as Allington (1983) points out, "virtually all adult-like post-reading questions fall into the scriptally implicit category" (p. 231), because they have an affective or evaluative orientation. For example, teachers often ask the following types of questions, particularly when working with groups of better readers, "Do you think the character was justified in .....?, "What part did you like best about.....? Why?" and "Is ...... a statement of fact or opinion? Why?". All these questions would fall into Pearson and Johnson's (1978) script-implicit classification. However, because it is not clear how much text and/or script knowledge is necessary for an adequate response to such questions, the label of "script-implicit" appears inadequate (Allington, 1983). It seems that the QAR system is just too simplistic to handle such murky but important matters (Pearson, 1983).

To comment further on the limitations of QAR categories: Script-implicit questions seek to access background knowledge, however, this may present a problem for some students who may simply not have the information available. As one of Raphael's trained students exclaimed, "I went to my head but there's nothing there!" (Raphael & Pearson, 1985, p. 230). Training in question-answer relationships is simply not enough for students who are lacking in prior knowledge. These students need additional instruction and more information.
regarding the materials they are being asked to read before QAR training can be effective. Furthermore, question-answer relationships do not take into account that there are some questions for which no answers exist in the text or knowledge base (Gavelek & Raphael, 1982). Although these types of questions are rarely used in the school setting, it should be made apparent to students that they exist.

Another limitation of Pearson and Johnson's taxonomy is that paraphrases of text information are difficult to classify. Because a paraphrase represents some integration of text information into the students' knowledge base, it is unclear whether the answer is actually text-based or script-based. Raphael (1980) found that students often provided paraphrases to questions that allowed or invited text-explicit answers. These students who wrote answers "in their own words" in response to questions which had an answer directly in the text presented a classification problem to researchers and in some cases were penalized for doing so. For example, a student may have identified a QAR as text-explicit but responded with a paraphrased answer. In such a case, although both the category and content of the answer may be correct, the student will not receive a "match" between his/her category and answer. This is because the response is not derived from a single sentence in the passage and therefore, by definition, is not text-explicit. In such a situation, it should be remembered that QAR classification, like any strategy, is a means to an end.
The students' comprehension as indicated by the content of his/her answer response is what really matters.

A point to note about the QAR taxonomy is that the whole system is only appropriate when text is available to students. If the students can't look back at a text or if they can only listen to content, then it is very difficult to identify where the questions and responses are located. In a sense, whatever is remembered by the student becomes script-implicit or part of what is already known about the topic (Pearson, 1983). Further, in the no-text condition it cannot be inferred unambiguously that the text was the source of a response because it is possible that the student already possessed the information in a store of prior knowledge (Tuinman, 1971).

A final major criticism of question-answer relationship research should be considered. Some researchers have found that the QAR classification system is far from foolproof. Allington (1983) and his colleagues have observed that raters often disagree as to the appropriate category for question-answer relationships. They suggest that these disagreements stem from the fact that both the question and the desired response need to be presented in order to classify many QARs. For example, although a teacher may intend a question to be responded to with a text-implicit answer, it may be possible to respond adequately with a simple text-explicit answer. Similarly, a question which requires a simple text-explicit response may be answered more fully by using...
text-implicit or script-implicit information, or a combination of these sources. Without knowledge of the intention in asking the question, Allington (1983) suggests that these disagreements are more than likely to occur over the classification of question-answer relationships.

Despite its limitations, the use of QAR training appears to be warranted. It is recalled that question-answer relationship training conducted by Raphael and her colleagues has consistently improved the reading comprehension of poor and average readers. Such empirical evidence provides strong reason for continuing research into question-answer relationship training despite the acknowledged limitations of this approach. The remainder of this review relates to the 3H strategy which replicates and extends parts of Raphael's research.

The 3H Strategy

In response to the comments and confusions of classroom teachers who have used the original program with students of all ages and abilities, Raphael (1985) has outlined a modified and updated QAR program. Many of her suggestions were incorporated in the 3H strategy. Other comments from Raphael's paper justified changes that had already been made in developing the 3H strategy for a pilot study. Further alterations were made in response to indications from other areas of research, the limitations to QAR research just discussed, and personal classroom observation. The major ways in which the
3H strategy differs from previous QAR training will be discussed in under these headings: (a) Classification, (b) Instruction, and (c) Self-instruction versus Didactic Teaching.

**Classification.** Instead of beginning with all three categories of QAR (text-explicit, text-implicit, script-implicit), two main classifications were introduced in the initial training session. The primary sources of information for answering questions were presented as (a) "In the Text" and (b) "In my Head". Once the students were comfortable with this distinction, the In the Text classification was expanded to encompass text-explicit and text-implicit QARs which were labelled “Here” and “Hidden” respectively. Along with the "In my Head" category which had already been introduced, these keywords (Here, Hidden and In my Head) give the 3H strategy its name.

The 3Hs were preferred over Raphael’s labels (Right Here, Think and Search, On My Own, and in the revised version of QAR training (Raphael, 1985), the Author and You) because they make use of alliteration, another mnemonic device, which should allow the QAR terms to be remembered more easily. This is an important aspect of the program for poorer readers who are more likely to have memory problems (Paris & Meyers, 1981; Yuille & Marschark, 1984).

The 3Hs also make sense in relation to the main objective of question-answer relationship training which is to increase students’ awareness of sources of information to answer questions. Students can
summarize the 3H strategy by asking themselves, "Where is the answer to this question found?". The 3Hs respond to this query. All three QAR labels (Here, Hidden or In my Head) are places where the answer to a question may be located. In contrast, Raphael's terms are not as consistent. They refer to either places where answers may be located (Right There) or actions the student must carry out to find the correct response (Think and Search, On my Own). Because the 3Hs are all places where the answer may be, the student can visualize the answer as Here in one sentence from the text, Hidden amongst two or more sentences or paragraphs in the text, or in the student's own Head (knowledge base) and not in the text at all. This type of visualization can enhance the learning of poor readers who often lack spontaneous generation of imagery to facilitate memory (Yuille & Marschark, 1984).

Instruction. In planning the instruction of the 3H strategy, the criticism that students need to know the answer as well as the intent of the question before being able to classify many QARs was taken into account (Allington, 1983). It was considered important to encourage the students' use of the question-answer relationships to foster strategic question-answering behavior. Therefore, care was taken to actively engage the learner in applying the 3H strategy through a series of steps leading to a final QAR classification. It was reasoned that the active application of a question-answer relationship strategy would avert the criticism that students need to know the answer as
well as the question before question-answer relationships are useful.

Observations of students in the pilot study for this research showed that without prompting they used the 3H method to classify question types rather than whole question-answer relationships. It was easy and logical for these learners to work from the known questions to appropriate answers. The students used the questions to provide clues to where the answers were located. For example, students thought of simple questions as "Here questions" because the answers were most likely right here in one sentence in the passage. They also classified opinion or general knowledge questions as "In my Head questions" because the answer was most likely in their own head or knowledge base.

The observations of strategy use in the pilot study indicated that an emphasis on the question identification in QAR training was natural and successful. A close examination of Raphael et al.'s training materials also revealed a concentration on being able to "identify question categories" (Raphael, 1985, p 6) and "kinds of questions" (Raphael, 1982, p 13). Therefore, the pilot study observations and the content of previous training materials can justify the 3H strategy's concentration on question identification to teach QARs.

In the 3H strategy, the concept of question-answer relationships has two main purposes. First it introduces the sources of information available to
answer questions and then it provides a category system for the questions and their answers once they have been located. These are the same functions that QARs have served in previous training studies. The difference between the 3H strategy and past research, however, lies in the student's role which will now be explained.

Raphael (1982) suggests teachers instruct their students that "each question type can be figured out by deciding where you got the information to answer it" (p 13). This basic method is still retained in the 3H strategy but more emphasis is placed on the direct teaching of the processes involved in finding the response information. The question-answering and categorization tasks are broken down into steps which, it is hypothesised, should be particularly useful for teaching QARs to poor readers.

In the 3H strategy, the student's task has three parts. First, s/he works from clues given in the question to make a prediction as to where the answer is located. The students are taught to remember that the answers are usually Here, Hidden or In my Head and are attuned to the following cues: (1) a Here question is often responded to by a sentence which contains many of the same words. If the question seems fairly simple and the words it uses also seem familiar from the story, it is likely to have an answer right here in the passage (e.g. When was Jim scheduled to arrive at the airport? Jim was scheduled to arrive at the airport at noon.); (2) a Hidden question often asks for a list of
items or is interested in a relationship (comparison, cause and effect or explanation) between two or more parts of the story. Information hidden amongst two or more sentences in the passage is used to provide an answer to this type of question (e.g. What three tools did the pygmies use? Which animal lived the longest? How does the forest affect the pygmy's way of life?); (3) an In my Head question often asks for a personal opinion or experience, or some background knowledge related to the main idea of the passage. There is no information in the passage which can answer these questions the answer comes from the student's head or prior knowledge (e.g. Where would you keep a platypus if you had one as a pet? If you don't live in a tropical country, where would you find a coconut? What do you think of the way the dragon acted?).

The second part of the student's task is to follow through with the prediction s/he has made about the location of the answer and write an appropriate response from either the text or her/his knowledge base. During training students were reminded that when in doubt about where to find an answer they should check the text first. Subsequently, if they read the passage carefully (keeping in mind that sometimes the answer is hidden in the text and requires some real thinking to uncover it), but still found no information to respond to the question, then they could be sure that the question was looking for a response from their own knowledge base.

The third step for the student is deciding upon the final QAR classification.
The final category chosen may be the same as the initial prediction or the original selection may need revision once the relationship between the question and its answer is clear. Students were cautioned during training to check with particular care the sources of information for QARs that they were classifying as either text-explicit or text-implicit. The students were given this warning because it is relatively easy to make a prediction that a question will have an answer Hidden in the passage, yet find that all the information necessary for an appropriate response is contained in one sentence and, therefore, the QAR is appropriately classified as Here. This can occur in the same way with questions classified as Here that have answers in more than one sentence in the passage. In these examples, if the original QAR category is not changed it will not match the response the student has provided for the comprehension question.

The student’s role in the 3H strategy is a general difference between this study and previous question-answer relationship research. A specific difference in the instruction of QARs lies in the definitions used for the text-explicit and text-implicit categories in the 3H strategy. There was some confusion between these classifications in the original QAR training procedures, mainly because of anaphoric inferences. Teachers found it difficult to explain to students that the answer to a question was really in two sentences linked by a pronoun and not in one sentence as it appeared. This
problem is illustrated by the following passage and question taken from Raphael (1982):

Ralph sat in the old rocking chair. He rocked harder and harder.

Suddenly he found himself sitting on the floor!

Question: What did Ralph do while sitting in the chair? (He rocked harder and harder.)

In Raphael’s original system, this QAR would be labelled text-implicit because an inference is needed between the pronoun (he) in the second sentence and its subject in the first sentence (Ralph). Also, the words used to make up the question and the words needed for the answer are not in the same sentence, so it does not fit the definition of the Right There (text-explicit) classification.

Raphael (1985) now recommends that initially this type of QAR be termed text-implicit (Think and Search) to remain consistent with her definitions for question-answer relationships. When students begin to make comments like “This is an awfully easy Think and Search. It seems like it should be Right There.” (p 7), then, she suggests that this QAR can be introduced as an exception to the one sentence rule for Right There QARs and treated as text-explicit.

The 3H strategy seeks to be consistent in its treatment of the difference between explicit and implicit question-answer relationships. This is considered important because exceptions to rules can be very confusing to younger and poorer readers. As a result the 3H strategy classifies a QAR as
text-explicit if an adequate answer to a question is found in one sentence from the text. This eliminates the provision that both the answer and the question must be derived from the same sentence for a question-answer relationship to be text-explicit. The 3H definition, however, still retains the idea that a text-explicit QAR has both a question and answer found easily by, to use Pearson and Johnson's terminology, "reading the lines of the text".

Text-implicit question-answer relationships are defined in the 3H strategy the same way as in Raphael's studies (i.e. as requiring the integration of response information from two or more sentences in the passage.) Differentiating between Here (text-explicit) and Hidden (text-implicit) questions by these definitions is a modification to original QAR training.

Another alteration to previous QAR instruction is in the way category selections and answers are recorded in the 3H strategy. Raphael et al. provided students with three lines, each one labelled with a QAR category:

Right Here ____________________________________________

Think and Search _______________________________________

On My Own ___________________________________________

This format (with Here, Hidden and In my Head replacing Raphael's labels) proved confusing for students in the pilot study. They often circled the correct QAR but wrote the answer on the top line regardless of which category they had chosen. It is suggested that this common mistake occurred out of a habit.
Students could have formed patterns of responding from completing other worksheets, on which it is the convention to begin the answer on the first line. In the 3H strategy, only a space was provided for answering questions. Students were instructed to write the category of QAR as well as their answer in this space. Instead of labelled lines, a prompt card was used to remind students of the three categories and the meaning of each (Appendix 6). The use of the prompt card was faded over the course of instruction.

**Self-instruction vs didactic teaching.** The final difference between previous QAR training and the current study is the use of two methods of instruction to teach the 3H strategy to students. In this research, the effectiveness of didactic teaching was compared with self-instructional training of the strategy. The rationale for this comparison has already been provided. This last section will deal only with the differences between the 3H strategy and previous QAR research.

In the traditional didactic teaching condition students learned about the 3H strategy through discussion and practice, in much the same way as in past studies. Training, in fact, followed the general procedures outlined by Raphael (1982). In contrast, the self-instruction condition emphasised the importance of self-monitoring. The students in this experimental group were taught three self-questions which they used to guide their strategy use. The three self-questions presented to students were:
1. How will I answer this question?

2. What type of question is this? (Where will I find the answer to this question?)

3. Is my answer correct?

The three self-questions have the following purposes (a) to focus attention on the task; (b) to provide a basis for deciding where the answer to a question is found (i.e. Here, Hidden or In my Head); and (c) to remind students to check their work and take time to congratulate themselves if they used the 3H strategy conscientiously. A prompt card with the three self-questions on one side and a description of the QAR categories on the other was used for the self-instruction condition (Appendix 6). Direct measures of the student’s use of the strategy were gathered during testing. It is noted that the collection of students’ self-reports on their use of the self-questions may have served as a prompt for correct strategy use. Although this is a limitation of the current study, it was considered important to gather some data which would reflect the students’ application of the 3H strategy in the self-instruction condition.

Summary

Currently reading comprehension is an important area of research interest. Many recent comprehension intervention studies have been influenced by cognitive psychology. The main impact of cognitive psychology stems from its conceptualization of reading as an active process for both the teacher and the
student. One particularly useful and successful line of research has been conducted by Raphael and her colleagues (e.g. Raphael, 1981; Raphael & McKinney, 1983; Raphael & Pearson, 1985). These studies have investigated the effectiveness of teaching question-answer relationships (QARs) to promote active involvement with reading and improve reading comprehension performance. The 3H strategy used in this study is based on Raphael's training programs. However, some changes have been made in developing this QAR strategy to enhance its applicability to poorer readers and the consistency of its classification system.

Raphael's research is metacognitive in nature because it involves increasing students' awareness of their own cognitive processes—in this case, the sources of response information available for answering questions after a passage. However, the self-regulation component of metacognition has not been directly addressed in previous QAR training.

The current research focuses on the effect of an intervention (the 3H strategy) which combines the training of direct metacognitive self-monitoring processes with a question-answering strategy on reading comprehension performance. To explore this effect, two methods of teaching the QAR strategy were compared. Didactic teaching, the technique used in Raphael's prior research, was contrasted with self-instructional training. Self-instruction was chosen as an appropriate technique to contrast to didactic teaching.
because it is a procedure that combines self-monitoring with strategy training. It has also proven a particularly useful way of teaching complex skills to poor readers.

On the basis of the research reviewed in this chapter, the following hypotheses were made concerning the effectiveness of the 3H strategy for enhancing reading comprehension:

1. That students trained in a question-answering strategy (the 3H strategy) will perform better on reading comprehension tasks than students not taught a question-answering strategy.

2. That students taught a question-answering strategy (the 3H strategy) through self-instructional training will perform better on reading comprehension tasks than students taught the same strategy by didactic teaching methods.

3. That the effects of self-instructional training on poor readers taught a question-answering strategy (the 3H strategy) will be greater than for average students taught by the same method.
III. Method

Subjects

A total of ninety students from grades five and six participated in this study. They were selected from four schools in the suburban school district of Coquitlam, British Columbia.

General Selection Criteria

All subjects were students in grade five or six between the ages of 9 years, 11 months and 13 years, 1 month (mean age: 11 years, 1 month; standard deviation: 7 months). Subjects were excluded from the study if interviews with their class teacher indicated that they had poor physical health, were suffering from uncorrected sensory problems (e.g. poor eyesight) or were not competent users of English.

Specific Selection Criteria

The Gates-MacGinitie Reading Tests (Level D, Form 1) were administered to all grade five and six students in the four participating schools. On the basis of these test scores, lists of possible subjects in the average and poor reading range were formed by the researcher. The class teachers used their knowledge of the students' general performance to finalize the groups of poor and average readers selected to take part in the study.

Average readers. All subjects in this group satisfied the general selection criteria. In addition, they were identified as performing at or slightly above
grade level by their class teacher and by grade equivalent scores obtained on the Gates-MacGinitie Reading Tests. The mean total T-score for average readers was 51.8 (standard deviation: 4.0). This T-score converts to an average grade equivalent of 6.1 for the readers in this condition. The mean grade equivalent for the comprehension subtest of the Gates-MacGinitie was 5.9.

**Poor readers.** Poor readers met the general selection criteria and were considered to be performing below grade level by their teachers. Their scores on the Gates-MacGinitie Reading Tests were approximately one year below their current grade placement. The mean total T-score for poor readers was 44 (standard deviation: 3.3). This T-score converts to a grade equivalent of 4.7 for the readers in this condition. The mean grade equivalent for the comprehension subtest of the Gates-MacGinitie was 4.4.

**Instruments**

**Gates-MacGinitie Reading Tests: Level D Form 1.** The Gates-MacGinitie tests are a series of group administered tests designed to measure reading achievement from kindergarten to year twelve. Level D is intended for use with grade four, five and six students. It consists of subtests of vocabulary and comprehension. The vocabulary test samples the student's reading vocabulary by asking the student to choose, from five alternatives, the word or phrase that means most nearly the same as the test word provided. The comprehension test
measures the student's ability to read and understand paragraphs and correctly answer multiple-choice questions about them.

**Metacognitive questionnaires.** An oral questionnaire was developed to investigate the students' attitudes towards reading and their ability to solve certain reading problems (Appendix 1). This questionnaire was based on one developed by Canney and Winograd (1979). It was included in this study for the purpose of exploring the effect of training on metacognitive awareness. The full twelve item questionnaire was administered to all subjects before training. Five of the questionnaire items were readministered at the completion of the training and testing programs (Appendix 2).

A written questionnaire, which investigated attitudes towards the reading comprehension strategy taught in the experimental conditions, was completed only by students in the two treatment groups: self-instructional training and didactic teaching. After the completion of all post and maintenance testing these students were asked to use a five point advocacy scale to rate how well they had learned the strategy, its usefulness to them in school situations, and how much they enjoyed learning it. This questionnaire also asked the students for their own ideas about how the reading strategy could help other students (Appendix 3).

**Stimuli**

**Training passages.** Training passages and questions pertaining to them were
developed from curriculum materials and from stimuli used in previous studies by Raphael (1982) and Wong and Jones (1982). A pilot study, conducted in a Coquitlam school similar to the schools used in the research project, assisted in the development and sequencing of materials.

In all, eight passages and related questions were developed for training (Appendix 4). The training passages were sequenced so that they increased in length and difficulty as the students progressed through the training phase of the research. The number of questions after the training passages increased from three to eight and the number of words per passage increased from 41 to 404. Four additional passages and sets of questions were available for extra instruction and practice if the students did not meet the mastery level for training set at 85% correct on each of the last two set training passages.

Test passages. The immediate post tests and the maintenance tests were also developed from curriculum materials and stimuli used by Raphael (1982) and Wong and Jones (1982) (Appendix 5). These materials were tested for their suitability during the pilot study.

Post-testing took place immediately after training was completed. First the students received two test passages on two consecutive days, with one test administered each day. Subsequently, they received two additional sets of maintenance test passages. Again each set contained two test passages, which were given on consecutive days, one passage per day. There was an interval of
one week between the two immediate post-tests and the first maintenance test. Similarly, an interval of one week separated the first and second sets of maintenance tests.

A total of 42 questions were asked about the six test passages. For each of the three sets of tests, one test had six questions (two of each question-answer relationship category taught) and the other had eight questions (three text explicit questions, three text implicit questions and two script implicit questions). The order of the explicit, implicit and knowledge base questions on each test sheet was random.

Prompt cards. Prompt cards were used during the initial training sessions with the treatment groups but were faded as the program continued. The prompt cards for the didactic teaching condition consisted of an explanation of the three keywords for the categorization of questions and answers (HERE, HIDDEN or in my HEAD) printed on a yellow card which measured five inches by eight inches. For the self-instructional training group, the same yellow cards had information printed on both sides. On one side the three keywords were defined as in the didactic teaching condition; on the other side the three self-questions which guide strategy use were printed (Appendix 6).

Procedure

Before participating in this research project, students were required to return a consent form that gave them permission to participate in extra reading
instruction. Data collection in each school was completed before moving to the next school. The investigator tested and taught all groups in all four schools. Ideally this research would have been carried out by teachers who were not aware of the study's hypotheses, however, such resources were not available. The investigator did not knowingly vary her teaching to influence the results, but a possible confound related to having the same experimenter for all groups is noted. No similar studies in the recent literature have eliminated this factor.

Before Training

On the basis of teacher consultation and scores from the Gates-MacGinitie Reading Tests, grade five and six students from each school were selected and randomly assigned to didactic teaching, self-instruction or control conditions. Before training, the complete oral metacognitive questionnaire was administered to each subject. The students' responses were tape-recorded and transcribed for analysis.

Training

The program consisted of a total of 225 mins of instructional time. Training for all students lasted three weeks. Each small group of four to eight subjects completed three, 25 minute training sessions per week. Training for each condition is described in the following sections.

Control. Thirty students were assigned to the control group. These students worked in groups of seven or eight, on the same materials as the two
treatment groups. Students took turns reading aloud parts of the passages, then worked alone to answer questions relating to these passages. The researcher assisted with any vocabulary problems that became evident and gave general help to students who had difficulty answering in sentences. The students in the control groups were not taught a question-answering strategy to assist in reading comprehension until after the research was completed in their school. At this time the researcher introduced the control group to the question-answer relationship strategy and modelled a full class lesson for the teachers whose classes were involved in the research project.

Treatment groups. The self-instructional training and didactic teaching groups each contained 30 students. In small groups of four or five, these students were introduced to a reading comprehension strategy designed to help them answer questions after reading a passage. The terminology and teaching sequence employed to introduce this strategy to both treatment groups, and to all classes after the completion of training, is outlined below.

The terminology used for this strategy is based on that developed by Raphael and her colleagues (e.g. Raphael & Pearson, 1980; Gavelek & Raphael, 1982; Raphael & McKinney, 1983; Raphael, 1985). Raphael's work on question-answer relationships (QARs), in turn stems from Pearson and Johnson's (1978) taxonomy of comprehension question which categorizes questions in terms of the relationship between the question and possible sources of response.
information. The taxonomy describes the following categories: text explicit (information to be used to provide the most appropriate response to a question is stated directly in the text); text implicit (response information is located in the text but requires integration across different sentences, paragraphs or pages); and script implicit (response information is located in the reader's knowledge base).

In a series of successful studies Raphael used the mnemonics "Right There", "Think and Search" and "On my Own" to teach Pearson and Johnson's categorization system to poor and average grade four, six and eight students. In the strategy used for this research, "Here", "Hidden" and "In my Head" (The "3Hs") replace Raphael's mnemonics for text explicit, text implicit and script implicit question types. This 3H mnemonic was used as a guide for generating questions for training and test materials. It was also taught to students in the self-instruction and didactic teaching condition to assist them in selecting an appropriate question-answering strategy.

The rationale for using the 3Hs instead of Raphael's terms is as follows. Because of the alliteration used in the Here, Hidden and in my Head labels, it is suggested that students, particularly poor readers, would find it easier to remember this 3H strategy. Another reason for using Here, Hidden and In my Head to teach question answer relationships is because these terms respond to what could be considered the essence of Pearson and Johnson's QAR idea.
Namely where is "the data source that must have been used by the reader to generate that particular response"? (Pearson & Johnson, 1978, p 163). From the reader's perspective this could be paraphrased as, "Where will I find the answer to this question?" and answered with "Here?", "Hidden?", or "In my Head?". This question and its keyword answers summarize the 3H strategy.

"Here", "Hidden" and "In my Head" provide an easy way to remember the different types of comprehension question-answer relationships. In addition, they indicate by their meanings where the student has to look to access information to answer questions. For example, in the case of text explicit (Here) question-answer relationships, questions have answers that can be found easily right here on the page. In text implicit (Hidden) QARs, questions have answers that require some integration of information which may be hidden across sentences, paragraphs or pages of a text. Lastly, in script implicit (In my Head) QARs, questions do not have answers in the text but in the student's head or knowledge base. The following paragraphs describe each type of reading comprehension question-answer relationship relevant to the study and give examples from initial training passages.

**Explication of question-answer relationship categories.** For the purposes of this research, a question-answer relationship was defined as **text-explicit** when the question involved could be answered completely using information from only one sentence in the passage. It was pointed out to the students that
the type of answer often associated with this QAR may contain many of the same words used in the question. For example, the question

What do plants need to grow?

can be answered by the sentence from the passage:

Plants need soil, sunshine and water to grow.

Using the "3H" strategy, the mnemonic Here describes the type of question that has its answer in one sentence on the page.

A text-implicit QAR was defined as consisting of a question which has its response located in the passage, but not as directly stated in the text as in the previous category. Information to answer this type of question was described as being found in two or more sentences, perhaps in different paragraphs or on different pages. The mnemonic Hidden was used to underline the extra effort that may be necessary to find the information to answer this type of question.

An example of a Hidden question-answer relationship is illustrated by the passage and question below.

One kind of starfish is called the sunstar. It may have seven or more rays. The rays look like the lines around the sun. This starfish grows to be over twelve inches wide. Like the setting sun, it is also red.

What are two ways that this starfish looks like the sun? (Its rays look like the lines around the sun and it is also red like the setting sun.)
Information from two sentences in the passage was needed to answer this question.

A script-implicit QAR was identified when students could only answer a given question by using their knowledge base. In training examples, no explicit or implicit information was available from the text to answer this type of question. Instead, the answer was to be found in the students' heads i.e. they had to use what they already knew about the topic, or offer their own opinion, or an account of their experiences in response to the question. An example of a script implicit question that refers to the previous passage about starfish is:

Where would you most likely find a sunstar starfish? (You would find the starfish in a rock pool at the beach.)

Teaching sequence

In introducing the 3H strategy to the students assigned to the treatment groups, the researcher/teacher began by discussing reading and reading tasks. The students and teacher listed subject areas where question and answer tasks after reading some content are common (e.g. reading lessons, science, social studies, and mathematics word problems) and discussed the importance of responding carefully and correctly to reading comprehension tasks in these areas. The "3H" strategy was presented as a method of avoiding some common reading problems. Specifically, these problems were (a) not reading carefully; (b) relying on the passage too much; and (c) relying on memory and general
knowledge too much. By following the 3H strategy, students were told they would remember to read carefully and would be more likely to know when it was appropriate to use the passage or their general knowledge to locate the answers to questions. An example illustrating each reading problem mentioned above was discussed to provide a shared context for the 3H strategy between the teacher and her students. The main point of these discussions are outlined below.

"Not reading carefully" was considered a problem because it can mean that the content of the passage or the question itself may be misunderstood. The importance of taking responsibility for reading to understand was emphasised. Strategies useful in extracting meaning from unfamiliar words or phrases were referred to briefly (e.g. sounding out words, using context clues, seeking help from the dictionary or the teacher etc). The student's part in regulating the use of these strategies and doing something themselves if they felt they didn't understand a word, or passage or question was emphasised.

"Relying on the passage too much" was presented as inappropriate in some reading situations, for example, when questions ask the reader for personal opinions, or experiences, or when they require extending an idea from the text into what the student already knows. The answers to questions like these are not in the text but in the student's own knowledge base.

"Relying on general knowledge and memory too much" was presented as a
mistake commonly made by students who may read a passage through once and then answer questions without consulting the text again. It was pointed out that relying on memory to this extent does not allow the student to take advantage of the text and may result in careless mistakes. It was also mentioned that sometimes memories and general knowledge are unreliable. For example, misconceptions about how plants make food and how light allows us to see are common among students and teachers (Anderson & Smith, 1984). If there is information in the text that helps answer a question, it was suggested that this information be used. Although using general knowledge to answer some questions is appropriate, the students were told that this is not a suitable strategy when information is available in the text. Using information from the text was discussed as important because it helps students provide reasons for their responses, and allows them more confidence in responding because they can locate the source of their answer if they are challenged.

After speaking about common reading problems, the 3H strategy was introduced as a way to avoid these difficulties. It was described as a way of turning reading problems into a reading plan or strategy. Instead of not reading carefully, the importance of reading both the passage and the question carefully was emphasised. Instead of relying on the text or general knowledge too much when answering questions, the 3H strategy was shown to provide a
way of deciding when it was appropriate to use either text or knowledge base information. Here and Hidden QARs were introduced by discussing the appropriate use of the text to answer questions. In my Head question-answer relationships were described when elaborating on when to use general knowledge to answer a comprehension question.

In general, the main features of the "3H" strategy discussed as reasons for its use were (a) the ease with which it can be remembered and used as a plan for answering questions; (b) the reminder it provides as to the possible locations of answers to questions; (c) the way it can help students analyse difficult questions; and (d) the accountability that the strategy can build into a question-answering task by insisting that each student have a reason for QAR categorization as well as for the response they write to answer the question itself.

**Didactic teaching.** Students in the didactic teaching condition (n = 30) were introduced to the "3H" strategy and given a prompt card outlining the three categories (Here, Hidden and In my Head) of question-answer relationships in the first training session. In subsequent sessions, students took turns at reading parts of a short passage aloud. They then used the 3H strategy to categorize QARs and respond to the comprehension tasks in sentences. To explain the student's role in more detail, they used the 3H strategy to (a) first predict from each question where its answer would be located, then (b) respond
to the comprehension task, before (c) deciding on the final QAR category (Here, Hidden or In my Head) after examining the relationship between the question asked and the answer they had provided.

**Self-Instructional training.** The thirty students in this training condition were introduced to the 3H strategy in the same way as the students in the didactic teaching condition. The instruction of how to perform the strategy differed, however. These students were taught a series of self-questions designed to guide strategy use. The instruction of these questions followed the self-instructional training model used by Meichenbaum and Goodman (1971). During training the students were taught (a) to follow the directions of the researcher as she modelled the responses to the questions aloud; (b) to guide their own behaviour through self-talk; (c) to guide their own behaviour through whispered instructions; and finally (d) to use the self-questions presented to them as a form of covert inner dialogue to guide behaviour.

The three self-questions relating to QARs presented to the students were

1. How will I answer this question?

2. What type of question is this? (Where would I find the answer to this question?)

3. Is my answer correct?

An example of appropriate modelling dialogue is presented below.
1. HOW WILL I ANSWER THIS QUESTION?
(I will have to remember to read carefully – both the question and the passage. I’ll use the 3H strategy to help me.)

2. WHAT TYPE OF THE QUESTION IS THIS? (WHERE WILL I FIND THE ANSWER TO THIS QUESTION?)
(The question can give me clues. The answer is either in the text or in my head. I’ll check the text first. If the answer isn’t there I’ll use what I already know.)

(A) Is the answer HERE on the page?
(This is a simple HERE question if the answer is in one sentence from the passage. Sometimes many of the same words are in the “answer sentence” as were in the question.)

(B) Is the answer HIDDEN in the passage?
(If the question asks for more than a simple fact from the passage then this is a HIDDEN question. The information to answer it comes from two or more sentences in the passage.)

(C) Is the answer in my HEAD?
(If I have read carefully and can’t find the answer to the question in the text, then I have to use what I already know. This is an In my HEAD question?)
3. IS MY ANSWER CORRECT?

(Have I really answered the question? I should re-read the question and my answer to see if they "fit" together. I should have a reason for my answer.

The three self-questions have the following purposes (a) to focus attention on the task; (b) to provide a basis for deciding where the answer to a question is found (i.e. Here, Hidden or In my Head); and (c) to remind students to check their work and take time to congratulate themselves if they used this strategy conscientiously.

The students in the self-instruction condition were provided with a prompt card which outlined the question-answer relationship categories on one side and listed the three self-questions on the other. After taking turns to read aloud segments of a passage, the students in this condition worked through the three self-questions to perform the 3H strategy.

Initially, the students in this condition listened to the teacher as she modelled the use of the self-questions. Then they performed the strategy under the guidance of the teacher who worked aloud through the strategy. Gradually, the students began to control their strategy use through their own overt, then covert verbalizations. The teacher regularly asked individual students in this experimental condition to "think aloud" for her as they worked through the
steps involved in answering a comprehension questions.

How the self-instructions relate to the student's role as an active comprehender is described as follows. The first self-question reminds the students to take care with their reading and to use all the steps of the 3H strategy. The second question prompts the students to predict a QAR category based on the type of question they have to answer. The final self-question emphasises the importance of checking the accuracy of responses. This includes both the content of the written response and the QAR category chosen to describe the relationship between the given question and answer that the student provided. During training it was stressed that students must have reasons for the answers and classifications they choose, and be able to state them.

After training, Data was collected from a total of six tests after training. Each test consisted of a passage and questions which followed the same format as previous materials. As in the training sessions, all students took turns reading sections of the passages and the related questions aloud. For students in the control group the only task was to answer the questions in sentences. Students in the other conditions had to fulfill the additional requirement of providing a QAR category for each question and its answer.

The following testing schedule was adhered to for all conditions. Immediately after training, two post-tests were administered on consecutive
days. One week later, the first set of two maintenance tests were completed by all students. After an interval of a week, the last maintenance data was collected.

Following the completion of testing, five items from the initial oral metacognitive questionnaire were readministered to students in all three conditions. Responses were tape recorded for comparison with answers collected during the original questionnaire. Students in the didactic teaching and self-instruction conditions also completed a written questionnaire which probed their opinions on the usefulness of the 3H strategy to them.

Dependent Measures

This study investigated average and poor readers' metacognitive knowledge as well as the effect of different methods of strategy training on reading comprehension performance. Dependent measures related to metacognition and reading comprehension will be discussed in separate sections below.

Strategy training. The first dependent measure used in this study was appropriate for subjects in all three conditions (control, didactic teaching and self-instruction). This variable was the provision of complete and accurate responses to each comprehension question and was labelled "comprehension".

The remaining dependent measures relate to the strategy trained groups only. The second dependent measure was the correct identification of the question-answer relationship classification appropriate for each question. The
students categorized each question as either Here, Hidden or In my Head. This measure corresponds to the variable termed "hits" in some other QAR research (e.g. Raphael & McKinney, 1983). This measure concerns the students' ability to correctly identify question-answer relationship classifications, with the criteria for correctness being whether the categorizations agree with those of the researcher. This variable is termed "category" in the current study.

The remaining measures analyse the pattern of the preceding dependent variables to examine the relationship between correct categorization and appropriate comprehension responses. This approach differs slightly from that used in previous work with question-answer relationships (e.g. Raphael, 1982; Raphael & McKinney, 1983; Raphael & Pearson, 1985). In these studies, three dependent measures were used most often: categorization, comprehension and the number of "matches" between the type of question-answer relationship identified by the student and the answer s/he actually provided. For example, if a student categorized a QAR as In my Head and provided an answer from his/her background knowledge then s/he has achieved a match. If an answer from the text was provided instead, then the chosen QAR and response do not match.

On the match variable it is possible for a student to identify the QAR incorrectly according to the investigator's categories, and provide an incomplete written answer yet still achieve a match score because of
consistency between the category the student identified and his/her answer to
the comprehension question. An illustration of this situation would be if a QAR
was intended to be classified as Hidden (text-implicit) but was identified as
Here (text-explicit) by a student. If that student then provided an answer that
was found in one sentence in the passage, s/he would achieve a match score.
This is despite the fact that the written response provided would be incorrect
because it does not provide enough information from the passage to fully
answer the question. A complete answer would have required some integrating
of information from different parts of the passage.

While the match measure provides information about the consistency of
strategy use, it does not focus on comprehension accuracy. Since the purpose
of teaching a question-answering strategy is to improve comprehension
performance and not to concentrate on strategy use if that strategy is not used
appropriately, this measure is not included for analysis in the current study.

The dependent measures which examined the patterns of classification and
comprehension scores are defined as follows. The third dependent variable for
this study was termed a "positive match". This pattern was coded when both
categorization and comprehension responses were correct. When
categorization of question type was correct but the written answer response
was incorrect then a "negative match" was coded. This was the fourth
dependent variable. The fifth dependent measure was coded when the
comprehension question was answered correctly but the category of question type was not identified accurately. This was termed a "hit". The sixth dependent measure was labelled "incorrect". It was coded when neither of the student's category or comprehension responses were appropriate.

Additional measures of direct strategy use were obtained from students in the self-instruction condition. After completing each test, the students were asked to write on their answer sheets the three self-questions which they had learned during training. The students were then requested to think about their own use of the 3H strategy in responding to the test questions they had just completed and indicate next to the appropriate self-questions two important pieces of information. First, they were asked to show by a check mark the steps of the strategy that they had actually used in answering the test questions. Students were encouraged to be honest in their evaluation of their question-answering behavior. Second, the students were required to denote which particular self-question they considered most useful to them in completing their comprehension test. Students indicated this self-question by writing the word "most" alongside it.

Scoring. Prior to commencing this research but after information gathered during the pilot study had been incorporated into the training and test materials, each question after each passage was categorized and answered by two graduate students of Education. Prior to this task the graduate students
were introduced to the QAR classification system. They were instructed to provide complete answers to each question. Overall, there was very little disagreement between the student's identification of QARs and their best possible answers to each question. In the case of occasional questions which required opinion or personal experience responses from the individual's knowledge base, the rationale for deciding upon acceptable answers was agreed to by the experimenter and the two scorers. Whatever disagreement occurred was resolved by discussion and in some cases rewording of the question to make the task less ambiguous. A scoring key was developed from these deliberations (Appendix 7).

The researcher marked each student's post tests and maintenance tests using the scoring key to decide on the correctness of the student's QAR selection and the appropriateness of their answers. One full point was given for each appropriate written response. One point was given for each correct categorization of question-answer relationship.

After all the data had been collected and marked, a random sample of responses was scored by another graduate student who had been introduced to the QAR strategy. The correlation between this student's and the researcher's scores for QAR categorization was .96. The correlation for written comprehension responses was .87.

Metacognitive Questionnaire
A twelve item metacognitive questionnaire was administered to all subjects prior to their participation in the research. Five of these questionnaire items were readministered at the end of training. The dependent measure relating to metacognitive knowledge in this study was the change in scores from pretest to post test on the five common items.

Scoring. A marking plan for responses to the open-ended questions was developed by the researcher and a university professor of Learning Disabilities. Each question was analysed and appropriate responses were listed and assigned a value of 0 - 0.50 - 1.00 - 1.50 - 2.00. Ideas from Canney and Winograd (1979) were also used in developing an appropriate way of scoring student responses. The scoring key and sample responses are provided in Appendix 8.

After all protocols had been scored, a graduate student of education used the scoring key to rescore a random sample of responses. The correlation between the researcher's and the graduate students' scores was .97.
IV. Results

The results of this study will be reported in three sections. In the first section, findings related to the hypotheses will be presented. In the second section, findings related to other aspects of the use of the 3H strategy, such as categorization and patterns of QAR identification will be described. In the third section, results from the metacognitive questionnaires will be reported.

Section 1.

The a priori predictions regarding the effectiveness of the 3H strategy for enhancing reading comprehension were:

1. That students trained in a question-answering strategy (the 3H strategy) will perform better on reading comprehension tasks than students not taught a question-answering strategy.

2. That students taught a question-answering strategy (the 3H strategy) through self-instructional training will perform better on reading comprehension tasks than students taught the same strategy by didactic teaching methods.

3. That the effects of self-instructional training on poor readers taught a question-answering strategy (the 3H strategy) will be greater than for average students taught by the same method.

All these hypotheses relate to the subjects’ comprehension performance.
Table 1
Means, Standard Deviations (SD) and F Values for Total Comprehension Scores of Poor and Average Readers in the Self-Instruction, Didactic Teaching and Control Conditions

<table>
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<th>Condition</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Poor</td>
<td>Average</td>
</tr>
<tr>
<td>Self-instruction</td>
<td></td>
<td>29.06</td>
<td>30.93</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.18)</td>
<td>(2.39)</td>
</tr>
<tr>
<td>Didactic Teaching</td>
<td></td>
<td>27.07</td>
<td>29.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2.39)</td>
<td>(3.52)</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td>23.27</td>
<td>26.47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3.84)</td>
<td>(2.87)</td>
</tr>
</tbody>
</table>

\[ F(1,84) = 39.06^{**} \]
\[ F(1,84) = 5.09^{*} \]

Note. Maximum score = 42

Contrasts:  
\( a \) Trained students versus untrained students  
\( b \) Self-Instruction condition versus didactic teaching condition

* \( p < .05 \)

** \( p < .01 \)
Table 1 reports the means and standard deviations for the total comprehension scores. An examination of these data indicates that training of the 3H strategy appears to have improved reading comprehension performance, and that self-instruction seems to have improved comprehension performance more than didactic teaching for both poor and average readers.

A 2 (Status: poor and average) by 3 (Condition: self-instruction, didactic teaching and control) analysis of variance was used to analyse the comprehension data. The results indicated significant main effects for both Condition \([F(2,84) = 22.11, p < .01]\) and Status \([F(1,84) = 14.84, p < .01]\). The interaction between status and condition was not significant. Thus, the comprehension performance of students in this study differed as a result of the type of instruction they received and whether students were identified as either poor or average readers prior to training. Figures 1 and 2 further illustrate the effects of condition and status on reading comprehension scores. The lack of interaction is evident from these graphs which show that training effects on both poor and average readers were similar.

Based on the a priori predictions made for the study, orthogonal contrasts using F-ratios were performed to investigate the effects of training condition and reading group in more detail. Only those contrasts which were of interest were investigated to limit the error rate to an acceptable level (Howell, 1982). Comparisons of the comprehension performance of trained and untrained
Figure 1.
Average Comprehension Scores for Poor and Average Readers in the Self-instruction, Didactic Teaching and Control Conditions.
Figure 2.
Status x Condition for Total Comprehension Scores
students, and the results of students in the self-instruction condition compared to didactic teaching condition were of importance with regard to the hypotheses. The effectiveness of self-instructional training versus didactic teaching relative to both poor and average readers was also examined.

The results showed that training was significant in improving the reading comprehension of poor and average readers \( F(1,84) = 39.06, p > 0.01 \), and that self-instruction was more effective, at the .05 level of significance, than didactic teaching \( F(1,84) = 5.09 \). However, the F-ratios for the comparison of the two experimental conditions for poor and average readers were not significant. The F-ratio for the poor readers was \( F(1,84) = 3.25 \). For the average readers the F-ratio was \( F(1,84) = 1.91 \). More specific information concerning the hypotheses is presented in the following sections.

**Hypothesis 1.** stated that students trained in a question-answering strategy (the 3H strategy) will perform better on reading comprehension tasks than students not taught a question-answering strategy. In terms of the means, untrained students averaged 24.87 for comprehension while the mean score for combined training groups was 29.12. Because teachers often convert raw scores to percentages before presenting students’ achievement results, percentages will also be used to report the findings. In relation to percentages of the 42 comprehension questions asked during post and maintenance testing, the results represent an improvement of 10 percentage
points from an average of approximately 59% for control students to 69% correct for trained groups. As mentioned in the general results section, results were significant when the main effect of condition was partitioned into a trained versus untrained a priori contrast \([F(1,84) = 39.15, p < .01]\). These results support the first hypothesis that training in a question-answering strategy would improve performance on reading comprehension tasks.

Hypothesis 2 stated that students taught a question-answering strategy (the 3H strategy) through self-instructional training will perform better on reading comprehension tasks than students taught the same strategy by didactic teaching methods.

In terms of percentages, self-instruction elicited a mean performance of 71% in comparison to 67% for didactic teaching. At the .05 level of significance, the data showed self-instruction to be the more effective technique for improving reading comprehension \((F(1,84) = 5.07, p = .05)\). Thus, hypothesis 2 was supported.

Hypothesis 3 stated that the effects of self-instructional training on poor readers taught a question-answering strategy (the 3H strategy) will be greater than for average students taught by the same method.

This hypothesis was not substantiated. There was no significant difference between the effects of self-instructional training for poor readers and the effects for average readers. If a difference was likely, it would have been
indicated by a significant interaction between Condition and Status in the $2 \times 3$ analysis of variance. Instead, as illustrated by Figure 1 and Figure 2, the effects of training were similar for both poor and average readers.

In considering possible reasons for the performance of the poor and average readers in the self-instruction condition, the information concerning the students' application of the 3H strategy to the comprehension test questions was examined. These direct measures collected during testing were analysed to uncover patterns of strategy use. Table 2 represents the self-report data from the thirty students in the self-instruction group.

All but two of the 15 students in the self-instruction condition for poor readers were able to recall the three self-questions accurately after each test passage. The two students who made mistakes confused the three self-questions used to guide strategy use and the three categories for question-answer relationships on all test passages. Of the average readers, 12 were able to provide all three self-questions for all the passages. Three average students did not write all the self-questions after a total of four passages. They made less regular mistakes than the poor readers, usually by omitting a step or confusing the order of questions.

In general, the questions used by the students in answering their comprehension tests were reported in similar proportions by both poor and average readers. The students reported that they used Question 2 most often,
### Table 2
Direct Measures Data From Poor and Average Readers
in the Self-Instructional Training Condition

<table>
<thead>
<tr>
<th>Question 1</th>
<th>Question 2</th>
<th>Question 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poor Readers</strong></td>
<td><strong>Average Readers</strong></td>
<td><strong>Poor Readers</strong></td>
</tr>
<tr>
<td>S-Q Used</td>
<td>Most Used</td>
<td>S-Q Used</td>
</tr>
<tr>
<td>13</td>
<td>52</td>
<td>2 2 3 1</td>
</tr>
<tr>
<td>12</td>
<td>55</td>
<td>2 3 4 2 2 1</td>
</tr>
</tbody>
</table>

**Note.**
- S-Q = the number of students in each group (n = 15) who provided all three self-questions after all six test passages.
- The six test passages
and Question 1 next. However, in relation to Question 3, which incorporates self-evaluation and self-reinforcement components into the 3H strategy, poor readers were more likely to use it than average readers. Specifically, poor readers stated that they actually used the self-questions to assist them in responding to the comprehension test items in the following proportions: Question 1 (How will I answer this question?) was used 58% of the time in answering comprehension questions; Question 2 (What type of question is this? Where will I find the answer to this question?) was indicated in 85% of the students' self-reports; and Question 3 (Is my answer correct?) was marked as used in completing 67% of the comprehension tasks. In comparison, the average readers reported the actual use of Question 1 in 61% of the comprehension tests; Question 2 in 80% of cases and Question 3 on 53% of the tasks.

Poor students were also asked to rate the usefulness of the three self-questions they used to complete comprehension tasks. The responses from poor readers were as follows: Question 1 which focuses on strategy use was considered most important by 9% of the subjects; Question 2, the question which helps students choose the appropriate QAR category, was checked as most important by 65% of the students; Question 3 which guides students through self-evaluation and self-reinforcement steps at the end of the 3H strategy was chosen as most important by 26% of subjects. Average students
viewed the self-questions as important in the following proportions: Question 1 was identified as most important by 15% of the average readers, Question 2 by 57% of the readers and Question 3 by 28% of the average readers.

Examination of this self-report data shows that both poor and average students marked the self-questions as "most important" in a similar pattern. In descending order of importance, the students marked these questions; first, Question 2, which guides the actual QAR classification in the 3H strategy; second, Question 3 which includes self-monitoring steps; then Question 1, the focusing question which prompts the students to read carefully and use all the steps they have learned. Within these data, a trend is evident which suggests that students indicated different questions as being most important as the testing progressed. On the earlier tests, more students marked Questions 1 or 2 as most important, but as the students completed more comprehension tests they began to designate Question 3 as most important to their performance (e.g. on passages 4, 5, 6).

These results show that there is room for students to improve their strategy use to make their application of the 3H strategy more uniform. In general, students reported the same pattern of strategy usage. Students considered self-monitoring (Question 3) more important towards the end of the testing program.

Section 2
Findings on passage effect for comprehension, categorization of QAR types, and the dependent measures of "positive match", "negative match", "hit" and "incorrect" are presented in this section. These findings concern the students' application of the 3H strategy.

**Passage Effect for Comprehension**

The post-test and maintenance passages provided data on a total of 42 comprehension questions in six test passages. All means and standard deviations per passage are reported in Table 3. Students' mean performance on the passages according to their experimental condition is graphed in Figure 3. The fourth passage, "Written in the Trees", decreased performance abruptly for all students in all conditions. It is suggested that this result was due to the content of the comprehension passage which may have caused confusion for students with some prior knowledge about the annual rings on a tree trunk. "Written in the Trees" explains how the rings of growth found on a tree can be used to interpret how much rain fell in a year. The passage does not mention the alternate use of annual rings to estimate the tree's age. The students' written comprehension responses indicated that some they tended to confuse these two ideas unless they read the passage carefully before answering the comprehension questions.

Univariate F-tests conducted on the passage comprehension scores revealed that four of the six passages showed a significant difference because of
Table 3

Means, Standard Deviations (SD) and Significant F Values for Total Scores on the Comprehension Variable

<table>
<thead>
<tr>
<th></th>
<th>Passage 1</th>
<th></th>
<th>Passage 2</th>
<th></th>
<th>Passage 3</th>
<th></th>
<th>Passage 4</th>
<th></th>
<th>Passage 5</th>
<th></th>
<th>Passage 6</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
</tr>
<tr>
<td>S-I</td>
<td>4.67</td>
<td>5.13</td>
<td>4.80</td>
<td>5.60</td>
<td>5.67</td>
<td>5.60</td>
<td>3.67</td>
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<td>5.07</td>
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</tr>
<tr>
<td></td>
<td>(.82)</td>
<td>(.83)</td>
<td>(1.08)</td>
<td>(.83)</td>
<td>(.93)</td>
<td>(1.06)</td>
<td>(.72)</td>
<td>(1.01)</td>
<td>(.70)</td>
<td>(.63)</td>
<td>(1.08)</td>
<td>(1.12)</td>
</tr>
<tr>
<td>DT</td>
<td>4.53</td>
<td>5.20</td>
<td>5.47</td>
<td>5.60</td>
<td>5.27</td>
<td>6.13</td>
<td>3.00</td>
<td>2.87</td>
<td>4.73</td>
<td>5.07</td>
<td>4.07</td>
<td>4.53</td>
</tr>
<tr>
<td></td>
<td>(.74)</td>
<td>(.94)</td>
<td>(1.25)</td>
<td>(.98)</td>
<td>(1.10)</td>
<td>(1.51)</td>
<td>(1.60)</td>
<td>(1.36)</td>
<td>(.88)</td>
<td>(.96)</td>
<td>(1.27)</td>
<td>(1.02)</td>
</tr>
</tbody>
</table>

F-Ratios

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a1</td>
<td></td>
<td>F = 11.73**</td>
<td>F = 12.90**</td>
<td>F = 10.36**</td>
<td>F = 8.71**</td>
<td>F = 6.74*</td>
</tr>
<tr>
<td>b2</td>
<td></td>
<td></td>
<td>F = 6.74*</td>
<td></td>
<td></td>
<td>F = 13.23**</td>
</tr>
</tbody>
</table>

Note: S-I = Self-Instruction

DT = Didactic Teaching

Contrasts:  

\[{}^{a}\text{Trained versus Untrained}\]

\[{}^{b}\text{S-I > DT}\]

**p < .01

*p < .05
Figure 3.
Average Comprehension Scores Obtained by Each Condition for the Six Test Passages
Status. These passages were tests 1, 2, 3, & 6. This difference because of status was explained by the better comprehension performance of average students compared to poor students.

Five test passages displayed a significant F-ratio because of Condition. These passages were tests 2, 3, 4, 5, & 6. The results due to condition were explored using preplanned orthogonal contrasts. It was appropriate to use these tests because a priori reasons had been given for the expectation that trained students would outperform untrained students on comprehension tasks, and that self-instruction would lead to better comprehension results than didactic teaching. The following comparisons were statistically significant at the .05 level or better: Trained > Untrained (F(1,84) = 11.73, p < .01) for passage 2; Trained > Untrained (F(1,84) = 12.90, p < .01) for passage 3; Trained > Untrained (F(1,84) = 10.36, p < .01) and Self-Instruction > Didactic Teaching (F(1,84) = 5.27, p = .05) for passage 4; Trained > Untrained (F(1,84) = 8.71, p < .01) for passage 5; and Trained > Untrained (F(1,84) = 6.74, p < .05) and Self-Instruction > Didactic Teaching (F(1,84) = 13.23, p < .01) on passage 6.

These values are presented in Table 3.

In general, training positively influenced comprehension performance on the last five test passages. Self-Instruction was significantly more effective than
didactic teaching on two of these passages. On passage 4, the passage that
decreased overall performance, scores from students in the self-instruction
condition were significantly better, at the .05 level. At the end of the testing
program on passage 6, there was a significant difference between
self-instruction and didactic teaching at an alpha level less than .01. These
results indicate that self-instruction may have been more successful in
counteracting the confusion caused by passage 4 and more successful in
maintaining comprehension performance during the testing program.

To explore whether self-instruction was more likely to maintain
comprehension performance, students' scores were analysed in the following
groups (a) post-tests (passages 1 & 2), (b) maintenance tests 1 (passages 3 &
4) and (c) maintenance tests 2 (passages 5 & 6). Post hoc F-tests indicated
that the performance between self-instruction and didactic teaching groups did
not differ significantly on the two immediate post-tests or the first set of
maintenance tests. However, the performance of students in the
self-instruction condition was reliably better than that of students in the
didactic teaching condition on the second set of two maintenance tests [F(1,
84) = 10.10, p <.01]. Thus, self-instruction was more effective in maintaining
comprehension performance after training than didactic teaching of the 3H
strategy.
**Categorization**

Categorization is a measure of correct QAR identification appropriate to the test responses of students in the self-instruction and didactic teaching conditions. Means and standard deviations for this measure are provided in Table 4.

A multivariate analysis of variance for Condition (self-instruction, didactic teaching) and Status (poor, average) across the categorization scores for the six test passages showed no effect for Status and no interaction. A significant omnibus F for Condition \((F(6,51) = 2.72, p < .05)\) was obtained. Univariate F-tests indicated that there was a significant difference between the means for Passage 3 only. Students in the didactic teaching condition (mean = 6.93) categorized more question types correctly than students in the self-instructional training condition (mean = 5.87). Therefore, students in the didactic teaching condition identified marginally more QARs than those students taught by self-instruction.

**Other Dependent Measures**

The positive match, negative match, hit and incorrect dependent measures investigate the students' patterns of strategy use. These data provide information on how the students' comprehension results are related to the QAR identification task for the six test passages. The variable "positive match" was coded when the student correctly answered both the QAR and comprehension
Table 4
Means and Standard Deviations (SD) of Correct Categorization of QAR Type for the six test passages

<table>
<thead>
<tr>
<th>Passage 1</th>
<th>Passage 2</th>
<th>Passage 3</th>
<th>Passage 4</th>
<th>Passage 5</th>
<th>Passage 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6.00</td>
<td>5.80</td>
<td>11-15</td>
<td>5.73</td>
<td>5.60</td>
<td>4.87</td>
</tr>
<tr>
<td>(.99)</td>
<td>(.77)</td>
<td>(1.45)</td>
<td>(.76)</td>
<td>(.91)</td>
<td>(.91)</td>
</tr>
<tr>
<td>4.80</td>
<td>5.07</td>
<td>6.30</td>
<td>6.00</td>
<td>6.60</td>
<td>7.20</td>
</tr>
<tr>
<td>(1.37)</td>
<td>(1.16)</td>
<td>(1.93)</td>
<td>(1.18)</td>
<td>(1.59)</td>
<td>(1.49)</td>
</tr>
</tbody>
</table>

F-Ratio

| S-I > DT |          |          | 9.40**   |          |          |
| DT > S-I |          |          |          |          |          |

Note. DT = Didactic Teaching
S-I = Self-Instruction

** p = < .01
task. "Negative match" was coded when the QAR category was correct but the comprehension question was not responded to appropriately. A "Hit" answer was when the question-answer relationship was not identified correctly but the student provided a correct comprehension response. As its name suggests, the variable "Incorrect" was coded when neither QAR or comprehension task were completed acceptably. The means and standard deviations related to these variables are presented in Tables 5, 6, 7, and 8.

A series of 2 Status X 2 Condition multivariate analyses of variance were conducted for the positive match, negative match, hit and incorrect dependent variables across the six test passages. Significant omnibus F effects, at the .05 level or better, for Condition were obtained on all measures—positive match: \[ F(6,51) = 2.71, p < .05 \]; negative match: \[ F(6,51) = 2.47, p < .05 \]; hit: \[ F(6,51) = 3.00, p = .014 \]; incorrect: \[ F(6,51) = 3.07, p < .05 \]. One effect for Status was evident for the variable "incorrect" \[ F(6,51) = 2.32, p < .05 \]. No interaction was found between Status and Condition for any variables.

Table 7 describes the details of comparisons between the means of self-instruction and didactic teaching conditions for each passage. The one effect obtained for status on the variable "incorrect" showed that poor readers (mean =6.2) had significantly more incorrect categorization and comprehension answers on passage 2 than average readers (mean = 5.5).

Overall, the comparisons show that students in the self-instruction condition
Table 5
Means, Standard Deviations (SD) and Significant F Values for Total Scores on the Positive Match Variable

<table>
<thead>
<tr>
<th></th>
<th>Passage 1</th>
<th></th>
<th>Passage 2</th>
<th></th>
<th>Passage 3</th>
<th></th>
<th>Passage 4</th>
<th></th>
<th>Passage 5</th>
<th></th>
<th>Passage 6</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
</tr>
<tr>
<td>S-I</td>
<td>4.20</td>
<td>4.73</td>
<td>3.73</td>
<td>4.93</td>
<td>4.93</td>
<td>4.60</td>
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<tr>
<td></td>
<td>(.77)</td>
<td>(.88)</td>
<td>(1.33)</td>
<td>(1.10)</td>
<td>(1.60)</td>
<td>(.93)</td>
<td>(1.40)</td>
<td>(.90)</td>
<td>(1.98)</td>
<td>(1.21)</td>
<td>(1.36)</td>
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<td>5.00</td>
<td>4.47</td>
<td>4.73</td>
<td>5.93</td>
<td>2.67</td>
<td>2.53</td>
<td>3.73</td>
<td>4.53</td>
<td>3.73</td>
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<td></td>
<td>(1.40)</td>
<td>(1.30)</td>
<td>(1.07)</td>
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<td>(1.11)</td>
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<td>(1.72)</td>
<td>(1.19)</td>
<td>(.88)</td>
<td>(1.30)</td>
<td>(1.44)</td>
<td>(1.53)</td>
</tr>
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</table>

F- Ratios

<table>
<thead>
<tr>
<th>a</th>
<th>1</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F = 8.82**

Note. S-I = Self-Instruction
DT = Didactic Teaching

Contrasts:  

\[ ^a S-I > DT \]
\[ ^b DT > S-I \]

** p < .01
Table 6
Means, Standard Deviations (SD) and Significant F Values for Total Scores on the Negative Match Variable

<table>
<thead>
<tr>
<th></th>
<th>Passage 1</th>
<th>Passage 2</th>
<th>Passage 3</th>
<th>Passage 4</th>
<th>Passage 5</th>
<th>Passage 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
</tr>
<tr>
<td>S-I</td>
<td>.67</td>
<td>.46</td>
<td>.93</td>
<td>1.47</td>
<td>1.13</td>
<td>1.33</td>
</tr>
<tr>
<td>DT</td>
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<td>.70</td>
<td>1.33</td>
<td>1.53</td>
<td>1.87</td>
<td>1.33</td>
</tr>
</tbody>
</table>

F-Ratios

| a₁      |           |           |           |           |           |           |
| b₂      |           |           |           |           |           |           |
|         |           |           |           |           |           |           |
| F = 5.02** |           |           |           |           |           |           |
| F = 9.10** |           |           |           |           |           |           |

Note. S-I = Self-instruction
DT = Didactic Teaching

Contrasts: a S-I > DT
b DT > S-I

** p < .01
Table 7
Means, Standard Deviations (SD) and Significant F Values for Total Scores on the Hit Variable

<table>
<thead>
<tr>
<th>Passage 1</th>
<th>Passage 2</th>
<th>Passage 3</th>
<th>Passage 4</th>
<th>Passage 5</th>
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<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
</tr>
<tr>
<td>S-I</td>
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<td>.47</td>
<td>1.07</td>
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<td>.67</td>
</tr>
<tr>
<td></td>
<td>(.74)</td>
<td>(.64)</td>
<td>(1.22)</td>
<td>(.82)</td>
<td>(1.13)</td>
</tr>
<tr>
<td>DT</td>
<td>.67</td>
<td>.73</td>
<td>.60</td>
<td>1.13</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>(1.11)</td>
<td>(1.10)</td>
<td>(.83)</td>
<td>(1.06)</td>
<td>(.50)</td>
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F-Ratios

<table>
<thead>
<tr>
<th>a 1</th>
<th>F = 8.12**</th>
<th>F = 5.36*</th>
</tr>
</thead>
<tbody>
<tr>
<td>b 2</td>
<td></td>
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</table>

Note: S-I = Self-Instruction
DT = Didactic Teaching

Contrasts:  

a $S-I > DT$

b $DT > S-I$

**p < .01
*p < .05
Table 8
Means, Standard Deviations (SD) and F Values for the Total scores on the Incorrect Variable

<table>
<thead>
<tr>
<th></th>
<th>Passage 1</th>
<th>Passage 2</th>
<th>Passage 3</th>
<th>Passage 4</th>
<th>Passage 5</th>
<th>Passage 6</th>
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<tbody>
<tr>
<td></td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
<td>Poor</td>
<td>Avge</td>
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<tr>
<td><strong>S-I</strong></td>
<td>.67</td>
<td>.33</td>
<td>2.27</td>
<td>1.17</td>
<td>1.27</td>
<td>1.06</td>
</tr>
<tr>
<td></td>
<td>(.62)</td>
<td>(.49)</td>
<td>(.93)</td>
<td>(.70)</td>
<td>(.79)</td>
<td>(1.09)</td>
</tr>
<tr>
<td><strong>DT</strong></td>
<td>.40</td>
<td>.20</td>
<td>1.07</td>
<td>.87</td>
<td>.67</td>
<td>.53</td>
</tr>
<tr>
<td></td>
<td>(.74)</td>
<td>(.56)</td>
<td>(.79)</td>
<td>(1.06)</td>
<td>(.82)</td>
<td>(.64)</td>
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**F-Ratio**

<p>| | | |</p>
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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>a1</td>
<td>F = 6.66*</td>
<td>F = 6.59*</td>
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<tr>
<td>b2</td>
<td></td>
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</tbody>
</table>

**Note.**  
S-I = Self-instruction  
DT = Didactic Teaching

**Contrasts:**  

- a S-I > DT  
- b DT > S-I

*p < .05*
more likely to answer a question correctly despite not identifying the QAR correctly. The didactic teaching group displayed the opposite pattern. They were more likely to identify the question-answer relationship category, but less likely to carry out the rest of the 3H strategy efficiently and provide an appropriate comprehension response.

Section 3

Three metacognitive questionnaires were administered to the subjects in this study. Two of these were oral questionnaires completed with all students. The third written questionnaire was administered only to the students in the self-instruction and didactic teaching conditions. The data collected provides qualitative as well as quantitative indications of intermediate grade students' metacognitive knowledge about reading.

Pre and Post-training Questionnaires

Examples of the students' responses from the pre and post-training questionnaires are provided in Appendix 9 and Appendix 10. The content of the student's answers was initially rated using Canney and Winograd's (1979) system for describing the theme of students' responses about reading as either an object focus, a decoding focus or a meaning focus (Table 9). General results showed that poor readers tend to provide fewer answers with a meaning focus than average readers. After training, more responses from both the self-instruction and didactic teaching groups were focused on meaning,
understanding and strategy use. The control group's answers also showed some increase in the number of references they made towards reading for meaning. This was probably due to the practice effect of the common items in the pre and post-test metacognitive questionnaires.

The protocols from the oral questionnaires were scored using the marking scheme provided in Appendix 8. A 2 (Status) X 3 (Condition) analysis of variance was conducted on the total scores of the before-training questionnaire and the total scores of the after-training oral questionnaires. A significant effect for Status was not evident for the before or after questionnaires. No interactions were evident. However, Condition proved significant for the after questionnaire results \[F(2,84) = 6.44, p < .01\]. Post hoc \( F \)-tests demonstrated that the metacognitive performance of trained readers was reliably better than that of untrained readers \[F(2,84) = 12.27, p < .01\]. Thus, QAR training increased the students' general metacognitive knowledge as it was measured by the questionnaire developed for this study.

A 2 (Status) X 3 (Condition) multivariate analysis of variance was run to further gauge the effect of training on students' metacognitive knowledge. This analysis used the difference scores between the five common items in the metacognitive questionnaires as the dependent variables. To obtain the difference scores, the before-training questionnaire response was subtracted from the after-training questionnaire response for the five common
Table 9
Focus of Students' Responses to Metacognitive Questionnaire

Object focus---
* reading a book
* listening to instruction by a teacher

Decoding Focus---
* learning the alphabet/learning vowels and consonants
* sounding out words
* saying words
* looking at words
* recognizing words
* learning words
* memorizing words
* blending words to form compound words
* spelling words
* writing words
* punctuating sentences

Meaning Focus---
* learning word meanings
* understanding word meanings
* remembering what is read
* interpreting signs and symbols
* thinking about what is read
* learning about people and the world
* a form/means of communication

Note. From "Schemata for Reading and Reading Comprehension Performance", by G. Canney and P. Winograd (1979), Technical Report No. 120, Urbana, IL: University of Illinois, Center for the Study of Reading.
questionnaire items. A significant effect on the omnibus F-tests was found for condition \( F(10, 162) = 2.45, p < .01 \). No effect for status or any interaction was evident. Univariate F-tests indicated that students' results differed reliably on post-test measures of question 3, "When you can't answer a test question, what do you do?". Post hoc F-tests indicated that trained students had a greater change in their scores on this question than untrained students \( F(2, 84) = 3.08, p < .01 \). There was no significant difference between the scores of students in the didactic teaching and self-instruction conditions. These data indicate that training increased students' metacognitive awareness of how to answer questions after comprehension passages. This was one of the goals of the 3H strategy.

Written Questionnaire

Three types of response was collected by the written questionnaire. Of the seven questions asked, five required that the student circle a number on a five point scale (5 very much to 1 not at all) to express an opinion about the 3H strategy (e.g. How well did you learn this strategy? Now that you have learned the "3H" strategy, how will you do on future reading tests given to you by your teacher?). Another item asked, "Would you encourage other children to learn this strategy?", and provided three alternatives (yes, maybe and no) for the student to circle. The remaining questionnaire item asked the students to write a response sentence to the question, "How do you think learning the 3H
strategy could help other children?". Results from the three parts of the written questionnaire will be presented separately.

The first data gathered from the written questionnaire was the attitude response score. This score was based on those items which required students to circle a response from a scale of 5 (very much) to 1 (not at all). The means for both groups of trained students were high. Of a possible score of 25, the self-instruction condition achieved an average of 20.80. The students in the didactic teaching group displayed an mean score of 20.27. No further analysis was carried out to examine the sum of students' responses to these five questionnaire items because of the sameness of their scores.

In all, 60 students from the self-instruction and didactic teaching conditions completed this written questionnaire. Of these, 52 responded that they would encourage other children to learn the 3H strategy. Eight students circled the alternative "maybe", four from the self-instructional training condition and four students from the didactic teaching group. No students responded that they would not encourage others to learn about question-answer relationships.

Written comments by students centered around the 3H strategy's utility in helping learners "answer questions", "read carefully" and "understand more". One student really proved she had learnt the 3H strategy by providing the following response to the questionnaire item asking how students thought the
3H strategy could help other learners:

"In my Head. They could learn how to read much better and answer questions correctly".

This very thorough student had identified the question-answer relationship appropriate to the questionnaire item prior to providing her response!

Examples of other responses from the written questionnaire are provided in Appendix 11. The overall results of the written questionnaire show that students in both experimental groups had a positive opinion of the 3H strategy.

Summary of Results

The findings of this study indicate that, as predicted, the 3H question-answer relationship strategy was useful in increasing students' comprehension performance. Also as predicted, self-instructional training of the strategy was more effective in enhancing reading comprehension than didactic teaching. However, the hypothesised greater training effect from self-instruction on poor readers compared to average readers was not found.

In examining reasons for the performance of students in the self-instruction condition, the data involving direct measures data were analysed. Findings indicate that poor and average students used the 3H strategy in similar ways. Poor readers were more likely, however, to use the self-monitoring component of the three self-questions. Within these data, there was a trend that suggests students used the self-monitoring aspects of self-instruction more
towards the end of testing. In relation to the patterns of strategy use explored by the positive match, negative match, hit, and incorrect variables, self-instruction students tended to be more accurate and consistent in providing appropriate comprehension answers than didactic teaching students. Indications are that students in the didactic teaching condition classified more QAR categories correctly, but were not able to match these with correct comprehension responses as often as self-instruction students. This suggests that the steps of self-instruction assisted students in completing all steps of the 3H strategy from QAR classification to writing an appropriate response answer. The analysis of test passages, divided into post-test, maintenance 1 and maintenance 2 subgroups, showed that students trained by self-instruction were more likely to continue their strategy use and retain comprehension gains over time. Information from the metacognitive questionnaires indicated that trained students increased their metacognitive knowledge as a result of training, particularly their awareness of how to answer comprehension questions after a passage. Findings from the written questionnaire showed that students who learned the 3H strategy found it useful and would recommend it to their classmates.
V. Discussion

The research reported in this thesis investigated the effect of comprehension strategy training on students' reading performance. The comprehension strategy, the 3H question-answering strategy, involves increasing students' awareness of specific question-answer relationships. The study also investigated the comparative effectiveness of self-instruction and didactic teaching as question-answer relationship training conditions, and their suitability for use with poor and average students. Three hypotheses were set for this study. In brief, they were (1) that students trained in the 3H question-answering strategy would outperform untrained students on reading comprehension tests; (2) that students trained by self-instruction would perform better than students who had learned the 3H strategy through didactic teaching methods; and (3) that self-instructional training effects would be greater for poor readers than average readers.

Hypotheses of the Study

Concerning Hypothesis 1, the data indicated that training of the 3H question-answer relationship strategy was effective in enhancing the reading comprehension of intermediate grade students. This result replicates the findings of previous question-answer relationship research from which the 3H strategy originated (e.g. Raphael, 1980; Raphael & McKinney, 1983; Raphael &
In addition, the success of the 3H question-answering strategy adds support to the body of research which has demonstrated the usefulness of direct teaching of comprehension processes (Duffy, Mason & Roehler, 1984).

The results from the current study also indicated that, as predicted in the second hypothesis, self-instructional training was more effective in enhancing reading comprehension than the didactic teaching of the 3H strategy. This finding supports the conclusions of some recent research that suggests the particular usefulness of self-instruction as a method for teaching complex tasks and also the application of this technique to academic areas (e.g. Johnston, Whitman & Johnson, 1980; Evangelisti, Whitman & Johnston, 1985).

Further, the indication that self-instruction was more effective than didactic teaching, is of importance because of the implications of this finding for intervention research. It was argued in Chapter 11 that the self-monitoring component of metacognition should be included in academic interventions as well as the awareness aspect of this construct. The technique of self-instruction combines the teaching of both self-regulation and self-evaluation skills with students' strategy use. In comparison, didactic teaching is more concerned with the presentation and explicit explanation of strategy content. Therefore, evidence of the success of self-instruction when compared to traditional didactic teaching can be taken to indicate support of the effectiveness of including self-monitoring processes in strategy training.
The third hypothesis, that self-instructional training effects would be greater for poor readers than average readers, was not supported by the data. The results indicated that the effect of self-instruction was equally beneficial for both poor and average students.

There are two possible explanations offered for these findings. The first is that the poor readers were hampered in their application of the 3H strategy by the reading level of the test passages. These passages ranged in difficulty from grade equivalents on the Dale-Chall readability formula of 4.8 to 6.2. (Harrison, 1980). As the subjects in the poor reading group were performing at least one year behind their grade level, the passage difficulty could have influenced their application of the 3H strategy. This is a reasonable possibility because poor readers from grade five in this study were, by definition, reading at or below the grade four level.

The test passages and their levels of readability were part of an attempt to build some ecological validity into the current study for both grade five and six students. It was considered important that the average grade six students in the study should be given some passages which approximate their reading level. In addition, a brief survey of class texts showed that many of the reading books used by grade five students contained stories above their reading level, so it was considered that practice on more difficult passages could assist the students in preparing for their class assignments. The experimenter did make
an attempt to ameliorate the difficulty of reading the training and test passages and questions through guiding the students in taking turns to read aloud each paragraph. However, the students' independent reading to locate answers was obviously involved in the comprehension tasks.

Certainly, in this study poor readers in all conditions had to cope with passage difficulty, but it is suggested that after the sizeable improvement in comprehension performance attributable to the QAR strategy, the passage difficulty factor could have intervened to hamper further significant reading improvement in the self-instruction condition. Clearly, there appears to be no simple solution to the problem of materials for cross-ability studies. Common passages invariably mean that students of different ability experience differing levels of difficulty (Pearson & Johnson, 1985).

The second explanation offered for the lack of substantiation of Hypothesis 3 relates to the students' application of the strategy to comprehension tasks. The breakdown of data from the direct measures of strategy use indicates that there was room within the current study to improve the consistency with which both poor and average students applied the three basic self-questions to question-answering tasks. If poor readers had applied all three parts of the strategy more conscientiously perhaps the self-instructional training effects for them would have been significantly greater, as hypothesised, rather than only showing a trend in the predicted direction. These comments like any
observations made on self-report or questionnaire data, are made tentatively because there is some concern over the ability of intermediate students to accurately recall and report on their question-answering behavior (cf. Borg and Gall, 1983).

In general, the direct measures data provide some interesting insights into students' strategy use. This information helps furnish an explanation as to why Hypothesis 3 was not supported and justifies an emphasis on teaching students to apply all the steps of a self-instructional package consistently. Additionally, there is an indication from those questions which students indicated as most important to their strategy use, that the self-monitoring aspect of a self-instruction intervention should be emphasised because this component may become increasingly important as other steps become automatic.

To this point, the discussion has focused on results supporting the training of question-answer relationships to enhance reading comprehension, and the indications that self-instruction improved reading performance for both poor and average intermediate students. Findings from the analyses of comprehension performance related to the six test passages and the variables which investigate patterns of strategy use will now be considered. These data appear to reinforce and extend the points already made in relation to the utility of QAR research and self-instruction.
Results from Test Passages

A suggestion of the better maintenance of comprehension performance in the self-instruction condition comes from an examination of the passage data in relation to the three sets of tests—immediate post-tests, first maintenance tests, and second maintenance tests. On the immediate post-test measures, didactic teaching students performed at a slightly higher level than those taught by self-instruction. The first set of maintenance tests were influenced by the effect of passage 4, "Written in the Trees". This passage probably decreased general comprehension performance because of confusion due to students' prior knowledge about the uses of annual rings of trees. However, self-instruction was significantly more effective for this passage than didactic teaching. It is suggested that on this comprehension test, the steps of self-instruction may have prevented prior knowledge from interfering as much for average students: Self-instruction may also have given poor readers more direction in locating the answers than didactic teaching. Results from the final set of maintenance tests demonstrate an actual improvement in comprehension scores for the self-instruction group compared to the immediate post-tests. This is particularly evident for passage 6, the last test passage, administered more than two weeks after the completion of training. As the test passages were conservatively arranged with regard to readability level, this finding indicates that the students in the self-instruction condition
achieved an increase in performance on the most difficult set of test passages. In contrast, the average performance of the students in the didactic teaching group on the final set of maintenance tests was eight percentage points below their level on the immediate post-tests.

These trends in the data suggest the importance of designing studies which include the collection of maintenance data. Researchers should not only investigate whether strategy use is maintained because of the importance of retention of what has been learned in a classroom setting, but also because the learning of some strategies may change and consolidate with time. Using only immediate post-test measures may increase the likelihood of Type II error (Wong, 1985). For example, in this study, students in the didactic teaching condition were originally performing marginally better than self-instruction students on measures of comprehension performance. This trend was reversed by the end of testing. The above suggestion of better maintenance of strategy use through self-instruction would have been strengthened had the superiority of this training condition over didactic teaching been consistent across all six test passages.

Other Dependent Measures

The dependent measures of category, positive match, negative match, hit and incorrect provide additional information about students' use of the 3H strategy. Overall the results showed that although students in the didactic
teaching condition identified more QAR categories correctly than students in
the self-instruction condition, they provided less correct comprehension
responses. These findings are interpreted to suggest that although students
taught by didactic teaching mastered the question-answer relationship
identification task, they were less consistent in their total strategy use than
students in the self-instruction group.

The patterns of QAR identification and comprehension response for students
in the self-instruction group indicate the consistency with which their
category choice and written answer matched. The self-monitoring aspects of
the 3H strategy (Question 3) emphasised that students check their answers and
have a reason for the QAR classification and response they provided. It is
suggested that this training in self-monitoring assisted students in their
consistent strategy use in the self-instruction condition.

The importance given to reading carefully in self-instruction training
(Question 1) and checking the content of the question and its answer to see if
they "fit" (Question 3) could also explain the better performance of students in
answering comprehension questions without correctly identifying the QAR
category. Reading for meaning and providing appropriate written
comprehension responses were emphasised in training students. The 3H
strategy was introduced as a way to help them accomplish these tasks.
Therefore, the higher comprehension score could reflect how students in the
self-instruction condition focused on the content of the comprehension task and not only the QAR strategy.

In summary, the data collected from the test passages and the dependent measures, which relate QAR classification and comprehension responses, provides some evidence to suggest that self-instruction was more effective than didactic teaching because it guided students in applying the 3H comprehension strategy more consistently and thoroughly. In particular, the self-monitoring aspects of strategy use were suggested as important for the appropriate use of the 3H strategy. Specifically, self-monitoring seemed to have an effect in ameliorating the impact of inappropriate prior knowledge on comprehension performance. However, this observation, based only on passage 4, is made with caution.

There is also some evidence, from the performance of the self-instruction group on the last test passages, that this condition was more effective in promoting the maintenance of comprehension improvement. This finding, along with indications from the direct measures data that self-monitoring (Question 3) was rated as a more important part of the strategy during the last three tests, implies both the importance of self-monitoring, and the way in which students may change their use of strategy over time.

**Metacognitive Questionnaires**

The data from the oral questionnaires indicated that QAR training fostered
an increase in metacognitive knowledge, as it was measured in this study. The reading focus of students' responses was observed to shift towards a more meaning-orientated perspective. Students in the training conditions also increased their performances from pre-test to post-test. However, there were no significant differences on measures of metacognitive performance between the subjects in the self-instruction and didactic teaching conditions. All students were positive in their evaluation of and opinions about the 3H strategy.

In general, the questionnaire results show that QAR training did increase students' metacognitive awareness of some aspects of reading. In particular, students' knowledge about how to answer a comprehension test question after a passage was heightened. The questionnaire results reinforce the link between QAR training and metacognition.

Implications

The most important implications of the current study stem from the finding that question-answer relationship strategy training, which combines both the awareness and self-monitoring aspects of metacognition, can enhance poor and average students' reading comprehension performance more than training which instructs the same content, but does not attend to self-monitoring processes. Implications can be drawn on two levels. First, this study has indicated that self-instructional training interventions are more likely to enhance students'
performance than didactic teaching. Second, the total 3H strategy package, which includes self-instructions to guide strategy use, has direct application to the classroom.

Evangelisti, Whitman and Johnston (1985) called for further research to examine the comparative effectiveness of self-instruction and didactic teaching across a wide range of academic tasks which vary in difficulty. This study has shown that self-instruction is an effective procedure for teaching reading comprehension and, therefore, compliments the current literature on the use of self-instruction in academic areas. As the applicability of instructional procedures that can be administered to only one student at a time is limited (Graham, 1985), the present study has indicated that self-instruction can be used successfully with groups of four or five students. As small group remedial reading instruction is common in schools, the implication is that self-instructional strategy training can be easily accomplished in this setting.

The 3H question-answer relationship strategy lends itself to a variety of uses in the regular classroom classroom and the remedial center. The QAR training it provides can be a basis for including a variety of question types into comprehension lessons. This can avoid the situation that is often reported where teachers overuse simple explicit questions (Durkin, 1978-79; Guzak, 1967, Shake 1986), particularly when teaching poor readers (Sadker & Sadker,
1982). Students, as well as teachers, can use the 3H strategy to develop a variety of different questions about a reading passage. Additionally, the 3H labels (Here, Hidden, In my Head) can be used as clues to prompt students who are having difficulty answering questions. The three self-questions which guide strategy use can be prominently displayed on charts in the student work areas. This type of instructional aid reduces the need for constant teacher interaction (Schunk, 1986) and can free teachers to concentrate on those students who need extra assistance.

The 3H strategy may also be particularly suited to use as a tutoring task. In the remedial room or with small groups in the classroom, students who have mastered the 3H strategy, could introduce it to their peers or to younger students. This tutoring activity could enhance the poor readers' sense of self-efficacy and would provide potent direct measures of how well the student understood the strategy s/he was explaining.

This discussion will conclude with research implications. Observing students as they tutor others in a specific strategy is recommended as a measure of direct strategy use for future research. It is also suggested that the individual profiles of learners which make them achieve well under self-instruction should also be explored. There is a tendency noted by Kosiewicz, Hallahan, Lloyd and Graves (1982), and observed in this study for some students to spontaneously proceed to covert instruction. Whether this
tendency reflects a sophistication in the use of self-instruction or
embarrassment at instructing aloud has not been explored in relation to
individual differences. Just as the effect of self-instruction on individual
learners should be explored, so too should the effect of individual components
of self-instruction. The identification of the components of self-instruction
which promote optimal maintenance and generalization of strategy use is the
research challenge for the decade (Ryan, Weed, & Short, 1985). Findings from
research directed to this challenge, and towards an examination of the relative
utility of didactic teaching and self-instructional training for a wide range of
academic tasks, will have considerable significance for teachers, those who
design educational programs, cognitive psychologists, and those concerned
about the special needs of children.
References


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APPENDIX 1

Oral Metacognitive Questionnaire Before Training

Metacognitive Questionnaire

Question 1.

Suppose you have a friend who has a little brother/sister who was going to start school soon. And that little boy/girl said to you, "My mum said that when I go to school, I will read ________, what's reading?" What would you tell him/her that reading is all about?

Metacognitive Questionnaire

Question 2.

Do you think reading is important? Why?

Metacognitive Questionnaire

Question 3

When you don't do well in a class reading test, what do you think are the reasons?

Metacognitive Questionnaire

Question 4

When you can't say a word in your reading book, what do you do?
Metacognitive Questionnaire

Question 5

When you can't understand a word or a sentence in your textbook, what do you do?

Metacognitive Questionnaire

Question 6

When you can't answer a question about a passage you have read, what do you do?

Metacognitive Questionnaire

Question 7

Many people think that reading is one of the most important things that you do in school. What would you say that reading is?

Metacognitive Questionnaire

Question 8

What things does a person have to learn to be a good reader?
Metacognitive Questionnaire

Question 9

What things does a person have to do to be a good reader?

Metacognitive Questionnaire

Question 10

When a person in first grade is reading, are they doing the same things as when a person in grade five (or six) is reading?

Metacognitive Questionnaire

Question 11

Why do you think some children have trouble reading?

Metacognitive Questionnaire

Question 12

What things do you need to learn to be a better reader than you are right now?
APPENDIX 2

Metacognitive Questionnaire After Training

Metacognitive Questionnaire

Question 1.

Suppose you have a friend who has a little brother/sister who was going
to start school soon. And that little boy/girl said to you, "My mum said that
when I go to school, I will read. _______, what's reading?" What would you tell
him/her that reading is all about?

Metacognitive Questionnaire

Question 2.

Do you think reading is important? Why?

Metacognitive Questionnaire

Question 3

When you can't answer a question about a passage you have read, what do
you do?
Metacognitive Questionnaire

Question 4

What things does a person have to learn to be a good reader?

Metacognitive Questionnaire

Question 5

What things does a person have to do to be a good reader?
APPENDIX 3

Written Metacognitive Questionnaire - After training

1. Did you enjoy learning the "3H" strategy for answering comprehension questions?

   very much  a lot  some  not really  not at all
   
   5  4  3  2  1

2. How well did you learn this strategy?

   very well  well  o.k.  not very well  not well at all
   
   5  4  3  2  1

3. How much do you think the "3H" strategy will help you in class when you discuss stories and answer questions about them?

   very much  a lot  some  not much  not at all
   
   5  4  3  2  1

4. How much do you think the "3H" strategy will help you in class when you answer written comprehension questions?

   very much  a lot  some  not much  not at all
   
   5  4  3  2  1
5. Would you encourage other children to learn this strategy?
   yes    maybe    no

6. How do you think learning the “3H” strategy could help other children?

7. Now that you have learned the “3H” strategy, how will you do on future reading tests given to you by your teacher?
   very well    well    o.k.    not very well    not well at all
   5    4    3    2    1
Large animals often live longer than small ones. The giant turtle can live for 152 years or more. A cat only lives twenty years. Mice and smaller animals live only a few years. Some insects live only for a single day.

1. What type of animals often live the longest?

2. Which lives the longest: the turtle or the cat?

3. How old is the oldest animal you know?
Plants grow almost everywhere. They grow in the city and in the country. They grow in hot deserts and even under the snow. Some plants grow under the water. Almost anywhere you look out of doors, you see plants. Plants grow wherever there is soil, sunshine and water.

1. What do plants need to grow?

2. What plants grow in deserts?

3. Would plants grow in a city covered in snow?
One kind of starfish is called the sunstar. It may have seven or more rays. The rays look like the lines around the sun. This starfish grows to be over twelve inches wide. Like the setting sun, it is also red.

1. Where would you most likely find a sunstar starfish?

2. What are two ways that this starfish looks like the sun?

3. How wide does this starfish grow to be?
While you are sleeping in your bed at night, animals in the fields are sleeping too. So are the animals in the forests, lakes and rivers. Like you, they must rest.

Some animals sleep on the ground. Some sleep in the water. Some sleep in trees. Each has its own way of making itself comfortable.

If you tried to sleep standing up, you would probably fall down. But a horse can just stand on its four legs, relax its muscles and go to sleep.

When a horse is tired, it may lie down on its belly or on its side. But much of the time, a horse sleeps standing up. It just closes its eyes and dreams of whatever it is that horses dream about.

1. What would happen if you tried to sleep standing up?

2. Name four places that animals sleep.

3. What might a horse dream about?
How Fish Get Food

When we want to catch seafood, we must use different kinds of tools and traps to catch it. But animals that live in the water must catch their food without bait, nets, harpoons or fish hooks.

How does a fish catch its dinner? A fish is able to get food by using its mouth as hunting equipment. Different kinds of fish have their teeth in many different places in their mouths. Some have their teeth on the roofs of their mouths. Some have them on their tongues. Some fish even have their teeth in their throats.

If you were to open a herring’s mouth and look along the gill slits, you would see two rows of little rods set close together called gill rakes. They look like tiny rakes. Sea water passes through a herring’s mouth and out through the gills. If there are any tiny plants and animals in the water, the gill rakes act like built-in strainers and hold them back for the fish to swallow.
Reading Comprehension Test Questions on Passage: Fish

1. What must we do if we want to catch seafood?

2. Why might fish have different kinds of teeth?

3. How are fish able to get food?

4. What are two different places that fish have their teeth?

5. What do herring's gill rakes look like?
The coconut is the biggest seed in the world. It is also one of the tastiest. Coconuts grow in warm places like Florida and Hawaii on tall palm trees. This large seed has two shells covering it. One is an outer shell that is brown and hairy. Beneath these two shells you will find delicious meat.

There are three things you must do to get to the meat inside. If you shake the coconut you can hear something sloshing around inside. This is the coconut juice. The first thing you do is get the juice out. You need to find three little black spots on the bottom of the coconut called the "eyes". Hammer a nail into each of these spots, and then pull the nail out. Set the coconut on a small bowl and let the juice drain out through the holes. Shake the coconut a little to make the juice flow out.

Second, you should put the coconut in an oven at 350 degrees for about thirty minutes. This will make the shell easier to crack.

Cracking the shell is the third step to getting the meat. After the coconut cools a bit put it on a towel on the floor and hit it as hard as you can with a hammer. Keep pounding until the shell cracks.

When the shell is cracked, you can see the coconut meat. There will be a thin brown skin on the white meat. Peel this off with a vegetable peeler.

You can cut the coconut into little pieces for a chewy snack. You can grate it and sprinkle it on deserts. You can use it in cakes. You can use it in cookies too.
Reading Comprehension Test Questions on Passage: How to Crack a Coconut

1. What three steps do you need to follow to get to the coconut meat?

2. Where do coconuts grow?

3. Why would you put a coconut on a towel on the floor to crack it?

4. How can you use coconut meat? Write three ways to use it.

5. If you don't live in Florida or Hawaii, where would you find a coconut?

6. What is the biggest seed in the world?
Dolphins are mammals that live in the water. They look like fish, but they are not fish. Fish breathe in the water, but dolphins can’t. A dolphin has to breathe air. That is why a dolphin comes to the top of the water so often. A dolphin usually comes to the top of the water every half minute or so. However, they can stay under the water for six or seven minutes if they have to. How do they keep from drowning? They hold their breath.

Dolphins are friendly and useful animals. They usually live in a group. This group is called a school. Dolphins eat together in the school. They usually stay together in the school when they sleep too. Dolphins help each other in many ways. They help each other when an enemy finds them. The killer whale and the shark are enemies of the dolphin. If an enemy comes too close, the dolphins make a circle. Usually the enemy won’t try to attack them in such a group. If a dolphin should become injured or sick, another dolphin will become its nurse. The nurse will swim around with the sick dolphin. If the sick one becomes too deeply asleep, the nurse will give it a gentle push up for a quick breath of air.

Studying dolphins can teach us many things. Dolphins are able to keep away from things in the water no matter how dark or muddy the water is. This is because they have sonar. Sonar is the ability some animals have for using sounds to find their way around. Doctors are interested in dolphin sonar. They hope to make a sonar that will help blind people.
Comprehension Test Questions on Passage: Dolphins

1. Who are the dolphin's enemies?

2. What are two ways a "nurse" dolphin looks after a sick or injured dolphin?

3. What is sonar?

4. How might a dolphin become injured or sick?

5. Why would a dolphin stay underwater for six or seven minutes?

6. What things do dolphins do together as a school?
You have probably run head first into a spider web at one time or the other. Did you stop to notice how neatly it had been put together? The spider works very carefully, often producing a web as beautiful as it is useful. This is because webs serve two very important purposes for the spider. First, the web is where the spider lives. Second, the web is used by the spider to catch insects for food.

Of all the different kinds of spider's webs, the orb web is probably the most beautiful. It is called an orb web because the lines of the web go around and around in circles. The owner of this orb web is called the orb weaver. He makes the web from a very strong silk, the finest thread found in nature. It is so strong that if you were to make a rope of it one inch thick, it would be stronger than a one inch thick rope made of iron!

The orb web usually hangs straight up and down. This way an insect flying through the air will run into it and be caught. The circling lines of the web stretch and are very sticky. The flying insect gets stuck by the sticky material. The spider waits in the centre or along the sides of the web. When an insect gets caught on the sticky lines, the spider moves along one of the crosslines. Since the crosslines are the only parts of the web that aren't sticky the spider will not get trapped.
Reading Comprehension Test Questions on Passage: Web Weavers

1. What does the spider do with the insect that gets caught in its web?

2. Which lines of the web stretch and are very sticky?

3. What two purposes does the web serve for the spider?

4. What is the spider who builds the orb web called?

5. Why do the lines of the web need to be made from very strong material?

6. How does the orb weaver catch an insect with its web?
The Dragon's Tears

Far away in a strange country there lived a dragon. The dragon's home was in a deep mountain cave. Very often when the people living nearby were gathered in the evening by the fire, one would say, "What a terrible dragon is living near us!" Another would agree saying, "Someone should kill him." Whenever children were told about the dragon they were frightened.

But there was one funny little boy who was never frightened. All the neighbours said, "Isn't he a funny little boy?" When it was almost time for that funny little boy's birthday, his mother asked him, "Who would you like to invite to your birthday party?". Then that little boy said, "Mother, I would like to ask the dragon." His mother was very much surprised and asked, "Are you joking?" "No," said the little boy very seriously, "I mean what I say. I want to invite the dragon." And, sure enough, on the day before his birthday, the little boy stole quietly out of his house. He walked and he walked and he walked until he reached the mountain where the dragon lived. "Hello, Mr Dragon," the little boy called down the valley in his loudest voice. "What's the matter? Who's calling me?" rumbled the dragon, coming out of his cave. Then the little boy said, "Tomorrow is my birthday and there will be lots of good things to eat at my party, so please come Mr Dragon. I came all the way to invite you."

At first the dragon couldn't believe his ears and kept roaring at the boy. But the boy wasn't frightened at all and kept saying, "Please, Mr Dragon, please come to my party."

Then the dragon stopped roaring and began to cry. "What a happy thing to happen to me," the dragon sobbed. "I have never had a kind invitation from anyone before." The dragon's tears flowed and flowed until at last they became a river. Then the dragon said, "Come, climb on my back and I'll give you a ride home." The boy climbed bravely onto the back of the ferocious dragon and away the dragon went, swimming down the river of his own tears.

But as he went, by some magic, his body changed it's size and shape. Suddenly -- what do you know! -- the little boy was sailing bravely down the river toward home as captain of a dragon-steamboat!
Reading Comprehension Test Questions on Passage: Dragon's Tears

1. Where was the dragon's home?

2. Who was never frightened by the dragon?

3. What did the little boy do after he walked to the dragon's mountain on the day before his birthday?

4. Why did the dragon start to cry?

5. What happened when the dragon began to swim the river to take the boy home?

6. What did most of the people living near the dragon think of it and what did they think should be done with it?

7. What is another story you have read that has a dragon in it?

8. Why do you think the little boy wasn't afraid of the dragon?
A Seashell is His House

A hermit crab does not have a hard shell as most crabs do. His long, soft body makes a nice meal for a hungry fish. He needs a way to protect himself. To make himself safer he moves into the empty shell of a sea snail or other sea animal.

The hermit crab lives safely inside his borrowed house. Only his legs and eyes stick out from the shell opening. He can move around with his house on his back and still see where he is going.

The hermit crab has only one problem. The shell cannot grow in size as he grows larger. There comes a time when his house is too small.

The hermit crab must keep his old home until he finds another. But finding the right home is not always easy. He is like a man shopping for a new coat. He must make sure he gets one that fits properly.

When the hermit crab sees a shell that looks right, he leaves his old one. He backs into the new seashell and tries it on for size. If it is too large, a fish might pull him out. If he picks a house that is too snug, he will not be comfortable. The hermit crab searches until he finds a house that is just right for him.
Reading Comprehension Test Questions on Passage: Seashell

1. What are two good points about the hermit crab's seashell house?

2. Have you seen hermit crabs at the beach? Draw some if you have.

3. Why is it important for the hermit crab to have a house that is not too large or too snug for him?

4. What does the hermit crab do to make sure his new house is the right size for him?

5. What parts of the hermit crab stick out from his borrowed shell?

6. What is another animal that can move around with its house on its back?
The Platypus

The platypus is one of the oldest animals in the world. It is found in Australia.

The platypus has a bill that is broad, long and flat. It looks like a duck's bill, but it is different. The platypus has a bill that is not as hard as the duck's bill. Its bill is as soft as leather. Many sensitive nerve cells cover the bill. When swimming in the water, the platypus looks much like a furry seal. Its feet are webbed and have long, sharp claws.

The platypus lives near the water and catches much of its food under water. It hunts along the mud bottom of a pond at dawn and in the evening. The platypus keeps its eyes tightly closed when swimming under water. The nerves on its bill help it find and catch its food. The tiniest movement of its prey is sensed by the sensitive bill. The platypus quickly finds and eats worms, crayfish and other food from the bottom of a pond or stream.

The duckbilled platypus breathes air and breast-feeds its young. But the baby platypus is not born alive. The female platypus lays eggs. When it is egg-laying time she digs a long burrow at the water's edge. Here the female platypus hides to lay her eggs.

After the eggs are laid, she curls up in a ball. The female platypus holds her eggs to her chest and keeps them warm for nine or ten days. When the eggs hatch the young feed from their mother. The platypus would make a nice pet. It is clean and well-behaved and friendly. Swimming, playing and searching for food in a pond help keep the platypus clean and neat.
Reading Comprehension Questions on Passage: Platypus

1. Why does the female platypus curl up in a ball for nine or ten days after her eggs are laid?

2. If Australia gives the people of B.C. a platypus, where do you think a good place to keep it would be? Why?

3. What kinds of things does a platypus eat?

4. What are two ways that the bills of the platypus and the duck are different?

5. Why would a platypus make a nice pet?

6. What are two animals that parts of a platypus look like?

7. What activities keep the platypus clean and neat?

8. Why does the platypus close its eyes tightly as it is hunting along the muddy bottom of a pond? Do you swim with your eyes open or closed?
The Cactus

Cacti are remarkable plants. All day without any shade they stand in the desert. The hot sun beats down on them. They receive only a very short period of rain each year.

The cactus can live in such conditions by being an expert at storing water. Unlike our leafy plants which evaporate a lot of water, the cactus has either no leaves or ones as small as scales. The stems have a wax-like surface which also helps prevent the loss of water.

Inside the stems are large cells for storing water and on the outside, hairs and spines which give some protection against the sun’s rays.

During the dry season, the cactus plant grows little if at all. As soon as there is any rain, it’s roots, which grow near the surface, soak up the moisture and the cactus will have a sudden spurt of growth. When the rain is over, the plant will produce beautiful blossoms.

Although many kinds of cacti are found in Europe, Africa and Australia, the true home of the cactus is in the New World stretching from British Columbia as far south as Argentina.

The biggest cactus in the world is the giant suguaro or suwarrow which grows to a height of twelve metres with some shallow roots stretching out for nearly nine metres. Some plants take up to one hundred years to reach their maximum size.

One of the best known cacti is the prickly pear which grows in B.C. The flat pear-shaped joints of its stems bear purple flowers.

Many desert animals depend upon cacti to stay alive. Some dig deeply in the desert sand in search of underground stems produced by the cacti. Here they find stored water. For some animals the cactus stem is also a food supply. Others use the shade the cactus provides to escape the desert heat.
Reading Comprehension Test Questions on Passage: Cactus

1. Why do you have to be careful around cactus plants?

2. How tall does the biggest cactus in the world grow to be?

3. Why are cacti remarkable plants?

4. What are two ways the cactus saves water?

5. How would you care for a cactus garden?

6. When does the cactus produce its beautiful blossoms?

7. In what ways do desert animals depend on cacti for staying alive?

8. Which cactus plant is well known and grows in B.C.?
How much rain has fallen on the earth in the past? Man has not always kept weather records. Because scientists need a way to learn about past rainfall, they study tree rings.

A tree's trunk grows bigger each year. Beneath its bark, a tree adds a new layer of wood each year it lives. If you look at a tree stump, you can see the layers. They are called annual rings.

On some trees, all of the rings are the same width. But the ponderosa pines that grow in the American southwest have rings of different widths. The soil in the southwest is dry. The pines there depend on the rainfall for water. In a year of good rainfall, they form wide rings. In a dry year, they form narrow ones.

Scientists do not have to cut down a pine tree to see its rings. With a special tool, they can remove a narrow piece of wood from the trunk without harming the tree. Then they look at the width of each ring to see how much rain fell in the year it formed.

Some pines are hundreds of years old and have hundreds of rings. These rings form an annual record of the past rainfall of the southwest.
Reading Comprehension Test Questions on Passage: Written in the Trees

1. What are annual rings on a tree trunk?

2. What do scientists find out when they look at the width of each annual ring on a pine tree?

3. Have you seen annual rings on a tree stump? Draw some if you have.

4. Do some trees have rings the same width?

5. Why is it good that scientists can study the annual rings of a tree without cutting the tree down?

6. Where would you find the most recent annual ring of a tree?
Children of the Forest

The Mbuti pygmies live in Africa in the depths of the Congo’s tropical rainforest. They are less than five feet tall. Because the forest provides all they want, they call themselves “Children of the Forest.”

Pygmies live together in groups. The members of a pygmy band are not always related. From time to time, some families leave and others come, yet the band always stays together. The men hunt wild game with bows and poisoned arrows while the women gather mushrooms, nuts, roots and berries.

In some parts of the forest, men women and children hunt together. Each family has its own hunting net which is hundreds of feet long. The women and children walk through the bush and drive animals into the nets. The men then kill the trapped animals with spears.

A band of pygmies stays in one area for as long as the food supply lasts. Then they move on and pitch a new camp. They use branches and huge leaves to build their beehive-shaped shelters.

Even though a pygmy band has no leader or chief, each person knows what the group expects of him. Even children have certain duties. For example, they must often stay at home with their grandparents while the adults hunt. Their lively play helps keep wild animals away from the camp. Each person in the band is loyal to the others.
Name: 
Grade: 
Treatment Condition: 
LAC/no LAC 

Reading Comprehension Test Questions on Passage: Children of the Forest 

1. How tall are African pygmies? 

2. Why don’t pygmies live in the same place in the forest all the time? 

3. Do the pygmies hunt like hunters in B.C.? How is their hunting the same or different. 

4. What do pygmy women gather in the forest for food? 

5. Pygmy children help their parents by staying at home with their grandparents. How do you help your parents? 

6. What are three tools or weapons that pygmies use to hunt or trap animals?
The Emperor Penguin

The Antarctic is the home of the biggest of all penguins, the emperor penguin. It stands almost a metre high and weighs around 45 kilograms.

The emperor is a handsome bird with its lemon front, grey-blue back and bright orange patches on its neck. Like all penguins, the emperor cannot fly. Instead it waddles around or slides on its stomach on the slippery ice. When hungry, these penguins dive off their icefloes into the sea to catch fish or squid underwater.

In late May the emperor penguin hen is ready to lay her single egg. Once it has appeared, the male penguin takes it on his feet and covers it with the skin of the lower part of his body. Here the egg is kept off the ice and the blubber y skin keeps it protected against damage. A nest would be impossible to build in Antarctica as any materials would be quickly covered with snow or ice.

While the male is minding the egg, the hen goes off to search for food. In winter the ice may stretch up to 160 kilometres out to sea, so she has to make a long journey to reach the open sea.

After satisfying her hunger and rebuilding her strength, the hen returns home at the end of July just as her chick is about to hatch.

It is a mystery how the hen almost always turns up just in time for the hatching of her egg. On the odd occasion when she is a little late, perhaps delayed by bad weather conditions, the male can even take over the initial feeding of the downy young chick. He produces a special milky substance from the crease of his empty stomach.

Once the pair are reunited the parents take turns to look after their offspring. The hungry father who is approximately 40 percent lighter than he was when he started minding the egg, is glad to have some freedom to search for food. The mother feeds the chick on half digested fish and shrimp from her crop.

Already the winter ice has probably started to break up. As the weeks pass, the distance across the ice to the open sea becomes less and less and the daylight hours lengthen. The chick grows quickly and can soon stand on its own feet. Sometimes while the parents feed, the young penguins are left in groups called creches.
Finally with the approach of summer, the ice all around the penguins begins to crack up and flood. As the family floats on its individual icefloe, the young penguin needs little encouragement to find its own food. By the beginning of January it will be able to look after itself, leaving the parents to prepare for the next season’s egg.
Reading Comprehension Test Questions on Passage: Emperor Penguins

1. What colours is an emperor penguin?

2. If you had a penguin for a pet, how would you look after it?

3. How can the male penguin care for the egg and the newly hatched chick?

4. When they are hungry, what do the emperor penguins catch to eat?

5. What is a group of young penguins called?

6. What are three things that a penguin chick could eat after it has hatched?

7. If a penguin chick is able to look after itself by the beginning of January, how old is it then?

8. What is another bird besides the penguin that cannot fly?
APPENDIX 6

(a) Prompt card for Didactic Teaching Condition

HELPERS

(a) HERE
   The answer is in one sentence from the passage.

(b) HIDDEN
   Use more than one idea from the passage to answer the question.

(c) In my HEAD
   Use what you already know to answer the question.
(b) Prompt card for Self-Instruction Condition.

On one side there was the same description of the 3H Helpers as used in the didactic teaching condition. On the other side the three self-questions for self-instruction were printed.

<table>
<thead>
<tr>
<th>HELPERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How will I answer this question?</td>
</tr>
<tr>
<td>2. Where is the answer to this question found?</td>
</tr>
<tr>
<td>(a) HERE</td>
</tr>
<tr>
<td>(b) HIDDEN</td>
</tr>
<tr>
<td>(c) In my HEAD</td>
</tr>
<tr>
<td>3. Is my answer correct?</td>
</tr>
</tbody>
</table>
Large animals often live longer than small ones. The giant turtle can live for 152 years or more. A cat only lives twenty years. Mice and smaller animals live only a few years. Some insects live only for a single day.

1. What type of animals often live the longest?

**HERE** Large animals live the longest *not* the giant turtle.

The question asks for the "type of animals".

2. Which lives the longest: the turtle or the cat?

**HIDDEN** The turtle lives the longest.

Despite the fact that the child might have known the answer already, two sentences from the passage are needed to answer the question. The students should always use the passage first.

3. How old is the oldest animal you know?

**HEAD** The answer should be an animal from the child's own experience. The age should be given to answer the question correctly.
Plants grow almost everywhere. They grow in the city and in the country. They grow in hot deserts and even under the snow. Some plants grow under the water. Almost anywhere you look out of doors, you see plants. Plants need soil, sunshine and water to grow.

1. What do plants need to grow?

HERE Plants need soil, sunshine and water to grow.

2. What plants grow in deserts?

HEAD Cacti or cactus plants grow in deserts.

3. Would plants grow in a city covered in snow?

HIDDEN Yes.

The passage has a sentence about the plants in the city and another sentence about plants under the snow, so the answer is HIDDEN.
One kind of starfish is called the sunstar. It may have seven or more rays. The rays look like the lines around the sun. This starfish grows to be over twelve inches wide. Like the setting sun, it is also red.

1. Where would you most likely find a sunstar starfish?

HEAD You would find a sunstar in the ocean, the sea, rock pools or on the beach. (Water is not explicit enough to be accepted.)

2. What are two ways that this starfish looks like the sun?

HIDDEN 1. It has rays around the its body like the sun.

  2. It is red like the setting sun.

3. How wide does this starfish grow to be?

HERE The sunstar starfish grows to be over twelve inches wide.
While you are sleeping in your bed at night, animals in the fields are sleeping too. So are the animals in the forests, lakes and rivers. Like you, they must rest.

Some animals sleep on the ground. Some sleep in the water. Some sleep in trees. Each has its own way of making itself comfortable.

If you tried to sleep standing up, you would probably fall down. But a horse can just stand on its four legs, relax its muscles and go to sleep.

When a horse is tired, it may lie down on its belly or on its side. But much of the time, a horse sleeps standing up. It just closes its eyes and dreams of whatever it is that horses dream about.

1. What would happen if you tried to sleep standing up?

HERE If you tried to sleep standing up you would probably fall down.

2. Name four places that animals sleep.

HIDDEN Any combination of places mentioned in the passage.

3. What might a horse dream about?

HEAD Be ready for some different answers.
1. What must we do if we want to catch seafood

**HERE** We must use different kinds of tools and traps to catch seafood.

2. Why might fish have different kinds of teeth?

**HEAD** Fish have different kinds of teeth because they eat different kinds of food.

3. How is a fish able to get food?

**HERE** A fish is able to get food by using its mouth as hunting equipment.

4. What are two different places that fish have their teeth?

**HIDDEN** Any two places from the passage.

5. What do herring's gill rakes look like?

**HERE** They look like tiny rakes.
Reading Comprehension Test Questions on Passage: How to Crack a Coconut

1. What three steps do you need to follow to get to the coconut meat?

There are "marker" sentences in the passage.

1. First, you get the juice out. 2. Then you put the coconut shell in the oven for half an hour at 350 degrees. 3. Lastly, you crack the shell.

2. Where do coconuts grow?

Coconuts grow in warm places like Florida and Hawaii on tall palm trees.

3. Why would you put a coconut on a towel on the floor to crack it?

You put a towel on the floor to protect it from mess and to stop all the pieces of coconut scattering around when you hit the nut with a hammer.

4. How can you use coconut meat? Write three ways to use it.

You can use coconut as a chewy snack, in cakes or in cookies. You can also grate it on deserts. (Any three)

5. If you don't live in Florida or Hawaii, where would you find a coconut?

You would find one in the grocery store or the fruit shop.

6. What is the biggest seed in the world?

The coconut is the biggest seed in the world.
Comprehension Test Questions on Passage: Dolphins

1. Who are the dolphin's enemies?

HERE The killer whale and the shark are the dolphin's enemies.

2. What are two ways a "nurse" dolphin looks after a sick or injured dolphin?

HIDDEN The "nurse" dolphin swims around with the sick dolphin. It also pushes the sick dolphin up for a breath of air if it falls too deeply asleep.

3. What is sonar?

HERE Sonar is the ability some animals have for using sounds to find their way around.

4. How might a dolphin become injured or sick?

HEAD It could be hurt by its enemies. Perhaps the dolphin became caught in fishing nets or had to swim in polluted water. (Any reasonable answer.)

5. Why would a dolphin stay underwater for six or seven minutes?

HEAD The dolphin could have found a large school of tasty fish to feed on. It may have been chased by enemies. It may be scared of skindivers. (Any reasonable answer.)

6. What things do dolphins do together as a school?

HIDDEN Dolphins eat, sleep and protect themselves together.
1. What does the spider do with the insect that gets caught in its web?

HEAD The spider eats it or it may wrap the fly in silk for later. (Any other reasonable answer.)

2. Which lines of the web stretch and are very sticky?

HERE The circling lines stretch and are very sticky.

3. What two purposes does the web serve for the spider?

HIDDEN The web is where the spider lives. It is also used by the spider as a trap to catch food.

4. What is the spider who builds the orb web called?

HERE The orb weaver builds the orb web.

5. Why do the lines of the web need to be made from very strong material?

HEAD If the lines were not strong the web would not support the spider. The insects would break through the web without being caught if the web was weak.

6. How does the orb weaver catch an insect with its web?

HIDDEN (from the last paragraph) The spider builds its web where it hangs straight up and down and insects are likely to fly into it. Once the insect is caught by the sticky material, the spider moves along to it. The spider moves on the crosslines so it doesn’t get stuck.
Reading Comprehension Test Questions on Passage: Dragon's Tears

1. Where was the dragon's home?

HERE The dragon's home was in a deep mountain cave.

2. Who was never frightened by the dragon?

HERE There was one little boy who was never afraid of the dragon.

3. What did the little boy do after he walked to the dragon's mountain on the day before his birthday?

HIDDEN The little boy called the dragon and invited it to his birthday party.

4. Why did the dragon start to cry?

HERE The dragon cried because he had never had a kind invitation before.

5. What happened when the dragon began to swim the river to take the boy home?

HIDDEN The dragon changed his size and shape until he became a dragon-steamboat.

6. What did most of the people living near the dragon think of it and what did they think should be done with it?

Hidden They thought it was a terrible dragon and someone should kill it.

7. What is another story you have read that has a dragon in it?

HEAD (Any acceptable title.)

8. Why do you think the little boy wasn't afraid of the dragon?

HEAD Any thoughtful answer. Perhaps the little boy had read a lot and realized that dragons were sometimes kind. Maybe the boy reasoned that although the dragon looked fierce it had never hurt anyone.
Reading Comprehension Test Questions on Passage: Seashell

1. What are two good points about the hermit crab's seashell house?

HIDDEN The hermit crab can live safely in his shell (protection). The shell is the crab's home and he can move around with it on his back.

2. Have you seen hermit crabs at the beach? Draw some if you have.

HEAD The students drawing and answer must be reasonable.

3. Why is it important for the hermit crab to have a house that is not too large or too snug for him?

Hidden If the shell is too large, a fish might pull the hermit crab out. If it is too snug, he will not be comfortable.

4. What does the hermit crab do to make sure his new house is the right size for him?

HERE The hermit crab backs into the new seashell and tries it on for size.

5. What parts of the hermit crab stick out from his borrowed shell?

HERE Only the crab's legs and eyes stick out from the shell.

6. What is another animal that can move around with its house on its back?

HEAD The turtle or the snail move with their houses on their backs.
Reading Comprehension Questions on Passage: Platypus

1. Why does the female platypus curl up in a ball for nine or ten days after her eggs are laid?
   HIDDEN The female platypus curls up to keep her eggs warm so that they will hatch.

2. If Australia gives the people of B.C. a platypus, where do you think a good place to keep it would be? Why?
   HEAD (Any sensible answer and reason for it e.g. Stanley Park Aquarium so that plenty of people could see the animal and it would be cared for well.

3. What kinds of things does a platypus eat?
   HERE The platypus eats worms, crayfish and other food from the bottom of the pond or stream.

4. What are two ways that the bills of the platypus and the duck are different?
   HIDDEN The platypus' bill is softer and it is covered with sensitive nerve cells.

5. Why would a platypus make a nice pet?
   HERE The platypus would be a good pet because it is clean, well-behaved and friendly.

6. What are two animals that parts of a platypus look like?
   HIDDEN It looks like a duck and a furry seal.

7. What activities keep the platypus clean and neat?
   HERE Swimming, playing and searching for food in the pond keep the platypus clean and neat.

8. Why does the platypus close its eyes tightly as it is hunting along the muddy bottom of a pond? Do you swim with your eyes open or closed?
   HEAD The platypus swims with its eyes closed because otherwise dirt or mud from the bottom of the pond may hurt its eyes. Students own answer about swimming with the eyes open or closed.
Reading Comprehension Test Questions on Passage: Cactus

1. Why do you have to be careful around cactus plants?

HEAD  The cactus plants have prickles that can hurt your skin.

2. How tall does the biggest cactus in the world grow to be?

HERE  It grows to be twelve metres high.

3. Why are cacti remarkable plants?

Hidden (First paragraph) They are remarkable because they can stand in the sun all day without shade and they receive only a short period of rain each year to provide moisture.

4. What are two ways the cactus saves water?

HIDDEN  Any two from the passage, e.g. Cacti have no leaves or ones as small as scales. They have wax-like stems. Hairs and spines prevent the loss of water. The cacti stems have large cells for storing water.

5. How would you care for a cactus garden?

HEAD  You would give it very little water and keep it in a warm sunny spot.

6. When does the cactus produce its beautiful blossoms?

HERE  The cactus blooms when the rain is over.

7. In what ways do desert animals depend on cacti for staying alive?

HIDDEN  The desert animals depend on the cactus for shade, food and water.

8. Which cactus plant is well known and grows in B.C.?

HERE  The prickly pear is well-known in B.C.
Reading Comprehension Test Questions on Passage: Written in the Trees

1. What are annual rings on a tree trunk?

HIDDEN The annual rings are the new layers of growth that a tree adds each year. They are just beneath the bark.

2. What do scientists find out when they look at the width of each annual ring on a pine tree?

HERE The scientists see how much rain has fallen in the year during which the annual ring formed.

3. Have you seen annual rings on a tree stump? Draw some if you have.

HEAD Any reasonable answer and drawing.

4. Do some trees have rings the same width?

HERE Yes, on some trees all of the rings are the same width.

5. Why is it good that scientists can study the annual rings of a tree without cutting the tree down?

HEAD It is good because otherwise the scientists would have to kill the tree. We need our forests so we should protect trees. Also with a special tool the scientists can study the same tree again next year. Any other reasonable answer.

6. Where would you find the most recent annual ring of a tree?

HIDDEN You would find the most recent ring of a tree beneath the bark. It is the new layer of wood of the tree.
Reading Comprehension Test Questions on Passage: Children of the Forest

1. How tall are African pygmies?

**HERE** Pygmies are less than five feet tall.

2. Why don’t pygmies live in the same place in the forest all the time?

**Hidden** The pygmies stay in one area for as long as the food supply lasts. Then they move to a new area and pitch camp.

3. Do the pygmies hunt like hunters in B.C.? How is their hunting the same or different.

**HEAD** No, they hunt with different weapons. The pygmies hunt different animals from those in Canada. (Any reasonable answer.)

4. What do pygmy women gather in the forest for food?

**HERE** The women gather mushrooms, nuts, roots and berries.

5. Pygmy children help their parents by staying at home with their grandparents. How do you help your parents?

**HEAD** Any reasonable answer.

6. What are three tools or weapons that pygmies use to hunt or trap animals?

**HIDDEN** The pygmies use nets, bows and arrows and spears.
Reading Comprehension Test Questions on Passage: Emperor Penguins

1. What colours is an emperor penguin?
   HERE An emperor penguin has a lemon front, grey-blue back and orange patches on its neck.

2. If you had a penguin for a pet, how would you look after it?
   HEAD Keep it cool and feed it fish. (Any reasonable answer)

3. How can the male penguin care for the egg and the newly hatched chick?
   HIDDEN The male penguin takes the egg on his feet and covers it with his skin to keep it off the ice. The male penguin can feed the newly hatched chick with a milky substance if the female is late to arrive back from the sea.

4. When they are hungry, what do the emperor penguins catch to eat?
   HERE They catch fish and squid to eat.

5. What is a group of young penguins called?
   HERE A group of young penguins is called a creche.

6. What are three things that a penguin chick could eat after it has hatched?
   HIDDEN The chick could eat half-digested fish or shrimp or it could feed from the milky substance produced by the male.

7. If a penguin chick is able to look after itself by the beginning of January, how old is it then?
   HIDDEN The chick is five months old by the beginning of January.

8. What is another bird besides the penguin that cannot fly?
   HEAD The ostrich cannot fly. The emu cannot fly. (Any other reasonable answer.)
Appendix 8

Answer Key for Metacognitive Questionnaire

Metacognitive Questionnaire

Question 1.

Suppose you have a friend who has a little brother/sister who was going to start school soon. And that little boy/girl said to you, "My mum said that when I go to school, I will read. ________, what's reading?" What would you tell him/her that reading is all about?

0,1,2, scale (halves allowed)

Reading is (1) Decoding and understanding

(2) Learning associated

Question 2.

Do you think reading is important? Why?

0,1,2, (halves allowed)

(1) Important for learning to decode and getting meaning.

(2) Uses of reading.

Question 3

When you don't do well in a class reading test, what do you think are the reasons?

0,1,2 (halves)

(1) Awareness of reading difficulty (decoding, comprehension or both)

(2) Task/test difficulty

(3) Effort/attention
Question 4
When you can't say a word in your reading book, what do you do?
0, 1, 2 (halves)

(1) Decode (sound it out)
(2) Seek help - dictionary, teacher/adult/peer

Question 5
When you can't understand a word or a sentence in your textbook, what do you do?
0, 1, 2 (halves)

(1) Use a dictionary or seek help (adult, teacher, peer)
(2) Use of context

Question 6
When you can't answer a question about a passage you have read, what do you do?
0, 1, 2 (halves)

(1) Use a strategy to use time more efficiently.
(2) Go back to the source to check.
(3) Maybe the answer is in my head.
(4) Seek help (teacher/adult/peer)
Question 7
Many people think that reading is one of the most important things that you do in school. What would you say that reading is?
0,1,2 (halves)

(1) Answer should emphasise utility.
(2) Decoding and comprehension.

Metacognitive Questionnaire

Question 8
What things does a person have to learn to be a good reader?
0,1,2 (halves)

(1) Decoding/vocabulary
(2) Comprehension skills

Question 9
What things does a person have to do to be a good reader?
0,1,2 (halves)

(1) Practise/study
(2) Effort
Question 10
When a person in first grade is reading, are they doing the same things as when a person in grade five (or six) is reading?
0,1,2 (halves)

(1) Grade 1 is easier. Task variety.
(2) Reading to learn in grade 5 versus learning to read in grade 1.

Question 11
Why do you think some children have trouble reading?
0,1,2 (halves)

(1) They haven't learned how to decode, vocabulary is poor etc.
(2) The passage is difficult.
(3) Not enough effort e.g. Practice at home.

Question 12
What things do you need to learn to be a better reader than you are right now?
0,1,2 (halves)

(1) Practise, effort
(2) Mastery (decoding, vocabulary).
APPENDIX 9

Samples of Students' Responses from the Before-Training Metacognitive Questionnaire

**Question 1.** (Suppose you have a friend who has a little brother/sister ...) What's reading?)

"You read books. It is the words and the sense." Grade 5 Average student

"Hard. Reading is hard to understand." Grade 5 Poor student

"You look at something and you know how to say it. You see how to say it and can explain it too." Grade 6 Average student

"Words. Work." Grade 6 Poor student

**Question 2.** (Do you think reading is important? Why?)

"Because you learn new words and more words and when you're bored you can read." Grade 5 Average

"Because it helps you speak." Grade 5 Poor

"You understand and you learn from it" Grade 6 Average

"Yes, because you always have a reader and you learn to write." Grade 6 Poor

**Question 3.** (When you don't do well on a class reading test, what do you think are the reasons?)

"I didn't study and I didn't pay attention and didn't read the story properly"

Grade 5 Average

"I didn't study". Grade 5 Poor
"One reason would be, I didn't read the instructions carefully or I didn't check my work." Grade 6 Average

"I don't know. Ask the teacher." Grade 6 Poor

**Question 4.** (When you can't say a word in your reading book, what do you do?)

"Use the dictionary, sound it out or use the index." Grade 5 Average

"Spell it out." Grade 5 Poor

"Do it syllable by syllable or look it up in a dictionary." Grade 6 Average

"Go on." Grade 6 Poor

**Question 5.** (When you can't understand a word or a sentence in your textbook, what do you do?)

Read a sentence before and after it." Grade 5 Average

"Read it over." Grade 5 Poor

"Read again and look around the page and try to understand it." Grade 6 Average

"Read it over and over again." Grade 6 Poor

**Question 6.** (When you can't answer a question about a test passage, what do you do?)

"I go back and read the parts and read the questions again and look back in the passage." Grade 5 Average

"I put a question mark or something." Grade 5 Poor

"Read back and find the answer. Try hard, but if I can't get it I go on and when
I'm all finished I go back to it again." Grade 6 Average

"Go on to the next one." Grade 6 Poor

**Question 7.** (What would you say reading is?)

"It's to learn and for when you grow up." Grade 5 Average

"Up to you, I guess." Grade 5 Poor

"Learning and a way of entertainment and understanding." Grade 6 Average

"When you read a book." Grade 6 Poor

**Question 8.** (What things does a person need to learn to be a good reader?)

"Words, comprehension, spelling. To look at the words and know them and to just read." Grade 5 Average

"All about life and stuff like that." Grade 5 Poor

"How to say words and know what you are reading about." Grade 6 Average

"The alphabet" Grade 6 Poor

**Question 9.** (What things does a person need to do to be a good reader?)

"Practice and read a lot." Grade 5 Average

"Be nice.". Grade 5 Poor

"Spell and know the letters. Listen well and try hard. Use your brain." Grade 6 Average

"How to go to school." Grade 6 Poor

**Question 10.** (When a person in grade one is reading, are they doing the same things as when a person in grade five or six is reading?)
"In grade one you are just starting out and in grade five you already know how to read and you answer questions. Grade ones only practice letters." Grade 5 Average

"Easier, I don't know." Grade 5 Poor

"Grade sixes do harder stuff. The ones are just learning to read words and we read words and we read sentences and answer questions and stuff." Grade 6 Average

"Yes, they're just reading a different book." Grade 6 Poor

Question 11. (Why do you think some children have trouble reading?)

"They don't practise or take time and they forget information because they rush so much." Grade 5 Average

"The children just can't get it." Grade 5 Poor

"They don't sound it out. They say it's too hard and then they give up" Grade 6 Average

"Usually they don't have time to sit down and read a lot." Grade 6 Poor

Question 12. (What things do you need to do right now to be a better reader than you are right now?)

"Read half an hour to an hour everyday. When I find a word I don't know I should look it up." Grade 5 Average

"Read books." Grade 5 Poor

"Study a lot more and go to the dictionary and look up new words." Grade 6
Average

"I do need lots of practice and lots of help sometimes." Grade 6 Poor
APPENDIX 10

Samples of Students' Responses from the After-Training Metacognitive Questionnaire

Question 1. (Suppose you have a friend who... What would you tell him/her that reading is all about?)

"Reading is something that is communication and everyone should know how to do it. There is vocabulary and different types of reading." Average, Self-Instruction condition

"It's learning how to recognize words more thoroughly and easier and learning new words." Poor, Self-Instruction condition

"A lot of letters. Twenty-six of them and I'd tell her that these letters form up words which form up sentences and these form paragraphs and once you get to a large age group these paragraphs become stories." Average, Self-Instruction condition

"Reading is for knowing words." Poor, Self-Instruction condition

"You read books. It is the words and the sense." Average, Didactic Teaching condition

"Reading is learning to learn." Poor, Didactic Teaching condition

"Basically, reading is a way of connecting what you're reading and when you read you can answer questions so it is trapped in your mind. To understand what you are reading you have to write it out." Average, Didactic Teaching
"Something you do a lot in school. It tells you what to do and it is enjoyable and gives you ideas." Poor, Didactic Teaching condition

"Reading is when you learn to say words. They could be in a sentence or a paragraph." Poor, Control condition

Question 2. (Do you think reading is important? Why?)

'It's communication. It's one of the most important things in your life because you need it so much when you get older." Self-instruction

"You use reading in tests and stuff. You need to be able to read the question and you need to read in reading period and everything." Didactic Teaching

"You need it if you go out for a drive or need things at the store." Control

Question 3. (When you can't answer a question about a passage you have read, what do you do?)

"You can read the questions again and you read the passage and find out the answer. You use the 3Hs to help you." Self-Instruction

"Read the passage and see if the answer is there. If it isn't then you should use your head." Didactic Teaching

"Try to find out the part in the passage and write it down as your answer." Control

Question 4. (What things does a person have to learn to be a good reader?)

"He or she has to learn the meaning of what you're reading as what's the use of
reading if you don't understand it." Self-Instruction

"You have to learn meaning and to read what the words are." Didactic Teaching

"Sound out the words and know how to spell them and like to read." Control

**Question 5** (What things does a person have to do to be a good reader?)

"Co-operate and try the hardest and figure out stuff on your own."

Self-instruction

"Read carefully and answer carefully." Didactic Teaching

"Read a lot and spell a lot." Control
APPENDIX 11

Sample of Students' Responses from the Written Metacognitive Questionnaire

These responses were in answer to the following question: "How do you think learning the "3H" strategy could help other children?

Self-Instruction (Average, Grade 5)

"It tells them to look harder in the passage and not to use their heads too much."

"By learning how to check questions carefully."

Self-Instruction (Poor, Grade 5)

"Help them with both the passage and the answer."

It will help them to think."

Self-Instruction (Average, Grade 6)

"It could help them remember to look over their questions and help them read better."

"I think the 3H strategy is an easy way to learn reading which will help children. And 3H is very fun and instead of reading the passage again you only have to look and check."

Self-Instruction (Poor, Grade 6)

"To think and not put a silly answer down."

"If you don't know a question, the 3H strategy will help you!"

Didactic Teaching (Average, Grade 5)
"It helps by teaching to know where you had gotten the answer from, not to just put any old number down."

"I think it could help other children to answer questions like the questions Ms Graham gave us."

**Didactic Teaching (Poor, Grade 5)**

"Reading it carefully. Answer the question carefully but read it first."

"The 3H strategy could help other people because it is a good way to find out the answers and it helps you to "learn" to spell (through checking the spelling in your own answer with that in the passage)."

**Didactic Teaching (Average, Grade 6)**

"It could help other children by reading over the passages."

"I think the 3H strategy could help other children by helping them find out the answers to questions."

**Didactic Teaching (Poor, Grade 6)**

"It helps children use what's in their head."

"It would help them really well and understand what they are reading."
In introducing the 3H strategy to the students assigned to the treatment groups, the researcher/teacher began by discussing reading and reading tasks. The students and teacher listed subject areas where question and answer tasks after reading some content are common (e.g. reading lessons, science, social studies, and mathematics word problems) and discussed the importance of responding carefully and correctly to reading comprehension tasks in these areas. The "3H" strategy was presented as a method of avoiding some common reading problems. Specifically, these problems were (a) not reading carefully; (b) relying on the passage too much; and (c) relying on memory and general knowledge too much. By following the 3H strategy, students were told they would remember to read carefully and would be more likely to know when it was appropriate to use the passage or their general knowledge to locate the answers to questions. An example illustrating each reading problem mentioned above was discussed to provide a shared context for the 3H strategy between the teacher and her students. The main point of these discussions are outlined below.

"Not reading carefully" was considered a problem because it can mean that the content of the passage or the question itself may be misunderstood. The importance of taking responsibility for reading to understand was emphasised.
Strategies useful in extracting meaning from unfamiliar words or phrases were referred to briefly (e.g. sounding out words, using context clues, seeking help from the dictionary or the teacher etc). The student's part in regulating the use of these strategies and doing something themselves if they felt they didn't understand a word, or passage or question was emphasised.

"Relying on the passage too much" was presented as inappropriate in some reading situations, for example, when questions ask the reader for personal opinions, or experiences, or when they require extending an idea from the text into what the student already knows. The answers to questions like these are not in the text but in the student's own knowledge base.

"Relying on general knowledge and memory too much" was presented as a mistake commonly made by students who may read a passage through once and then answer questions without consulting the text again. It was pointed out that relying on memory to this extent does not allow the student to take advantage of the text and may result in careless mistakes. It was also mentioned that sometimes memories and general knowledge are unreliable. For example, misconceptions about how plants make food and how light allows us to see are common among students and teachers (Anderson & Smith, 1984). If there is information in the text that helps answer a question, it was suggested that this information be used. Although using general knowledge to answer some questions is appropriate, the students were told that this is not
a suitable strategy when information is available in the text. Using
information from the text was discussed as important because it helps
students provide reasons for their responses, and allows them more confidence
in responding because they can locate the source of their answer if they are
challenged.

After speaking about common reading problems, the 3H strategy was
introduced as a way to avoid these difficulties. It was described as a way of
turning reading problems into a reading plan or strategy. Instead of not reading
carefully, the importance of reading both the passage and the question
carefully was emphasised. Instead of relying on the text or general knowledge
too much when answering questions, the 3H strategy was shown to provide a
way of deciding when it was appropriate to use either text or knowledge base
information. Here and Hidden QARs were introduced by discussing the
appropriate use of the text to answer questions. In my Head question-answer
relationships were described when elaborating on when to use general
knowledge to answer a comprehension question.

In general, the main features of the “3H” strategy discussed as reasons for
its use were (a) the ease with which it can be remembered and used as a plan
for answering questions; (b) the reminder it provides as to the possible
locations of answers to questions; (c) the way it can help students analyse
difficult questions; and (d) the accountability that the strategy can build into a
question-answering task by insisting that each student have a reason for QAR categorization as well as for the response they write to answer the question itself.

**Didactic Teaching Condition**

Students in the didactic teaching condition (n = 30) were introduced to the “3H” strategy and given a prompt card outlining the three categories (Here, Hidden and In my Head) of question-answer relationships in the first training session. In subsequent sessions, students took turns at reading parts of a short passage aloud. They then used the 3H strategy to categorize QARs and respond to the comprehension tasks in sentences. To explain the student’s role in more detail, they used the 3H strategy to (a) first predict from each question where its answer would be located, then (b) respond to the comprehension task, before (c) deciding on the final QAR category (Here, Hidden or In my Head) after examining the relationship between the question asked and the answer they had provided.

**Self-Instructional Training**

The thirty students in this training condition were introduced to the 3H strategy in the same way as the students in the didactic teaching condition. The instruction of how to perform the strategy differed, however. These students were taught a series of self-questions designed to guide strategy use. The instruction of these questions followed the self-instructional training
model used by Meichenbaum and Goodman (1971). During training the students were taught (a) to follow the directions of the researcher as she modelled the responses to the questions aloud; (b) to guide their own behaviour through self-talk; (c) to guide their own behaviour through whispered instructions; and finally (d) to use the self-questions presented to them as a form of covert inner dialogue to guide behaviour.

The three self-questions relating to QARs presented to the students were:

1. How will I answer this question?

2. What type of question is this? (Where would I find the answer to this question?)

3. Is my answer correct?

An example of appropriate modelling dialogue is presented below.

1. **HOW WILL I ANSWER THIS QUESTION?**

   (I will have to remember to read carefully - both the question and the passage. I’ll use the 3H strategy to help me.)

2. **WHAT TYPE OF THE QUESTION IS THIS? (WHERE WILL I FIND THE ANSWER TO THIS QUESTION?)**

   (The question can give me clues. The answer is either in the text or in my head. I’ll check the text first. If the answer isn’t there I’ll use what I
already know.)

(A) Is the answer HERE on the page?

(This is a simple HERE question if the answer is in one sentence from the passage. Sometimes many of the same words are in the “answer sentence” as were in the question.)

(B) Is the answer HIDDEN in the passage?

(If the question asks for more than a simple fact from the passage then this is a HIDDEN question. The information to answer it comes from two or more sentences in the passage.)

(C) Is the answer in my HEAD?

(If I have read carefully and can’t find the answer to the question in the text, then I have to use what I already know.

This is an In my HEAD question?)

3. IS MY ANSWER CORRECT?

(Have I really answered the question? I should re-read the question and my answer to see if they “fit” together. I should have a reason for my answer.

The three self-questions have the following purposes (a) to focus attention on the task; (b) to provide a basis for deciding where the answer to a question is found (i.e. Here, Hidden or In my Head); and (c) to remind students to check their
work and take time to congratulate themselves if they used this strategy conscientiously.

The students in the self-instruction condition were provided with a prompt card which outlined the question-answer relationship categories on one side and listed the three self-questions on the other. After taking turns to read aloud segments of a passage, the students in this condition worked through the three self-questions to perform the 3H strategy.

Initially, the students in this condition listened to the teacher as she modelled the use of the self-questions. Then they performed the strategy under the guidance of the teacher who worked aloud through the strategy. Gradually, the students began to control their strategy use through their own overt, then covert verbalizations. The teacher regularly asked individual students in this experimental condition to "think aloud" for her as they worked through the steps involved in answering a comprehension questions.

How the self-instructions relate to the student's role as an active comprehender is described as follows. The first self-question reminds the students to take care with their reading and to use all the steps of the 3H strategy. The second question prompts the students to predict a QAR category based on the type of question they have to answer. The final self-question emphasises the importance of checking the accuracy of responses. This includes both the content of the written response and the QAR category chosen.
to describe the relationship between the given question and answer that the student provided. During training it was stressed that students must have reasons for the answers and classifications they choose, and be able to state them.