

CHILDREN'S THEORIES ABOUT READING DIFFICULTIES
A DEVELOPMENTAL STUDY

CENTRE FOR NEWFOUNDLAND STUDIES

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RHONDA JOY



CHILDREN'S THEORIES ABOUT READING DIFFICULTIES:
A DEVELOPMENTAL STUDY

BY



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A thesis submitted in partial fulfillment of the
requirements for a degree of
Master of Education

Department of Educational Psychology
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ABSTRACT

Research findings indicate that children construct integrated metacognitive theories about cognitive processes. These theories have been hypothesized to play a major role in learning and development. In the present study, the development of children's metacognitive theories about the causes, manifestation, and remediation of reading difficulties was investigated. Twenty-one subjects from each of grade 1, 3, 5, and 7 participated in two experimental sessions. Each subject was presented with four short stories (i.e., two stories per session). Each story depicted a child of the same sex and age as the subject who is a poor reader. The intellectual ability (high versus low) and the level of work effort (high versus low) of the depicted children was varied systematically across the four stories. Following each story presentation subjects' memory for the story propositions was assessed. Next, subjects were asked to determine (1) the cause of the depicted child's reading difficulty; (2) the manifestation (i.e., specific aspect(s) of the reading process affected) of the reading difficulty; and (3) remediation strategies. The major

findings were that, regardless of age, or the ability and effort levels depicted in the stories, subjects

(1) primarily attributed the cause of reading difficulties to either insufficient effort or specific cognitive problems (e.g. inadequate attentional processing); (2) considered that reading difficulties may be manifested in either word identification or comprehension problems; and (3) recommended an increase in effort as the primary remediation strategy. The implications of these findings, for both learning to read and for the social consequences of reading difficulties in school, are discussed.

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INTRODUCTION

Overview

Metacognition is defined as knowledge about the human information processing system (Wellman, 1983). The role of metacognition in reading development has been receiving increased attention from researchers in cognitive development and education (Jacobs & Paris, 1987). Investigations in this area have been focussed primarily on (1) pre- and beginning readers knowledge about the reading process and (2) elementary schoolers specific knowledge about reading comprehension. A review of this literature highlights two trends in the research on metacognition about reading. First, the research has been focussed on a relatively narrow range of metacognitive variables and children's understanding of a number of important reading related variables has yet to be explored. Second, most investigations have been concerned with children's knowledge about individual as opposed to combinations of reading related variables. The present study was designed, in part, to address both of these issues. The study is concerned with an aspect of metacognition that has received little empirical attention, that is, knowledge about reading difficulties.

In addition, children's theories about the cause, manifestation and remediation of reading difficulties, rather than knowledge of a single variable, was investigated. In what follows, a definition of metacognition and its hypothesized role in cognitive development in general, and reading development in particular, is presented. Then the literature on metacognition about reading in (a) pre and beginning readers and (b) elementary schoolers is briefly reviewed and research trends discussed. Next, the literature on the development of children's knowledge about the causes, manifestation, and remediation of reading difficulties is presented, followed by an overview of the present study.

Metacognition

Beginning in the 1970's the term "meta" became increasingly popular in the human developmental literature with terms such as metacognition, metalearning, metamemory, and metareading appearing (Thomas, 1979). The term "meta" is usually intended to mean an analysis of, or knowledge about, the subject to which the meta is attached or prefixed (Thomas, 1979).

Flavell (1979) defines the general concept of metacognition as "...that segment of your stored world knowledge that has to do with people as cognitive creatures and with their diverse cognitive tasks, goals, actions and experiences" (p. 906). Specific aspects of metacognition are associated with specific cognitive processes. For example, metamemory is knowledge about memory and metareading is knowledge about reading. An example of metamemory would be knowing that long lists are usually harder to remember than short lists. An example of metareading would be realizing that you do not understand the passage you are currently reading.

The concept of metacognition is relatively new and is not precisely defined at this time. Wellman (1983) considers that the concept is an inherently "fuzzy" one because while there is agreement about the central components of metacognition, there is little consensus concerning its definitional boundary. For example, there is agreement that the central components of metacognition include knowledge about the properties of cognition and knowledge about the current cognitive state. However, there is disagreement about whether the concept includes (a) the regulation or use of metacognitive knowledge

(Brown, Bransford, Ferrara & Campione, 1984), (b) conscious and/or unconscious experiences (Cavanaugh & Perlmutter, 1982), and (c) emotional and motivational components (Brown, Bransford, et al., 1984). Nonetheless, as Flavell (1979) points out, metacognition is fundamentally identified as a form of knowledge. What distinguishes metacognition is its referent -- it is knowledge about the information-processing system. Moreover, as Wellman (1983) suggests, metacognition is stored in long-term memory like other knowledge and has, on average, no more or less implications for behaviour than other knowledge.

Despite the imprecision of the concept, research in metacognition, especially in the area of metacognitive development, has proceeded at a fast pace. Research interest is derived, at least in part, from the hypothesized causal role that metacognition plays in cognition in general and cognitive development in particular. That is, metacognition is hypothesized to inform and regulate cognitive routines and strategies (Brown, 1978). The sophisticated cognitive agent is assumed to integrate metacognitive knowledge with strategic behaviours in solving problems. This

interchange enables the cognizer to select, modify, and invent strategies and to modify the contents of metacognition through successful problem-solving (Brown, 1978). Investigations of this hypothesized metacognitive-cognitive link have indicated that the development of metacognition distinguishes between the relatively mature versus relatively immature learner (Pressley, Borkowski, & O'Sullivan, 1985). With age, developmental achievements in metacognition accompany (a) the acquisition and use of cognitive skills and strategies and (b) improvements in performance in a variety of cognitive domains, for example, memory, reading, and problem solving (for a review see Pressley, Borkowski & Schneider, 1987).

Metacognition About Reading

Reading is a complex behaviour that involves interactions among perceptual processes, cognitive skills, and metacognitive knowledge (Myers & Paris, 1978). Metacognition about reading involves understanding the purposes, skills, and dimensions of reading. Some examples are knowing that comprehension is the major goal in reading, knowing about reading

strategies, and knowing that reading is an important vehicle for learning. Metacognition is presumed to play a central role in reading in that children's understanding of the purposes, skills, and dimensions of reading should influence how they learn to read (Myers & Paris, 1978). The development of metacognition about reading appears to accompany the acquisition of reading strategies and reading fluency (Brown, Armbruster, & Baker, 1984).

Metacognition has become a popular term in research on reading during the past ten years, mainly because it emphasizes how readers plan, monitor, and repair their own comprehension (Jacobs & Paris, 1987). In addition, many articles written for teacher educators and curriculum supervisors have endorsed metacognition as a key ingredient for cognitive instruction that leads to independent learning (e.g. Costa, 1986). However, such enthusiasm may be slightly premature because, despite the importance credited to metacognition about reading, relatively little research has been conducted to explore children's knowledge about the parameters of reading and the influence of this knowledge on reading development. The existing research in this area is focussed primarily

on (1) investigations of metacognition in pre and beginning readers and, (2) investigations of metacognition about reading comprehension in elementary school age children.

Metacognition in Pre and Beginning Readers

Our current understanding of pre-readers' and beginning readers' metacognition about reading is primarily based on naturalistic, correlational, and interview studies. This research has shown that young children possess considerable metacognition about the reading process prior to reading instruction or just after its inception (e.g., Bussis, Chittenden, Amarel, & Klausner, 1985; Clay, 1979; Cochran-Smith, 1984; Doake, 1981; Hiebert, 1981; Holdaway, 1979; Sulzby, 1981; Taylor, 1983). For example, young children display some awareness of why people read and what people do when they read (Downing, 1970; Hiebert, 1981). Similarly, before children are reading conventionally from print, they recite language that sounds like reading and like book language (Doake, 1981; Taylor, 1983). Cochran-Smith (1984) reported that preschoolers knew that they could and probably would be readers throughout their lives.

Researchers have also shown that beginning readers seem to lack metacognition about several aspects of written language. Clay (1972) found that beginning readers were often confused about whether they should read the pictures, or the print (see also Johns, 1980). Forrest-Pressley and Waller (1984) reported that many young children believe that "good reading includes verbatim recall of the text and that many beginning readers consider that the major purpose of reading is to pronounce all the words correctly.

O'Sullivan (1988) examined developments in primary grade children's metacognition about (1) the role of context and world knowledge in reading, (2) decoding strategies, and (3) the purpose of silent and oral reading tasks. Findings indicated that awareness of the facilitative effect of context (see Stanovich, 1986) seems to emerge in grade 2. Moreover, children of all ages were aware of the facilitative effects of world knowledge (see Durkin, 1983) although there were developmental differences in the type of world knowledge children consider to be important. In addition, regardless of age, most subjects recommended "sounding out" as the best decoding strategy. Finally, children

of all ages differentiated between the purpose of silent versus oral reading (see Durkin, 1983). Grade 1 children believed that recognition is the major purpose during silent reading and comprehension the top priority for oral reading. This pattern was reversed for older children.

Researchers have examined the relationship between metacognition about reading and formal reading ability in young readers. Reading ability has been correlated with awareness of the meaning of the terms letter, word, and sentence (Mickish, 1974) and with children's scores on tests of written language knowledge (e.g., Concepts About Print Test, Clay, 1979) (John's, 1980). In addition, researchers have observed a robust relation between awareness of the phonological structure of language (i.e., a metalinguistic skill) and success at learning to read (see Liberman & Shankweiler, 1985, for a review). Several types of evidence support the hypothesis that variations in phonological awareness are strongly and causally related to reading, spelling, and word recognition skills (Bradley & Bryant, 1983, 1985; Ehri, 1985; Fox & Routh, 1984; Juel, Griffith, & Gough,

1986; Olofsson & Lundberg, 1985; Torneus, 1984; Treeman & Baron, 1983).

In summary, young children seem to possess considerable metacognition about the reading process prior to reading instruction or just after its inception. Yet these young readers seem to lack understanding about several important dimensions of reading, including knowledge about the purpose of reading. Metacognition about reading appears to be related to formal reading ability in young readers. While all of the studies reviewed in this section attest to the possible role of metacognition in the reading acquisition process, there have been few systematic investigations of the causal links between metacognition and reading development. A more complete understanding of the role of metacognition in the initial acquisition of reading skill awaits such investigations.

Metacognition About Reading Comprehension in Elementary-School-Age Children

A considerable body of research has been focussed on the development of metacognition about reading comprehension in elementary-school-age children. Most

of these studies have been concerned with children's knowledge/understanding about reading comprehension strategies, or children's comprehension monitoring skills (i.e., a metacognitive skill). Developments in both aspects of metacognition distinguish the relatively mature versus relatively immature reader. With age, achievements in metacognition about reading comprehension accompany the acquisition and use of reading comprehension skills and strategies, and improvements in reading comprehension performance (for a review, see Brown, Armbruster, et al., 1984).

Children's reading comprehension can be limited because they do not know about strategies such as using context to discern new words, that can aid their understanding (Paris & Myers, 1981). They may not realize that they should stop periodically to check their own comprehension and take corrective steps (Garner, 1987; Wagoner, 1983). Even when children know about strategies, they may not understand their benefits or rules of application clearly (Brown, 1980; Myers & Paris, 1978). Such knowledge appears to develop during the elementary school years. For example, Myers and Paris (1978) found that older children (age 12) were more aware

than younger children of the effects and the use of strategies for comprehension. Kobasigawa, Ransom and Holland (1980) suggest that although children of all ages could describe skimming, only the oldest children (age 14) could use skimming as a strategy. Paris and Myers (1981) compared good and poor fourth grade readers and found that good readers knew more about reading strategies, detected more errors more often while reading, and had better memory for the material than did poor readers.

Children's reading comprehension can also be limited because they do not monitor their understanding of reading material effectively (Pressley, Forrest-Pressley, Elliott-Faust, & Miller, 1985). In numerous studies children have been presented prose containing nonsense words, anomalous sentences, internal logical contradictions, and content that clashes with world knowledge (see Baker, 1985, for an overview). In general, children frequently do not report problems with flawed materials (Baker, 1985). Even when young children do detect inconsistencies in reading material they frequently fail to translate those experiences into

*action or fix-up strategies (Pressley, Forrest-Pressley, et al., 1985).

The effectiveness of reading comprehension monitoring appears to improve during the elementary school years and such improvements are associated with achievements in reading comprehension (Baker, 1985). For example, Forrest and Waller (1979) explored children's (grade 3 and 6) ability to evaluate their understanding of reading material. Older children and those who were better readers were more successful at evaluating their performance on a comprehension test than younger or poorer readers. Also, the older and better readers were more likely to adjust their reading strategies in response to the instructions given. The younger and poorer readers were less aware of comprehension monitoring and fix-up strategies. Isakson and Miller (1976, 1978) found that when good fourth grade readers encountered a word that did not make sense in a passage, they frequently tried to fix up the resulting comprehension difficulty by replacing the word with a more meaningful word. Poor readers tended to read the passage with the anomalous words without being aware of any problems.

The influence of metacognition on reading comprehension has been evaluated in the context of training studies (for a review see Pearson & Dole, 1987). For example, Short and Ryan (1984) instructed grade 4 students in the use of a comprehension monitoring strategy which led to improvements in reading comprehension. Scott Paris and his colleagues (e.g., Paris, Saarnio, & Cross, 1986; Paris, Cross, & Lipson, 1984; Jacobs & Paris, 1987) have developed a "metacognitive curriculum" for the promotion of comprehension strategies. This curriculum involves teaching children comprehension strategies and supplementing that training with metacognition about those strategies (e.g., when, where, and why to use them). This training appears to increase children's awareness of comprehension processes, their use of comprehension strategies and their level of reading comprehension as measured by cloze and error procedures (e.g., Paris, et al., 1984).

In summary, metacognition plays an important role in the reading comprehension process. Older and better readers appear to monitor their comprehension more often and more accurately than younger and poorer readers.

Similarly, older/better readers know more about comprehension strategies and use these strategies more effectively than younger/poorer readers. Finally, the provision of metacognitive information during instruction appears to be a potent factor in promoting the acquisition of reading comprehension strategies.

Metacognition About Reading: Research Trends

The preceding review highlights two trends in the research on metacognition about reading. First, the research has been focussed on a relatively narrow range of metacognitive variables. Second, in most studies children's knowledge about single as opposed to combinations of reading related variables have been examined. With regard to the first observation, the majority of experimental studies in this area has either been concerned with phonological awareness or with children's knowledge of comprehension strategies. However, children's understanding of a variety of other reading related variables and the links between this understanding and reading behaviour has yet to be explored. Several potential research questions have particular relevance for education. For example, what

do young readers know about the effects of context and world knowledge on the reading process? What do young readers understand about computer-based versus textbook-based reading programs? What do young readers know about reading difficulties? Answers to these questions have implications for how children learn to read and could provide suggestions for instructional modifications.

With regard to the second observation, most investigations in this area have been focused on children's knowledge of individual reading related variables. In contrast, few studies have examined children's understanding of the combined influence of reading relevant variables. Wellman, Collins, and Gliberman (1981) point out that children construct metacognitive "theories" incorporating knowledge of several variables. Further, it is these integrated theories, rather than knowledge of isolated variables, that drive cognitive behaviour (Wellman et al., 1984). For example, a child's decision to use a particular reading strategy is influenced not only by her knowledge about the strategy's effectiveness, but also by her estimates of the time and effort required to execute it. Wellman et al., (1981) suggest that causal links between

between metacognition and cognitive behaviour will not be clearly established until researchers expand their focus beyond children's knowledge of single variables to encompass children's metacognitive theories.

The present study was designed, in part, to address both of the issues outlined above. The focus of the present study was to investigate the development of children's theories about reading difficulties. Thus, the study is concerned with an aspect of metacognition about reading that has received little empirical attention (i.e., knowledge about reading difficulties). In addition, children's theories, (i.e., knowledge about the causes of reading difficulty, the manifestation of reading difficulties, and remediation strategies), rather than their knowledge of a single variable were investigated. In the following section, the available literature on children's metacognition about reading difficulties is reviewed followed by a brief outline of the present study.

The Development of Metacognition About Reading Difficulties

Relatively little is known about children's understanding of reading difficulties. There are no published reports of studies designed to investigate children's theories about the causes, manifestation, and remediation of reading difficulties. However, several studies have been focussed on children's understanding about one of these variables, that is, the causes of reading difficulties.

Most of these studies have been conducted by researchers interested in the cognitive components of achievement motivation. In cognitive theories of achievement motivation, beliefs about why things happen have been appointed a major role (Weiner; 1979; 1983). These attributional approaches to motivation propose a sequence of events that proceeds from the identification of an outcome as success or failure, to the formation of causal attributions, to emotional reactions to future behaviour (Weiner, 1979; 1983). The underlying assumption of attributional theory is that people search for reasons to explain why things happen to them. These causal beliefs are assumed to be the basis for action

mediating achievement motivation by influencing future expectancies, affect, and behaviour. These beliefs about the causes of success and failure on cognitive tasks are considered to be part of metacognition (Borkowski, Johnston, & Reid, 1987).

Metacognition About the Causes of Reading Difficulty

In a few studies, differences in causal attributions of success and failure in reading between children of different reading achievement levels have been investigated. Butkowsky and Willows (1980) investigated the cognitive-motivational characteristics of children varying in reading ability. Grade 5 children of relatively good, average, and poor reading ability were exposed to a variety of reading tasks where success and failure were manipulated by the experimenter. Following each reading task, the children were asked to attribute their success or failure to one of four possible causes - ability, effort, task difficulty, or luck. The results indicated that poor readers attributed their success to luck or effort, and their failure to a lack of ability. In contrast, good readers attributed their success to ability and their failure to hard luck or lack of effort.

Causal attributions were found to be related to level of persistence on reading tasks and expectancy of success following failure. Poor readers who attributed failure to lack of ability were less persistent and showed greater decrements in expectancy of success following failure. Butkowsky and Willows (1980) concluded that remedial education for poor readers should include a component designed to teach these children to think more adaptively about their failures.

Hiebert, Winograd, and Danner (1984) examined developmental changes in children's causal attributions of success and failure in reading. The attributions of children of low and high reading achievement in the third and sixth grade were assessed in two reading situations: evaluation of reading performance (i.e., good or poor grades/marks achieved in reading) and reading for meaning (i.e., success or failure in reading comprehension). Children were asked to rate the degree to which each of six causes (ability, paying attention, studying, luck, task difficulty, and assistance from others) contributed to their success or failure in the two reading situations.

The results indicated that sixth graders differentiated between the two reading situations in determining the causes of success and failure while third graders did not. On the reading evaluation task, sixth graders attributed significantly more importance than third graders to internal factors such as ability and studying as determinants of their school marks in reading. On the reading comprehension task, subjects in both grades attributed more importance to external factors such as task difficulty, than to internal factors such as studying.

In addition, Hiebert et al. (1984) report a significant age by achievement interaction. Low achieving third graders were more likely to attribute success to external factors (e.g., luck, task difficulty) than high achieving third graders. However, this difference did not appear between high and low achievers in grade six. Thus, it appears that both achievement and developmental levels are related to causal attributions of success and failure in reading. Hiebert et al. (1984) report that they find the similarity between high and low achieving sixth graders to be puzzling and question whether this pattern of results is unique to reading.

They suggest that additional developmental studies in this area are required to clarify this issue.

Despite the demonstrated importance of the developmental component, there have been few investigations of the development of knowledge about the causes of reading success and failure among average or exceptional readers. Recently, O'Sullivan (1988), as part of a larger study, investigated developmental differences in average readers' knowledge about the causes of reading success. Grade 1, 2, 3, and 5 children participated in a structured interview. Items were designed to measure children's understanding of the relationship between ability (i.e., general ability or ability in specific domains such as mathematics and sports) and success in reading and their knowledge of strategies for achieving success in reading.

The results indicated that young children understand that ability in mathematics or sports is not necessarily related to success in reading. However, only fifth graders seemed to understand that general intellectual ability is not necessarily predictive of success in reading. Thus, knowledge about the relationship between general ability and reading ability appears to develop

later than knowledge about the relationship between abilities in specific domains. In addition, the findings indicated that regardless of age, children attribute primary importance to the role of effort as a strategy for achieving reading proficiency.

In the studies reviewed so far, ability and effort variables have been demonstrated to have particular importance for children's reasoning about reading success and failure. Average readers tend to attribute success to these internal variables (i.e., ability and effort) and tend to attribute failure to external factors such as luck, or characteristics of the text. In contrast, poor readers are likely to attribute reading success to external factors and failure to effort and ability. However, there are no published reports on the development of knowledge about the individual and combined influence of effort and ability on reading. Thus, it is not clear whether there are developmental differences in the importance attributed to ability versus effort variables or developmental differences in understanding the combined influence of these variables on reading. Answers to these questions are important for elaborating our understanding of the development of

knowledge about the causal aspect of children's theories of reading difficulties.

While answers to these questions await further research, there is a body of literature on the development of knowledge about the individual and combined influence of effort and ability variables in academic areas other than reading that may have implications for the reading process. However, findings from these studies have failed to indicate consistent developmental effects. On the one hand, several authors (e.g., Harari & Covington, 1981; Stipek, 1981; Stipek & Tannatt, 1984) have reported that before adolescence children tend not to differentiate between effort and ability in their causal attribution judgements about spatial reasoning and academic competence. For example, Nicholls (1978) and Nicholls and Miller (1984) in several investigations on the development of reasoning involving ability and effort concluded that children progress through four levels of reasoning about effort and ability between the ages of 5 and 13 years. Children at level I (5-6 years) tend to equate ability with effort (i.e., high effort is synonymous with high ability). At level II (7-9 years) reasoning, children believe that effort

is the sole cause of outcomes. At level III (9-10 years) children begin to differentiate between ability and effort although this differentiation is not always present or completely understood. Finally, children at level IV (12-13 years) reasoning perceive ability as capacity. At this level, ability and effort are clearly and consistently differentiated.

In contrast, other authors (e.g., Whitehead, Anderson, & Mitchell, 1987; Whitley & Frieze, 1985) failed to demonstrate developmental differences in children's judgements about the influence of effort and ability variables on a variety of academic, social, and leisure tasks. Whitley and Frieze (1985) conducted a meta-analysis of children's (i.e., grade 1 to grade 7) causal attributions for success and failure. No significant effects for grade level on effort or ability attributions were obtained. Whitley and Frieze (1985) point out that some academic tasks may be perceived to require more effort or ability than others and that these perceptions may influence attributions. They suggest that the development of knowledge about the influence of effort and ability seems to be task dependent and that caution should be exercised in generalizing results of

attributional research across tasks. Given the apparent task dependent nature of reasoning about effort and ability, the development of such reasoning about reading requires direct investigation. The present study was designed, in part, to address this question.

To summarize, several authors have examined the development of knowledge about the causes of reading failure and the relationship between this knowledge and achievement-motivation (e.g., Butkowsky & Willows, 1980; Hiebert et al., 1984). The findings from these studies highlight the importance that children attribute to ability and effort variables in determining reading difficulties. However, the development of knowledge about the role of ability and effort as causes of reading difficulties has not been investigated systematically. Findings from related research (e.g., Nicholls, 1984; Whitley & Frieze, 1985) suggest that the development of knowledge about ability and effort may be task dependent. Thus, it is necessary to investigate these developmental processes in the specific context of reading.

In addition, it seems essential to extend the investigation beyond children's knowledge of causal variables to encompass related and integrated knowledge

of other variables critical to reading difficulties. As pointed out earlier, children develop integrated theories about cognitive processes and it is these theories, rather than knowledge of isolated variables, that guide cognitive behaviour. Thus, if we are to understand the relationship between knowledge of reading difficulty and reading behaviour it seems necessary to investigate the development of integrated knowledge about the dimensions of reading difficulty. Specifically, the development of knowledge about the manifestation and remediation of reading difficulties should be examined, in addition to knowledge about cause.

Metacognition About the Manifestation and Remediation of Reading Difficulties

What might children know about the manifestation and remediation of reading difficulties and how might this knowledge change with age? For example, do children understand that reading difficulties may be manifested in word identification problems, comprehension problems, or both? Similarly, do children have an 'elaborated' understanding of remedial strategies and do they differentiate between these strategies in terms of their

effectiveness? There have been few published reports of studies designed to address these questions.

O'Sullivan (1988) reports some interesting, although indirect, developmental findings about children's understanding of the manifestation of reading difficulties. Children in grades 1, 2, 3 and 5 were asked how they could identify good and poor readers. Regardless of age, children reported that the quality of a reader's oral production is indicative of their reading proficiency. These children identify poor readers on the basis of word recognition failures, stuttering, and stumbling. This is not surprising given the emphasis placed on oral reading in school (Durkin, 1983). Thus, oral reading in school may provide children with the most obvious opportunity for evaluating others reading proficiency. In this context, a focus on quality of oral production is not surprising. However, it is not clear from these findings whether or not children understand that reading difficulties may be manifested in other ways, especially in comprehension problems.

Children's knowledge about the manifestation of reading difficulties may be influenced by their understanding about the purpose of, and processes

involved in, reading. Beginning readers often misunderstand the purpose of reading, believing that decoding rather than comprehension is the priority (Forrest-Pressley & Waller, 1984). Similarly, beginning readers often fail to distinguish between decoding a word and understanding its meaning (John's, 1980). Older children distinguish between decoding and comprehension processes and consider comprehension to be the main goal in reading (Forrest-Pressley & Waller, 1984). Thus, it may be the case that young readers associate reading difficulties with decoding problems while older children are more likely to understand that comprehension, in addition to decoding, problems may be involved.

What do children know about remedial reading strategies? Again, there are few published reports of studies designed to investigate this question. O'Sullivan (1988) reports that children in grades 1 through 5 consider that effort and practice together with assistance from teachers or parents are the optimal strategies for improving reading proficiency. Similarly, several authors (e.g., Licht, 1984; Licht & Kistner, 1986) have concluded that children with reading difficulties view increased effort as the primary

strategy for remediating their difficulties. These findings highlight the importance that children attribute to the role of effort as a remediation strategy. However, it is not clear whether children prescribe this strategy indiscriminately for a variety of reading problems or if they discriminate between reading difficulties in developing their remedial suggestions. For example, do children understand that in some cases reading difficulties persist despite tremendous effort? If so, what do they consider to be the most effective remedial strategy in such cases? As Wellman et al. (1981) suggest, children construct integrated metacognitive theories about cognitive processes. Therefore, it might be expected that remedial reading suggestions are linked to understanding about the causes of reading difficulty. The present study was designed, in part, to address this question.

The Present Study

The present study was designed to investigate the development of children's theories of reading difficulty. Each of 84 "normal" readers from grades 1, 3, 5 and 7 were presented with four short stories, all of which

depicted a poor reader (of the same sex and age as the subject). Because amount of work effort and intellectual ability have been shown to be influential variables in the developmental attribution literature, ability (high versus low) and effort (high versus low) were varied systematically across the stories. Following each story presentation, subject's memory for the story was assessed and then they were asked to determine (1) the cause of the reading difficulty, (2) the manifestation of the reading problem, and (3) remediation strategies. The study was designed to address three specific questions. First, are there developmental changes in children's understanding about the influence of effort and ability variables as determinants of reading difficulties? Second, what do children understand about the manifestation of reading difficulties and how does this understanding change with age? Third, in prescribing remedial strategies do children discriminate between reading difficulties associated with different causes and are there developmental changes in this process?

METHOD

Subjects

A total of 84 subjects participated in the study, 21 from each of grades 1, 3, 5, and 7. The sex, average age, and age range of subjects at each grade level are displayed in Table 1. The subjects attended a middle class, public, Roman Catholic School in St. John's. All of the subjects were placed in a regular classroom setting and none was receiving special remedial assistance in any academic area. Each subject's participation was secured by written parental consent.

Materials

Each child was exposed to four short stories, typed individually on 10 x 15 cm. index cards. Each story contained six propositions (the child's name, sex, age, level of intellectual ability, level of work effort and reading ability) about a fictitious child (see Appendix A). Reading ability was held constant across the four stories and the fictitious child was always depicted as "a bad reader". The intellectual ability (high versus low) and level of work effort (high versus low) of the depicted children were varied systematically across the four stories such that, all combinations of ability and

TABLE 1

Sex, Average Age, and Age Range of Subjects at Each Grade Level

Grade	Sex		Average Age	Age Range
	Females	Males		
1	9	12	7 yrs. 4 mos.	6 yrs. 5 mos. to 7 yrs. 6 mos.
3	14	7	8 yrs. 11 mos.	8 yrs. 5 mos. to 9 yrs. 4 mos.
5	9	12	10 yrs. 9 mos.	10 yrs. 6 mos. to 11 yrs. 11 mos.
7	11	10	13 yrs. 4 mos.	12 yrs. 3 mos. to 14 yrs. 4 mos.

N = 21 At Each Grade Level

effort were represented (see Appendix A). For each story, the age and sex of the depicted child was matched to the age and sex of each individual subject. The names of the children in the stories were selected from the vital statistics report of the ten most popular names for male and the ten most popular names for female newborns in Newfoundland in 1987 (see Appendix B). The names of the depicted children were randomized across stories and subjects, with the constraint that the sex of the child in the story was matched to the sex of the subject.

Procedure

Subjects were seen individually in a quiet room in their school. Each subject participated in two sessions over a two-day period, with each session lasting for approximately 10-15 minutes. Two stories were presented per session. During each session, the experimenter and the subject sat side by side at a small table. Subjects were informed that the experimenter was interested in their ideas about reading. The children were assured that this was not a test and that there were no right or wrong answers.

The following sequence of experimental procedures was employed for each of the four stories. First, the index card was placed on the table between the experimenter and the subject. Then, the experimenter read the story aloud while the children followed visually. Following story presentation, the subject's memory for 5 of the 6 story propositions was assessed. Subjects were not asked to recall the depicted child's name. A simple question answering format was used to assess memory. For example, the children were asked "Is (relevant name) a bad reader?" (see Appendix C). The order in which memory for propositions was assessed was completely randomized across stories and subjects. If a subject failed to achieve perfect recall of the story propositions, the experimenter read the story again and a second recall test was administered. (The majority achieved perfect recall on the first trial and the remaining children reached this criterion on the second trial).

Following successful recall, the subjects were asked three questions about the child in the story. The questions were administered in the following fixed order. The first question was designed to elicit children's

knowledge about the cause of the depicted child's reading problem. Subjects were simply asked "Why is (relevant name) a bad reader?" The second question was designed to elicit children's understanding about the manifestation of that reading difficulty. The question used was "What is the hardest part of reading for (relevant name)?" Pilot testing revealed that many children encountered difficulty with this second question. They answered simply 'reading' or 'the words' and would not or could not elaborate. Therefore, in the experiment proper if children answered this question in that manner they were supplied with an additional forced choice question. That question was "What is the hardest part of reading for (relevant name), saying the words or knowing the meaning of the words?" Finally, the third question was intended to elicit children's ideas about remediating reading problems. They were asked "What could be done to make (relevant name) a better reader?"

The order of presentation of the four stories was completely randomized. For each story, propositions about the depicted child's name, sex, and age were presented first and in that fixed order. However, the order of propositions about the child's intellectual

ability, effort level, and reading ability was completely randomized. All responses were recorded on tape.

RESULTS

The results will be presented separately for causal attributions, remediation strategies and manifestation of reading difficulties.

Causal Attributions

Data Preparation. Causal attribution responses were coded according to a seven-category coding scheme (see Table 2). This scheme was developed by forming clusters of responses along general factors and attaching descriptive labels (e.g., Stipek & Tannatt, 1984). The aim of such analyses is to maximize the rule of parsimony. That is, the fewest number of categories necessary to describe the data adequately were developed.

Most subjects provided several causal attribution propositions in their responses to individual stories. For each story, if a subject provided causal attributions from different categories (e.g., the child is not smart (ability) and needs eye glasses (physical)) one score for each relevant category was entered for that subject. When a subject provided two different causal attributions from a single category (e.g., the child is not trying hard enough (reading related effort) and does not spend enough time reading (reading related effort)) that

TABLE 2
Description of Categories Used to Score
Causal Attribution Responses

Category	Description of Causal Attributions
Ability	Insufficient intellectual ability.
Cognitive	Specific cognitive problems (e.g., poor attentional processing).
Motivation	Lack of interest in or dislike of reading.
Physical	Physical or sensory problems (e.g., illness, poor eye sight).
Reading Related Effort	Insufficient time or energy devoted to reading, studying, practicing.
Social-Personal	Personality factors (e.g., shyness) affect (e.g., nervousness), and social factors (e.g., fear of ridicule by classmates).
Other	Responses which could not easily be assigned to the other 6 categories.

subject was assigned one score for each attribution provided in that category. Finally, if a subject provided several highly similar attributions from a single category (e.g., the child dislikes reading (motivation), the child dislikes reading books (motivation)) these attributions were considered to be duplicates and the subject was assigned one score in the relevant category.

The causal attribution responses were coded by two independent raters. The interrater reliability was 95%. Disagreements were resolved through discussion and 100% agreement achieved.

Analyses. The causal attribution data were analyzed using a 4 (grade) x 2 (ability: high y low) x 2 (effort: high y low) x 7 (response category) analysis of variance (ANOVA). In this analysis the first factor (i.e., grade) is a between subject variable and the remaining three factors (i.e., ability, effort, and response category) are within subject variables. Post-hoc analyses were conducted using Tukey's HSD (honestly significant difference) Test (Kirk, 1982).

The only significant main effect that emerged from the analysis was for response category, $F(6,480) =$

44.854, $p < .01$. Post-hoc analyses (see Table 3) indicated that the response frequency in the seven categories was ordered in the following manner: cognition = reading related effort > motivation = other > ability = physical = social-personal. Thus, children attributed the cause of reading difficulties most often to either cognitive or effort factors. Significantly fewer attributions involved motivation factors. Finally, an equivalent number of attributions involving ability, physical, and social-personal factors were obtained. These responses occurred significantly less often than any other category of response.

Two significant first order interactions involving effort x response category, $F(6,480) = 4.169$, $p < .01$, and ability x response category, $F(6,480) = 3.050$, $p < .01$, were obtained. Post-hoc analyses of the effort x response category interaction indicated the central feature of this interaction was that when a story depicted a child who did not work hard, subjects were significantly more likely to attribute the problem to insufficient reading related effort than when the story depicted a child who worked hard. Post-hoc analyses of the ability x response category interaction indicated the

TABLE 3

Comparison of Mean Number of Causal Attributions In Each Response Category

	Reading Related Effort	Cognition	Motivation	Other	Social Personal	Physical	Ability
Reading Related Effort x = .770	--	.15	.49*	.52*	.67*	.68*	.69*
Cognition x = .622		--	.35*	.37*	.52*	.54*	.54*
Motivation x = .276			--	.02	.17*	.19*	.19*
Other x = .255				--	.15	.17*	.17*
Social-Personal x = .104					--	.02	.02
Physical x = .086						--	.003
Ability x = .083							--

*Critical difference between means for the HSD Test = 0.17 at $p < .05$

following central feature. When the story depicted a child of high intellectual ability, subjects made significantly more attributions to reading-related effort versus cognitive factors. However, when the story depicted a child of low intellectual ability, there were no significant differences between effort and cognitive attributions.

To summarize, these analyses indicated that (1) regardless of age or story content, children attributed the cause of the reading difficulty most often to either specific cognitive factors or reading-related effort, (2) children discriminated between the effort levels depicted in the stories in terms of their attributions involving effort, and (3) children discriminated between the intellectual ability levels depicted in the stories, in terms of their attributions involving effort and cognitive factors.

Remediation Strategies

Data Preparation. Remediation responses were coded according to an eight-category coding scheme (see Table 4) developed in the same manner as the previous scheme. Most subjects provided several remediation suggestions

TABLE 4
Description of Categories used to Score
Remediation Recommendations

Category	Description of Remediation Strategies
Assistance From Others	Obtaining help/assistance from significant others (e.g., teacher, family).
Assistance From Special Placement	Placement in a special class or school.
Cognitive	Modification of specific cognitive processes (e.g., listen carefully, pay attention).
Motivation	Increasing interest in or liking for reading (e.g., get them interested, make them like it).
Physical	Intervention for physical or sensory difficulties (e.g., go to a doctor, wear eye glasses).
Reading Related Effort	Increasing the time or energy devoted to reading, studying, or practicing (e.g., try harder, read more).
Social-Personal	Modification of personality, affect or social factors (e.g., don't be shy, don't be afraid).
Other	Responses which could not easily be assigned to the other 7 categories.

in their responses to individual stories. For each story, if a subject provided remedial suggestions from different categories (e.g., the child should visit a doctor (physical) and get interested in reading (motivation)) one score for each relevant category was entered for that subject. When a subject provided two different remedial suggestions from a single category (e.g., the child should listen carefully (cognitive) and pay attention (cognitive)), that subject was assigned one score for each suggestion provided in that category. Finally, if a subject provided several highly similar recommendations from a single category (e.g., the child should get help from parents (assistance from others) and from grandparents (assistance from others)), ~~these~~ recommendations were considered to be duplicates and the subject was assigned one score in the relevant category.

The remediation recommendation data were coded by two independent raters. The interrater reliability was 95%. Disagreements were resolved through discussion and 100% agreement achieved.

Analysis. The remediation recommendation data were analysed using a 4 (grade) x 2 (ability: high y low) x 2 (effort: high y low) x 8 (response category) ANOVA

where grade is a between subject variable, and the remaining three factors are within subject variables.

A significant main effect for grade, $F(3, 80) = 5.574$, $p < .01$, emerged from the analysis. Post-hoc analysis, (see Table 5) indicated that grade 1 subjects provided significantly fewer remedial recommendations than grade 3 and grade 5 children. A significant main effect for response category was obtained, $F(7, 560) = 76.049$, $p < .01$. Post-hoc analysis (see Table 6) indicated that the response frequency in the 8 categories was ordered in the following manner: reading related effort > cognitive = assistance from others > assistance from special placement = motivation = other = physical = social-personal. Thus, increasing effort was the strategy recommended most often. Suggestions for modifying cognitive processes or for obtaining help from others occurred with equivalent frequency. However, these responses occurred significantly less often than effort suggestions, and significantly more often than all other categories of response.

Two significant first order interactions involving effort x response category, $F(7, 560) = 3.169$, $p < .01$, and ability x response category, $F(7, 560) = 2.512$, $p <$

TABLE 5

Comparison of Mean Number of Remediation Recommendations
at Each Grade Level

	Grade 1	Grade 7	Grade 5	Grade 3
Grade 1 \bar{x} = .230	--	.04	.07*	.09*
Grade 7 \bar{x} = .270		--	.03	.05
Grade 5 \bar{x} = .300			--	.02
Grade 3 \bar{x} = .320				--

*Critical difference between means for the HSD test =
0.07 at $p < .05$.

TABLE 6

Comparison of Mean Number of Remediation Recommendations in Each Response Category

	Reading Related Effort	Assistance From Others	Cogni- tion	Other	Assistance Special Placement	Social Personal	Motiv- ation	Physical
Reading Related Effort x = .976	--	.40*	.55*	.87*	.94*	.94*	.95*	.96*
Assistance From Others x = .577		--	.15	.47*	.54*	.54*	.55*	.56*
Cognition x = .428			--	.32*	.39*	.39*	.40*	.41*
Other x = .110				--	.07	.07	.08	.09
Assistance: Special Placement x = .041					--	0.0	.01	.02
Social- Personal x = .041						--	.01	.02
Motivation x = .029							--	.01
Physical x = .017								--

* Critical difference between means for the HSD Test = .17 at $p < .05$

.05, were obtained. Post-hoc analyses of the effort x response category interaction indicated the central feature of this interaction was that when the story depicted a child who did not work hard, subjects were more likely to recommend an increase in effort than when the story depicted a child who worked hard. Post-hoc analyses of the ability x response category interaction indicated the following central feature. When the story depicted a child of low intellectual ability, subjects were significantly more likely to recommend assistance from others versus modification of cognitive processes. However, when the story depicted a child of high intellectual ability, recommendations for assistance from others versus cognitive modification occurred with equivalent frequency.

To summarize, these analyses indicated that (1) grade 1 children provided significantly fewer remedial suggestions than grade 3 and 5 children, (2) regardless of age or story content, increased effort was the remediation strategy most often recommended (3) children discriminated between the effort levels depicted in the stories, in terms of their recommendations for increased effort, and (4) children discriminated between the

intellectual ability levels depicted in the stories in terms of their recommendations for receiving assistance from others and for modifying cognitive processes.

Manifestation of Reading Difficulties

Recall that for each story subjects were asked to indicate the most difficult aspect of reading for the depicted child. If subjects did not provide a scoreable response then a forced-choice question was administered (i.e., what is the hardest part of reading, saying the words or understanding the meaning of the words). Sixty-one percent of the subjects did not provide a scoreable response for the first story presented to them. Grade 1 children in particular had difficulty with this question (see Table 7). Consequently, all of these subjects received the forced-choice question.

Two interesting phenomena were observed using this procedure. First, subjects who provided scorable responses on the initial or subsequent stories/trials all implicated either word recognition or comprehension problems. Thus, these responses corresponded with the alternatives provided in the forced-choice question. Second, the provision of the forced-choice question

TABLE 7

Percentage of Subjects Responding Saying or Understanding
on Open-Ended Questions As a Function of Story Sequence and Grade

Grade	Story Sequence			
	First	Second	Third	Fourth
1	29.1	25.0	41.6	41.6
3	45.8	33.3	54.1	66.6
5	33.3	38.1	61.9	61.9
7	47.6	61.9	71.4	85.7

N = 21 in each condition

seemed to influence subjects' ability to respond to the open-ended question on subsequent trials. That is, increasing numbers of subjects provided saying or understanding responses to the open-ended question across stories/trials. This influence was most pronounced for the older subjects (see Table 7).

As the responses were identical (i.e., saying or understanding) for the open-ended and forced-choice questions, question format was not entered as a factor in the analysis. Instead, the frequency of saying and understanding responses was calculated for each of the four experimental conditions at each grade level (see Table 8). These data were subjected to a series of Chi-Squared analyses designed to evaluate the effects of grade and of the ability and effort factors. While a trend in favor of saying responses is evident in these data (see Table 8), no significant differences were obtained from the analyses.

TABLE 8

Frequency of Saying and Understanding Responses in Each Experimental Condition for Each Grade

Grade	Experimental Condition							
	High Ability High Effort		High Ability Low Effort		Low Ability High Effort		Low Ability Low Effort	
	Saying	Understanding	Saying	Understanding	Saying	Understanding	Saying	Understanding
1	12	6	12	8	14	7	9	11
3	13	8	9	10	7	14	8	12
5	12	8	12	6	10	10	12	8
7	11	8	12	7	12	7	8	13

In some conditions a few subjects responded both or do not know. These data are not included.

The present study was designed to investigate the development of children's theories of reading difficulties. Specifically, children's metacognitive theories about the cause, manifestation, and remediation of reading difficulties were investigated. Children from grades 1, 3, 5 and 7 were exposed to 4 short stories, all of which depicted a poor reader of the same age and sex as the subject. The amount of work effort (high versus low) and intellectual ability (high versus low) of the depicted children was varied systematically across the stories. Following the presentation of each story, subjects' memory for story content was assessed. Next, subjects were questioned about the cause, manifestation, and remediation of the reading difficulty.

The major findings were (1) children's theories about the cause, manifestation, and remediation of reading difficulties did not change significantly with age, (2) children's understanding of the causes and remediation of reading difficulties seemed to be dominated by the influence of effort and cognitive variables, and (3) children seemed to understand that reading difficulties can be manifested in either word

identification or comprehension problems. The discussion of these findings will be orchestrated around the following topics -- developmental findings, causal attributions, remediation suggestions, manifestation of reading difficulties, and educational implications.

Developmental Findings

Causal Attributions. No significant main effect for age and no significant interactions involving age were obtained for the causal attribution data. Thus, regardless of age, the pattern of causal attribution responses was equivalent for each of the four stories. This absence of significant developmental differences in judgements about the influence of effort and ability variables contrasts with findings reported by Nicholls (1978) and Nicholls and Miller (1982) who report that by the age of 12 years, children clearly differentiate between effort and ability variables in their causal attributions. However, the Nicholls (1978) and Nicholls and Miller (1982) findings were obtained on academic tasks other than reading.

The absence of significant developmental effects in the present study is similar to findings reported by

Whitehead, et al. (1987) and Whitley and Frieze (1985). As Whitley and Frieze (1985) point out, judgements about the influence of effort and ability variables seem to be highly task dependent. It appears that in the context of reading, children in grades 1 to 7 judge effort and cognitive variables to be the major determinants of reading difficulties. In their judgements, the role of intellectual ability seems to have been appointed little significance. These findings lend some support to the Whitley and Frieze (1985) hypothesis that children may perceive some tasks as requiring much more effort than ability and that these perceptions affect attributions. Tasks may be scalable for the degree to which they require ability and effort for successful completion. However, children's attributions to these factors may vary as a function of the degree to which children perceive them as being inherent in the task. Clearly, a taxonomy of tasks as well as of attributions might assist in understanding how children perceive the causes of failure and success (Whitley & Frieze, 1985). In the context of the present study, however, the findings are clear.

Remediation Strategies. A main effect for age was obtained for the remediation data. Subjects in grade 1 gave significantly fewer scorable responses than subjects in grades 3 and 5, indicating that grade 1 children offered fewer suggestions for remediating reading difficulties. This finding may be related to the fact that, typically, systematic school-based remediation for reading problems is not introduced until grade 2 or 3. Thus younger children may have less experience with the variety of remedial options. Interestingly, while grade 1 children seem as familiar with the causes of reading difficulties as older children, they seem to have less knowledge about how to overcome these difficulties.

No significant interactions involving age were obtained on the remediation data indicating that at each grade level, the pattern of remedial suggestions was equivalent for each of the four stories. These findings suggest that children in grades 1 to 7 have similar ideas about what to do to overcome reading difficulties, and most of those ideas are centered on increasing effort. The absence of significant developmental differences in remedial suggestions parallels similar findings obtained for causal attributions.

O'Sullivan (1988) also failed to observe developmental differences in children's solutions for overcoming word identification problems. Such findings may reflect the fact that regardless of age, children are exposed to a relatively constant reading environment in school. That is, they experience a relatively fixed and limited number of remedial suggestions from teaching staff (Durkin, 1983). Future research could be designed to investigate the origin of children's remedial suggestions and the factors that may be contributing to the apparent developmental invariance of this knowledge.

Manifestation. There were no significant developmental effects for the data on manifestation of reading difficulties. Children of all ages seemed to understand that reading difficulties can be manifested in word identification and/or comprehension problems. However, there seemed to be a trend in favour of word identification at all ages.

Many authors (e.g., Forrest-Pressley & Waller, 1984) have found that with age, children increasingly focus on meaning as the most important component in reading. The results of this study suggest that children do not necessarily associate the manifestation of the reading

problem with the most important aspect of the reading process. The data suggest that, regardless of age, most children believe reading difficulties are focused on recognition. This finding is consistent with findings reported by O'Sullivan (1988). In that study, children from grades 1 to 5 reported that they identify poor readers on the quality of their oral production. Thus understanding about the manifestation of reading difficulties may be related to children's experiences with problem readers. In the school situation these experiences seem to take place primarily in the context of oral reading. Public demonstrations of comprehension difficulties are far less frequent in the classroom (Durkin, 1983).

These findings must be interpreted with caution in light of the methodological difficulties associated with this measure. Pilot testing revealed that most children did not provide elaborated, scoreable responses on this measure. Therefore, in the experiment proper, if children did not provide a scoreable response they were supplied with an additional forced choice question (i.e. what is the hardest thing about reading -- saying the words or understanding the meaning). While subjects

appeared to have no difficulty understanding the question, the findings are nonetheless tied to this particular method of measurement.

In summary, the developmental findings from this study suggest that regardless of age, children have similar theories about the causes, manifestation, and remediation of reading difficulties. Regardless of story content, children at all grade levels provided equivalent causal attributions and suggestions for remediation. Further, at each grade level, children associated reading difficulties with both word identification and comprehension problems.

Causal Attributions

No significant main effects were associated with the ability and effort manipulations in the causal attribution data. That is, an equivalent number of scoreable causal responses was obtained for each of the four situations. A significant main effect for response category was obtained and indicated that subjects attributed the cause of the problem most often to effort or specific cognitive problems, next to the motivation

and the other categories, and last to the ability, physical and social-personal categories.

Children's preoccupation with effort as a causal factor has also been demonstrated in previous research. Butkowsky and Willows (1988) found that good readers attribute failure to a lack of effort. Harari and Covington (1981) also found that effort was highly valued in the elementary grades. That is, even in grade 6, children still believed that if you work hard you will succeed. This apparent preoccupation with effort could be a result of the influence of parents and teachers who constantly reinforce the belief that hard work leads to success (e.g., Barker & Graham, 1987).

Children's concern with specific cognitive problems suggest that they understand the link between cognition and reading problems. This finding is consistent with those findings reported by Hiebert et al. (1984), in which children implicated cognitive factors, such as attention, as important determinants of reading proficiency. Thus, it appears that children have some understanding of, and attribute importance to, the role of cognitive variables in determining reading difficulties.

The inclusion of this cognitive response category seems to be significant methodologically. Few authors have differentiated between effort and cognitive variables. Many authors have combined the effort and specific cognitive responses of subjects under the single broad category of effort. However, when separate response categories are constructed, the importance that children attribute to cognitive variables is demonstrated. Indeed subjects in this study responded with equivalent numbers of cognitive and effort responses. Thus, subjects' knowledge of cognitive variables could be grossly underestimated if they were placed under the broad category of effort.

The children discriminated between the intellectual ability levels depicted in the stories in terms of their causal attributions involving effort and cognitive factors. On high ability stories, subjects were significantly more likely to attribute the problem to insufficient effort versus cognitive problems. However, on low ability stories effort and cognitive attributions occurred with equivalent frequency. It seems that the children had some understanding of the interplay between ability, effort and cognitive factors. In particular,

they recognized that insufficient effort was less likely to be the cause of reading difficulties for a child with low versus high intellectual ability.

The children discriminated between the effort levels depicted in the story in terms of their causal attributions involving effort. When the story depicted a child who worked hard, subjects were less likely to attribute the problem to lack of effort than when the story depicted a child who did not work hard. Thus subjects demonstrated some understanding of the influence of effort. However, given the predominance of effort attributions it seems that overall these subjects are rather insensitive to the influence of effort on reading difficulties. Thus, even when a story depicted a child who worked hard, subjects were likely to attribute the problem to not working hard enough.

In summary, the findings for causal attributions indicate that regardless of the ability and effort manipulations subjects were primarily concerned with the influence of effort and cognitive variables. Subjects discriminated between the effort and ability levels presented in the stories but, overall, they seemed to be

relatively unconcerned with ability and relatively insensitive to the influence of effort.

Remediation Strategies

There were no significant main effects obtained for the ability and effort manipulations on the remediation data. Subjects gave an equivalent number of responses in each of the four conditions. There was a significant main effect for response category indicating that subjects gave significantly more effort related responses than any other strategy. The cognitive and assistance from others category contained an equivalent number of responses, but contained significantly fewer responses than the effort category and significantly more responses than in each of the remaining categories. The physical, social-personal, motivation, other, and assistance from a special placement categories contained an equivalent number of responses.

Effort related responses seemed to dominate the suggestions for remediation regardless of story content. This domination of effort responses is consistent with the effort focus in the children's causal attributions. Thus, it seems that children consider insufficient effort

to be a major cause of reading difficulties and not surprisingly, therefore, remediation is seen as requiring an increase in effort.

The children discriminated between the effort levels depicted in the stories in terms of their recommendations for increased effort. When the story depicted a child who did not work hard, subjects were more likely to recommend increased effort than when the story depicted a child who worked hard. Thus, subjects demonstrated some understanding about the role of increased effort as a remedial strategy. However, given the predominance of effort-related remedial suggestions it seems that, overall, subjects were relatively insensitive to the influence of this variable. Even when a story depicted a child who worked hard, the predominant remedial suggestion was to work harder.

Why do children propose increased effort so consistently? Perhaps they believe it to be the most effective remedial strategy or they may simply consider that it is the most immediate and perhaps easiest route to take. Alternately, the domination of effort may reflect limited understanding of other remedial

strategies. These questions could be addressed in future research.

Although subjects tended to focus on effort, there was also some emphasis on cognitive factors and on obtaining assistance from others. The emphasis placed on cognitive factors and obtaining assistance from others indicates some awareness of alternate strategies for improving reading. Moreover, children were more likely to recommend that a child of low intellectual ability should get assistance from others versus attempting to modify cognitive processes. For children of high intellectual ability, both suggestions occurred with equivalent frequency. It seems that children have some understanding of the interplay between intellectual ability and remedial routes.

While cognitive problems were appointed major importance as causes of reading difficulty, interestingly, children seemed to have fewer ideas about remediating such cognitive difficulties. This is not surprising given the paucity of instruction directed at the cognitive components of reading in school (Pearson & Dole, 1987). Typically, children are told that listening, attention and monitoring are important for

reading. However, instruction in the processes of listening, attending or monitoring is extremely rare (Pearson & Dolé, 1987).

In summary, the findings for the remediation data indicate that regardless of the ability and effort manipulations, increased effort was the primary remedial suggestion offered. Consistent with the causal attribution data, subjects displayed a major concern with effort. However, this preoccupation with effort seemed to result in the indiscriminate use of effort related remedial strategies, suggesting an incomplete understanding of the influence of effort on reading difficulties. Subjects also displayed some knowledge of other remediation strategies with suggestions relating to cognition, obtaining assistance from others, obtaining assistance from a special placement, physical, social-personal, and motivation categories.

Educational Implications

The findings from this study suggest that children's theories about reading difficulties appear to undergo little change between grades 1 and 7. Within this age range, children believe that reading difficulties are

caused by cognitive problems or insufficient effort, factors within the individual's control. Similarly, they appear to believe that children with reading difficulties can overcome these problems by simply trying harder. These findings have implications for both learning to read and for the social consequences of reading difficulties.

Learning to Read. The results of this study suggest that when children encounter reading difficulties, in themselves or others, they relate them to effort and believe that increased effort will help to overcome them. This may have both positive and negative implications. First, children who believe they can control their behaviour will try harder. Butkowsky and Willows (1980) found causal attributions to be related to the level of persistence on reading tasks and expectancy of success following failure. Good readers who attributed failure to lack of effort tended to be more persistent and showed greater increments in expectancy of success than poor readers who attributed failure to lack of ability.

However, the belief that increased effort will lead to success also has negative implications. Children who work hard but continue to fail may develop the belief

that their actions are unrelated to task outcome (i.e., success or failure). Research has shown that this perceived independence of action and outcome may lead to passivity, lack of persistence in the face of failure, negative feelings about intellectual ability and competence, and lower self-esteem (e.g., Dweck, 1975; Kistner & Torgesen, 1987). Children who repeatedly fail in reading despite considerable effort may begin to perceive an independence between their actions and task outcome which may lead to deficits in other areas unrelated to the actual skill deficit in reading. This suggests that children may require instruction about the dimensions of reading failure. For example, children may need to be taught how to figure out when they are working hard enough and it is not helping. Instruction may be needed to help children differentiate between the quantity versus the quality of effort. As well, instruction in how to overcome specific cognitive problems (e.g., how to listen more effectively), as opposed to simply trying harder, may be needed.

Social Consequences. Children's beliefs about the causes of other children's problems are known to influence their social behaviours towards these "problem"

children. For example, Maas, Marecek, and Travers (1978) found that young children believe that aggressive behaviour is deliberate and can be controlled by the aggressive child. In contrast, they believe that problems with anxiety or social withdrawal is beyond the control of the individual child. These causal attributions are translated into social behaviour in that aggressive children tend to be openly rejected while anxious/withdrawn children are tolerated (Maas et al., 1978). Thus children's understanding about the cause of a particular problem may influence their social behaviour towards the target child or children.

The findings in the present study suggest that if children believe that reading difficulties are caused by and can be corrected by effort, then they are likely to view children with reading difficulties in a negative way. It is well known that children with reading disabilities, for example, tend to be among the most unpopular children in school (Horne, 1982). The findings from this study suggest that children's theories of reading difficulties may be contributing to the social standing of children with reading difficulties.

A guidance module that is focused on delivering education about the causes of reading difficulties seems to be indicated. If children can understand that reading difficulties are not always within the control of the individual, then perhaps their perceptions of and behaviour towards children with reading difficulties may become more flexible. Such a program could be in effect throughout both the primary and elementary grades because, in this study at least, increasing age was not accompanied by increasing understanding.

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Appendix A**Stories**

_____ is a boy/girl. S/he is the same age as you.
S/he is a bad reader. S/he is not a smart boy/girl.
S/he does not work hard.

_____ is a boy/girl. S/he is the same age as you.
S/he is a very smart boy/girl. S/he is a bad reader.
S/he does not work hard.

_____ is a boy/girl. S/he is the same age as you.
S/he works very hard. S/he is a very smart boy/girl.
S/he is a bad reader,

_____ is a boy/girl. S/he is the same age as you.
S/he is a bad reader. S/he is not a smart boy/girl!
S/he works very hard.

Appendix B

Vital Statistics

Listed below are the four most popular names given
to newborn babies in Newfoundland over the last year:

Male

Christopher

Matthew

Andrew

Michael

Female

Jennifer

Ashley

Melissa

Amanda

Appendix C

Memory Test Format

Subjects were asked the following questions in random order:

Now can you tell me if the story said:

- _____ was a boy or a girl?
- _____ was smart?
- _____ was a good reader?
- _____ was the same age as you?
- _____ works hard?



