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CHILDREN'S KNOWLEDGE ABOUT EFFECTIVE READING-STUDY
STRATEGIES AND IT'S RELATIONSHIP TO THEIR
ACADEMIC PERFORMANCE

by

Patricia Lynn Mason

A Dissertation
submitted to the Faculty of Graduate Studies
through the Department of
Psychology in Partial Fulfillment
of the requirements for the Degree
of Doctor of Philosophy at
The University of Windsor

Windsor, Ontario, Canada

1979

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ABSTRACT

CHILDREN'S KNOWLEDGE ABOUT EFFECTIVE READING-STUDY
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Patricia Lynn Mason

Children's knowledge about their own learning has been investigated in various studies of learning and memory. However, there are few studies on what children can come to know about variables affecting their school learning. Reading is an important part of school learning. Educational technologists have emphasized that the use of certain reading strategies can facilitate learning and recall.

The primary purpose of this study was to investigate what children know about repetition as a reading study strategy. Repetition has two aspects: (1) simple repetition, i.e. rereading something exactly; and (2) differential repetition, i.e. the use of some reading strategy such as recitation prior to rereading. The interpolated activity can help the reader assess what has already been learned, and can guide further readings. Knowledge about simple repetition was assumed to develop prior to knowledge about differential repetition. Conditions influencing use of a repetition strategy were also investigated. The second purpose of the study was to investigate the relationship between knowledge about repetition and children's academic performance.

Thirty children from grades 2, 5, and 8 responded to a series of questions. One set of questions asked the children to describe their own reading behaviours. Responses were analyzed for indications of awareness of reading for learning strategies, especially repetition.

The second set of questions involved eight story descriptions in which the study behaviours utilized by two children were contrasted. The children were asked to choose which child was the more effective learner, and to justify their choices. The story descriptions included questions on a simple repetition strategy; three differential repetition strategies (asking oneself questions, recitation, reading with differing purposes and rates); and two task demand (memorize versus be familiar with, high versus low performance goal), and two material (familiarity, difficulty level) variables on use of a repetition strategy. Responses were recorded, transcribed, summarized, and categorized. The categorized responses were analyzed by Chi Square analyses.

To investigate the second purpose, correlations were computed between the children's responses to the interview, and teacher ratings of classroom behaviour and achievement, final grades, and composite achievement scores on the Canadian Tests of Basic Skills.

Responses indicated that by grade 2, children are aware of simple repetition as a reading for learning strategy, even though they are unlikely to be able to explain how it influences learning. In contrast, significantly more grade 5 and grade 8 children were able to provide adequate explanations for how simple repetition can influence learning.

Grade 2 children displayed even less knowledge about differential repetition strategies. However, by grade 5 the children verbalized significantly greater knowledge about how various strategies can affect their learning. They were more likely than the younger children to suggest some strategy use in their own reading, and displayed significantly greater knowledge about the effects on learning of the differential repetition strategies.

investigated. Even greater improvement in understanding of the effects of differential repetition was shown by the grade 8 children. Thus, the major changes in children's acquisition of knowledge about simple repetition occurred between grades 2 and 5, while the major changes in acquisition of knowledge about differential repetition strategies occurred between grades 5 and 8. It is also noteworthy that on one-third of the interview questions, a more mature level of responding was possible past grade 8, indicating that some aspects of children's knowledge about effective reading-study behaviours develop beyond the late elementary years.

Responses to the story descriptions assessing the influence of task and material variables indicated that most children realized repetition was more important when the material was difficult or unfamiliar. Similarly, most children showed an awareness that a higher performance goal or an instruction to memorize a story should result in better learning. However, the grade 2 children were significantly less able than the older children to explain how these variables might produce differences in reading-study behaviours, and were also less able to appreciate that various factors might influence learning and should be considered before making their choices.

These developmental changes in children's knowledge about effective reading-study behaviours were discussed in terms of changes in children's cognitive skills, and changes in educational practices.

When the relationship between children's achievement and their performance on the questionnaire was calculated, it became evident that the pattern of significant correlations differed at each grade level. For example, correlations involving simple repetition were frequently significant at grades 2 and 5, but not at grade 8. This

supports the assumption that knowledge about simple repetition would develop during the early elementary years. At the grade 5 level, the majority of the significant correlations dealt with differential repetition strategies. Thus, at each grade level, those children who were rated as achieving better, were also the same children who displayed greater awareness of the relevant aspects of a repetition strategy. It may be therefore, that one variable influencing children's achievement in school is their knowledge about effective reading behaviours. (

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CHAPTER I INTRODUCTION

Recently, children's knowledge about their learning has become an important variable in investigations of why children frequently exhibit better performance with increasing age in many learning and recall tasks (e.g.: Brown, 1975; Flavell, 1971; Flavell and Wellman, 1977). Much of the research has been concerned with children's awareness of strategies that can assist their learning of tasks in experimental situations. Other studies have been concerned with such everyday situations as remembering a telephone number or finding a lost item. However, children's awareness of strategies that can assist their school learning has rarely been investigated in a systematic manner (see the Review of the Literature, Appendix A).

The present study was concerned with children's knowledge about a school related study strategy. It had two aspects.

One aspect of the study was concerned with children's knowledge of a repetition study strategy in tasks involving learning from prose materials. The second aspect of the study was concerned with whether children's knowledge about a repetition strategy will have implications for their school behaviour and achievement. Children may achieve poorly in school for a variety of reasons, such as limited ability, poor health, lack of motivation, or the lack of knowledge of appropriate learning behaviours and strategies. Possibly then, knowledge of a repetition strategy which is useful in learning from prose materials, may be an important variable influencing children's classroom behaviour and achievement, in academic tasks where repetition may be used to assist learning.

In summary, the intent of this research was to investigate what children know about a reading-study

strategy involving repetition, and whether that knowledge is related to their school achievement. However, the present paucity of research information on children's awareness of strategies to assist their learning in school tasks (see Appendix A) made it difficult to know where to begin the investigation. It was essential to develop a concise conceptualization of repetition as a learning strategy, and to demonstrate that such a strategy has implications for learning. The conceptualization must also include what children may come to know about repetition and its use. It should also provide guidelines for developing the experimental procedures and materials. In the following section, a conceptualization of repetition will be developed and research relevant to this understanding of repetition will be reviewed. In addition, the relationship between knowledge of repetition and actual academic behaviour will be elaborated.

Conceptualization of repetition as a reading for learning strategy

A. Definition and implications for learning

One of the definitions of repetition given by Webster's New World Dictionary (1968) is as follows: "a repeating, a doing or saying again." This is close to the definition of repetition utilized by the author. Repetition is the redoing of a task. In this redoing, either of two possible actions may be undertaken: (a) an exact copy of the original behaviour, herein after called simple repetition, or (b) a redoing, wherein the original behaviour has been altered according to some design or reason of the learner, herein after called differential repetition. Both types of repetition are useful study strategies, depending upon the task and material conditions presented to the learner. A mature conception of repetition involves an awareness of both of the above types, and of the task and material variables which influence when and if they are required

and utilized.

A brief survey of some of the relevant experimental research on repetition gives evidence that both types of repetition do have implications for learning.

When children and adults must learn a series of discrete items (e.g. lists of words), verbal rehearsal (i.e. simple repetition of the items) has been found to influence positively their learning and recall (e.g. Flavell, Beach and Chinsky, 1966; Keeney, Cannizzo and Flavell, 1967; Hintzman, 1976). Flavell et al (1966) conducted a study in which kindergarten, grade 2 and 5 children had to remember the order in which a number of items were touched. With increasing age, more of the children were observed using a rehearsal strategy to remember the items. Recall performance also increased with increasing age. Keeney et al (1967) found that when grade 1 children who did not spontaneously use a verbal rehearsal technique were taught to use it, their recall performance also increased. Thus, simple repetition can act as an important tool to keep information in short term memory. In the school setting, children are frequently urged to repeat what they are doing in order to consolidate a new skill or piece of information. For example, simple repetition is a tool used to help children learn to remember the association between a letter of the alphabet and its sound; or to learn simple number facts. Similarly, in their manuals on effective reading, educational technologists (e.g. Morgan and Deese, 1957; Morris, 1973; Wrenn and Larsen, 1976) have stated that learning from prose materials will be facilitated by reading the textual passage more than once.

However, much of the research on children's learning in memory related studies has shown that simple repetition often does not ensure optimum learning. Rather, variations in the repeating of the task may produce better learning

and recall. Such variations are also more likely to be utilized by older children. A study by Flavell, Friedrichs and Hoyt (1970) illustrates both of the previous points. In that study, nursery school, kindergarten, grade 2 and 4 children were given an unlimited amount of time to study a series of pictures, until they were certain that they would be able to recall them perfectly in the same serial order in which they were initially presented. The authors found an increase with age in the use of a rehearsal strategy; also, the grade 4 children were more likely to use additional strategies (e.g. anticipation naming and self-checking) along with rehearsal, as their study time progressed.

In many studies, rehearsal has been deemphasized as a study strategy, and emphasis has been placed on other study activities. For example, Clarkson (1973) in a paired associate learning task found that mental elaboration was more effective for learning and eventual recall than simple repetition of the items. It seems likely, that in most of the learning situations involving prose materials, simple repetition may not be the best strategy. Rather, differential repetition may be more important.

Educational technologists (e.g. Morgan and Deese, 1957; Morris, 1973; Wrenn and Larsen, 1976) have emphasized that an effective reading for learning strategy requires differential repetition. Such a reading for learning strategy may involve reading with different purposes in mind for each reading of the passage (e.g. finding the main idea, finding supporting details, relating the material to previously acquired information), or reading using differing study activities during successive readings (e.g. asking questions and searching for answers to these questions while reading; reviewing mentally what was read and then rereading to check one's recall). Thus use of strategies such as these is generally assumed to

result in better learning and comprehension of the material.

In summary, knowledge of repetition as a useful study strategy will include knowledge of both simple and differential repetition. Both influence learning, and their use may depend upon the learning task and also the age of the children involved.

B. Developments in children's knowledge about repetition

In a paper dealing with children's knowledge about their learning, Flavell and Wellman (1977) presented a taxonomy for conceptualizing what an individual might eventually come to know about, or know how to find out about, in situations calling for immediate or future retrieval of acquired information. This taxonomy is useful for furthering our conceptualization of what children may come to know about repetition and how it may be used.

Flavell and Wellman suggest that at least two types of learnings are involved in an individual's preparation for a retrieval situation. First, the individual will come to be able to distinguish when planful memory exertions are required and when they are not required. Available research (e.g. Appel, Cooper, McCarrell, Sim-Knight, Yussen and Flavell, 1972; Rogoff, Newcomb and Kagan, 1974), outlined in the review (Appendix A) have indicated that there are developmental trends in children's ability to appreciate a learning situation sufficiently to prepare for it. In addition, it appears that children's increasing appreciation of the necessity of planful learning behaviour is influenced by their levels of cognitive maturity and experience, and the demands imposed by the learning task. For example, Wellman, Ritter and Flavell (1975) found that young children did engage in simple study strategies such as touching and looking, when they had to remember the location of a hidden object. This latter finding suggests the importance of investigating

task appropriate strategies which are available to the level of children involved in the study.

Applying this first aspect of the Flavell and Wellman taxonomy to situations involving learning from prose materials, the child should eventually be able to discriminate when this reading requires the use of planful learning strategies. Some situations (e.g. reading for pleasure) do not require an attitude of planfulness for later retrieval. However reading with the intention of writing a test, or answering a quiz or retelling the story exactly, may require the use of planful reading-learning strategies. In these situations, unless directed by the teacher, the child must her/himself make a decision whether she/he will engage in planful learning.

If the child decides that planful learning is required, then she/he may choose an appropriate strategy, such as rereading the material, asking questions or summarizing the material, or a combination of these. Repetition is a strategy that is likely to be chosen, since it is familiar to school age children. From the early grades, children are urged to repeat what they are doing in order that newly acquired skills be consolidated. Thus, through teaching instruction and/or spontaneous learning experiences, young school age children should "know" that repeating an action assists in learning it. It is an assumption that children's knowledge about a repetition strategy useful for reading, will first include only simple repetition (i.e. just rereading the material). Eventually, children will become aware of differential repetition (i.e. reading each time with a different purpose and/or using various study strategies as interpolated tasks between successive readings). Knowledge about differential repetition is assumed to be a later developmental acquisition, since use of this technique requires the child to keep in mind more than one type of

7
activity, and to be able to change activities as the requirements of the task change.

According to Flavell and Wellman (1977) the second thing that the child will come to know, is that various factors may influence the quality of her/his performance in memory tasks. The quality of performance may depend upon person, task or strategy variables, or any combination of these.

Characteristics of the person include any personal attributes or states that are relevant to data retrieval (e.g. ability level, interests). Flavell, Friedrichs and Hoyt (1970), in the study described earlier, found that older children were more accurate judges of their ability to remember a series of items. The children had been asked to estimate how many items they could remember. In addition, the children were also required to study a series of items until they felt they could recall it perfectly. The older children spent significantly more time studying the series. They were also more accurate in predicting their readiness for the recall task.

Some tasks are harder than others. Characteristics of the tasks, such as the type of materials (e.g. easy versus difficult, organized versus disorganized, familiar versus unfamiliar), and retrieval demands may influence learning. Kreutzer, Leonard and Flavell's (1975) study involving school age children's knowledge about memory and memory phenomena indicated that even young children knew that fewer or familiar items would be easier to learn than more or unfamiliar items. Moynahan (1973) found that with increasing age, children are more likely to realize that categorized information is easier to learn than uncategorized material.

Children's knowledge about potentially employable strategies that may be used to assist their learning is another type of variable influencing performance in memory

tasks. A considerable amount of research has been conducted on the influence of strategies used to assist in learning, and is outlined in Appendix A. As indicated previously, there have been few studies investigating the use of strategies in school like tasks. Smirnov's (1973) study, to be described, is one exception.

In developing a procedure for investigating what children know about repetition, the Flavell and Wellman taxonomy provided a useful structure. Conditions under which materials need to be read and studied more than once in order to be learned could be developed. Examples of such conditions are: (a) the type of reading situation--reading for learning and later retrieval versus reading for pleasure; (b) characteristics of the materials--familiar versus unfamiliar, long versus short, difficult versus easy, organized versus disorganized; (c) task demands--memorize versus be familiar with, learn to a specified performance criterion versus learn as best you can. In addition, children having available knowledge about both simple and differential repetition strategies must evaluate their use in light of the task conditions.

In the present study, both task, material, and strategy (simple and differential repetition) variables were used to assess children's developing awareness of repetition in reading for learning situations.

There has been only one previous study investigating children's verbalized knowledge of a differential repetition strategy. In this study, Smirnov (1973) gave adults and children in grades 2, 4, and 6 a prose passage to learn under a mnemonic orientation to memorize it as completely as they could. Afterwards, he interviewed them regarding how they had learned the passage. The adults consistently reported using differential repetitive reading behaviours, such as keeping a different purpose in mind for each reading; mentally retelling parts of the

text in a self-checking manner; and returning to a section which had already been read in order to stabilize it in memory, before continuing to the end of the passage.

In contrast, the children's replies to how they had memorized the passage fell into three categories indicating apparent developmental trends in their verbalized use of a differential repetitive reading strategy to assist their learning: (1) no diversity in reading behaviour; (2) some diversity in reading behaviour, but an inability to verbalize about it (i.e. the children reported reading both silently and outloud, but were unable to verbalize reasons why. Smirnov hypothesized that this reflected an underlying diversity in reading purpose.); and (3) conscious and deliberate diversity in reading behaviour paralleling that reported by the adult subjects.

Smirnov reports that grade 2 children were found in all 3 categories, while grade 4 and 6 children were found only in the latter 2 categories. Smirnov also reports considerable individual differences in children's descriptions of how they had learned the text. In fact, individual differences generally overlapped with any age differences.

This singular study of children's knowledge of a differential repetitive learning strategy has several limitations. From a methodological viewpoint, the use of only 12 children at each grade level, the lack of statistical data, and of criteria for judging the children's responses, make it impossible to conclude whether there are developmental trends in children's utilization of such a strategy, or just individual differences. In addition, since children's performance was investigated under only one task-material condition, the fact that certain children did not verbalize using a differential repetition strategy while reading may have been because they do not have any knowledge of this strategy and its potential usefulness

under any circumstances, or in that specific task-material situation, or because they know of the strategy, but actively chose not to use it in the particular task given. Possibly, the selection of a wider range of reading situations might provide more information about children's developing knowledge of a repetition reading strategy.

C. Knowledge about repetition and academic behaviour

Reading is very important for the acquisition of knowledge, both in and out of school. Consequently, it would seem that knowing how to read effectively is an important acquisition for children. Reading effectively requires the use of the skill of reading in a planful manner, as an aid to learning. One aspect of knowing how to read effectively involves knowing various reading for learning strategies. In the previous sections, a conceptualization of repetition as a possible reading for learning strategy has been developed. Since reading is a means of acquiring knowledge, and achieving in school (especially in the junior and intermediate grades), possibly then, children with greater knowledge about a reading for learning strategy like repetition, might do better in school. An investigation of this hypothesis formed the second aspect of the study.

D. Summary

In the previous three sections, many issues were raised concerning an investigation of children's knowledge of repetition as a reading for learning study strategy. A two part definition of this strategy was developed. It was assumed that children will demonstrate developmental trends in their knowledge about using both simple and differential repetition strategies in learning from prose materials. One purpose of the present study therefore, was to investigate the developmental trends in children's knowledge about both aspects of a repetition strategy.

Adopting the taxonomy developed by Flavell and Wellman

(1977), it was suggested that to use a repetition strategy, children should come to know: (a) when reading tasks require such reading for learning strategies, and (b) the material and task conditions which may influence use of these strategies. In the present study, both of these aspects of knowledge were investigated utilizing a variety of learning situations. Many learning situations were used, in order to ensure that children having knowledge of these strategies had several opportunities to verbalize their knowledge. This investigation of task and material variables formed the second purpose of the study.

Finally, the last issue raised concerned the relationship between this knowledge and actual classroom behaviour and achievement. This issue formed the final purpose of the present study.

The present study

The present study involved an extensive investigation of children's knowledge about repetition in learning from prose materials, and the relationship of this knowledge to their academic achievement.

Initially, children's sensitivity to the fact that some reading situations require active reading for learning behaviours while other reading situations do not, was investigated. Two reading passages were described. One was introduced with the instruction "to read", and the other was introduced with the instruction "to read in order to learn all about". The children were then asked to describe what they would do, and their answers were analyzed according to whether they were able to respond to the difference by describing differing reading behaviours in the two situations. References to the use of simple or differential repetition strategies were specifically noted.

The present study was also concerned with children's knowledge about four task demand and material variables

that could influence their choice of reading behaviours such as repetition, and about four repetition strategies. The latter included simple repetition and three types of differential repetition--an example of reading each time with a different purpose in mind; reading with followup questions; and reading then reciting what has been read, then rechecking one's answers or amount remembered during the next reading.

Simple repetition (i.e. rereading the passage) is a strategy more likely to be known by younger children. However, with increasing experience in learning situations, children may become more aware of the various differential repetition strategies. Reading with questions, or reading with recitation strategies can assist the reader's learning in several ways. Both may provide immediate benefit in the present, by helping the reader to focus upon the main aspects of the passage, in order to be able to assess what is already known or not known about the passage. For example, a child may read the passage, then try to recite to her/himself what was just read. If the story can be recited accurately, then the reader knows that she/he knows the story. In contrast, if the child only reads the story she/he has no way of knowing how much is known of what was just read. Use of a recitation strategy can also assist the reader in guiding future reading and learning. After reciting the story back to her/himself, the child may then read the story again to check the accuracy of their recall of the passage. Similarly, when questions have been posed about the passage, the second reading can be used to assess the accuracy of the answers. The second reading might also involve skimming over parts that the child was confident of knowing, and spending more time on parts of the story that she/he was less sure about. Thus, a mature knowledge about these two differential repetition reading strategies should include an awareness of how the successive reading is affected by the interpolated study

activity.

The fourth strategy variable involved reading with differing purposes in mind for each successive reading. Experts on effective reading have suggested that it is important to read actively. One technique for active reading is to read holding a different purpose in mind for each reading. Each person may have an individualized way of tailoring their reading skills. For example, one person may quickly skim the passage in order to obtain a general idea of what it was about, and then go back and read it carefully to pick up the major points and details. Another person may read carefully the first time, then quickly skim over it to find any item missed earlier, then read again, covering only the important points. The example of active reading used in this study was reading slowly at first, to get the general idea of the story, then reading again with the aim of picking up the important details, then reading a third time as a review. This description was used simply as a sample, to determine whether the children had any knowledge about the value of an active reading technique.

Four task and material variables were also investigated, to assess children's knowledge of how such variables might influence a repetition strategy. The material variables included perceived familiarity with, and perceived difficulty level of, the passage material. These variables were included to determine whether the children would realize that difficult or unfamiliar material would require more reading for learning behaviours than easy or familiar material. Similarly, task demand conditions included an orientation to memorize versus to be familiar with the material, and to work towards a high versus a low performance criterion. Children's responses were assessed for their awareness that differing task demands may require differing reading study behaviours, such that

repetition may be useful and/or necessary in some situations, but not in others.

Children's knowledge of these task, material, and strategy variables was assessed by an interview technique. The interview questionnaire consisted of two sets of questions: open ended and fixed story descriptions. Both sets of questions focussed around the reading of two passages, one about bears and one about explorers. A brief description of the content of each passage was given at the beginning of the interview (i.e. in the first two open ended questions), in order to make the passages more concrete for the children. The descriptions of the prose passages were similar in both sets of questions, in order to make comparisons more easily between the children's responses to these questions.

There were four open ended questions. For the first, one prose passage was described, and the children were asked how they would read it. Then the other prose passage was described, and the children were asked to indicate how they would read it to learn all about it. These two questions were devised to assess whether the children were able to perceive the need for reading-study behaviours in the second situation, and described use of such behaviours. Next, they were specifically asked whether they would read the two stories differently; and finally, they were asked how often they typically would read a story in order to learn all about it. Thus, the open ended questions asked the children to describe what they would do in specific reading situations, with the intention of determining whether children are aware of repetition strategies.

Following these initial questions, the children were presented with the fixed story descriptions. In each, the content of the passage was referred to (either bears or explorers), and then the study behaviours utilized by

or required of two children were contrasted. Depending on the story descriptions, the children were asked to respond to questions such as, which child had the easier task, which child was the more effective learner, how many times did the child have to read the story etc. These story descriptions were designed to assess children's knowledge of the task, material, and repetition strategy variables previously outlined.

Children in grade 2, 5 and 8 were interviewed in order to demonstrate the expected developmental trends in children's knowledge about a repetition strategy. Grade 2 children were included, since at this age level, there should be a beginning awareness of simple repetition (i.e. the fact that redoing a task improves learning). Grade 8 children were included, since at this age level, children should have some awareness of differential repetition, and of the manner in which the activity interpolated between successive readings should influence the following rereading of the prose materials.

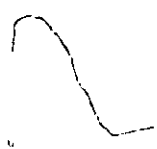
The second aspect of the study was an investigation of whether children's knowledge of repetition as a reading-study strategy, and conditions influencing its use, had implications for their academic achievement, since effective reading is such an important component of a child's achievement in school. For this purpose, the teachers were asked to rate their children on four variables: reading achievement, overall level of achievement, effective use of learning-study time, and oral expressive ability.

Reading achievement and overall level of achievement were included as measures of the child's academic performance, as perceived by their teachers. These measures should correlate with children's knowledge about repetition, since knowledge about this reading-study strategy should result in more effective reading skills, and

therefore should influence children's achievement in reading tasks. In addition, reading achievement is an important influence on overall school achievement. Effective use of study time was included as an externally observable example of good study-learning skills, which might parallel children's verbalized use and knowledge about an internalized reading-study strategy. Oral expressive ability provided an additional estimate of these children's classroom behaviour, as perceived by their teachers.

For grades 5 and 8, additional achievement scores on the Canadian Tests of Basic Skills (CTBS), and final point averages, were also available. Correlations were computed between the teacher ratings, CTBS scores, and final averages, and the children's responses to the interview questionnaire.

The correlations were computed separately for each major question in the interview, in order to assess whether certain types of knowledge about repetition were more important at specific ages. For example, since a conception of the importance of simple repetition for learning is assumed to be developing around the grade 2 level, correlations dealing with questions assessing this type of knowledge may be particularly informative at grades 2 and 5. Similarly, since awareness of differential repetition is expected to develop later, correlations regarding these questions should be important at grades 5 and 8.



CHAPTER II METHOD

Subjects

Fifteen girls and fifteen boys from each of grades 2 (age 7 years 5 months--8 years 5 months), 5 (age 10 years 5 months--11 years 5 months), and 8 (13 years 5 months--14 years 6 months), participated in the study. The children were enrolled in a Separate School in a predominantly working to middle class small town, located close to a large urban setting.

The children were randomly selected from among the available students in the school's two classes at each grade level. Students who had repeated a grade were excluded from the selection procedure.

Materials

The interview questionnaire consisted of two sets of questions, given to the children in a prescribed sequence. These questions were focussed around the reading of two prose passages. One of the passages was described to the children as being about different kinds of North American bears. The other was described as being about explorers. For example, when describing the passage about bears, E indicated that it told about what they ate, where they lived, how big they were etc. The two passage topics were randomly assigned to the interview questions such that each story was described in one-half of the various questions.

The first set of questions was open ended, in order to investigate how the children described their own reading behaviour. Four open ended questions were presented.

Open ended questions 1 and 2 were very similar in format, with the exception that question 2 specifically indicated that the child was to read with the purpose of learning the material. Question 1 did not specify this

purpose. These two questions were devised to assess whether S was able to perceive the differing situation demands, and recognize the need for reading-study behaviours in question 2.

1. "I have a story here about explorers--about where they came from, where they travelled, what they found in the new lands, and all the troubles they met in their travels. It's an interesting story, and I'm sure you will enjoy it."

"First, tell me about how you are going to read my story. What will you do as you are reading my story?"

"Is there anything else you would do?"

2. "I have another story that I want you to read. It is a story about different kinds of North American bears --where they live, what they eat, how big they grow, what colour they are. It is an interesting story too. I want you to read this story and learn all about it, and then I'm going to ask you some questions about the story."

"But first, tell me about how you are going to read my story to learn all about it. What will you do as you are reading my story to learn all about it?"

"Is there anything else you would do?"

Question 3 was a specific prompt contrasting questions 1 and 2, and specifically asking the children whether they would read the stories differently, since one of the stories should be read with the purpose of learning all about it. It was included in order to determine whether younger children would need such a specific question, in order to describe different reading-study behaviours for the stories with differing reading purposes.

3. "One of my stories you can read just for fun. One of my stories you can read to learn all about it. Will you read my story that you have to learn all about

any differently than you will read my story that you are reading just for fun? How will you read the two stories differently?"

The last major question in the open ended set was an inquiry about how often S would read a story to learn all about it, and why she/he would read it that number of times. This question was included to assess the children's verbalized understanding and use of repetition as a learning technique.

4. "How many times do you usually like to read a story when you have to learn all about it to answer questions? Why?"

If a differential repetitive reading strategy was not described in the justification response to question 4, a specific prompt (question 4B) inquired whether, when reading the story the second (third, fourth) time, S did anything differently from the first reading. This question was devised for an initial exploration of children's understanding of differential repetition.

"When you read it the second time, how do you read it? Do you read it differently, or the same way as you read it the first time?"

In summary, the open ended questions were devised to determine whether S: (1) gave indication of the fact that some reading tasks require the child to assess the need for a reading for learning strategy; (2) described using a simple or differential repetition reading strategy; and (3) gave indication of an awareness of the usefulness of these strategies for learning.

The second set of questions involved eight story descriptions. For each of these story descriptions, the prose passage was briefly described (either about bears or explorers, randomly assigned), and then the reading-study behaviours used by or required of each of two children

were contrasted. The children were always asked to decide if one child was a more effective learner, and to explain the reasons for their choice.

Four story descriptions were devised to assess children's knowledge about simple repetition and differential repetition as learning strategies. The other four story descriptions were devised to assess children's awareness of material and task conditions which might influence the usefulness of a repetition strategy.

1. Strategy variable--Simple repetition

"The other day I asked two children to read one of my stories because I wanted to see how well they could learn all about it. I asked them how many times they would like to read the story before I took it away and asked them questions about it."

* One child said she/he would read it four times. The other child said she/he would read it one time."

1. Which child learned and could remember the most about my story, the one who read it one time or the one who read it four times, or did they both learn the same?
2. Why?
3. Why do you think the first child wanted to read it four times?
4. What would you do?

The following 3 story descriptions were designed to investigate children's awareness of 3 differential repetition reading-study strategies.

2. Differential repetition--Reading twice versus reading, asking questions and rereading

"I gave one of my stories to two more children to read and learn about. One child read the story quickly, then she/he asked her/himself some questions about the story, and after asking her/himself

the questions, she/he read the story again. The other child read the story quickly, then immediately read it straight through again, from beginning to end, without stopping to ask her/himself some questions."

1. Which child learned and can remember the most about my story, or will they both remember the same?
 - 2.. Why?
 3. Why do you think the first child asked her/himself some questions?
 4. When she/he read the story again, how do you think she/he read it? Did she/he do anything differently than when she/he read it the first time? (If yes) What?
 5. Do you think it made a difference that she/he had asked her/himself some questions? Do you think the questions would affect how she/he read it again?
 6. Would you do the same as one of these children if you had to learn my story? Why/why not?
3. Differential repetition--Reading twice versus reading, reciting back and rereading

"I gave two more children my story about explorers to read and learn about. Both of the children read my story twice. One child read the story, then immediately read it straight through again, from beginning to end. The other child read the story, then she/he told the story back to her/himself, and after saying the story to her/himself, she/he read the story again."

1. Which child learned and can remember the most about the story, or will they both remember the same?
2. Why?
3. Why do you think the second child tried to say the story back to her/himself before she/he read it

again?

4. When she/he read it again; how do you think she/he read it? Did she/he do anything differently the second time than when she/he read it the first time? (If yes) What?
5. Do you think it made a difference that she/he had said the story back? Do you think saying the story would affect how she/he read it again?
6. Would you do the same as one of these children if you had to learn my story? Why/why not?

4. Differential repetition--Reading four times the same way versus three times differently

"I asked two more children to read my story about the bears and learn all about it so they could answer my questions. One of the children read it four times. She/he said that she/he read it through in exactly the same way each time. The other child read it three times. She/he said that at first she/he read it slowly, to get the main ideas; the second time she/he read it more quickly, to get more facts; and the third time she/he read it to review the story."

1. Which child knew and could remember the most about the story, the one who read it four times, the same way each time, or the one who read it three times, doing something different each time, or did they both remember the same?
2. Why?
3. Would you do the same as one of these children if you had to learn my story? Why/why not?

The following four story descriptions were designed to investigate children's awareness of various task and material conditions which may influence the use of a repetition strategy. Two material conditions (perceived

difficulty, familiarity/unfamiliarity) and two task conditions (differing performance goals, differing learning instructions) were investigated.

5. Material variable--Perceived difficulty

"I gave my story about the explorers to two more children to read, and told them I was going to ask them some questions later about the explorers. One child said that social studies--especially explorers--was a very difficult subject for her/him to learn. The other child said social studies was easy, it was her/his favourite subject in school. I asked both the child who found social studies very hard and the child who found social studies easy to study my story and answer my questions."

1. How many times do you think the girl/boy who found social studies very hard to learn, will need to read my story to learn it and answer my questions?
2. Why?
3. How many times do you think the girl/boy who found social studies very easy to learn, will need to read my story to learn it and answer my questions?
4. Why?
"Both children had time to read my story just once."
5. Do you think that one child could remember more about the explorers and answer more questions than the other child, or will they both remember the same?
6. Why?

6. Material variable--Familiarity/Unfamiliarity

"I gave my story about the bears to two more children to read, and told them I was going to ask them some questions later about the different kinds of bears. One of the children said she/he already

knew about these bears, because she/he had done a project on bears. The other child said she/he didn't know very much about bears. I asked both the child who had done a project on bears and the child who didn't know very much about bears to study my story and answer my questions."

1. How many times do you think the girl/boy who knew about bears will need to read my story to learn it and answer my questions?
 2. Why?
 3. How many times do you think the girl/boy who didn't know much about bears will need to read my story to learn it and answer my questions?
 4. Why?
"Both children had time to read my story just once."
 5. Do you think that one child could remember more about the story and answer more questions than the other child? Which one?
 6. Why/why not?
 7. What could the other child have done so that she/he would also remember more facts about the bears?
7. Task variable--High versus low performance goals
- This story description was included to assess S's awareness that generally, a higher performance goal requires greater learning study behaviours in order to learn the material, than does a low performance goal.
- "I gave my story about the explorers to two more children to read and learn all the facts. I told them that after they finished studying the story, I had 15 questions to ask them about the explorers. I told one child that if she/he got 12 out of 15 questions correct, I would give her/him 50¢. I told the other child that if she/he got 5 out of 15 correct I would give her/him 50¢."

1. Which child learned the most about the explorers, the one who had to get 12 out of 15 correct, or the one who had to get 5 out of 15 correct, or did they both learn the same?
2. Why?
3. Will the child who had to get 12 out of 15 correct to earn her/his prize have to study the story differently, or the same way as the child who had to get 5 out of 15 correct to earn a prize?
4. What would she/he have to do?
5. I gave both the child who had to get 12 out of 15 to earn a prize, and the child who had to get 5 out of 15 to earn a prize, the same amount of time to study my story. When their time was up, do you think one child learned and could remember more about the explorers? Which one? Why?
8. Task variable--Memorize versus be familiar with the story

This story description was included to assess S's awareness that a requirement to memorize a story or passage requires differing study behaviours than a requirement to simply be familiar with the material.

"I gave my story about bears to two more children to read and learn about. I told one child to memorize the story so she/he could remember it and tell it exactly as it was written, just like memory work. I told the other child to read the story and know what it was about, but not to learn it like memory work."

1. ~~Which~~ child learned the most and can remember the most about the bears, the one who had to memorize the story, or the one who had to just know what it was about, or did they both remember the same?
2. Why?

3. How did the child who had to memorize learn the story? What did she/he do?
4. How did the child who just had to know about the story learn about it? What did she/he do?
5. Did one child have an easier task to do? Which one?
6. Why?
7. I gave both the child who had to memorize my story and the child who just had to know what the story was about, the same amount of time to study my story. When their time was up, do you think one child learned and could remember more about the bears? Which one? Why?

In Table 1, the various questions of the interview just described are summarized and tabulated according to the purposes of the study that they were designed to investigate. The fourth major purpose of the study, the investigation of the relationship between children's knowledge about repetition and their school behaviour and achievement, involved all the interview questions.

In addition to the interview questionnaire, other materials were devised in order to investigate the relationship between children's knowledge about repetition as a reading-study strategy and their academic achievement. Rating sheets (Appendix B), were used by the teachers to rate their pupils on four dimensions. These included the teacher's perceptions of the children's achievement and ability levels in: (1) reading ability, (2) overall level of achievement, (3) effective use of learning/study time, and (4) oral expressive ability.

The Canadian Tests of Basic Skills was administered to the grade 5 and 8 children by their teachers in the spring. This test includes sections on reading (e.g. vocabulary, comprehension), mathematics (e.g. math concepts, math problem solving), language skills (e.g.

TABLE 1

Summary of the Purposes of the Study and
the Questions associated with these purposes

| Purpose | Questions | |
|--|--|---|
| | Open Ended | Story Descriptions |
| 1. To assess children's sensitivity to the need for reading for learning behaviours | #1, 2, 3 (description of reading differences) | |
| 2. To investigate developmental trends in children's knowledge about repetition | | |
| A. Basic awareness of the value of simple repetition for learning | #4 "How many times..." i. choice ii. justification | #1 i. choice ii. justification #5, 6 (choice of # of readings for easy, familiar material) |
| B. Awareness of differential repetition | #4, 4B (explanation) | #2 Ask Questions #3 Recite #4 Read with different purposes |
| 3. To investigate children's awareness of task and material variables influencing use of a repetition strategy | | #5, 6 (indication of more readings for difficult over easy, and unfamiliar over familiar materials) |

TABLE 1 continued

| Purpose | Questions | |
|---------|------------|--------------------------|
| | Open Ended | Story |
| 3. | | Descriptions |
| | | #7 Performance goals |
| | | #8 Memorize/ Familiar |

spelling, capitalization, usage), and work-study skills (e.g. map reading, use of reference materials), and provides an overall composite score for the child. These scores were recorded, and the composite score, as well as the year-end average mark for the children in these grades, were correlated with the interview data.

Procedure

Each child was seen individually in a quiet room. E and S sat side by side at a small table on which was placed a tape recorder and microphone. The entire interview was tape recorded.

After a brief discussion to establish rapport, E explained that she wanted to find out how children of different ages went about reading. E explained that there were no right or wrong answers to her questions, since people read and learn differently, but she just wanted to know how S went about reading.

E then presented the open ended questions and story descriptions in a prescribed sequence. If S appeared unable to answer a question or to have misunderstood it, E repeated the question. In addition, following the initial posing of a question, S's answers were explored as necessary with additional questioning, to ensure that E was able to understand S's response and reasoning. The interview took approximately 30 to 35 minutes with each child. The interviews were completed in May and June.

When the interviewing of the children was completed, the teachers were given a list of children from their class who had participated in the study. They were then given the rating forms, and asked to complete them one at a time, allowing some time to elapse between each rating. Ratings were made by assigning each child a score on a 9 point scale (a score of 9 indicating greater achievement). The teachers were asked to complete the ratings such that an approximately equal number of

children were placed within each of the 9 intervals. For the grade 5 and 8 children, recent results from the Canadian Tests of Basic Skills were recorded. In addition, the teachers of grades 5 and 8 were asked for a listing of their children's final grades for the 1976-77 academic year.

After completion of the data collection, each interview was transcribed verbatim. Then, each page of the transcript was given a specific coded number, one number for each child. Transcripts were then separated, and re-coalated according to question. For each question, the children's responses were evaluated according to the criteria to be outlined within the Results section. The individual responses were evaluated randomly, such that the rater was not aware of whose response was being evaluated at any time. Thus, each response was classified without knowledge of the child's performance on any previous question. Ratings of the responses for each question were then tabulated on a master list (sex x grade x response category). Chi square analyses were computed on the tabulated data.

The classified responses were given numerical values, to assist in the correlational analyses. Pearson Product Moment correlations were calculated between each major interview question and the achievement data (i.e. teacher ratings, Canadian Tests of Basic Skills composite score, final grade average).

A subsample of six questionnaires at each grade level (N=18), was reevaluated by a second rater to establish the reliability of the rating schemes. These reliability checks were conducted with questions requiring an evaluation of the children's responses. Reliability was calculated by the formula:
$$\frac{\text{number of discrepancies}}{\text{total number of cases (18)}} \times 100.$$

CHAPTER III RESULTS

The findings of this research project will be presented in several sections. First, the children's responses to the open ended questions, asking them to describe their reading behaviours, will be summarized. These questions were utilized to assess whether the children would spontaneously describe use of a repetition strategy when given the instruction to learn a story. Second, information related to children's knowledge about repetition, as explored in the more concrete story descriptions, will be presented. The third section will deal with children's awareness of task and material variables which may influence use of a repetition strategy. Data related to these three sections has been analyzed by means of Chi Square analyses. Where appropriate, followup analyses have been completed using Mainland and Murray's (1952) fourfold contingency tables. Unless otherwise stated $p .05$ was used to designate significance level.

In the fourth section, the relationship between the children's knowledge about repetition as a reading-study strategy and their academic performance will be explored. For this purpose, various aspects of the children's responses to the interview questionnaire were assigned numerical value. The children's achieved scores on each question were then correlated with their assigned teacher ratings and other achievement data.

I Children's descriptions of their own reading behaviours

The open ended questions were presented to determine how the children would describe their own reading behaviours (a) when the experimenter first described a story and the child was asked to tell how she/he would read it (question 1); and (b) when the experimenter described a second story and the child was asked to say how she/he

would read it to learn all about it (question 2). The children's responses were analyzed for a verbalized awareness that the learning requirement in question 2 would necessitate the intentional use of some learning-study strategy. The responses to these questions were summarized by listing the various types and frequencies of reading-study activities reported.

As indicated in Table 2, responses to these two reading tasks differed in several ways. At all grade levels, but particularly grades 5 and 8, there was an increase in the frequency of replies indicating use of simple repetition (e.g. "I'll read it again and again,") or use of a differential repetitive strategy (e.g. "I would ask myself questions, then read it again and check the story,") in response to the reading for learning instruction. In fact, 40 percent of grade 8, 37 percent of grade 5, and 11 percent of grade 2 responses suggested the use of a repetition strategy to assist in learning the story. Grade 5 and grade 8 children gave this more frequently than any other type of response.

A review of the other types of study activities suggested indicates that grade 5 and 8 children did not differ greatly in the total number of activities, but did differ in the types of activities suggested for each question. Grade 5 children were more likely than the other children to mention that they would refer to some additional resource materials. They also more frequently indicated that they would summarize the story in some manner, even when there was no requirement to learn. In contrast, the grade 8 children more frequently described trying to find main ideas and important facts while reading.

The grade 2 children responded quite differently. Rather than referring to specific activities, they were more likely to say they would "think about the story,"

TABLE 2

Types and Frequencies of Reading-Study Activities
suggested in Children's Descriptions of their
Reading Behaviour in Two Reading Tasks

| Activity | Reading | | | Reading for Learning | | |
|---|---------|-------|-------|----------------------|-------|-------|
| | Gr. 8 | Gr. 5 | Gr. 2 | Gr. 8 | Gr. 5 | Gr. 2 |
| 1. Simple Repetition | 1 | 1 | 0 | 16 | 11 | 3 |
| 2. Differential Repetition (memorize, ask questions, check) | 1 | 5 | 0 | 10 | 10 | 2 |
| 3. Read carefully | 5 | 2 | 1 | 9 | 4 | 4 |
| 4. Find main idea/important facts | 10 | 5 | 0 | 7 | 3 | 0 |
| 5. Survey book/anticipate future events | 1 | 2 | 0 | 0 | 0 | 0 |
| 6. Write/underline/highlight main facts | 1 | 3 | 0 | 8 | 8 | 5 |
| 7. Write summary/report/project | 0 | 4 | 0 | 1 | 3 | 0 |
| 8. Picture it/draw it | 5 | 1 | 0 | 1 | 3 | 3 |
| 9. Use other resource materials | 1 | 6 | 0 | 1 | 10 | 0 |
| 10. Try and remember (unelaborated) | 5 | 3 | 1 | 10 | 1 | 1 |

TABLE 2 continued

| Activity | Reading | | | Reading for Learning | | |
|---|---------|-------|-------|----------------------|-------|-------|
| | Gr. 8 | Gr. 5 | Gr. 2 | Gr. 8 | Gr. 5 | Gr. 2 |
| 11. Think about it (unelaborated) | 5 | 7 | 5 | 1 | 3 | 12 |
| 12. Reading Mechanics (with expression, slow, fast, silently) | 5 | 19 | 35 | 1 | 1 | 16 |

without being able to elaborate their answer. This type of response was seldom mentioned by grade 5 and 8 children when they were given an instruction to learn the story. In addition, a large difference was evident across grades in the frequency of responses involving references to the mechanics of reading. Only two out of 123 responses given by the grade 5 and 8 children referred to reading mechanics. In contrast, 16 out of 46 (33 percent) of the grade 2 children's responses to the story with a learning requirement were of this type.

The responses the children gave to these two open ended questions were then analyzed for evidence of a deliberately applied difference in reading-study behaviour in response to the requirement to learn. Responses were classified into three categories: (a) None, when a deliberately applied difference in reading was not given (e.g. "I don't know" responses, responses where similar behaviours were described for both stories, responses where a reading strategy was given for the first reading instruction, but not for the reading for learning instruction); (b) Adequate, when responses included one difference in reading-study behaviour, implying a deliberate strategy use for the reading for learning instruction (e.g. read again, ask questions about it) that was not given in response to the first reading instruction; and (c) Superior, when responses gave two or more deliberately applied study differences for reading a story with the instruction to learn it. Responses involving reading mechanics (e.g. read better, read with expression) were not accepted as examples of a deliberate reading-study strategy.

As can be seen in the outline of children's categorized responses in Table 3, a majority of the grade 2 children (60 percent) could describe the use of a reading-study strategy in response to an instruction to learn the

TABLE 3

Categories of Children's Descriptions of a
Deliberately Applied Reading-Study Strategy
in response to Open Ended Question 2,
involving a requirement to
learn the story

| Grade | None | Adequate | Superior |
|-------|------|----------|----------|
| 8 | 3 | 13 | 14 |
| 5 | 6 | 15 | 9 |
| 2 | 12 | 13 | 5 |

1. Comparing three categories by three grades
 $\chi^2=10.552$, $df=4$, $p<.05$
2. Comparing None versus Adequate and
Superior categories across pairs
of grades
gr. 8 versus 5, n.s.
gr. 8 versus 2, $p<.05$
gr. 5 versus 2, n.s.

story. However, few of these children were able to suggest more than one strategy. More children at grades 5 and 8 were able to suggest at least two study strategies. The analysis yielded a significant difference across the grades in type of responses given, $\chi^2=10.552$, $df=4$, $p<.05$. Followup analyses showed that the pattern of responding was significantly different between grade 2 and grade 8 children only.

When the children were given the specific prompt (open ended question 3) asking whether and how they would read the two stories differently, the differences across the grades in the children's verbalized descriptions of study strategies became stronger. The responses were classified according to the categories outlined earlier. As indicated in Table 4, now 100 percent of grade 8, 90 percent of grade 5, and 30 percent of grade 2 children described one or more study strategies for reading the story with the instruction to learn all about it. Thus, for grade 5 and 8 children, the experimenter's use of a specific prompt question resulted in an increase in verbalized descriptions of reading-study strategies. More of these children were also able to describe the potential use of more than one study strategy.

Unexpectedly, the prompt had the opposite effect for grade 2 children. The majority were unable to describe any difference in possible reading behaviours for the two stories. Perhaps the additional questioning was confusing, since the types of activities suggested were very similar to those originally given to describe their own reading behaviour, and these children might have thought that they had already answered the prompt in their reply to the earlier questions.

The age trends observed here were statistically reliable, $\chi^2=53.107$, $df=4$, $p<.001$. Followup analyses indicated that the grade 2 children responded significantly

TABLE 4

Categories of Children's Descriptions of a
Deliberately Applied Reading-Study Strategy
in response to Open Ended Question 3,
asking how the two stories will be
read differently

| Grade | None | Adequate | Superior |
|-------|------|----------|----------|
| 8 | 0 | 9 | 21 |
| 5 | 3 | 7 | 20 |
| 2 | 21 | 9 | 0 |

1. Comparing three categories by three grades
 $\chi^2=53.107$, $df=4$, $p<.001$
2. Comparing None versus Adequate and
Superior categories across pairs of
grades
 - gr. 8 versus 5, n.s.
 - gr. 8 versus 2, $p<.01$
 - gr. 5 versus 2, $p<.01$

differently from both grade 5 and grade 8 children. The latter two groups did not differ significantly from each other.

In summary, the responses of the children to these open ended questions indicated that at least some grade 2 children are able to describe use of a reading-study strategy to assist their learning. Grade 5 and 8 children are much more sensitive to a need for reading-study behaviours, and also are able to suggest more study strategies. Of the strategies suggested, repetition was given the most frequently by these children. In addition, when more than one strategy was suggested, a repetition strategy was included in at least 50 percent of the replies. Grade 2 children were more likely to give an unelaborated answer (e.g. "think about it") or to describe a characteristic of their vocal reading style, rather than refer to the use of repetition.

The infrequency of references to repetition in grade 2 children's descriptions of their own reading behaviours may not be an adequate reflection of their knowledge about this strategy. Perhaps they perceived the intent of the questions differently from the older children. The remainder of the interview questions were more specifically related to the use of repetition as a study strategy. Thus, any potential confusion about the questions should be minimized, and the children's responses to these questions should provide an accurate reflection of their knowledge about this reading strategy.

II Children's knowledge about repetition

A. Simple Repetition

Investigation of the children's knowledge about simple repetition was undertaken through analyses of their responses to open ended question 4 and various aspects of story descriptions 1, 5, and 6, as described in the

following sections. In these questions, four choices were presented to the children: (1) how often would you read a story to learn all about it? (open ended question 4); (2) who would learn more, the child who read it one time, or the child who read it four times, or would they both learn the same? (story description 1); (3) how many times did the child who found social studies easy read the story? (story description 5); and (4) how many times did the child who knew about the bears read the story? (story description 6). In each case, the children's answers were analyzed for an indication that reading material more than once is usually necessary to learn it.

A summary of the children's choices in these four situations is provided in Table 5. As indicated in these data, children at all grade levels generally indicated that reading something more than once can assist learning. Chi Square analyses of these data did not yield any significant differences in choice patterns across the grades for any of these questions. Nonetheless, there was some variability in the pattern of responding across the four questions. Choices to questions 3 and 4, in which characteristics of the material to be read were taken into consideration, yielded greater variability, and more children at all three grade levels indicated that they would only have to read the story once to learn it when the material was either easy or familiar, (see C and D).

When asked to justify their choices, differences in children's understanding of simple repetition quickly became evident. Justifications were required for the children's responses to three questions. First, the children were asked to explain their choice for open ended question 4, inquiring how often they would read a story to learn about it. The justifications were summarized and then analyzed by placing each response into one of three categories: (a) None, if no explanation was

TABLE 5: A to D

Children's Choices to Questions Investigating
Awareness of the Value of Repetition.

A: Frequency of reading something to learn all
about it

| Gr. | Choice | |
|-----|--------|----------------|
| | Once | More than once |
| 8 | 1 | 29 |
| 5 | 1 | 29 |
| 2 | 3 | 27 |

$$\chi^2=1.694, \text{ df}=2, \text{ n.s.}$$

B: Reading 1 time versus 4 times

| Gr. | Choice | |
|-----|--------|----|
| | 1 | 4 |
| 8 | 1 | 29 |
| 5 | 0 | 30 |
| 2 | 1 | 29 |

$$\chi^2=1.023, \text{ df}=2, \text{ n.s.}$$

C: Difficulty level of material

| Gr. | Choice | |
|-----|--------|----------------|
| | Once | More than once |
| 8 | 9 | 21 |
| 5 | 10 | 20 |
| 2 | 14 | 16 |

$$\chi^2=2.010, \text{ df}=2, \text{ n.s.}$$

D: Familiarity of material

| Gr. | Choice | |
|-----|--------|----------------|
| | Once | More than once |
| 8 | 15 | 15 |
| 5 | 11 | 19 |
| 2 | 15 | 15 |

$$\chi^2=1.434, \text{ df}=2, \text{ n.s.}$$

given for the choice; (b) Other, if an answer was given without an elaboration of the possible value of repetition (e.g. "to get a good mark," "to pass," "to learn it," "it's fun"); and (c) Adequate, if some indication of the value of repetition for learning was given. An understanding of the value of repetition could indicate that repetition may involve any of the following: more study time, greater concentration, or better understanding of the material.

As can be seen in Table 6, approximately one-third of the grade 2 children were able to give an answer indicating an adequate awareness of the value of repetition for learning. This percentage increases greatly with age, with approximately two-thirds of the grade 5, and most of the grade 8 children giving adequate answers. Analyses indicated that grade 2 children responded significantly differently from both grade 5 and grade 8 children, although the latter two groups did not differ significantly from each other.

Similar analyses were made of the children's justifications for their choice responses to the question "who would learn more, the child who read it four times, or the child who read it once, or did they both learn the same?" and the question "Why do you think the child wanted to read it four times?" Responses were recorded and then analyzed using the same criteria as in the previous justification question. On these questions, the grade 5 and 8 children responded similarly, 65 percent of grade 8 and 62 percent of grade 5 responses included an adequate explanation of the value of repetition for learning. For grade 2 children, 27 percent of the justifications was acceptable.

In summary, it appears that although many of the grade 2 children did not refer to repetition in their self

TABLE 6

Categories of Responses by Children for why they
would Read a story more than once to learn it

| Grade | Categories | | |
|-------|------------|--------------|----------|
| | None | Other | Adequate |
| 8 | 1 | 3 | 26 |
| 5 | 1 | 9 | 20 |
| 2 | 4 | 16 | 10 |

1. Comparing three categories by three grades
 $\chi^2=20.959$, $df=4$, $p<.001$
2. Comparing None and Other versus Adequate
categories across pairs of grades
gr. 8 versus gr. 5, n.s.
gr. 8 versus gr. 2, $p<.01$
gr. 5 versus gr. 2, $p<.05$

descriptions of reading behaviours, these grade 2 children are just as knowledgeable as older children of the fact that repetition can result in better learning, as evident in their choice responses. Approximately one-third of these grade 2 children could also adequately explain how repetition might affect learning. The percentage of children who could explain the value of repetition for learning increased significantly between grades 2 and 5.

B. Differential Repetition

Developmental trends in children's acquisition of knowledge about differential repetition are analyzed from two open ended questions and three story descriptions. It will be seen that the children responded similarly to the "questioning" and "recitation" story descriptions. In contrast, the story description about reading with differing purposes required the children to consider more variables, and resulted in more variable responding.

Open ended questions

When the children were given the open ended questions and asked to describe their own reading behaviours (see Table 2), differential reading strategies were described slightly less frequently than simple repetition (total of 28 versus 32). Grade 5 and 8 children suggested these types of strategies considerably more often than grade 2 children. Fifteen percent of grade 8 and 17 percent of grade 5 children's responses, when asked to describe their reading behaviours in order to learn the story, indicated a differential repetition strategy. In contrast, the grade 2 children suggested a differential repetition strategy in only four percent of their replies. This latter finding suggests that knowledge of and therefore use of differential repetition techniques might be slight amongst grade 2 children.

Children's responses to the question inquiring why

they would read a story for the number of times they had indicated (open ended question 4) and to the specific prompt (question 4B) were analyzed for an indication that the reader would do something differently with successive readings of the same material, such as differences in reading rate, purposes or studying activities. There were considerable differences in the frequency with which the children gave indications of using a differential repetition strategy.

As Table 7 shows, almost all of the grade 8 children (97 percent) indicated, either spontaneously or after the prompt, that they would read the story differently the second, third or fourth time. Their comments included: "I'd try to find new facts each time, and see what I'd missed earlier"; "try to see if I could remember all the facts"; "pay less attention to the unimportant facts and concentrate more on areas I didn't concentrate on before"; "try and summarize the main parts to myself." These comments are good examples of a differential reading strategy. Sixty-three percent of the grade 5 children also suggested that they might use a differential repetitive strategy, whereas less than one-fifth of the grade 2 children (17 percent) gave any indication of their possible use of this strategy. The remaining children, who did not suggest a differential repetition strategy even in response to the prompt, gave answers such as, read it the same or read using expression.

The age related trends observed here yielded statistically significant differences, $\chi^2=40.020$, $df=2$, $p<.001$. Followup analyses (grade by indication of differential repetition) indicated that with increasing grade levels, significantly more children reported they would use a differential repetitive reading strategy. Grade 2 children tended not to consider this type of strategy use while reading for learning. Generally, their descriptions

TABLE 7

Indication of a Differential Repetitive Reading
Strategy in Children's Descriptions of their
Reading Behaviour

| Grade | No Indication of Differential Repetition | Indication of Differential Repetition | | |
|-------|--|--|-------------------|-------|
| | | With Prompt | Without Prompt | Total |
| 8 | 1 | 20 | 9 | 29 |
| 5 | 11 | 15 | 4 | 19 |
| 2 | 25 | 5 | 0 | 5 |

1. Comparing No Indication versus Total Indication
 $\chi^2=40.020$, $df=2$, $p<.001$
2. Comparing Indication Prompt versus Indication
without Prompt
 $\chi^2=2.412$, $df=2$, n.s.
3. Comparing No Indication versus Total Indication
across pairs of grades
gr. 8 versus gr. 5, $p<.01$
gr. 8 versus gr. 2, $p<.01$
gr. 5 versus gr. 2, $p<.01$

of their reading behaviours focused upon the mechanics of reading.

Story descriptions

Three story descriptions were also developed to yield information on children's knowledge about differential repetitive reading strategies.

1. Reading twice versus reading, asking questions and rereading

This story description involved a comparison between simple repetition versus the addition of a question asking strategy between successive readings of a story. After presenting the contrast, the children were asked a series of questions including: (1) which child learned more about the story? (2) why? and (3) why do you think the first child asked her/himself some questions?.

Concerning the choice question, at all grade levels, the majority of children chose the child who used the questioning strategy as learning more. Ninety-three percent of grade 8, 90 percent of grade 5, and 70 percent of grade 2 children gave this response. This similarity in responding yielded a nonsignificant finding, $\chi^2=7.901$; $df=4$, $p>.05$. With only one exception, the children who made a different choice felt that each child in the story would learn and remember the same. However, the reasons given for this alternative choice differed. Generally, the grade 2 children felt they would learn the same because both had read it twice, or because they were both in the same grade. For the grade 5 and 8 children, two indicated they would learn the same because they both read it twice, while three children presented some rationale for equalizing the learning due to differing activities attempted by the two children. For example, one child said reading twice very carefully is as good as reading, asking questions and rereading.

Children's responses to the justification question, and the question regarding why the child asked her/himself questions, yielded vastly different results from the choice question. Adequate responses to these questions should include references to how the strategy may help the reader to assess the present state of learning, and to guide future reading activities.

A questioning strategy may be useful in the present, by helping the reader to assess what she/he already knows and does not know about the passage. Types of adequate responses included: "to make sure she knew and understood everything," "to see what she knows and find out what she doesn't know," "to find out what parts are easy and what parts are hard for her." Table 8 outlines the frequency of adequate responses by the children, as well as the types of inadequate responses. Three-quarters of the grade 8 children, almost one-half of the grade 5 children, and one-fifth of the grade 2 children were able to give an adequate explanation for this present value of a questioning technique. This pattern of responding yielded a significant Chi Square value, $\chi^2=19.327$, $df=2$, $p<.001$, when frequencies of adequate versus inadequate responses were compared. Followup analyses indicated that grade 8 children responded significantly differently from both grade 5 and grade 2 children, although the latter two groups did not differ significantly from each other.

Differences were also evident in the types of inadequate responses (see right half of Table 8). The majority of the grade 2 children either simply repeated the story contrast without further elaboration; indicated that the two children would learn the same; or felt that the child asked questions in order to know the story better, or get a good mark. The grade 8 children generally mentioned that the child asked questions in order to know the story better. The response given most frequently by grade 5

TABLE 8

Indication of the Awareness of the Value of
 Repetition for Monitoring Present Learning,
 in Children's Responses to the Question
 "Why do you think she/he asked some questions?"

| Grade | Adequate Explanation | Inadequate Explanations | | | |
|-------|-------------------------|-------------------------|------------------------|---------------------------------|-------|
| | | Repeated Contrast | Both Learn the same | Get good mark Know Questions | Other |
| 8 | 23 | 0 | 1 | 6 | 0 |
| 5 | 14 | 2 | 2 | 10 | 2 |
| 2 | 6 | 7 | 8 | 6 | 3 |

1. Comparing Adequate Explanation versus Total
 Inadequate Explanation
 $\chi^2=19.327$, $df=2$, $p<.001$
2. Comparing Adequate Explanation versus Total
 Inadequate Explanation across pairs of grades
 gr. 8 versus gr. 5, $p<.05$
 gr. 8 versus gr. 2, $p<.01$
 gr. 5 versus gr. 2, n.s.

children was that perhaps the questions might be the same as the teacher will ask, and so the child will know more, other responses emphasized getting to know the answers, and getting a good mark.

The children's responses to the same two justification questions were also analyzed for indications of how a question-asking strategy might guide future readings of the same material. Adequate answers fell into three categories: (1) on the second reading, the child checked over what she/he did and did not know, perhaps skimming over what was known, and spending more time on parts unknown; (2) the second time, the child looked for information missed previously; and (3) on the second reading, the child checked on his answers to the questions.

If a child was unable to provide an adequate explanation of this future value of the questioning strategy, two additional prompting questions could be asked. These questions were: (1) "when she/he read the story again, how do you think she/he read it? Did she/he do anything differently than when she/he read it the first time? What?"; and (2) "Do you think it made a difference that she/he had asked her/himself some questions? Do you think the questions would affect how she/he read it again?" The second question was presented only if an adequate answer had not been given to the previous prompt question.

Thus, the children could have been presented with up to four questions to probe their awareness of how use of a question asking technique could influence future readings of the material. Responses were therefore categorized according to the extent of questioning required, and were placed into one of four categories: (a) spontaneously described difference refers to adequate answers given in reply to the original two justification questions; (b) general prompt refers to adequate answers in reply to the first prompt question; (c) specific prompt

refers to adequate answers given in reply to the second prompt question; and (d) no adequate explanation includes those children unable to give an adequate explanation of reading differently after all four questions were presented, but maintained that the child would read it differently.

The children's responses to these questions are categorized in Table 9. Twenty-four grade 8; 15 grade 5, and four grade 2 children were able to provide an adequate explanation of how the second reading would be different. Most of the grade 2 children were unable to give an adequate explanation of reading differently, or felt that the two readings would be the same. Many of the grade 2 children's descriptions of how the child would read the story differently referred to the mechanics of reading (e.g. read aloud, slower, better, with expression). Of the 12 grade 5 children unable to describe a difference in reading, six also referred to differences in reading mechanics. In contrast to these two grades, more than half of the grade 8 children gave an adequate explanation spontaneously without the need of the two additional prompt questions.

Chi Square analysis across grades in read same versus read differently responses yielded a highly significant result, $\chi^2=17.985$, $df=2$, $p<.001$. Between grade analyses indicated that grade 2 children responded considerably differently from both grade 8 and grade 5 children, although the latter two groups did not differ significantly from each other. A second analysis across the grades comparing the various read differently responses also yielded a significant result, $\chi^2=20.232$, $df=6$, $p<.01$. There were also significant differences in the extent to which the children gave an adequate explanation spontaneously. Grade 2 children gave spontaneous explanations significantly less frequently than either grade 8 or

TABLE 9

Children's Choices of how the child who read, asked questions, then reread the story would read it the second time, and the extent of questioning necessary before an acceptable response was given

| Grade | Read same way | Read differently the second time | | | | |
|-------|---------------|----------------------------------|----------------|-----------------|----------------|-------|
| | | Spontaneously | General Prompt | Specific Prompt | No Explanation | Total |
| 8 | 1 | 15 | 7 | 2 | 5 | 29 |
| 5 | 3 | 7 | 6 | 2 | 12 | 27 |
| 2 | 13 | 0 | 2 | 2 | 13 | 17 |

1. Comparing Read Same versus Total Read Differently
 $\chi^2=17.985$, $df=2$, $p<.001$
2. Comparing Read Same versus Read Differently across pairs of grades
 gr. 8 versus gr. 5, n.s.
 gr. 8 versus gr. 2, $p<.01$
 gr. 5 versus gr. 2, $p<.01$
3. Comparing Read Differently responses in the prompt conditions
 $\chi^2=20.232$, $df=6$, $p<.01$
4. Comparing Adequate answers (spontaneous, general prompt, specific prompt categories) versus all other responses
 gr. 8 versus gr. 5, $p<.05$
 gr. 8 versus gr. 2, $p<.01$
 gr. 5 versus gr. 2, $p<.01$
5. Comparing Spontaneously given difference versus all other responses across pairs of grades
 gr. 8 versus gr. 5, n.s.
 gr. 8 versus gr. 2, $p<.01$
 gr. 5 versus gr. 2, $p<.05$

grade 5 children. The latter two groups did not differ significantly.

In summary, the three grade levels of children were consistent in their choice of the child using the question technique, as learning more. However, there were considerable differences amongst all grade levels in the extent to which they were able to demonstrate an awareness of how this study technique could be used to monitor present learning or to guide future reading of the material. Fewer than one-fifth of the grade 2 children were able to demonstrate either aspect of knowledge, whereas approximately half of the grade 5 children responded adequately. In contrast, approximately four-fifths of the grade 8 children were able to provide answers indicating their awareness of how this study technique could be used effectively.

2. Reading twice versus reading, reciting back and rereading

This story description, similar in design to the preceeding one, involved a comparison between simple repetition versus the addition of a recitation strategy between successive readings of a story. After presenting the contrast, the children were asked a series of questions including: (1) which child learned more? (2) why? and (3) why do you think the second child tried to say the story back to her/himself before she/he read it again?.

In response to the choice question, almost all of the grade 8 and 5 children and more than half of the grade 2 children chose the child who used the recitation technique as learning more. Thus, grade 5 and 8 children responded similarly to each other, but differently from grade 2 children, $\chi^2=12.878$, $df=4$, $p<.05$. Of the remaining children, all but one grade 8 child indicated that the

two children would learn the same. One grade 5 child presented a reasonable explanation for the choice of "same" indicating that the two children may have needed different learning styles because of differences in learning ability, and that the combination of approach and ability yielded similar learning. The usual type of answers given by the remaining children were "both knew it," "both read it the same," and "both read it twice."

Children's responses to the two justification questions were analyzed for awareness of how the recitation technique could be used to monitor present learning and/or guide future readings. A recitation technique may be useful in the present, by helping the reader to assess what she/he already knows and does not know about the passage. The following types of answers were considered to be adequate: "to find out if he has anything mixed up," "to see if he can remember most of the points," "to know for sure if he knows it." Inadequate responses included: "to know more," "to learn more," "to remember it." These latter responses were inadequate, since they simply repeated the wording of the original contrast question (i.e. "which child could learn and remember more about the story...") and were not further elaborated.

As outlined in Table 10, approximately three-quarters of grade 8, one-half of grade 5, and one-quarter of grade 2 children were able to give an adequate response. This pattern of responses was significantly different across the three grade levels, $\chi^2=17.164$, $df=2$, $p<.001$. Further analyses indicated that grade 2 children were significantly less aware of this value of a recitation repetition technique than either grade 5 or 8 children.

The children's responses to the two justification questions were also analyzed for verbalized indications of how use of a recitation technique could influence

TABLE 10

Indication of Awareness of the Value of a Recitation
Technique for Monitoring Present Learning,
in children's responses to
"Why do you think she/he said the story
back before reading it again?"

| Grade | Adequate Explanation | Inadequate Explanations | | |
|-------|-------------------------|------------------------------|-------|-------------|
| | | Know More, Get good marks | Other | No Response |
| 8 | 23 | 5 | 2 | 0 |
| 5 | 16 | 14 | 0 | 0 |
| 2 | 7 | 18 | 3 | 2 |

1. Comparing Adequate Explanation versus
Total Inadequate Explanations

$$\chi^2=17.164, df=2, p<.001$$

2. Comparing Adequate Explanation versus
Total Inadequate Explanations across
pairs of grades

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, $p<.01$

gr. 5 versus gr. 2, $p<.05$

future readings of the same material. Adequate answers fell into several categories, including: "she checked to see if what she remembered was right," "she skimmed over the parts she knew and/or concentrated on the parts she wasn't sure about when she read it," and "she read more carefully, to catch the parts she missed."

If the children were unable to give an adequate explanation in response to either of the two justification questions, one or two additional questions were presented as prompts. These questions were: (1) "when she/he read it again, how do you think she/he read it? Did she/he do anything differently the second time than when she/he read it the first time? What?"; and (2) "Do you think it made a difference that she/he had said the story back? Do you think saying the story would affect how she/he read it again?"

As with the previous story description, the children's answers were categorized according to the extent of questioning necessary before they were able to give an adequate description of how the second reading would be different. The categories were similar to those described for the previous story description: (a) spontaneously described difference, (b) general prompt, (c) specific prompt and (d) no adequate explanation given. The categorized responses are outlined in Table 11. Most of the children in grades 8 and 5, and approximately half of those in grade 2 felt that the child would read the story differently the second time. Thus, when Read Same versus Read Differently responses were compared, a highly significant difference in the response pattern became evident, $\chi^2=17.746$, $df=2$, $p<.001$. The grade 5 and 8 children responded similarly to each other, but differently from the grade 2 children.

However, amongst those children who chose that the

TABLE 11

Children's Choices of how the child who read, recited,
then reread the story would read it the second time,
and the extent of questioning necessary before
an acceptable response was given

| Grade | Read same way | Read differently the second time | | | | Total |
|-------|---------------------|----------------------------------|-------------------|--------------------|---------------------|-------|
| | | Spontan- eously | General Prompt | Specific Prompt | No Explan- ation | |
| 8 | 3 | 12 | 9 | 2 | 4 | 27 |
| 5 | 2 | 7 | 7 | 2 | 12 | 28 |
| 2 | 14 | 1 | 1 | 1 | 13 | 16 |

1. Comparing Read Same versus Total Read Differently
 $\chi^2=17.746$, $df=2$, $p<.001$
2. Comparing Read Same versus Total Read Differently
across pairs of grades
gr. 8 versus gr. 5, n.s.
gr. 8 versus gr. 2, $p<.01$
gr. 5 versus gr. 2, $p<.01$
3. Comparing Read Differently responses in prompt
conditions
 $\chi^2=19.389$, $df=6$, $p<.01$
4. Comparing all adequate versus all inadequate
responses
 $\chi^2=17.164$, $df=2$, $p<.001$
5. Comparing all adequate versus all inadequate
responses across pairs of grade levels
gr. 8 versus gr. 5, n.s.
gr. 8 versus gr. 2, $p<.01$
gr. 5 versus gr. 2, $p<.01$
6. Comparing Spontaneously given difference versus
all other responses
gr. 8 versus gr. 5, n.s.
gr. 8 versus gr. 2, $p<.01$
gr. 5 versus gr. 2, n.s.

TABLE 11 continued

7. Comparing Responses with prompts versus all other responses:

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, $p < .05$

gr. 5 versus gr. 2, $p < .05$

child would read the story differently, 23 out of 27 grade 8, 16 out of 28 grade 5, and three out of 16 grade 2 children were able to provide an adequate answer. Six grade 5 and 10 grade 2 children had been able to describe only differences in the mechanics of reading the second time around. In contrast, a considerable number of the grade 8 children were able to give an adequate answer spontaneously. Significantly more grade 8 than grade 2 children were able to provide spontaneous descriptions. In addition, 90 percent of the grade 2 children, 47 percent of the grade 5 children, and 23 percent of the grade 8 children either felt the child would read the story the same, or could not give an adequate explanation of reading differently. Thus, most of the grade 2 and almost half of the grade 5 children were unable to demonstrate adequate awareness of how a recitation study technique can guide future reading of material to be learned. Followup analyses indicated that grade 2 children gave adequate responses significantly less often than the grade 5 and 8 children. The latter two groups did not differ significantly on this variable. Final analyses indicated that the grade 2 children were significantly less likely than the grade 5 or 8 children, to be able to give an adequate explanation in response to the prompts.

In summary, the findings of this story description suggest considerable differences among the children in their knowledge about a differential repetitive strategy involving recitation. More than half of the grade 2 children responded that use of this technique can assist learning. By grade 5, almost all of the children appeared aware of this fact. Approximately one-quarter of the grade 2 children were able to describe how a recitation technique might be used to monitor present learning. This awareness increases with increasing age and experience, so that approximately three-quarters of the grade 8

children were able to provide appropriate explanations. Relatively few grade 2 children indicated any awareness of how a recitation technique could guide future readings. In contrast, approximately half of the grade 5 children and three-quarters of the grade 8 children were able to display this knowledge.

3. Reading four times the same way versus three times differently

This story description contrasted multiple identical rereadings of the same material with the technique of altering the purpose of the various readings, with a resulting alteration in reading speed and activity. After describing the contrast, the children were asked to choose whether one child would learn and remember more, and to justify their choice.

The children's choices are outlined in Table 12. Grade 5 and 8 children responded similarly. At both grade levels, a large majority of children indicated that the child who read it three times differently would learn more. In contrast, the grade 2 children responded significantly differently. Almost one-half indicated that the child who read it four times the same way would learn more. This choice was rarely made by the grade 5 children, and not made at all by the grade 8 children.

Justifications for the choices were analyzed according to whether an adequate explanation was given for the choice. An adequate justification for the choice of the child who read it three times might indicate some value for reading with differing purposes in mind (e.g. reading with a different point of view each time; actively looking for more/different information each time; reviewing and checking one's knowledge). An adequate justification for choosing the other child might include some idea that reading the same way will assist familiarization of the story, and prevent any confusion. If a response indicated

TABLE 12

Children's Choices and Justifications for their
 Choices of who would Learn More,
 the child who read the story four times the
 same way, or the child who read it
 three times; differently each time

| Grade | 3x Different | | 4x Same | | Same | | Depends | |
|-------|--------------|----|---------|----|------|---|---------|---|
| | A | I | A | I | A | I | A | I |
| 8 | 16 | 9 | 0 | 0 | 0 | 5 | 0 | 0 |
| 5 | 9 | 16 | 0 | 2 | 0 | 2 | 1 | 0 |
| 2 | 2 | 7 | 1 | 12 | 1 | 6 | 1 | 0 |

A means Adequate Response

I means Inadequate Response

1. Comparison of Choices across 4 categories and 3 grades

$$\chi^2 = 31.992, \text{ df} = 6, p < .001$$

2. Comparison of Adequate versus Inadequate justifications across 3 grades

$$\chi^2 = 8.956, \text{ df} = 6, p < .05$$

3. Comparison of Adequate versus Inadequate justifications across pairs of grades

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, $p < .01$

gr. 5 versus gr. 2, n.s.

some equalization of the two forms of study (e.g. both equally good, depends on learning style of the child) then the response was scored as adequate. Inadequate responses included no responses, "I don't know" responses, as well as responses which were a simple repetition of the story contrast.

As indicated in Table 12, 53, 33, and 17 percent of the children in grades 8, 5, and 2 respectively, were able to provide adequate explanations for their choices. This pattern of responding was statistically significant, with followup analyses indicating that grade 2 children were able to provide adequate explanations for their choices significantly less frequently than grade 8 children. Other grade differences were nonsignificant.

For the grade 8 children, the sixteen adequate explanations were given following the choice of the child who read the story three times. These explanations generally emphasized learning more when each reading involves differing points of view or differing purposes. Five grade 5 children also gave this type of response. In addition, four grade 8, five grade 5, and two grade 2 children emphasized that the child who read it three times differently would know more because she/he had studied the important parts, reviewed it, and made sure that she/he had actually learned the main points.

Responses given to justify the choice of "same" were generally inadequate, with three exceptions which included some variable that equalized the two different reading strategies (e.g. differences in reading speed, amount of concentration). Of the many children who chose the child who read it four times as learning more, only one child gave what was accepted as a weak, but adequate response (e.g. if you do it the same way; you get the hang of it better, and get the answers better). Many of these children (N=9) simply gave as their rationale the fact

that the child had read it four or more times.

In summary, on this question the grade 5 and 8 children responded similarly to each other but differently from grade 2 children in their choice of who would learn more. Grade 2 children's responses emphasized simple repetition over a differential repetition strategy. All grade levels of children showed trends towards being able to provide adequate explanations for their choices. However, even at the grade 8 level, almost forty percent of the children were unable to provide an adequate explanation for why a differential repetitive reading strategy involving differing purposes and reading rates is more beneficial for learning than simply continuous rereading.

Summary

The children's performance on these three story descriptions displayed a fair amount of variability, both in their choices and in their ability to explain adequately the value for learning of the differential repetition techniques. Significant differences in choice behaviour occurred on the recitation and three times differently story descriptions, with grade 5 and 8 children making choices similar to each other, but different from the grade 2 children. When explaining their choices, generally fewer than one-quarter of the grade 2 children were able to provide an adequate account of how the differential repetition strategy could affect learning, whereas approximately one-half of the grade 5 children were able to explain their choices acceptably. Grade 8 children, in contrast, were most frequently able to demonstrate an awareness of the value of the questioning and recitation techniques both for monitoring present learning and for guiding future reading. In contrast with these techniques on the story description involving differing reading rates and purposes, at all grade levels fewer children were able to provide an adequate explanation for their choices.

III. Conditions influencing use of a repetition strategy.

The third major purpose of the study was to investigate what children know about conditions that may influence use of a repetition strategy. Both task and material conditions were investigated.

Material Variables

Two story descriptions investigated the influence of familiarity and perceived difficulty level of the material on children's described reading behaviours.

1. Perceived easiness versus difficulty level of the material

The children were told that two children had been asked to read and learn a story about explorers. One child felt that the material was very hard for him/her; the other child felt that the material was easy. The children in the study were asked how many times each child would read the story. Most of the children at all grade levels appeared to be aware that difficult material requires more repetition than easy material. Twenty-eight, 30, and 25 children at grades 8, 5, and 2 respectively, indicated that the child who found the story hard would read it more often, $\chi^2=7.258$, $df=4$, n.s. Two grade 8 and three grade 2 children felt that each child would read the story the same number of times.

A more subtle assessment of the children's understanding of the influence of perceived difficulty level of material on learning was attempted by telling the children that each child had time to read the story only once. The children were asked to judge whether one child would have learned more after the one reading. Table 13 provides a summary of the responses.

Over three-quarters of the grade 5 and 8 children indicated that the child who thought it was easy would learn and remember more. In contrast, less than one-half of the grade 2 children made this choice. One-half of

TABLE 13

Children's Choices of who Learned More after
One Reading under Easy versus Hard
Material Conditions

| Grade | Easy | Hard | Same | Depends |
|-------|------|------|------|---------|
| 8 | 23 | 0 | 4 | 3 |
| 5 | 24 | 1 | 3 | 2 |
| 2 | 13 | 2 | 15 | 0 |

1. Comparing 4 response categories by 3 grades
 $\chi^2=20.591$, $df=6$, $p<.01$
2. Comparing Easy versus all other responses
 across pairs of grades
 gr. 8 versus gr. 5, n.s.
 gr. 8 versus gr. 2, $p<.05$
 gr. 5 versus gr. 2, $p<.01$
3. Comparing Same versus all other responses
 across pairs of grades
 gr. 8 versus gr. 5, n.s.
 gr. 8 versus gr. 2, $p<.01$
 gr. 5 versus gr. 2, $p<.01$

these children indicated that each child would learn and remember the same. — Thus, although on the previous question the grade 2 children responded similarly to the older children and demonstrated an understanding that difficult material requires more repetition for learning, they responded quite differently on this question. Chi Square analysis of the children's response patterns yielded significant results, $\chi^2=20.591$, $df=6$, $p<.01$. Followup analyses indicated that grade 5 and 8 children made the "easy" choice significantly more frequently than the grade 2's, while the latter group made the "same" choice significantly more often than the older grades.

Of the grade 2 children who chose "same," nine indicated that they would learn the same because they both read it once; five chose "same" because of various reasons irrelevant to the story descriptions (e.g. because they both liked the story); and one child indicated that a difference in application (interest, attitude, concentration) would make the two children equal (e.g. the one who found it hard would read it more carefully, with greater concentration). At the grade 5 level, two children said they would learn the same since both read it once, and one child did not give an explanation. All four grade 8 children who chose "same" indicated that differences in application and study style made up for the "hard" child's initial disadvantage.

One grade 5 and two grade 2 children felt that the child who found it hard would learn more, and all three used differences in application and study style to justify their choices. Three grade 8 and two grade 5 children indicated that the results depended on various factors, such as each child's memory skills, study style or reading ability. Of these five children, four chose the child who found it "easy" as learning more, when the experimenter redefined the question by saying that each of the two

children was equal in the skill area originally mentioned in the justification.

Thus, of the children who did not say on this question, that the child who found it "easy" would learn more, seven of seven grade 8, two of five grade 5, and one of fifteen grade 2 children provided reasonable explanations for their choices (e.g. referred to differences in study style, skills or ability level).

2. Familiarity versus unfamiliarity of the material

The influence of the variable of familiarity of the material on children's learning and use of repetitive reading was investigated employing a format similar to that of the previous question. The story description was given, and the children in the study were asked to indicate how often the child who was familiar with the material on bears, and the child who was unfamiliar with it, would read the story.

As with the preceeding question on difficulty level, all grade levels responded similarly: 29, 30, and 26 children in grades 8, 5, and 2 respectively indicated that the child who was unfamiliar with the material would read it more often. Thus, even the grade 2 children showed awareness that unfamiliar material should be read more often than material that is familiar.

To further assess the limits of this understanding, the children were then told that each child had time to read the story only once, and were asked if one child would know more after one reading. Their responses are given in Table 14. Two-thirds of the grade 2 children indicated that the child who was familiar with the material would remember more after one reading. A slightly higher percentage of grade 5 and 8 children made a similar response. This response pattern yielded significant findings, $\chi^2=15.260$, $df=6$, $p<.05$. Additional analyses indicated that grade 2 children chose "same"

TABLE 14

Children's Choices of who Learned More after
One Reading under Familiar versus Unfamiliar
Material Conditions

| Grade | Familiar | Unfamiliar | Same | Depends |
|-------|----------|------------|------|---------|
| 8 | 24 | 2 | 1 | 3 |
| 5 | 27 | 1 | 2 | 0 |
| 2 | 20 | 2 | 8 | 0 |

1. Comparing 4 response categories by 3 grades
 $\chi^2=15.260$, $df=6$, $p<.05$
2. Comparing Same versus all other responses
across pairs of grades
gr. 8 versus gr. 5, n.s.
gr. 8 versus gr. 2, $p<.05$
gr. 5 versus gr. 2, n.s.
3. Comparing Familiar versus all other
responses across pairs of grades--
all nonsignificant

significantly more frequently than grade 8 children.

Among those children who did not say that the child who was familiar with the material would learn more, six of six grade 8, two of three grade 5, and three of 10 grade 2 children provided reasonable explanations for their choices. These explanations generally included some variable which equalized the conditions for the two children (e.g. the child who knew about the bears just read it quickly, the other child really concentrated on the story).

Summarizing across these two story descriptions, it is evident that at all grade levels, most children realize that difficult or unfamiliar material must be read more often than either easy or familiar material, in order to learn it. However, the grade 2 children were significantly less likely than the others to realize that perceiving the material to be easy, or having prior familiarity with it would assist the reader, even if only one reading was possible. In addition, the patterning of responding indicates that previous familiarity with the material was considered to be more beneficial for learning than an initial liking for the material.

Task Variables

Story descriptions were also used to investigate children's knowledge of two task conditions that might influence use of repetition in reading-study tasks.

1. Memorize versus be familiar with the story

The children were told that one child was asked to memorize the story, while the other was asked to simply become familiar with the story. Afterwards, they were asked to choose whether one child would learn and remember more than the other, and were asked to describe in their own words what each child would do, in order to memorize or become familiar with the story.

In response to the choice question, 15, 19, and 19 children from grades 8, 5, and 2 respectively indicated that the child who memorized the story would remember it better. Eleven grade 8 and six grade 5 children felt that the child who was instructed to be familiar with the story would learn more. Reasons for this choice generally emphasized that it was easy to get confused when memorizing. Four grade 8, five grade 5, and 11 grade 2 children felt that both children would remember the same. Of these children, all grade 8, four grade 5, and one grade 2 child indicated that both children would know the important facts when questioned, and therefore would be able to remember the same.

This pattern of responding across three grades and three categories was statistically significant, $\chi^2=15.61$, $df=4$, $p<.01$. Followup analyses yielded no significant differences across all pairs of grades for choices of either "memorize" or "same". However, when comparing choice of "familiar" versus all other responses, both grade 5 ($p<.05$) and grade 8 ($p<.01$) children chose the child who was asked to be familiar with the story significantly more than grade 2 children.

Children's responses to the questions inquiring how each child would read the story in order to memorize or become familiar with it, were checked for indications of reading differently in response to the differing task demands. Responses were classified as: (a) "Read the same," when no indication of a difference in reading-study behaviours was given; and (b) "Read differently," when a difference in reading-study behaviour (e.g. read one more often, recite when memorizing, self checking etc.) was given in response to the two task conditions,

Most of the children at all grade levels were able to verbalize a difference in reading-study behaviours under the two task conditions; 30, 28, and 21 children for

grades 8, 5, and 2 respectively. However, Chi Square analysis across the grades, $\chi^2=13.878$, $df=2$, $p<.001$, and followup analyses indicated that both grade 8 ($p<.01$) and grade 5 ($p<.05$) children were able to describe a reading-study difference significantly more frequently than the grade 2 children. The types of differences suggested included both differing numbers of readings and differing study styles. For example, 19, 20, and 16 children from grades 8, 5, and 2 respectively indicated that the child who had to memorize the story would read it more than the other child. Thus, a majority of children at all grade levels was aware that memorizing frequently requires repetition.

An attempt was made to investigate children's awareness of the influence of a specific time constraint on the differing task instructions. Thus, an additional question asked the children to choose the child (memorizer or familiarizer) who would learn and remember the most when both were given the same amount of time. The choices were divided into four categories, as indicated in Table 15. A majority of grade 8 children chose the child with the task of becoming familiar with the story as learning more. In contrast, 30 percent of grade 5 and 20 percent of grade 2 children made that choice. A majority of the grade 5 children chose the child with the task of memorizing the story as learning more. The grade 2 children were generally divided amongst the choices. Chi Square analysis of the response pattern yielded significant findings, $\chi^2=21.05$, $df=6$, $p<.01$. Further analyses indicated that grade 8 children chose the child who memorized the story significantly less than the grade 5 children. Grade 5 and grade 2 children did not differ significantly on this choice. In addition, grade 8 children chose the child who was to become familiar with the story, significantly more often than the grade 2

TABLE 15

Children's Choices of the Child who would Learn More
under Memorizing versus Familiarizing
Task Conditions when each child had
the Same Amount of Study Time

| Grade | Memorize | Familiar | Same | Depends |
|-------|----------|----------|------|---------|
| 8 | 7 | 17 | 4 | 2 |
| 5 | 18 | 9 | 3 | 0 |
| 2 | 14 | 6 | 10 | 0 |

1. Comparing 4 choice categories by 3 grades
 $\chi^2=21.050$, $df=6$, $p<.01$
2. Comparing choice of Memorize versus all other choices, across pairs of grades
gr. 8 versus gr. 5, $p<.01$
gr. 8 versus gr. 2, n.s.
gr. 5 versus gr. 2, n.s.
3. Comparing choice of Familiar versus all other choices, across pairs of grades
gr. 8 versus gr. 5, n.s.
gr. 8 versus gr. 2, $p<.01$
gr. 5 versus gr. 2, n.s.
4. Comparing choice of Same versus all other choices, across pairs of grades--
all nonsignificant

children.

Justifications for the choices were checked for an indication of awareness of the effects of the time constraint on the task conditions. For example, the children might say that the child who had to be familiar with the story might learn more, because the other child would not be through memorizing it in the time allowed. Sixteen grade 8, five grade 5, and two grade 2 children gave responses which took into consideration the interaction of the time variable and the task conditions. This pattern of responding was statistically significant, $\chi^2=19.04$, $df=2$, $p<.001$, with grade 8 children responding significantly differently ($p<.01$) from both grade 5 and grade 2 children.

Summarizing the data related to this story description, it is evident that grade 2 children are generally as able as older children to recognize that a memorizing strategy requires more effort, specifically more repetition, and therefore usually results in better learning. In contrast, both grade 5 and grade 2 children were significantly less likely than grade 8 children to be able to appreciate the interactive effects of this task condition and a time dimension, upon the children's learning.

2. High versus low performance goals

The children were told that one child was asked to read a story and had to obtain 12 out of 15 followup questions correct in order to receive a prize, while another child could receive the same prize if she/he answered five of the questions correctly. Afterwards, they were asked to choose whether one child would learn more, to justify their choice, and to say whether each child would read the story differently, in order to obtain the prize.

In response to the choice question, at all grade

levels, the majority of children, 24, 29, and 25 at grades 8, 5, and 2 respectively, indicated that the child asked to obtain 12 answers correct would learn more. Of the 12 children who did not make this choice, eleven felt both children would learn the same. Statistical analyses indicated no significant differences in response pattern. Thus, even at the grade 2 level, children are aware that a higher performance goal should result in better learning.

However, grade level differences became evident when the children were asked to justify their choices. Justifications were placed into one of three categories:

- (a) None, including no responses, "I don't know";
- (b) Other, including responses which did not indicate that the child with the higher goal would learn more because she/he would have to work harder (e.g. "because she got 12 right," "she learned it"), and (c) Adequate, including those responses which indicated that the child with the higher goal has to work harder to obtain the goal, and so would probably learn more (e.g. "she worked harder, she had to learn more to get her 50 cents").

Five grade 2 children (17 percent) were able to explain adequately why the child with the higher performance goal would learn more. In contrast, 60 percent of the grade 5 and 77 percent of the grade 8 children gave responses indicating that they realized that a child given a higher goal would work harder, and consequently would learn and remember more. Chi Square analysis of this response pattern was highly significant, $\chi^2=25.797$, $df=4$, $p<.001$, with followup analyses indicating that grade 2 children responded significantly differently from both grade 5 and grade 8 children. The latter two groups did not differ significantly from each other.

Typically, the grade 2 children's responses did not make reference to the differing performance goal requirements. In fact, when a reference was made to the

performance goals, it frequently indicated that the children did not fully understand the story description, but rather believed that each child had already obtained 12 or five correct. This story description actually appears to have been quite difficult, since one, four, and 10 children in grades 8, 5, and 2 gave some indication that they misunderstood some aspect of the story, and needed correcting information before continuing with the remainder of the questions for this story description.

The children were also asked whether the two story children would read and study the story any differently under the different goal conditions. Responses were tabulated into four categories: (1) Read same; (2) Read differently, but no specific difference given; (3) Read differently, difference described in response to a specific prompt question, ("Do you think the child who had to get 12 out of 15 questions correct will read the story any differently than the other child? How?"); and (4) Read differently, difference described without necessity of the prompt question (i.e. described in the original justification for the choice).

The children's categorized responses are outlined in Table 16. As indicated in Table 16, the grade 2 children were significantly more likely to say that the two children would read the story the same. They were also significantly more likely than the other grade levels to indicate that the story would be read differently, without being able to describe a difference. In contrast, both grade 8 and grade 5 children were significantly ($p < .01$) more likely to describe a difference in reading-study behaviour in response to the specific prompt. There were no significant differences amongst the grade levels in children's ability to describe a difference without the prompt question.


When the types of suggested reading-study strategies

TABLE 16

Children's categorized responses to the questions
 inquiring whether the child asked to get
 12 of 15 questions correct and the child
 asked to get 5 of 15 correct would
 read the story differently

| Grade | Read Same | Read Differently | | | Total |
|-------|--------------|---------------------------|----------------|-------------------|-------|
| | | No Specific Difference | With Prompt | Without Prompt | |
| 8 | 3 | 1 | 22 | 4 | 27 |
| 5 | 2 | 0 | 23 | 5 | 28 |
| 2 | 13 | 8 | 8 | 1 | 17 |

1. Comparing Read Same versus Read Differently
 across three grades
 $\chi^2=15.417$, $df=2$, $p<.001$
2. Comparing Read Same versus Read Differently
 across pairs of grades
 gr. 8 versus gr. 5, n.s.
 gr. 8 versus gr. 2, $p<.01$
 gr. 5 versus gr. 2, $p<.01$
3. Comparing 3 categories of Read Differently
 responses across three grades
 $\chi^2=24.665$, $df=4$, $p<.001$



were tabulated, 10 grade 8, 10 grade 5, and three grade 2 children indicated that the child with the higher performance goal would read the story more often than the other child. This repetition response was the most frequently suggested strategy. Twenty-one children (10, 9, and 2 at grades 8, 5, and 2) suggested that the child with the higher goal would study harder, think about the story more, and try to memorize the important facts. In addition, sixteen children suggested asking oneself questions; five suggested recitation; and three suggested writing down the important facts. Five of these children gave more than one study difference.

Analogous to the previous story description, the children were also asked whether one child would learn more when both were given the same amount of time to study. Responses were scored according to whether the children appeared aware of the effects of the specific time constraint on the differing task conditions. At all three grade levels, the majority of children continued to maintain that the child with the higher goal would learn and remember more, 17, 24, and 18 at grades 8, 5, and 2; $\chi^2=4.905$, $df=4$, n.s. Ten, nine, and two children respectively at grades 8, 5, and 2 were able to take the time constraint into consideration, and give an adequate explanation for their choices. Examples of adequate responses included: "he had a lot to learn in that time, the other child could be lazy," "each had the same amount of time to do the same thing," "she had more time to work harder to get just those five questions right." The response pattern across the grades on this variable was significantly different, $\chi^2=7.081$, $df=2$, $p<.05$, with grade 2 children less likely than the other children to be able to assess the interactive effects of time and task demand conditions upon learning.

Summarizing the data related to this story

description, it is evident that grade 2 children are as aware as older children that a higher performance goal may result in more learning. However, they were less able to justify adequately their intuitive knowledge. In addition, grade 2 children were less likely to describe differences in reading behaviours as a result of the differing performance goals, or to appreciate the influence of the additional time variable upon reading-study behaviours. It should also be pointed out, that even at the grade 8 level, only one-third of the children were able to appreciate the interactive influence of the time and performance goal variables upon the children's learning.

Personal Choices

When presenting the four previously described story descriptions involving simple and differential repetition, the children were also asked each time what they would do in each of the situations described. Their choices are outlined in Table 17. Visual scanning of the data, and Chi Square analyses indicated that all children responded very similarly to the two differential repetition stories involving the recitation and question asking strategies. However, there was more variability on the simple repetition story and the differential repetition story involving reading differently with differing purposes.

On the simple repetition story, most grade 2 children indicated they would read the story four times. While this choice was also the most frequent choice by the grade 5 and 8 children, 40 to 46 percent of these children respectively, chose neither alternative. Rather, they frequently responded that they would read it more than once, but less than four times, depending upon other variables (e.g. interest, time available, subject etc.). When a comparison was made of children's choice of a given

TABLE 17: A to D

Personal Strategy Choices

A: Read Once versus Four Times

| Grade | Once | More than once Less than four | Four | More than four | Other (Depends) |
|-------|------|----------------------------------|------|-------------------|--------------------|
| 8 | 1 | 14 | 15 | 0 | 0 |
| 5 | 2 | 10 | 16 | 1 | 1 |
| 2 | 2 | 0 | 26 | 1 | 1 |

1. Comparing choice of "more than once/less than four" versus all other responses

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, $p < .01$

gr. 5 versus gr. 2, $p < .01$

2. Comparing choice of "four" versus all other responses

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, $p < .01$

gr. 5 versus gr. 2, $p < .05$

B: Read Twice versus Read, Ask Questions, Read

| Grade | Ask questions | Just read | Other |
|-------|---------------|-----------|-------|
| 8 | 23 | 3 | 4 |
| 5 | 26 | 3 | 1 |
| 2 | 23 | 5 | 2 |

All comparisons nonsignificant

C: Read Twice versus Read, Recite, Read

| Grade | Recite | Just read | Other |
|-------|--------|-----------|-------|
| 8 | 21 | 4 | 5 |
| 5 | 23 | 3 | 4 |
| 2 | 22 | 3 | 5 |

All comparisons nonsignificant

TABLE 17 continued

D: Read Three Times Differently versus Four Times
the Same

| Grade | 3x | 4x | Other |
|-------|----|----|-------|
| 8 | 17 | 3 | 10 |
| 5 | 25 | 3 | 2 |
| 2 | 11 | 16 | 3 |

1. Comparing choice of "3x" versus all other responses

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, n.s.

gr. 5 versus gr. 2, $p < .01$

2. Comparing choice of "4x" versus all other responses

gr. 8 versus gr. 5, n.s.

gr. 8 versus gr. 2, $p < .01$

gr. 5 versus gr. 2, $p < .01$

3. Comparing frequency of other responses

gr. 8 versus gr. 5, $p < .05$

gr. 8 versus gr. 2, n.s.

gr. 5 versus gr. 2, n.s.

alternative, versus choice of a different strategy, results indicated that the grade 2 children were significantly ($p < .01$) less likely to suggest an alternative strategy than either the grade 5 or grade 8 children.

All three grade levels responded differently to the story description about reading three times differently versus four times the same. Most of the grade 5 children chose to read the story three times differently. On this choice, they differed significantly ($p < .01$) from the grade 2 children. A majority of the grade 2 children chose to read the story four times the same way. This choice was made by them significantly ($p < .01$) more often than by either the grade 5 or grade 8 children. While a majority of the grade 8 children chose reading it three times differently, fully one-third of the children at this grade level chose neither alternative, and instead described various personal reading-study strategies.

The children's personal choices on these story descriptions indicate that the grade 8 children, and in some situations the grade 5 children, have a greater variety of reading-study activities available for personal use. Also, the grade 2 children are more likely than the others, to choose simple repetition over a differential repetition strategy.

Reliability

The children's responses to the various open ended questions and story descriptions were analyzed and categorized as indicated in the previous sections. For each question, a subsample of 18 responses was selected randomly, and categorized by a second rater. Interrater reliability was calculated, by comparing the two ratings for each of the 18 responses on each question. The reliability ratings ranged from 77 percent to 100 percent, with a mean rating of 92 percent.

When the two ratings of any individual response

resulted in a disagreement, discussion between the two raters continued until a consensus was reached. If the consensus resulted in a change of the original rating, all other responses to that question were reviewed to ensure that, where applicable, any other similar response was given the benefit of the new rating.

IV Relationship between children's knowledge about repetition and their academic performance

The last major purpose of the study was to investigate the relationship between children's performance on the interview questionnaire and their academic performance, as measured by teacher ratings. The children's responses to the various questions posed were categorized as outlined in the previous sections. The categorized responses were assigned numerical values, as indicated in Table 18. Correlations were computed between the children's assigned scores on the various sections of the interview, and the teacher ratings and achievement levels.

The teachers rated the children on four variables: (1) reading achievement; (2) oral expressive ability; (3) effective use of study time; and (4) overall level of achievement. Ratings on variables one, two and four were completed very similarly by all teachers (see Appendix C), and were therefore combined for correlational purposes. Ratings on the effective use of study time were different from the other three at grades 2 and 5, and were therefore used in separate correlational computations. For the grade 5 and 8 children, correlations were also computed with their composite score on the Canadian Tests of Basic Skills and their final grade point average. The correlations were computed separately for each major question in the interview, and are presented in Tables 19, 20, and 21.

It was hypothesized that certain types of knowledge about repetition would be more important at specific ages, and thus those children with a greater awareness of these

TABLE 18

Outline of the Numerical Values Associated with
Responses on the Repetition Questionnaire

| Question | Response Categories and Value | Total Value |
|--|---|----------------|
| 1. Sensitivity to the need for reading for learning behaviours— Open Ended questions 1, 2, 3 | None=0; Adequate=1; Superior=2 (N=2 analyses) | 4 |
| 2A. Knowledge of value of simple repetition | | |
| 1. Choice questions -Open Ended 4 Story Descrip- tion 1, 5, 6 | No indication=0; Indication=1 | 4 |
| 2. Justifications— Open Ended 4 Story Descrip- tion 1 (N=2 analyses) | None=0; Other=0; Adequate=1 | 3 |
| 2B. Knowledge of differ- ential repetition | | |
| 1. Open Ended-4, 4B | No indication=0; Indi- cation with prompt=1; Indication without prompt=2 | 2 |
| 2. Story Descrip- tions-2, 3 (Ask questions, Recite) | | |
| a. Value of strategy for moni- toring present learning | Inadequate=0; Adequate=1 | 2 |

TABLE 18 continued

| Question | Response Categories and Value | Total Value |
|--|---|-------------|
| 2B. 2.b. Value of strategy for guiding future reading | Read same=0; Read differently, no explanation=0; Read differently, specific prompt=1; Read differently, general prompt=2; Read differently, spontaneously=3 | 6 |
| 3. Story Description 4 (Read with different purposes--justification) | Inadequate=0; Adequate=1 | 1 |
| 3. Awareness of task and material variables affecting use of a repetition strategy | Other choice=0; Indication=1 | 2 |
| 1. Story Descriptions 5, 6 (indication of more readings for difficult and unfamiliar material) | | |
| 2. Story Description 7 (Performance goals) | | 4 |
| a. Choice | Other=0; 12/15 child=1 | |

TABLE 18 continued

| Question | Response Categories and Value | Total Value |
|--|---|-------------|
| 3. 2.b. Read differently or same c. Time constraint x Task interaction awareness | Read same=0; Read differently, no explanation=0; Read differently, prompt=1; Read differently, spontaneously=2 Absent=0; Present=1 | |
| 3. Story Description 8 (Memorize /Familiarize) a. Read differently or same b. Time constraint x Task interaction awareness | Read same=0; Read differently=1 Absent=0; Present=1 | 2 |
| | | 30 |

TABLE 19

Pearson Product Moment Correlation Coefficients
relating children's responses on Repetition
Questionnaire with Teacher Ratings of
achievement and study habits: Grade 2

| | Mean | Range | S.D. | TR-Ach | TR-ST |
|--|------|-------|------|--------|-------|
| <u>I Factors affecting use of repetition</u> | | | | | |
| 1. Assessing objective need for reading -study strategies | 1.06 | 0→3 | .87 | .531** | .388 |
| 2. Material variables | 1.7 | 0→2 | .60 | .192 | .101 |
| 3. Task demands-- Performance Goals | .57 | 0→3 | .82 | .397* | .42 |
| 4. Task demands-- Memorize | .77 | 0→2 | .50 | .495** | .20 |
| 5. 1→4 inclusive | 4.1 | 0→10 | 2.12 | .542** | .397* |
| <u>II Simple Repetition</u> | | | | | |
| 6. Choices and Justifications | 3.77 | 2→7 | 1.4 | .282 | .398 |
| <u>III Differential Repetition</u> | | | | | |
| 7. Indication of differential repetition in self description | .17 | 0→1 | .40 | .254 | .124 |
| 8. Read Question Read | .40 | 0→2 | .62 | .281 | .26 |
| 9. Read 3x Differently | .16 | 0→1 | .38 | .366* | .053 |
| 10. Read Recite Read | .43 | 0→4 | .93 | .302 | .151 |
| 11. 7→10 inclusive | 1.17 | 0→6 | 1.51 | .458* | .058 |
| Teacher Ratings--Achievement | 5.34 | | 2.44 | | |
| --Study Time | 5.5 | | 2.56 | | |

S.D. means Standard Deviation; TR-Ach means Teacher Ratings-Achievement; TR-ST means Teacher Ratings-Study Time

*p<.05

**p<.01

TABLE 20

Pearson Product Moment Correlation Coefficients
 relating children's responses on Repetition
 Questionnaire with Teacher Ratings of
 achievement and study habits, final grades
 and Canadian Tests of Basic Skills
 composite scores: Grade 5

| | Mean | Range | S.D. | TR-Ach | TR-ST | Final Grades | CTBS Score |
|--|------|-------|------|--------|-------|-----------------|---------------|
| I <u>Factors affecting use of repetition</u> | | | | | | | |
| 1. Assessing objective need for reading-study strategies | 2.66 | 0-4 | .99 | .029 | -.080 | -.001 | .056 |
| 2. Material variables | 2.0 | - | .0 | | | | |
| 3. Task demands--Performance Goals | 2.0 | 0-4 | 1.01 | .648** | .207 | .543** | .539* |
| 4. Task demands--Memorize | 1.1 | 0-2 | .48 | .081 | .029 | .071 | .163 |
| 5. 1-4 inclusive | 7.76 | 4-11 | 1.9 | .382* | .076 | .307 | .358* |
| II <u>Simple Repetition</u> | | | | | | | |
| 6. Choices and Justifications | 5.16 | 2-7 | 1.44 | .318 | .295 | .416* | .453** |

TABLE 20 continued

| | Mean | Range | S.D. | TR-Ach | TR-ST | Final Grades | CTBS Score |
|--|-------|-------|-------|--------|-------|--------------|------------|
| III Differential | | | | | | | |
| <u>Repetition</u> | | | | | | | |
| 7. Indication of differential repetition in self description | .76 | 0→2 | .67 | .166 | .151 | .261 | .275 |
| 8. Read Question Read | 1.63 | 0→4 | 1.62 | .223 | .29 | .41* | .326 |
| 9. Read 3x Differently | .33 | 0→1 | .47 | .245 | .4 | .343 | .158 |
| 10. Read Recite Read | 1.76 | 0→4 | 1.65 | .39* | .342 | .38* | .44** |
| 11. 7→10 inclusive | 4.5 | 0→10 | 3.2 | .38* | .41* | .513** | .477** |
| Teacher Ratings | | | | | | | |
| --Achievement | 5.08 | | 2.41 | | | | |
| --Study Time | 5.33 | | 2.45 | | | | |
| Final Grades | 68.16 | | 10.54 | | | | |
| CTBS Composite Score | 6.08 | | .86 | | | | |

S.D. means Standard Deviation

TR-Ach means Teacher Ratings--Achievement

TR-ST means Teacher Ratings--Study Time

CTBS Score means Canadian Tests of Basic Skills
Composite Score

*p<.05

**p<.01

***p<.001

TABLE 21

Pearson Product Moment Correlation Coefficients
relating children's responses on Repetition
Questionnaire with Teacher Ratings of
achievement and study habits, final grades
and Canadian Tests of Basic Skills
composite scores: Grade 8

| | Mean | Range | S.D. | TR-Ach | TR-ST | Final Grades | CTBS Score |
|---|------|-------|------|--------|-------|-----------------|---------------|
| <u>I Factors affecting use of repetition</u> | | | | | | | |
| 1. Assessing objective need for reading -study strategies | 3.06 | 2→4 | .69 | .126 | .058 | .023 | .119 |
| 2. Material variables | 1.9 | 1→2 | .30 | -.201 | -.044 | -.035 | -.103 |
| 3. Task demands--Performance Goals | 2.13 | 0→4 | 1.1 | -.229 | -.244 | -.093 | -.111 |
| 4. Task demands--Memorize | 1.53 | 1→2 | .5 | -.003 | -.053 | -.068 | .098 |
| 5. 1→4 inclusive | 8.63 | 5→11 | 1.4 | -.161 | -.190 | -.092 | -.015 |
| <u>II Simple Repetition</u> | | | | | | | |
| 6. Choices and Justifications | 5.3 | 3→7 | 1.17 | .209 | .046 | .176 | .181 |

TABLE 21 continued

| | Mean | Range | S.D. | TR-Ach | TR-ST | Final Grades | CTBS Score |
|---|-------|-------|-------|--------|-------|-----------------|---------------|
| <u>III Differential</u> | | | | | | | |
| <u>Repetition</u> | | | | | | | |
| 7. Indication of differ- ential re- petition in self des- cription | 1.26 | 0-2 | .52 | .395* | .338 | .469** | .438* |
| 8. Read Ques- tion Read | 2.8 | 0-4 | 1.49 | .201 | .190 | .200 | .145 |
| 9. Read 3x Differently | .53 | 0-1 | .50 | .203 | .160 | .289 | .183 |
| 10. Read Re- cite Read | 2.7 | 0-4 | 1.39 | .326 | .320 | .377* | .324 |
| 11. 7-10 inclusive | 7.3 | 1-11 | 3.08 | .345 | .320 | .394* | .321 |
| Teacher Ratings | | | | | | | |
| --Achievement | 4.97 | | 2.46 | | | | |
| --Study Time | 5.0 | | 2.54 | | | | |
| Final Grades | 64.83 | | 11.17 | | | | |
| CTBS Composite Score | 8.7 | | .95 | | | | |

S.D. means Standard Deviation

TR-Ach means Teacher Ratings--Achievement

TR-ST means Teacher Ratings--Study Time

CTBS Score means Canadian Tests of Basic Skills
Composite Score

*p<.05

**p<.01

facts might also be performing more adequately in related school performance as rated by their teachers. A conception of the importance of simple repetition was assumed to be developing around the grade 2 level. Consequently, it could be expected that correlations dealing with questions assessing this type of knowledge might be particularly informative at grades 2 and 5. Sections I and II of Tables 19, 20, and 21 provide data to evaluate this hypothesis. At the grade 8 level, none of the correlations involving simple repetition, or factors affecting the use of repetition were significant. In contrast, 50 percent of the correlations dealing with simple repetition were significant at both the grade 2 and 5 levels. Looking at the data on factors affecting the use of repetition, for the grade 2 children, a total of seven of the ten correlations were statistically significant. For the grade 5 children, five out of 20 (25 percent) of these correlations were significant.

There was significant positive agreement between both teacher ratings, and the grade 2 children's verbalized demonstration of sensitivity to the demands for reading-study behaviours in some reading tasks (Section I. 1). The parallel correlations for grade 5 and 8 children were nonsignificant. These findings support the Chi Square data which indicated that awareness that some reading tasks require learning-study behaviours, is generally consolidated by the grade 5 level. For all children, the correlations relating achievement variables to material variables, (Section I. 2), affecting the use of repetition were nonsignificant. All children responded similarly to these two story descriptions. In contrast, the story descriptions involving differing task demands, (Section I. 3, I. 4), were more difficult, and the children's performance on them more variable. The pattern of significant correlations for task demands variables suggest

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that those children displaying a greater awareness of how differing performance goals or instructions can influence their reading-study behaviours, were rated more highly by their teachers in terms of academic achievement.

It was also hypothesized that awareness of differential repetition would develop later than that of simple repetition, more likely at the later elementary grade levels. Consequently, it was expected that correlations dealing with the questions in Section III would be important at grades 5 and 8. Two of ten correlations were significant at the grade 2 level. For grade 5 children, nine of 20 correlations were significant. In fact, the majority of the significant correlations at the grade 5 level dealt with this aspect of knowledge. Thus, the grade 5 children who displayed considerable knowledge of various differential repetition techniques they could use to assist their learning, were also rated more highly by their teachers. In addition, the achievement variables related to final grades and CTBS scores were also very frequently positively correlated with children's knowledge about differential repetition techniques. At the grade 8 level, five of 20 correlations were significant.

The most difficult question assessing knowledge about differential repetition was the one asking children to describe their own reading-study behaviours, (Section III. 7). This question was assumed to be the most difficult, since it provided the children with less structure for formulating their responses. Interestingly, the correlations dealing with this variable were not significant at the grade 5 level, but were highly significant at the grade 8 level. Thus, the correlations that were significant at the grade 8 level, but not at any other grade level, were those related to what was assumed to be the most advanced part of the entire questionnaire.

In summary, it appears that the hypotheses regarding

the development of knowledge about both simple and differential repetition were given support by the data relating teacher achievement ratings to children's performance on the major sections of the repetition questionnaire. In addition, the fact that proportionally less of the correlations are significant as grade level increases supports the assumption that the questionnaire would be less discriminative at the oldest grade level, since most grade 8 children would have acquired the various aspects of knowledge about repetition assessed in the questionnaire.



CHAPTER IV DISCUSSION

The present chapter is organized into two sections representing the major aspects of this study: (1) an analysis of the developmental trends in children's knowledge about repetition, and (2) the relationship between this knowledge about repetition and children's academic achievement.

I Developmental changes in children's knowledge about repetition

Children can acquire at least three types of knowledge about repetition: (1) knowledge that the strategies exist; (2) knowledge that the strategies can influence learning; and (3) an understanding of how the strategies influence learning. In addition to developmental changes across grade level in these types of knowledge, it was also hypothesized that knowledge about simple repetition would develop prior to knowledge about differential repetition. Let us now look at what appears to be children's conception of repetition, and the variables which influence repetition, at each of grades 2, 5, and 8.

By grade 2, children are aware that simple repetition exists.. This is evident in their responses to the question asking how often they would read something to learn about it. Almost all children indicated they would read the story more than once. Grade 2 children also showed, by their choice responses to the story descriptions, that they know simple repetition can influence learning. When given the story description contrasting one versus four readings, almost all children chose the child who read it four times as learning more. These children were also likely to feel that simple repetition is more effective than a differential repetition strategy involving reading with differing purposes.

In contrast with these pieces of knowledge, the grade 2

children were less able to provide an adequate explanation for how simple repetition might influence learning. The children had three opportunities to give an explanation. Slightly more than one-half of the children were able to receive credit on at least one of these opportunities. When justifying their choices to the one versus four readings story description, most children simply stated that the child read it more, so she/he would learn more. They did not go beyond the immediate description of the problem in looking for a justification. For the two questions inquiring why a child would read a story several times, the majority of the justifications centered around learning the story, getting a good mark, learning how to read accurately, or simply stating that the story was interesting. Basically, these answers could have applied just as easily to one reading as to four. Consequently, it again appears that the grade 2 children did not go beyond the immediate description of the problem in giving their justification. Thus, while the grade 2 children could show knowledge of the existence and effects of simple repetition in response to specific questions, they were considerably less able to explain how simple repetition might influence learning.

Grade 2 children showed even less knowledge about differential repetition strategies. Knowledge that such strategies exist was gleaned from children's responses to the open ended question, inquiring how they would read a story each time, in order to learn it. Fewer than one-fifth of the children gave any indication of a differential repetition strategy. Similarly, significantly fewer grade 2 children, than either grade 5 or grade 8 children indicated in their choice responses that the various differential repetition strategies could facilitate learning and recall. The children had five opportunities to provide an explanation for how a differential repetition strategy might influence learning. More than half of these children were

unable to provide such an explanation on even one of these opportunities. In summary, the hypothesized developmental trend about the acquisition of knowledge about simple and differential repetition strategies was supported by the verbalizations of the grade 2 children.

Story descriptions investigating children's knowledge of the influence of task and material variables upon repetition, indicated that grade 2 children do know that variables such as material difficulty and familiarity will influence the number of times the material must be read to be learned. However, these children were less secure than the older children in their knowledge that material variables influence the use of learning strategies such as repetition. When the material conditions story descriptions were given, and the children were told that each child had time to read the story only once, more grade 2 children switched their original choices and indicated that the two children would learn the same, because they both read it once. Again, these children neglected to go beyond the immediate description of the problem when choosing an answer. The grade 2 children also knew that task demands can influence learning and reading behaviours. They were, however, unable to say how the future readings would be different because of the differing task demands.

Why is it that the grade 2 children have some understanding of simple repetition, but very limited understanding of differential repetition strategies? Why is it that they are unable to specify how differing task demands can influence future readings? To understand these data, we must consider at least two variables. The first variable is concerned with what children learn at school. The second variable is concerned with the children's own developing cognitive skills.

Instruction on learning to read at the grade 2 level is likely to involve the recognition of words and the establishment of a body of words that the child can decode

accurately. In developing this decoding skill, repetition is likely to be emphasized. Certainly, this emphasis is evident in the children's descriptions of their own reading behaviours. The grade 2 children frequently described their own reading by referring to the more mechanical aspects of reading, such as speed, vocal tone, accuracy of pronunciation. When they referred to repetition in their reading, it was within the context of reading the word more accurately the next time. This suggests that reading is considered as a mechanical decoding activity, rather than as a means for information presentation and retrieval. Without this latter context, it is unlikely that there would be any need to consider and develop any differential repetition strategies, although simple repetition would be emphasized. Also, with this conception of reading, it is unlikely that children would be able to consider how one might read differently, depending upon the task conditions. Rather, one would always simply attempt to decode as accurately as possible.

The second variable that must be considered is the children's own developing cognitive skills. The data suggests that the grade 2 children were frequently unable to go beyond the immediate description of the problem to consider several factors before making a response. This suggests a difficulty in being able to anticipate or be aware of the relationship between various factors. Existing research has shown that grade 2 children are weak at realizing the relationship between two variables, such as their own behaviour and their resultant learning. Using a discrete item task, Keeney, Cannizzo and Flavell (1967) required young children to use a rehearsal strategy, if they did not do so spontaneously. However, most of these children abandoned this strategy when they were actually not required to use it, in spite of the fact that their recall increased when they used it. They were

unable to relate the two factors to see that the strategy use was beneficial. If young children are generally unlikely to relate their own behaviour to their resultant learning and recall, it is also unlikely that they would understand the value of various repetition strategies for their learning. Consequently, there would be limited need for the development and utilization of these strategies, even if the children's responses to specific questions indicates that they might be aware of their existence.

As with the grade 2 children, the grade 5 children were aware that simple repetition exists, and that it can influence learning. They were more secure than the younger children in their knowledge that material variables will influence the use of learning strategies such as repetition. Also, when given the story descriptions investigating the influence of task demands variables on children's reading-study behaviours, the grade 5 and 8 children were significantly more likely than the younger children to be able to explain how the differing performance goals and the memorize/familiarize instructions would lead to differences in reading-study behaviours.

Probably the most significant changes occurring at the grade 5 level center around the children's conscious knowledge about strategy use to aid their learning. When describing their own reading for learning behaviours, they were much more likely than the younger children to suggest some type of strategy use (e.g. simple or differential repetition) to assist their learning. Most of these children were also able to describe how simple repetition could influence learning. Moreover, it is around this grade level that differential repetition strategies become part of children's conscious knowledge. Almost two-thirds of these children were able to describe use of a differential repetition technique in their own reading behaviours. In addition, most of the grade 5 children chose the

differential repetition strategies as being more effective than simple repetition. Also, approximately half of these children could give adequate explanations for how the recitation and questioning strategies could facilitate learning.

Thus, as expected the middle elementary years are an important time period for children's acquisition of knowledge about differential repetition strategies. This expectation was based on an understanding of instructional reading techniques, and on existing research which showed that by the grade 4-5 level, children are beginning to show some differentiation in their study behaviours in order to improve their own learning.

Reading is a two stage process (Carroll, 1964) involving initially decoding, followed by comprehending the written message so decoded. As we have seen, early reading instruction emphasizes decoding. However, by the junior grades more emphasis is placed on reading as a process or tool for gathering and comprehending information. To do this, children must discover ways of assessing what they understand from what they have read, and of helping themselves remember the information. Specific reading-study strategies may be taught, or may develop spontaneously as children encounter more situations requiring accurate interpretation and retrieval of the written word. In the process, differential repetition strategies may be discovered and used. The children's awareness of these strategies was evident in their descriptions of their own reading behaviours.

In addition, existing research indicates that children at this age level are better able to assess the effect of their own behaviours on their learning, and to alter their study activities as needed. Masur, McIntyre and Flavell (1973) found that when nineyear olds were given a list of items to recall, on each succeeding trial they selected out for study those items which they had not recalled in

the immediately preceeding trial. Flavell, Friedrichs and Hoyt (1970) showed that when children were required to study a series of pictures until they were sure they would be able to recall them perfectly, only the oldest age group (grade 4) showed a study pattern in which they varied their study activities, in order to monitor and maintain their gradually increasing state of recall readiness. The younger children simply used the same strategy repeatedly. In addition, Smirnov (1973) reported that by grade 4 all the children in his study (N=12) were describing some type of diversity in their reading behaviours, when attempting to memorize a prose passage.

Thus, it is expected, that by the middle elementary years, children have been exposed to more situations which have required accurate interpretation and recall of what they have read, and that during this process, strategies and study activities are discovered, begin to be used, and are evaluated for their effectiveness. Knowledge about differential repetition strategies is an example of this developing awareness.

At the grade 8 level, virtually all children had acquired an understanding of simple repetition as a learning strategy. They also generally referred to the use of various simple and differential repetition strategies in describing their own reading behaviours, and selected differential repetition strategies as being more effective than simple repetition. Thus, considering all three grade levels, it appears that children's knowledge that repetition strategies have effects on learning supports the assumption that this knowledge about simple repetition is acquired in the early elementary years, while this knowledge about differential repetition is acquired in the middle elementary years and reaches a maximum by the grade 8 level.

The greatest differentiation in responding between grade 5 and grade 8 children occurred on the justifications

and explanations for the differential repetition strategy choices. Most of the grade 8 children could give adequate justifications for both the recitation and questioning strategies. In fact, no grade 8 child failed to obtain some credit in explaining the value of these two techniques. For the story description assessing reading with differing purposes, approximately one-half of the children could provide an adequate description of the value of this strategy. Thus, it appears that this story description was conceptually more difficult than the other two. In light of these data, it should perhaps be pointed out that researchers investigating flexibility in reading behaviours have frequently reported that instructions to read according to differing purposes seldom produces flexibility in reading (Rankin, 1970-71). Thus, reading with differing purposes may not be adequately understood even by adults.

The grade 8 children differed from the younger children in still other ways. Throughout the choice questions in the interview, the grade 8 children differed from the younger children in the extent to which they were able to take additional variables into consideration before making a choice. They were more likely to add some type of qualification to their choices. For example, they might indicate that their choice depended upon the child's memory skills, reading ability or interest level. Grade 2 children never added this type of qualification. The fact that the older children did so indicates that they were taking into consideration more than one variable when making their choices.

The ability to consider more than one factor was also shown in these children's responses to the addition of the time variable in the task conditions story descriptions. For example, when they were asked to choose whether the child who had to memorize the story, or the child asked to be familiar with it, would learn and remember more, when

both had the same amount of time to study, it appeared easier for the grade 8 children to take the two variables into account when choosing. More grade 8 children switched their original answer to suggest that the child asked to be familiar with the story would learn and remember more in the time available, as the other child would be unlikely to finish. They were also more likely to refer to the time factor when justifying their responses. When the interactive effects of a time constraint and the high and low performance goals were investigated, once again significantly more grade 8 children were able to verbalize an awareness of this interaction, than the younger children. However, even at the grade 8 level, only one-third of the children gave responses which indicated that the reading behaviours initiated by the task demands would be modified by the additional time constraint.

Similar to these present data, Kreutzer, Leonard and Flavell (1975) also reported that older children are more likely than younger ones to be sensitive to the possible relationships of more than one variable on their memory performance.

We have been discussing developmental trends in children's knowledge about repetition as a reading-study strategy. The data have indicated major changes in children's knowledge about differential repetition strategies during the later elementary years. However, it is also evident that on many of the questions, a more mature rate of responding could be possible past grade 8. A summary of the pattern of responding across the 30 major questions of the interview indicates that on ten of these questions, there is the possibility of significant improvement in response pattern past the grade 8 level. The children can learn more about how strategies such as asking questions and recitation can be used prior to rereading to aid in learning. These strategies can be

used to assess what is already known about the material, and to guide future readings in order to maximize time spent and learning. They may learn more about how to differentiate their reading according to various purposes, and why this may be helpful. In addition, the children may come to understand more fully how varying task conditions may influence the type of reading behaviours that are appropriate, and that often several variables must be taken into consideration before choosing. Thus, the findings of the present study indicate that some aspects of children's knowledge about effective reading-study behaviours develops beyond the middle to late elementary years.

This finding is similar to that reported by Brown, Smiley and Lawton (1978) and Brown and Smiley (1978) who have shown that children above the seventh grade display more effective use of their study time in prose learning tasks than do younger children. Indeed, they reported some changes in reading-study behaviour which are maximized only at the college level.

In summary, it is evident that there are many changes in children's knowledge about effective reading behaviours, specifically simple and differential repetition strategies, throughout the elementary years, and possibly beyond. In addition the assumption that knowledge about simple repetition develops earlier than knowledge about differential repetition was well supported by the data.

II Children's knowledge about repetition and their academic achievement

The second aspect of the study dealt with children's knowledge about effective reading-study behaviours and their classroom behaviour and achievement. This aspect of the study was included because of the author's belief that knowledge about effective reading behaviours may be one variable influencing children's achievement in school.

Correlational data, although allowing more than one interpretation, do indicate whether some type of relationship exists between the variables. In the present study, a fairly large number of the correlations proved to be significant. More important, at each grade level, the patterns of significant positive correlations correspond with those aspects of knowledge about reading-study behaviours thought to be developing at the various grade levels. For example, knowledge about simple repetition was assumed to be developing around the grade 2 level and later. In support of this assumption, correlations dealing with questions assessing knowledge about simple repetition and factors affecting the use of repetition, were frequently significant at both the grade 2 and grade 5 levels, while at the grade 8 level none of these correlations were significant. Knowledge about differential repetition was hypothesized to be developing later than that of simple repetition. Consequently, correlations dealing with these variables were expected to be important at grades 5 and 8. Most of the significant correlations at the grade 5 level dealt with differential repetition variables, supporting this assumption. At the grade 8 level, the only significant correlations dealt with what was assumed to be the most difficult part of the questionnaire, in which the children were asked to describe their own reading behaviours. Responses to this question were analyzed for reference to the personal use of differential repetition strategies. Thus, the data indicate that those children with greater knowledge about the particular aspects of reading-study behaviours investigated in this research, were rated more highly by their own teachers and/or achieved higher grades.

By contrast, these correlational data also indicate that children with less knowledge about such effective reading behaviours do less well in school. Consequently, it may be possible to improve some children's learning by

making them more aware of their own reading behaviours, enlarging the repertoire of reading-study strategies that they have knowledge of, and demonstrating for these children the value of these techniques for their learning. Group discussions, focussing on the provision of such information, with followup practice in using the strategies and then monitoring their own learning, may be one way of exposing students to more information about effective reading behaviours. Such instructional techniques may be necessary for children who do not acquire such knowledge spontaneously.

APPENDIX A

REVIEW OF THE LITERATURE

Studies of children's learning and memory abilities typically show developmental changes towards better performance, in tasks where strategies are required. Several factors are involved in these developmental differences. One factor is the child's utilization of effective strategies for information storage and retrieval (eg. Flavell, Beach and Chinsky, 1966; Flavell, Friedrichs and Hoyt, 1970; Masur, McIntyre and Flavell, 1973; Kobasigawa, 1974; Tumolo, Mason and Kobasigawa, 1974). Another factor is the child's knowledge about "knowing" behaviours, his "metamemorial" process (eg. Flavell, 1971; Brown, 1975; Flavell and Wellman, 1977). Flavell and Wellman (1977) define metamemory as "the individual's knowledge and awareness of memory, or of anything pertinent to information storage and retrieval." According to these authors, the child gradually acquires knowledge about memory relevant characteristics of himself or herself as a learner, about the task, about potentially employable strategies, and about the interactions of these variables."

The purpose of this paper is to present research concerned with children's developing knowledge about the studying activities they can engage in to assist their learning. Two major questions concerning children's knowledge and use of study strategies provide the focus for this review: (1) do elementary school children have knowledge of study strategies that they can use to assist their learning?; and (2) are elementary school children able to tailor their learning-study behaviours to the demands imposed by the learning tasks?

Available studies relating to these two questions have typically utilized experimental tasks in experimental situations, although recently there have been several

investigations of children's knowledge about study strategies in real life situations. However, it will become evident that there are few available studies of children's awareness of strategies that can assist their school learning. Indeed, while children spend much of their daily lives at school, we know relatively little about what they know about effective school learning behaviours.

In the studies to be reviewed, the children's awareness or knowledge of effective study-learning behaviours is either assumed, on the basis of their task performance, or is assessed directly by interview or testing techniques.

Do elementary school children have knowledge of study strategies that they can use to assist their learning?

A. Experimental studies

Recently, research and two related review papers (Flavell, 1970; Hagen, Jongeward and Kail, 1975) have indicated that with increasing age and experience children do give evidence of more knowledge and use of study strategies to assist their learning. For example, it has been shown that they increasingly use verbal rehearsal (eg. Flavell, Beach and Chinsky, 1966; Kellas, McCauley and McFarland, 1975), apply an organizational scheme to the items to be remembered (eg. Moely, Olson, Halwes and Flavell, 1969; Neimark, Slotnick and Ulrich, 1971; Kreutzer, Leonard and Flavell, 1975), and use their study time more efficiently (eg. Masur, McIntyre and Flavell, 1973; Flavell, Friedrichs and Hoyt, 1970). Several of these studies will be reviewed briefly to illustrate some important facts concerning children's utilization of study strategies.

Researchers (eg. Keeney, Cannizzo and Flavell, 1967) have frequently reported that children's recall of discrete items is facilitated if they use a verbal rehearsal strategy. Flavell, Beach and Chinsky (1966)

observed that children increasingly began to use verbal rehearsal spontaneously to aid their remembering in a task requiring them to hold a particular sequence of objects in memory for a short time period. Twenty children at each of three grade levels--kindergarten, grade 2 and 5, performed the task. Two, 12, and 17 children respectively were observed to be rehearsing the items, although some of these children were not able to verbalize that they were using this strategy. In another study, Keeney, Cannizzo and Flavell (1967) found that when grade 1 children who did not spontaneously use a verbal rehearsal strategy were given instruction in doing so, their recall scores increased. However, a high percentage of these children abandoned this strategy when they were not actually required to use it. This latter finding illustrates an important point made by Meacham (1972) in his review of Soviet memory research. Children first acquire the ability to use a specific study strategy or skill, either through instruction or spontaneous discovery. Eventually, with practice and experience, this strategy becomes integrated within a higher means-goal relationship; that is, the strategy begins to be utilized spontaneously and intentionally as a means for obtaining a goal, the learning of the material.

Another strategy which facilitates learning and recall is to impose some organization onto the items to be learned. Children appear to become gradually aware of the usefulness of organization of items in assisting their learning. Neimark, Slotnick and Ulrich (1971) gave children in grades 1, 3, 4, 5, 6 and college students 24 pictures to memorize during a three minute study period. These 24 pictures could be grouped into four categories of six items each. Records were made of all study activities observed and the subjects were also questioned about their study activities. The college students exhibited more

deliberate reorganization of the materials than the children, and the older children showed more than the younger ones. In another study, children in kindergarten and grades 1, 3, and 5 were shown nine pictures which were potentially clusterable into three groups. Kreutzer, Leonard and Flavell (1975) asked the children to describe how they would go about learning the items. They classified the children's verbalized study plans according to whether they indicated the use of categorization, association, rehearsal, external storage aid, look or a random arrangement. These authors reported developmental trends in children's utilization of categorization to assist their learning. Moynahan (1973) also found first graders less likely than third graders to judge that a categorized list of items would be easier to remember than an uncategorized list of similar items.

With increasing age and experience, children also become able to use their study time more efficiently to aid their learning. Neimark et al (1971) briefly referred to an interesting strategy employed by 2, 1, 1, 4 and 5 of the children in grades 1 to 6 respectively, over the three study-recall trials given. These children were observed to segregate out the items omitted on the previous trial for more concentrated rehearsal. This study strategy was investigated more fully by Masur, McIntyre and Flavell (1973). Seven, 9, and 20 year old subjects were given lists of pictures to memorize (50 percent longer than their own previously assessed memory span), and were tested for recall on five occasions. Prior to the second and each succeeding recall trial, the Ss could re-study one-half of the items. Masur et al found that the 9 and 20 year olds, but not the 7 year olds were significantly more prone to select for study those items which they had not recalled in the immediately preceeding trial. They were also more likely to be able to verbalize that they

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were using that particular study strategy.. Flavell, Friedrichs and Hoyt (1970) also found that with increasing age, children were able to use their available study time more efficiently. In addition, Kreutzer et al also investigated children's verbalized awareness of the use of study time. They told children that they gave a group of 20 pictures to two children to study. One child studied the grouping one minute, the other child studied five minutes. When asked which child was a better learner and why, the authors found that children's answers indicated developmental trends in their ability to justify why five minutes would be better.

These studies indicate that children increasingly know about and use various study strategies to assist their learning, and are increasingly able to verbalize about the strategies they can use. It should be pointed out however, that in order to use study strategies either intentionally, or spontaneously without awareness, children must realize that the situation calls for planful memory-related exertions. Here again we find developmental trends; since the young child frequently does not appear to realize that he or she should be doing something to assist in learning and preparation for later retrieval of the information.

Appel, Cooper, McCarrell, Sims-Knight, Yussen and Flavell (1972) investigated the hypothesis that memorizing and perceiving are functionally undifferentiated for the young child, while deliberate memorization emerges only gradually as a separate form of cognitive activity. Preschool, and grades 1 and 5 children were seen under two instructional conditions: (1) to memorize a set of items for future recall, and (2) to look at a similar set of items carefully, with no hint that a recall test would follow. Two experiments were conducted, differing in the format for item presentation. In the first experiment,

the children had simultaneous access to all items (pictures of familiar objects) for a study period of 1.5 minutes, during which they were free to do whatever they liked. Four types of study period behaviours (sequential naming, sequential pointing, rehearsal and categorization) were recorded. They found that only by 11 years of age (grade 5), children were giving evidence in their recall scores and study time activities that they differentiated between simple perception and actual memorization as strategies useful in completing a learning task. The fifth graders rehearsed and categorized significantly more in the memory condition than in the look condition, while the grade 1 children showed a significant differentiation with respect to sequential naming. Preschoolers did not differ appreciably in their study behaviour between the look and memory conditions.

In the second study, the same items were individually slide projected. Again, the preschoolers showed no difference in recall between the two instructional conditions, while first and fifth graders both showed greater recall following the memory instruction. In addition, only the fifth graders showed significantly more studying behaviours in the memory condition, although non significant trends in a similar direction were evident with the grade 1 children.

In another study, Rogoff, Newcomb and Kagan (1974) gave groups of 4, 6, and 8 year old children concrete experience with one of three temporal delay periods: a few minutes, one day, or seven days. After experiencing these delays, the children were shown 40 pictures that they had experienced previously. They could study the pictures as long as they liked. In this task, children in the one or seven day delay condition studied significantly longer than those in the few minutes condition at 8 but not at 4 or 6 years of age. There was no difference

between the one and seven day delay periods, suggesting perhaps that preparation for retrieval conditions more distant than one day may be an even more developmentally advanced strategy. Thus, this study indicated that the younger children were less able to appreciate that longer retention intervals called for more study time to ensure their learning and recall.

These findings indicate that there are developmental trends in children's ability to appreciate a learning situation sufficiently to prepare for it. However, it should be pointed out that children's increasing appreciation of the necessity of planful learning behaviour will be influenced by the children's levels of cognitive maturity and experience, and the demands imposed by the learning task. This interaction is evident in the experimental findings (eg. Wellman, Ritter and Flavell, 1975; Acredelo, Pick and Olsen, 1975) which indicate that pre-school children can engage in simple study strategies (eg. looking, touching) to assist their learning for future retrieval situations, when the learning task and study behaviours are simplified, such as involving an external search for a lost or hidden object, rather than an internal search through one's memory, and the use of looking and touching rather than rehearsal, categorization or a similar, more elaborate study strategy.

In summary, the studies outlined in this section indicate that, depending on the task, children increasingly show awareness that some planful study behaviour is required in learning-memory situations, and increasingly show evidence of a wide variety of study strategies that they can use to assist their learning.

B. Everyday Learning Situations

Recently, several studies have assessed children's knowledge about strategies that can assist them in

preparing for situations typical of everyday experiences. These studies have been of 2 types: (1) investigations of children's awareness of preparatory behaviour they can engage in to assist themselves in a future situation, and (2) investigations of children's awareness of logical search behaviour which they can use to assist in their retrieval of previously acquired information. While the latter are not strictly investigations of studying strategies, they are included since presumably the formation of a logical plan of behaviour could be a useful study technique under some circumstances (eg. planning a research project for school, searching through a dictionary etc.).

Preparatory planning to assist learning and memory was investigated by Kreutzer et al (1975) in two of their interview situations. They asked children how they could remember to go to a party, and how they could remember to take their skates to school the next day. The authors generally reported increases with age in the number of children whose answers gave indication of the use of some type of planful, preparatory activity, and increases with age in the sheer number and variety of preparation methods the children were able to suggest. These findings were stronger for the second task (i.e. remembering skates). An interesting finding was that children of all ages frequently thought of relying on something other than their own internal memory processes to assist themselves in preparing for these tasks (eg. writing a note, asking someone else to remind them).

Kreutzer et al (1975) also investigated children's awareness of logical planning or search behaviour. In one situation, children were asked to think of everything they could do to find a jacket they had lost at school. Again, the older children could verbalize a greater number of possible strategies, and as well were more likely to suggest a systematic search plan. Drozda and Flavell

(1975) conducted a similar study with 20 children at each of the age levels between 5 and 10 years. Children were told a story about Charlie Brown and a toy who were exploring a house placed in front of the children. Charlie Brown's progression through the house was described to the children, and when he emerged from the house without his toy, the children were urged to say where in the house the toy must have been lost. This study thus involved the children's awareness of planful external (i.e. not in one's own memory) search behaviour. Again, developmental trends were evident in children's ability to determine correctly the critical search area, and plan their behaviour accordingly.

In summary, the studies presented in this section indicate that with increasing age children give evidence of their awareness of planful behaviours that can assist them in everyday learning and memory situations.

C. School Learning Situations

A few studies have investigated children's awareness of strategies that can assist their learning from prose materials.

Extending an earlier study by Smirnov (1973), Danner (1976) gave children in grades 2, 4, and 6 prose passages in which the sentences were either organized by topic or were disorganized. He found that with increasing age children showed increased awareness of how organization could assist their learning and recall. In addition, when the children were asked to select three of the sentences which they thought later would be useful notes to help them remember the rest of the story, Danner found an increase with age in the number of children who selected one sentence from each topic in the passage as their review notes, and a similar increase in the number of children who related their selection of the review notes to the topical organization of the passage.

Brown and Smiley (1977) investigated children's awareness of another aspect of prose materials which typically is assumed to have useful study implications. Children 8, 10, 12, and 18 years of age were asked to read stories and successively eliminate $3/4$ of the story units in such a way that the most important elements of the story remained when they were completed. The youngest children were not able to appreciate the various elements of the story in terms of their levels of significance, the 10 year olds could differentiate the most important units from the remaining text, while the two older age groups were able to pick out increasingly finer gradations in the levels of importance. This finding indicates that there is a developmental trend in elementary school children's ability to pick out and use the main idea of a story, and use this strategy to assist their learning from prose materials.

In a subsequent replication, Brown, Smiley and Lawton (1978) asked children in grade 5 and grades 7/8, and college students to choose the 12 most important ideas from stories which had approximately 55 idea units. The idea units had previously been rated into four categories according to importance. All age groups chose more of the most important units than any other category--47 percent by grade 5, 73 percent by grades 7/8, and 88 percent by college students. The youngest and the oldest group differed significantly from each other. Thus, the data from these latter two studies indicate that by the late elementary grades, children can choose the most important ideas from a story almost as reliably as college students.

Myers II and Paris (1978) also investigated children's knowledge of some organizing aspects of paragraphs. They found that grade 3 and grade 6 children have some awareness of the fact that sentences are organized within a paragraph,

and that grade 6 children were significantly more likely to realize that the leading sentence is the semantic introduction to a paragraph and that the last sentence has summary properties. Generally, there was room for significant improvement in these aspects of knowledge, past the grade 6 level.

These studies indicate that children increasingly are aware of such organizational variables of prose materials. Presumably, they will therefore also be increasingly able to use this knowledge to assist their learning from prose materials. Brown and Smiley (1978) investigated children's use of additional study time in a prose task. Grade 5, grade 7/8, and grade 11/12 students listened to two stories, each read twice, had a short period to study the story units, and then were asked to recall the gist of the story. They found that when given the additional study time, children from seventh grade up were able to improve their recall scores for the most important elements of the story, although recall of the less important units did not improve. The youngest children were unable to benefit from the additional study time. Previous research by the same authors had shown that these younger children are generally less able to appreciate what are the important features of these stories. Thus, depending upon the complexity of text materials, the research indicates that with increasing age, children can become more aware of the important organizational aspects of reading materials, and can use this knowledge to assist their learning.

Other studies of children's knowledge of strategies that can assist their school learning are lacking.

Are elementary school children able to tailor their learning-study behaviours to the demands imposed by the learning task?

This question is asking for evidence of a more mature study behaviour than that outlined in the previous section.

Specifically, with this question we are asking whether children are aware, and can respond to the fact that different tasks require different study strategies for effective learning, and also whether children realize that different study strategies may be useful as their experience with the task changes.

A. Experimental Studies

Developmental changes in the type of study strategies utilized during one learning task were forcefully demonstrated in a study by Flavell, Friedrichs and Hoyt (1970). Working with nursery school, kindergarten, and grades 2 and 4 children, they observed age related differences in the amount of time children spent studying a series of pictures, and the type of study strategies evident as the task continued. The children were given an unlimited amount of time to study the pictures, until they were sure that they would be able to recall them perfectly in the same serial order in which they were initially presented. Flavell et al report several interesting findings, including the following: (1) the grade 4 children spent almost twice as much time, on the average, as the younger children in studying; (2) there was a marked improvement with age in the children's ability to sense when they had memorized the items sufficiently to recall them perfectly; and (3) most importantly, there were significant differences in the types of study strategies displayed by the children. Four types of study behaviours were observed--naming, anticipation naming, rehearsal and use of gestures. With respect to these four behaviours, the younger and older children differed in two distinct ways: (1) the younger children showed significantly fewer instances of each of these behaviours, and (2) the younger children did not show significant differences in the frequency of these behaviours over the study period. In contrast, the grade 4 children showed a pattern in which they made more naming responses during the first

half of their study time, while in the second half they made more anticipation and rehearsal responses, apparently in an attempt to monitor and maintain their gradually increasing state of recall readiness. Thus, they were systematically altering their study strategies as a function of their experience with the task and the varying demands it placed on them to learn.¹ The fact that the younger children did not show any differential strategy use, but repeated using the same strategy, indicates that differential strategy use is a developmentally more mature cognitive behaviour.

A large number of studies have shown that children also become aware of, and can respond to the fact that different learning tasks require different study strategies for effective learning. Tversky (1973) found that young children are able to study and encode verbal and pictorial material in either a verbal or pictorial form, depending upon the type of recall test they anticipate. Other researchers (eg. Tversky and Teiffer, 1976; Horowitz and Horowitz, 1976) have shown that under certain circumstances children increasingly are able to fashion their stimulus encoding and/or storage activities so as to effectively meet the demands of an anticipated recall or recognition task. Kobasigawa (1975) found that children apparently are able to make use of retrieval cues (category names) during storage activities, without being specifically instructed to do so, when they expected that these cues would be available for use during retrieval. Grade 3 and 6 children were shown 24 pictures which could be grouped into eight categories (eg. picture of zoo cages with

1 There is an analogy between use of differential study strategies in this situation, as experience with the task changes, and in the use of a differential repetitive reading strategy, as described in the introduction, in a task requiring learning from prose materials.

pictures of a lion, monkey and camel). One-half of the children at each age level received the information that the category cues would be available during recall, while the remaining children were merely instructed to memorize the items for later retrieval. Following this instruction, the items were presented for study and then recall was tested under either a free recall or cued recall format. The grade 6 children recalled significantly more items than the grade 3 children; recall was significantly greater in the cued-recall preinformation condition; and recall was significantly greater under the cued recall than the free recall format. More importantly, Kobasigawa reported a significant interaction of preinformation x recall condition which supported the hypothesis that the different preinformation conditions would lead the children to use study-storage strategies which would allow them to benefit from the presence of the category cues during recall. This facilitative effect was more evident for the older children. Inferences made of the children's storage activities (by analyzing the number of categories and the number of items per category recalled) suggested that children given the cued recall preinformation apparently studied differently, and used the available retrieval cues more effectively to increase the number of categories and the number of items per category represented in recall.

These experimental studies indicate that children are increasingly able to tailor their learning-study behaviours to the type of learning task presented, and to their experience with the task.

B. Everyday Learning Situations

To the authors knowledge, there are presently no published studies that indicate how children may systematically alter their studying behaviours to assist in their learning of information in real life situations, outside of the academic sphere.

C. School Learning Situations

Kreutzer et al's (1975) monograph also included interview situations assessing children's awareness that the amount of study behaviours required by a task will be influenced by various characteristics of the materials and instructions. Using items such as pictures, stories and word lists, they found that even grade 1 children were able to sense that familiar items (Opposites-Arbitrary task), previously learned items (Savings task), and fewer items, are easier to learn than more difficult, new or more items. In a later study, Myers II and Paris (1978) asked twenty grade 3 and twenty grade 6 children whether the length and the familiarity of prose materials would influence their reading behaviours. All children realized that longer passages require more reading time, and almost all children realized that familiarity with the material aids in comprehension. Thus, children appear to be aware from an early age that characteristics of the material to be learned may influence their study behaviours. However, while even young children in the Kreutzer et al study had these awarenesses, they were also much less likely to recognize that the perceived level of task difficulty has implications for the amount and kind of preparatory activity they should carry out.

In another situation analogous to the school situation, Kreutzer et al also assessed children's awareness that learning a story in order to retell it later, word for word, was a more difficult task than learning it in order to retell it in one's own words. Children's responses to this question were rated according to whether they appeared aware that the one task was more difficult and that differential study behaviours would be necessary for the two tasks (eg. would have to study harder, listen to the story more frequently etc.). Children gave evidence of increasing awareness (with age) that learning something

word for word was a more difficult task than learning it to put in one's own words. — In addition, the grade 3 and 5 children were much more likely than the younger ones to suggest at least some form of study-learning activity and differential study for the two tasks.

Again, Myers II and Paris (1978) asked similar questions with regard to reading behaviours. They reported that almost all of their grade 6 children, and more than half of their grade 2 children indicated that recalling the meaning of a prose passage is easier than exact reproduction. In addition, while slightly more than half of the grade 6 children appeared to realize that knowing the goal of a reading task can lead to use of different behaviours, only one grade 3 child indicated this knowledge. In a followup question, the authors report that while most of the grade 6 children indicated they might execute an exact reproduction task differently than a meaning recall task, only one-third of the younger children gave this response. Unfortunately, Myers II and Paris did not pursue this questioning to determine whether these children could actually describe differences in how they would complete the two tasks.

In general, the findings of these two studies suggest that with increasing age, children appear to become more aware that their reading-study behaviours can be tailored to the task.

The tailoring of one aspect of reading behaviour, reading rate, to task demands was demonstrated in a study by Samuels and Dahl (1975). Grade 4 children read a prose passage in order to answer a test for detailed questions and a test for general overview questions. The appropriate reading purpose was established prior to each reading-testing situation, by the use of a similar practice reading-test situation. Samuels and Dahl report that when the children read for general overview, they read significantly faster than when they read for details. Thus,

even grade 4 children can adjust their reading rate according to the purpose for reading. Studies investigating other reading activities are generally lacking, with the exception of Smirnov's (1973) investigation of children's awareness of a differential repetitive reading strategy.

These studies indicate that there is some evidence that children in school like situations and tasks will become increasingly aware (with increasing cognitive maturity and experience) of study strategies that they can use to assist their learning, and can tailor these strategies to the task.

General summary and suggestions for future research

The studies reviewed generally indicate that with increasing age and experience with learning tasks, children become more aware of the studying-learning activities they can engage in to assist their learning. In addition, children also develop an expanding repertoire of useful study strategies, and with experience and practice become capable of utilizing these study behaviours in a planful intentional manner. In addition, children also become increasingly able to appreciate that certain learning tasks and situations require some type of planful preparatory activity, and of tailoring the study strategy to the requirements of the particular task.

As the review indicates, most of the published research has involved experimental tasks in experimental situations, rather than investigations of children's knowledge of study strategies useful in more naturalistic situations, such as daily life experiences, and in the classroom using school like materials. Since the naturalistic situations are those in which children generally find themselves, these situations require more research. A child's knowledge about the strategies that can assist him or her in learning effectively within an academic and/or social environment, may have important

implications for his or her academic achievement and sense of self as a learner.

If we consider the types of knowledge children can acquire to assist their school learning, several areas of research can be illuminated. Children's knowledge of strategies that are helpful in preparing for future retrieval situations, such as taking notes, or using differing study strategies to learn differing types of school subjects, or in preparing for differing kinds of testing formats may be investigated. Their effective use of learning and study time is another possible topic. For example, are children aware that they should spend less study time on subjects they find interesting or easy, and more study time on subjects that are difficult for them?

Another important area of effective school learning is knowing how to use resource materials and persons, such as knowing how to use a book or library efficiently, in order to search for printed information. A similar topic concerns what children know about how to develop a school project (i.e. the logical procedures to follow in obtaining information, planning the project etc.). Another whole area of concern is what children know about effective reading-study strategies.

Thus, while these possible areas of study touch on some of the behaviours that educational technologists (eg. Morris, 1973; Morgan and Deese, 1954) consider important aspects of effective school learning, they have not yet been studied by researchers interested in what children of various ages know about how to operate effectively within an academic setting.

APPENDIX B
STUDENT RATING FORM

Please consider separately each of the children in your class on the variable of _____, and indicate on the scale below where you would place each child. An approximately equal number of children should be placed in each of the nine intervals.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

← lesser
achievement

→ greater
achievement

APPENDIX C

CORRELATIONS AMONG THE FOUR TEACHER RATING VARIABLES

| Rating Variables | Grade | | |
|--|-------|-----|-----|
| | 2 | 5 | 8 |
| 1. Reading Achievement/Overall Achievement | .83 | .96 | .95 |
| 2. Reading Achievement/Oral Expressive Ability | .80 | .82 | .93 |
| 3. Overall Achievement/Oral Expressive Ability | .78 | .76 | .90 |
| 4. Reading Achievement/Effective Use of Study Time | .44 | .34 | .77 |
| 5. Overall Achievement/Effective Use of Study Time | .58 | .41 | .88 |
| 6. Oral Expressive Ability/Effective Use of Study Time | .35 | .28 | .74 |

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