THE EFFECT OF CONTEXT ON THE ACQUISITION OF VOCABULARY IN GOOD AND POOR READERS

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ABSTRACT

This study examined the effectiveness of context on the acquisition of new vocabulary for good and poor readers. Twenty-eight Grade Three children, fourteen good readers and fourteen poor readers, took part in a word-learning task within three conditions: (1) strong sentence context, (2) weak sentence context, and (3) list condition. The primary hypothesis was that poor readers would show less learning in the list condition than good readers and that there would be no difference in the amount of learning in the sentence conditions. Results revealed that: (a) Words are read faster in sentence contexts than in list contexts; (b) more learning or greater improvement in performance occurs in list contexts and weak sentence contexts as opposed to strong sentence contexts; and (c) that most of these differences can be attributed to the build-up of meaning in sentences. Results indicated that good and poor readers learned more about words in all three conditions. More learning and greater performance occurred in the list condition as opposed to the two sentence conditions for both subject groups. However, the poor readers learned significantly more about words in both the list condition and the weak sentence condition than the good readers.

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CHAPTER 1

INTRODUCTION

Children acquire new reading vocabulary by a variety of methods. New words may be presented either alone, in association with a picture, embedded in the context of a sentence, or in a combination of sentence context plus a picture. It is realized that these sentences are also usually embedded in the larger contexts of paragraphs, chapters, and stories. However, for the purpose of this study it will be assumed that these larger units of linguistic context are functionally equivalent to sentence context. Several studies have examined the best method of presenting new vocabulary to children but have been unable to determine the optimum approach (Singer, Samuels, Spiroff, 1973-74). Disagreement among researchers as to the best method of instruction has led to two opposing points of view: (1) Vocabulary acquisition will be more effective if new words are introduced alone; or, (2) vocabulary acquisition will be more effective if new words are introduced in a linguistic context.

Printed word learning appears to be a multi-faceted process which lies at the core of learning to read. Readers must not only learn to accurately pronounce printed words but also to read them rapidly both in and out of meaningful context.

One of the historical controversies in beginning reading instruction was in the 1950s and '60s during which "phonics" instruction was pitted against the "look-say" method of learning sight vocabulary (Chall, 1983). This controversy has not completely disappeared but has changed its form from the arguments based on

classroom practices to theoretically based arguments concerning beginning reading instruction. These theoretical positions are supported by research evidence accumulated from studies made in classrooms, reading clinics, and laboratories and are now often centered on whether reading is a psycholinguistic guessing game or a process of decoding print into spoken words.

Learning Words in Isolation

Researchers such as Nemko (1984), Perfetti and Hogaboam (1975), and Samuels (1967), support learning words in isolation. For example, Samuels (1967) argues that to facilitate new vocabulary acquisition, attention must be focused on the individual word and the best condition for this may be words presented in isolation. These researchers prefer bottom-up models of the reading process which emphasize a more structured approach to word learning. LaBerge and Samuels (1974) view word learning as an acquisition of a series of subskills. Lower-level skills are acquired initially while higher-level skills emerge only after the lower-level skills have reached automaticity.

Learning Words in Context

On the other hand, the pro-context group of researchers argue that the reader relies more heavily on the context in which a word is presented when the context is more likely to provide a basis for predicting the identity of a word (Tweedy, Lapinski, and Schwaneveldt, 1977). Smith (1978) views reading as a matter of making sense of written language rather than decoding print to

sound. Smith (1975, 1978) argues that there are no special kinds of skills that beginning readers must learn and exercise that are not involved in fluent reading. Fluent reading, according to Smith (1975), involves the basic skills of predicting meaning, sampling surface structures, and making the most economical use of possible visual information. These skills are not explicitly taught but a reader will develop them if he/she is placed in an appropriate learning situation. Context provides a reader with the opportunity to generate and test his/her hypotheses about the reading process.

Interactive Models of Reading

A third group of researchers support both the isolation and context view of word learning. Children who read words in meaningful contexts learn more about the word's syntactic/ semantic identities whereas those who read in unstructured lists learn more about the orthographic structure of those words (Ehri and Roberts, 1979). Chall (1979) has proposed a model of learning to read which is based on Piaget's stages of cognitive development. Chall's (1983) reading model suggests that both top-down and bottom-up processes are important but at different stages of the reader's development. Perhaps Rumelhart's (1977) interactive model provides a more adequate explanation of what actually occurs in the reading process than do subskill or holistic models. He proposes that reading is a process of formulating and verifying hypotheses based on the interaction of information received from independent bottom-up and top-down sources.

Advantages and Disadvantages

Researchers claim that there are both advantages and disadvantages to learning words either in isolation or in context. When reading words in sentences, word meanings are activated by both sentence context and orthographic information whereas when words are read in isolation, it may be more difficult for a reader to determine the meanings of words, particularly if the meaning of the word is context dependent (Ehri and Roberts, 1979). Ehri and Wilce (1980) found that subjects who read words in context are slower in recognizing them in isolation than subjects who practise reading them in isolation. Context provides the clues when a reader is uncertain about a word's meaning. Subsequent context will then provide feedback as to whether or not the child's hypotheses are right or wrong (Smith, 1978). The disadvantage of learning words in sentences may be that less attention is paid to the orthographic identities of words. This may result in poor decoding skills (Ehri and Roberts, 1979).

Purpose of Study

The above researchers defined the methods which can be used in the instruction of new words. However, they did not take into account that individual differences affect the mode of new word instruction. The purpose of this paper was to examine the effectiveness of sentence context and list context in the acquisition of new vocabulary for good and poor readers. Hypotheses relating to the acquisition of new vocabulary based on the effectiveness of context and individual differences are set down in

the next chapter. Chapter Two also provides the necessary background information to examine and discuss these hypotheses.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter examines the facilitative and inhibitory aspects of learning words either in context or in isolation. The significance of the role of perception in word learning is discussed. Congruous and incongruous contexts are defined and their significance is examined. These contexts form the basis of two of the test conditions in this study, Strong Sentence Condition and Weak Sentence Condition. As practice is an element of the test procedure, its effect on word learning is discussed.

An overview of the role of the reader is presented. Good and poor readers form the subject population of the experimental paradigm. Therefore, the terms good and poor readers are defined. Individual differences in relation to these terms are discussed.

A detailed description of Aaronson's (1983b) theory of lexical processing and learning and its relation to this study is discussed. Finally, the hypotheses for the study are stated.

Contextual Facilitation

A number of studies demonstrate that context does affect word recognition (Becker, 1976; Becker and Killion, 1977; Ehri and Roberts, 1979; Jacoby, 1983; Tweedy, Lapinski, Schvaneveldt, 1977; Schvaneveldt and McDonald, 1981; Merrill, Sperber, McCauley, 1980; Schwantes, Boesl and Ritz, 1980). These studies also support the hypothesis that context allows for decreased dependency on visual

information in order to more rapidly process the text. Becker and Killion (1977) argue that a word in context is recognized through the successful verification of a member of a semantic set while a word out of context is recognized as a result of the successful verification of a member of a sensory feature set. According to Becker's (1976) verification model, once a word is recognized through its sensory-feature set, the semantic features can be used to identify a semantically related set of words through the verification process in the same way as the sensory set of words. If a stimulus word is related to the context, it is recognized as a result of a successful cycle of selection, construction, and comparison of the verification process. When a context is provided, the verification process is assumed to begin processing the semantic set. Sentence context provides strong associative and semantic relationships with words and may effect the learning of new words.

A study by Ehri and Roberts (1979) shows that reading words in printed context appears to be a better way to amalgamate meaning to print than reading words in lists or on flash cards and listening to their meanings. The advantage of reading words in context may occur when appropriate semantic and syntactic cues are activated at the time the reader looks at the graphemic form of the word. Such information as the word's grammatical role, its position in relation to other words, and its semantic features become associated with the graphemic cue.

Tweedy, Lapiniski, Schvaneveldt (1977) support theories of word recognition which allow the reader to rely more heavily on the

context in which a word is presented when the context is more likely to provide a basis for predicting the identity of the word. Tweedy's et al. (1977) spreading excitation theory explains context effects in terms of specific and automatic increases in the accessibility of words which are semantically related to recently encountered words. Such specific contextual facilitation may occur whenever a semantic relationship exists between the word being recognized and some recently perceived word. Contextual facilitation allows for the semantic identity of the previously presented word to be a potentially useful source of prediction about the letter string being scrutinized. Context strengthens the predictability of the stimulus sequence when it contains instances of semantically related words.

A study by Schvaneveldt and McDonald (1981) supports the idea of the existence of two processing stages in word recognition. Context can influence the processing of stimulus information by way of a secondary analysis occurring subsequent to accessing the lexicon. Semantic context facilitates accessing the lexical representation of words related to the context. The initial processing involves the analysis of the sensory features of the stimulus and is not directly affected by the context. The secondary analysis of stimulus information is basically a memory-driven process in which hypotheses formed on the analysis of the stimulus information and predictions determined by the semantic context are tested. Verification of the hypotheses results in the identity of the stimulus. Semantic context can affect the responses selected on the basis of the initial stimulus.

According to Merrill, Sperber and McCauley (1980), a skilled reader is able to use the context in which a word is presented to reduce the number of visual cues necessary for accurate word identification and to reduce the amount of attention required for processing the word. Despite their differences in coding skills, good and poor readers appear able to extract equivalent meanings from the presentation of familiar single-word contexts and are also able to use that information to facilitate subsequent word processing. The presence of a sentence context shows greater facilitation than a single-word context. The sentence serves to increase the amount of contextual information available, thereby further reducing the time required to process target words.

Context facilitates the word recognition rate of younger readers in comparison to older readers (Schwantes, Boesl and Ritz, 1980). Younger children rely more heavily on contextual information to facilitate word recognition than do older readers. Due to the younger children's slower visual processing, their reliance on available contextual information during word recognition may be greater than that of older readers whose performance may be characterized to a greater degree by automatic word recognition processes.

In a study by Aaronson (1976), subjects who read for comprehension coded less structural information by making use of contextual redundancy. Coding time reflected the meaning rather the structure of the sentence. Aaronson argued that the greater the comprehension demands the more likely the subject will be to code major context items quickly eliminating the lexical and structural

details at an early stage of processing. Coding units are centered about the semantically important parts of the sentence (i.e., the subject noun, verb, and object noun). An interaction between meaning and structure indicate that the structure seems to facilitate arriving at the meaning.

In Aaronson and Ferres's (1983a) information processing model, lexical categories are organized hierarchically. Lexical categories vary in their contribution to the meaning and structure of the text. Context words contribute more to meaning and play a stronger role in comprehension, while function words contribute more to structure and are important for reading tasks that emphasize memory rather than comprehension. During lexical coding, visual input is translated into letters, syllables, or spelling patterns, and then into word units that can be accessed in a mental lexicon. During lexical access, readers retrieve semantic and syntactic information they have already stored in long-term memory about individual words. In coding meaning, words and phrases are integrated with their semantic context. The amount of time taken for coding meaning can decrease in the case of lexical categories having less meaning to code.

In summary, this research suggests that context does facilitate word recognition. The results of the present study are examined in relation to the results of these studies. Some questions will be raised regarding Ehri and Robert's (1979) amalgamation theory.

The Effects of Reading Words in Isolation

To facilitate the acquisition of word recognition responses, visual attention must be focused on the printed word and some

theorists (Guthrie, 1973; Singer, Samuels and Spiroff, 1973-74; Jacoby, Bartz and Evans, 1978; Jacoby, Craik and Begy, 1979) claim that the best condition for this is isolation. There is less distraction in this approach and the only cues the reader would attend to would be the graphemic stimuli of the word itself. Visual attention is an essential condition needed for learning to identify words. Guthrie (1973) supports the subskill view of reading. His subskill model contends that subskills develop independently. The Singer, Samuels and Spiroff (1973-74) focal attention hypothesis uses the whole-word method of acquiring vocabulary. To facilitate the acquisition of word recognition responses, visual attention must be focused on the printed word, and the best condition for this is words in isolation. When context is present, the reader does not know which were the relevant stimuli or how to respond to them. Efficiency in learning to associate responses to graphemic stimuli is significantly greater when the word is presented in isolation than when it is presented in sentence context. Readers learn to test their predictions using graphemic cues. Words presented in isolation may depend totally on memory for graphemic information (Jacoby, Bartz and Evans, 1978). Isolation forces the reader to rely more heavily on the visual analysis of the word for its later perceptual identification (Jacoby, Craik and Begy, 1977).

The Role of Perception

In many theories of perception there are no effects of context on memory because perception relies on abstract representations that do not preserve information about the previous processing of a word.

Jacoby (1983) argues against this view of perception. A single presentation of a word has both large and long-lasting effects and can influence its subsequent perceptual recognition. In an earlier study, Jacoby, Craik and Begy (1979) developed the view that if the initial processing of a word is difficult, requiring more time and extensive word analysis, a richer more distinctive record of the initial processing is held in memory. Perception is the process of describing a stimulus and the resultant memory trace may be regarded as a record of this description. The more difficult and complex the initial task, the richer, more elaborate and more precise is the resulting description. These precise descriptive records are distinctive and are potentially retrievable, provided effective cues are available to guide the retrieval process. The perceptual description of a word reflects the memory record of a word as a unit and serves as the basis for retrieval. Perceptual identification tasks appear to require data-driven (bottom-up) processing while recognition memory task may require conceptually-driven (top-down) processing. Providing context allows for conceptually-driven processing and thereby reduces the reader's reliance on visual information. Reading a word in context appears to do less to enhance later perceptual identification but may do more to aid later recognition memory, while reading a word in isolation may force the reader to rely more heavily on the visual analysis of the word which facilitates its later perceptual identification.

Jacoby (1983) has an episodic view of perception which utilizes a more persistent and specific effect of previous processing or experience. The interaction between constraints provided by the

stimulus, data-driven processing and conceptually-driven processing determines the outcome of both memory and performance. Perception and recognition memory utilize different forms of information rather than reflect the operation of different memories and are influenced by the encoding conditions of previous presentations of a word. In perceptual identification it is not necessary that a reader knows that he/she is remembering. He/She will become aware that he/she has remembered because of the fluency of his/her performance of the reading task.

Perception influences word learning. The role of perception, from Jacoby's point of view, is examined and related to the results of this study. These findings are explained in Chapter Four.

Congruous and Incongruous Contexts

Two modes of semantic processing (Eisenberg and Becker, 1982) may account for the difference in the pattern of facilitation and interference in word recognition. First, strongly related words induce readers to respond to a context stimulus by considering only a limited set of words as appropriate as related target words. When the target stimulus is presented, subjects can search the set quickly and accurately and automatically process the context. The use of related context ought to be successful on most if not on all trials. This mode of semantic processing, the prediction strategy, shows a facilitation dominance pattern. Secondly, in contrast, weakly related words induce readers to respond to a context stimulus by considering an unlimited set of words within a wide range of semantic relationships. Searching through this large set of words

takes much more time than searching through a smaller set of related words generated by the prediction strategy. A weakly related context stimulus creates an expectancy strategy which results in an interference dominance pattern. Interference can be described as a side effect of using an expectancy set. The search of the larger set of words generated by the expectancy set results in slower response time and less facilitation. As interference increases facilitation decreases (Becker, 1980). The crucial difference between facilitation and interference dominance is the size of the semantic set (Becker, 1976).

Eisenberg and Becker (1982) have shown that readers can use a context to predict a small set of words that follow from a context or they can use a context to expect one of a much larger set of words. Readers can vary their strategy to accommodate the predictiveness of a context. Thus, the predictiveness of the semantic relations used in a given context can affect the pattern of facilitation and interference. Young readers show evidence of displaying both facilitation and interference effects in semantic processing when reading (Eisenberg and Becker, 1982).

Becker (1980) states that a consistently strong context should result in selectivity of meaning and facilitation dominance whereas a weaker less consistent context should lead to non-selectivity and interference dominance. Becker's results provide ample support for the basic facilitation-interference patterns and for the identification of a stimulus list factor as an important determiner of the effect of context.

A word in an incongruent context reduces the amount of evidence needed to identify the word. A word read in an incongruent context requires the reader to attend to the individual letters of the word (Jacoby, Bartz and Evans, 1978).

According to Merrill, Sperber and McCauley, (1980), despite the differences in the amount of time required to process individual words, good and poor readers apparently benefited equally from the enriched context provided by a related sentence prime. Not only were the good and poor readers able to extract meaning from previous context in a sentence, but they were also able to use that information to facilitate subsequent word processing in the sentence. The presence of an inappropriate sentence context increased the response time for the poor readers but not for the good readers. The poor readers tended to process the sentence in a word-by-word fashion, therefore the response time increased. Also, an inappropriate sentence context interfered with the processing of the target word for the poor readers. The semantic information from the preceding context was not semantically related to the target word and caused interference in the processing of that word.

Stanovich and West (1983) also investigated the facilitation effects of congruous and incongruous contexts. Subjects responded faster to a word preceded by a congruous context. A congruous context provided contextual facilitation while a word within an incongruous context resulted in slower responses and contextual inhibition.

The Role of the Reader

In a study on context effects by Ehri and Wilce (1980), context subjects were able to supply more semantically correct target words for sentence completion whereas the isolation subjects could only partially complete the sentences or provide sentence completions that had questionable meanings. The results of this study and an earlier study (Ehri and Roberts, 1979) were influenced by the reader's purpose, which seemed to determine what aspects of the words were noticed and stored in lexical memory. Children who read target words in meaningful sentences learned more about their syntactic and semantic identities. However, this was at the expense of not learning orthographic identities completely enough to be able to read the words outside of context. Children who read words in isolation learned more about the word's orthographic identities and could outperform the context subjects in spelling target words, mapping letter sounds, and reading the words quickly and accurately.

In Aaronson's (1976) study, comprehension subjects spent more time viewing the semantic cues rather than the syntactic cues, while the recall subjects formed more lasting phonemic and perceptual codes from the visual stimulus. This accounted for the difference in coding time between comprehension and recall subjects. Comprehension subjects did not need to rely on perception and phonemic cues to process words. They had learned not to decode any more information then needed to perform their cognitive tasks. A reader's performance in coding strategies reflects those aspects of language for the specific cognitive task at hand. Memory and comprehension requirements of the task appear to influence the

coding procedure for stimulus sentences and linguistic features. Ehri (1976), Ehri and Roberts (1979) and Aaronson (1976) present some insights into the role that the reader plays in learning new words.

Individual Developmental Differences

Individual developmental differences in the use of sentence context to speed on-going word recognition may be best explained by an interactive-compensatory model of reading performance. This model assumes that if there is a deficit in any bottom-up or top-down process, a greater reliance on other knowledge sources will result regardless of their level in the processing hierarchy. It is not necessary for lower-level processes to be completed before the initiation of higher-level processes. Higher-level processes can actually compensate for deficiencies in lower-level processes. A reader with poor word recognition skills may rely on contextual factors because they provide additional sources of information (Stanovich, 1980).

According to the compensatory processing model, when word recognition is slow, another higher-level expectancy process, a conscious-attention mechanism, has time to operate. This provides additional facilitation as a result of available contextual information. Since poor readers have slower recognition times, it is likely this additional source of facilitation is implicated in their performance (Stanovich and West, 1981). As the conscious-attention mechanism becomes more involved, contextual inhibitions may appear.

Rapid context-free word recognition skills are major determinants of individual differences in reading fluency. A previous study by Stanovich and West (1979) suggests that rapid word recognition rather than superior contextual processing may be the key to fluent reading. Poor readers take longer to encode words thus utilizing the conscious-attention mechanism which can cause contextual inhibition. Fluent readers recognize words before the conscious-attention mechanism has time to act. A spreading-activation mechanism influences their performance. The rapid word recognition of better readers appears to be a direct cause of their reading skill. Their superior word analysis makes heavy reliance on contextual information unnecessary. Since the fluent reader does not use conscious-prediction processes, this leaves cognitive capacity free for comprehension processing.

Prior context also facilitates the fluent reader's recognition due to automatic spreading-activation processes. Compensatory processes, conscious-attention mechanism, and spreading-activation processes combine to provide sources of contextual facilitation. Prior context should also facilitate the word recognition skills of poor readers since spreading-activation and conscious-attention mechanisms are both operative. However, results indicate that poor readers have little cognitive capacity left over from these processes for integrative comprehensive processes. In fact, the slow and inaccurate decoding processes of the poor readers may degrade contextual information, making it ineffective and unusable.

While both good and poor readers use context to facilitate word processing, the good readers may give more attention to graphemic

information. Poor readers tend not to complete the internal analysis of words when there is contextual information on which to rely on. Context has a more facilitative effect on the performance of poor readers than that of good readers. Less skilled readers are much slower at recognizing words out of context and show a greater facilitation effect when a context is added (Stanovich, West, and Freeman, 1981).

Aaronson (1976) views word and context processing as interrelated in a complex way. They are dependent on the current task demands and on the reader's cognitive and linguistic abilities. The linguistic complexity of a word may influence the time for a low-level stage of processing a stimulus based largely on physical features and letter patterns: or to identify higher-level processing based on context. If the time is too short to form an optimum representation of each word in a word string, coding backlogs may accumulate over the string and degrade subsequent memory or comprehension performance.

LaBerge and Samuels (1974) view learning to read as the acquisition of a series of skills. All readers must go through similar stages of learning to read but do so at different rates. The slower the rate of learning to read, the more the reader must focus his/her awareness on component subskills.

Good and Poor Readers

There may be differences in the ability of good and poor readers in the way they read and learn new words. In a study by Samuels, Begy and Chen (1975-76), the good readers were superior to

the poor readers in the speed of word recognition. The good readers were able to process visually presented words at a faster rate. They were also significantly more aware of having made a false identification and were able to alter their recognition response, while the poor readers were less aware of the false recognition and are more likely to accept the wrong word. The better readers were able to use context and letter cues from the target words more efficiently. The good readers probably used less attention to decode words than the poor readers. The attention that was not required by the good readers to process lower-level skills could, therefore, be directed to higher-level skills such as comprehension. On the other hand, the poor readers required more attention to process lower-level skills. Therefore, only a minimum amount of attention was left over to process higher-level skills.

Guthrie (1973) supports the subskill view of reading for poor readers. Good readers have higher correlations among subskills than do poor readers. This suggests that good and poor readers differ in the way they organize component skills. One source of disability for poor readers is their lack of integration and interfacilitation among subskills. Poor readers fail to develop normally one or more of the independent component skills in reading. Guthrie's (1973) assembly model contends that subskills develop independently and disabled readers acquire most subskills but are deficient in a small number of them. Guthrie's model of reading also applies to the good readers since they are capable of intercorrelating subskills which are independently developed. Guthrie's reading model is

comprehensive because it accounts for the performance of both good and poor readers. The difference between the good and poor reader lies in the manner in which they organize component skills. The reading skills of poor readers are not sufficiently organized into a system of reading.

According to Singer, Samuels and Spiroff's (1973-74) focal attention hypothesis, good readers perceive and give correct responses to graphemes. Good readers learn to test their predictions using graphemic cues. The better reader is also more efficient than the poor reader in associating his/her responses to graphemic stimuli when a word is presented in isolation than when it is presented in sentence context. When the poor reader uses context, he/she does not know which are the relevant cues or how to respond to them. He/she tends to search for and/or rely on sentence contextual cues for eliciting a correct response. Under these conditions, the reader is less likely to acquire and associate responses to the graphemic stimuli.

A study conducted by Ehri (1976) indicates that familiar words are recognized automatically by good readers as early as the end of the first grade but poor readers will only reach this level of skill by the end of the third grade. According to Ehri and Wilce (1980), poor readers lack the letter-sound mapping skills necessary to decode words completely and store their orthographic forms in memory. Poor readers also resemble pre-readers in their awareness of the syntactic units of language. The superior reading performance of skilled over the less skilled reader is attributed to their different experiences with printed language (Ehri, 1976).

Ehri and Wilce (1983) describe unitization as the maximum speed a reader attains in identifying words. This is regarded as the final phase in the development of word recognition skill when spellings are stored in memory and integrated with their pronunciations and meanings. Performance patterns reveal that unitized speed is much slower to develop in less skilled readers.

Practice Effects

During the review of the reading process, reference was made to the effect of practice on word recognition. Practice failed to improve the reading speed of less skilled readers (Ehri and Wilce, 1983). These findings of Ehri and Wilce cast some doubts on practice theories for the acquisition of word-reading skills in younger, poor readers. The final phase of word recognition skill is when word spellings are stored in memory and integrated with their pronunciations and meanings. Poor readers' unitized speed is much slower to develop. Even practice fails to improve their reading speed. A possible explanation for the ineffectiveness of practice among younger, less skilled readers is Ehri's (1977) theory of printed word learning. Less skilled readers lack adequate knowledge of better-sound relationships. They have difficulty retaining and integrating complete spellings of words with their pronunciations in memory. Sometimes perception of spelling is incomplete and fails to specify how the word is pronounced. Therefore, when words are read it takes longer to locate their spellings and retrieve their pronunciations in memory. Therefore, it is not practice but knowledge about how orthography

systematically maps speech that is important.

Jacoby (1978) considers the perceptual recognition of words a skilled task. Through practice, performance becomes more efficient, word recognition is accomplished rapidly, smoothly, and with less effort. Repeated encounters of a word leads to automaticity. Graphemic information is incredibly well remembered over long intervals of time rather than quickly forgotten. The remembering of the encoding of a word eliminates the necessity of carrying out a visual analysis each time the word is presented. The permanent effects of perception are supposedly gained only through a large number of repetitions of a word. Perceptual fluency serves as a basis for recognition memory. The effects of study on words presented out of context enhances both recognition memory and later perceptual identification (Jacoby and Dallas, 1981).

Aaronson's Theory of Lexical Processing and Learning

A detailed description of Aaronson's (1983b) theory of lexical processing and learning is warranted at this point in the Review of the Literature. Her theory is based on the premise that the meaning and structural attributes of words play significant roles in word learning. Both this study and that of Aaronson examine the interactions between cognitive task demands and performance. The method devised by Aaronson to study reading task performance is a word-by-word reading paradigm. Her experimental paradigm has been modified to meet the specific needs of the present study.

Aaronson and Ferres's (1983b) model of the reading process suggests that reading strategies are influenced by text attributes,

task demands, and the individual abilities of the reader. The interactions between linguistic attributes and task performance provide information on subject controlled reading strategies.

Aaronson and Ferres (1983a) set forth two hypotheses regarding the structural and meaning attributes of the lexical categories. According to their Continuum Hypothesis, words and categories can be ordered in terms of their importance relative to other words in conveying the meaning versus the structure of the sentence. The Structure-Meaning Hypothesis claims that lexical categories can be organized hierarchically on the bases of their relative contribution to the meaning and structure of the text. Words can be divided into two main categories: content words whose primary role is to convey the meaning of the text and function words that signal the structural organization of the sentence (Aaronson and Ferres, 1983b).

To study the role of linguistic attributes set down in these two hypotheses, subjective ratings were obtained for various lexical categories as a function of their contribution to the structure and meaning of the text. Data obtained by the subjective ratings supported both the Continuum and Structural-Meaning Hypotheses. Content words contributed more to the meaning than to the structure of the sentence, whereas function words contributed more to the structure than to the meaning of a sentence. Within the content set, the noun set is rated higher on meaning and lower on structure than the verb set. Function words rated higher on structure than on meaning. Although the verb set is within the content set and contributes more to structure than the noun set, it also contributes

more to meaning than the function set.

Reading serves two purposes, first the complete retention, and second the immediate comprehension of a text. These differences in cognitive processing form the basis of Aaronson's third hypothesis, the Performance Task Hypothesis. This hypothesis predicts that lexical categories serve different purposes for language processing in different types of reading tasks. Lexical categories and attributes that are more important for structural organization will be more important for reading tasks that involve memory than for reading tasks that require comprehension. The lexical categories and attributes that are more important for conveying meaning will play a stronger part in immediate comprehension tasks than in memory tasks. Therefore, the interactions between cognitive task demands and the linguistic attributes of the stimulus determine differential encoding patterns in a sentence (Aaronson and Ferres, 1983b).

To study reading task performance, Aaronson and Ferres devised a word-by-word reading paradigm. Reading Times (RTs) were obtained when two subject groups read identical sentences for either comprehension of the sentence or for complete recall of the entire sentence. Reading Time patterns were examined to study the individual abilities of slow and fast readers within the two subject groups, Comprehension Subjects and Recall Subjects.

A detailed description of Aaronson and Ferres's (1983a) word-by-word reading paradigm is presented here. Subjects viewed sentences which were displayed one word at a time on a computer monitor. They pressed a key when they wanted to begin a trial and each time they wanted to read another word in the sentence for that

trial. The previous word was removed with the appearance of each new word. The computer recorded in milliseconds the Reading Times for the previous word. The word-by-word reading procedure was selected because it provided an "on-line" method of obtaining a processing time index for each individual word. This word-by-word reading procedure resembles normal reading. The RTs are paced by the reader and not by the experimenter. RTs are not limited to motor response times. This procedure includes the total viewing time in data analysis. Aaronson and Ferres (1983a) state that their procedure lacks the naturalness of normal reading in that it requires subjects to spend time on all words, even the small words that might be passed over in a normal reading situation. Two groups of subjects, recall and comprehension subjects, performed a different task after viewing a sentence. For the recall subjects, when the word RECALL was displayed immediately after a sentence, they attempted to write down the entire sentence verbatim on a prepared response sheet. For subjects in the comprehension group, an implied yes/no question of three to seven words was displayed after the sentence and the subject displayed a "yes" or "no" key to answer it.

The data from the word-by-word analysis supported the Performance Task Hypothesis in terms of the interactions between linguistic attributes and task performance. The data suggested that both task groups coded the meaning attributes of words but comprehension subjects spent less of their coding time on structure. Recall subjects spent more time decoding the verb set and relatively less time decoding the noun set in comparison to the comprehension

subjects. The slow readers within the recall group spent more time on the structural organization of phrases and on the detailed processing of individual words, than the fast recall readers. The slow readers were more sensitive to linguistic attributes but were less efficient at coding these attributes than the fast recall subjects. A more controlled mode of decoding by slow readers effected structural coding, detailed processing of individual words and sensitivity to syntactic context. Comprehension subjects contrasted the recall subjects. Comprehension subjects did very little or no structural processing beyond that correlated to semantic processing. They determined the deep structure and semantic relationships of the text. They abstracted key concepts and discarded less important information. The meaning related attributes of the noun set facilitated a semantic integration strategy for comprehension subjects, whereas a structural role of the verb set naturally facilitated a chunking strategy for recall subjects.

Practice effects for both task groups produced smooth and more consistent performances as indicated by the pattern reduction in relative RTs. The largest pattern reduction occurred primarily in reading related categories for comprehension subjects but in structure related categories for recall subjects. Both task groups showed changes for the relative RTs for the lexical categories most characteristic of their particular performance task. RTs decreased with practice but practice did not interact with task effects and played no role in the coding of structure and meaning. Practice affected only a base coding time and not higher level processing for

structure and meaning. The largest decreases in RTs were for slow recall subjects.

The cognitive demands of the reading task appear to require a specific reading strategy. The nature of the reading task influences the distribution of the RTs over the words in a sentence. Lexical categories can be organized hierarchically based on their relative contribution to the structure and meaning of the sentence. Lexical categories are used differently depending on the performance demands of the reading task.

In order to obtain a complete understanding of the reading process, it is necessary to understand the interactions between the linguistic attributes of the text and the cognitive demands of the task. Aaronson's reading model and the data that support it provide evidence that readers are selective in their use of a reading strategy.

Relation of This Study to the Aaronson Study

The word-by-word experimental paradigm used in the method section of this study is based on the Aaronson and Ferres's (1983b) study, with some variations. Aaronson and Ferres timed every word in the sentence, while in this study only the specific word being presented to the subject was timed. Every subject was tested in all three conditions in this study, while the Aaronson and Ferres (1983b) subjects were tested as either Recall or Comprehension subjects. The Aaronson and Ferres's (1983a)(1983b) study used sentences for both conditions, while this study used both sentences and word lists. Data from both studies were used to examine the

interactions between performance and cognitive task demands. The purpose of the Aaronson and Ferres's (1983a) study was to examine the nature of two reading tasks, while in this study the method used to learn new reading vocabulary and how it affected the level of learning that took place was studied. The effects of practice was also examined in both studies.

A relationship exists between these two studies. Aaronson used two subject groups to examine the purpose of the reading task. This was for either recall or for comprehension. For recall subjects, it was the lexical categories that stressed structure that contributed to the recall of the sentence. While, for the comprehension subjects, it was the lexical categories that emphasized meaning that contributed to the comprehension of the sentence. Similarly, in the present study, two subject groups were used to examine how context affected word learning. Good and poor readers learned new words under three test conditions. These conditions emphasized the meaning and structural attributes of words. Meaning and structure played significant roles in both these studies even though the format and results of the studies were somewhat different.

Hypotheses

In the review of the vocabulary acquisition from the viewpoint of several researchers, reference was also made to the element of practice. This study will also examine the effect of word recognition practice on new vocabulary for good and poor readers.

When learning new vocabulary, the method employed should affect the level of learning that takes place. Based on this premise, a study of the effectiveness of vocabulary acquisition

by learning words either in context or in isolation conditions will test the following hypotheses:

1. Words should be read faster in context than in isolation. This would be true for both good and poor readers (Samuels, Begy, Chen, 1975-76; Samuels, 1979; Aaronson and Ferres, 1983; Schwantes, Boesl and Ritz, 1980).

2. Words in a list condition should be learned more completely than words in a context condition. Students, therefore, should show greater improvement in performance over repeated trials (Ehri and Roberts, 1979; Jacoby, 1983; Singer, Samuels, and Spiroff, 1973-74; Stanovich, 1980, 1982).

3. Words read in the strong sentence context condition should be read faster but should show less learning than the words in the weak sentence context condition (Tweedy, Lapinski and Schvaneveldt, 1977; Eisenberg and Becker, 1982; Becker; 1980; Ehri and Wilce, 1980; Aaronson and Ferres, 1983; Aaronson, 1976; Jacoby, Bartz and Evans, 1978).

4. Words read in the weak sentence condition should result in faster responding but also exhibit less learning than words in the list condition.

5. Poor readers should show slower responding and less learning than the good readers in all three conditions (Aaronson and Ferres, 1983; Ehri 1977).

CHAPTER 3

METHOD AND RESULTS

Subjects

The following sub-tests of the Durrell Analysis of Reading Difficulty (3rd Edition, 1980) were individually administered to fifty-six Grade Three students to determine each child's reading level: Oral Reading, Silent Reading, Word Recognition-Word Analysis.

Twenty-eight subjects, fourteen good readers and fourteen poor readers, were selected on the basis of the results of the Durrell Reading Test. The good readers' group was comprised of nine girls and five boys while two girls and twelve boys made up the subject population of the poor readers' group. The good readers had a mean reading performance of Grade 3.5 and above and were within a reading range from Grade 3.1 to Grade 6.4. The mean reading performance of the poor readers was Grade 2.5 and below and was within a range of Grade 2.2 to 1.8.

At the time of testing for reading performance all subjects were eight chronological years of age, ranging from eight years one month to eight years eleven months. Both groups had a mean chronological age of eight years five months.

Materials

The stimuli for these experiments consisted of target words, presented either in list or in strong or weak sentence conditions. Target words were taken from the graded word lists that made up the

Word Recognition - Word Analysis sub-test of the Durrell Analysis of Reading Difficulty Test (3rd Edition, 1980).

Individual word lists comprising nine words, three words for each condition, were compiled from the errors made by each student on his/her Word Recognition - Word Analysis sub-test. From these word lists, the sentences and groups of words to be used in the three test conditions were developed. In the student's program, each condition was made up of three target words and for every target word there were fifteen trial word groups or sentences. According to Aaronson and Ferres' (1983a) Structure-Meaning Hypothesis, words can be divided into two sets, content and function words. The primary role of content words is to convey meaning, while the primary role of the function words is to signal the structural organization of the sentence. Content words contain the subsets of nouns and verbs. The noun set carries much of the sentence's specific meaning, while the verb set structures the sentence into a subject and a predicate. Therefore, nouns and verbs were used in this study as they presented the best source of information for the subjects in the experiment.

Each student's testing program was unique. It was based on his/her word list. Refer to Appendix I for an example of a student's individualized testing program.

Procedure

The procedure used in this experiment was modelled on an experimental paradigm developed by Aaronson and Ferres (1983a). This self-paced, word-by-word procedure approximated normal reading

even through the words were displayed one at a time and were subject paced rather than experimenter paced. This procedure allowed the subjects to identify, organize, and integrate linguistic information at their own rate. The word-by-word procedure was also selected because it was a method for obtaining a processing time index for the individual target word in list or sentence conditions. The computer was programmed to time the target words in the list and sentence conditions. The reading time of the target word reflected the amount of learning that took place. Although this procedure approximated normal reading, it still lacked a certain naturalness of reading. When reading, a reader automatically groups words and pauses at phrase boundaries. In a word-by-word reading task the subject is unable to do this. This type of reading does not lend itself to the natural fluency of reading. Word-by-word reading is accomplished in a rather stilted fashion.

The experiment comprised: (a) three reading conditions, strong and weak sentence and list conditions; (b) two subject populations, good and poor readers; and, (c) the element of practice.

Subjects were individually tested in a session that lasted approximately twenty minutes. Each child was tested in all of the three conditions but only one condition per day was tested. Conditions were tested in random order (See Appendix II). Three sessions were required to complete each participant's testing. The entire testing procedure required a month.

The experiment was very simple to administer as it required only the minimum of instructions. The good and poor readers were

simply told to read aloud the sentence or list of words as it appeared word-by-word on the computer monitor.

At the beginning of each testing session, the words, GET READY, were flashed four times on the computer monitor to ready the subject for the first word in the sentence or word list. To read the next word, the reader simply pressed the space bar. After each sentence or word list was completed, it disappeared off the monitor and the words GET READY flashed again four times. The first word of the next sentence or word list appeared and the cycle was repeated. In the first session the examiner demonstrated the use of the space bar. There was no need to repeat this demonstration for the second and third testings. There were no pre-trial examples before the first testing.

On-going oral testing for comprehension was carried out throughout the testing. Since the testing was subject paced, on-going questioning could be interjected whenever the examiner felt it was relevant. Questioning was rather informal in nature as the examiner did not want to distract the subject from the task at hand. Subjects were either asked to discuss the meaning of the word or to make up a sentence using the target word.

Results:

The results of this experiment were subjected to an analysis of variance consisting of one between group factor (Reading Ability), and two within group factors, (Conditions) and (Test). The results of this overall ANOVA are shown in Table 1. The overall ANOVA analyzed the results for the main effects of reading ability,

treatment conditions, and test. The analysis also provided interactions between reading ability and treatment conditions, between reading ability and test, and between treatment conditions and test. Finally, an overall interaction among all the factors, reading ability, treatment conditions and test was obtained.

TABLE 1

RESULTS OF OVERALL ANOVA

	Factors	M.S.E.	D.F.	F.
(a)	Reading Ability	17.667	1,26	7.851**
(b)	Conditions	22.973	2,52	7.7424**
(c)	Test	208.3715	1,26	100.1483**
(a)	x (b) Interaction	3.3771	2,52	1.3818
(a)	x (c) Interaction	1.5854	1,26	0.7619
(b)	x (c) Interaction	8.087	2,52	3.4520*
(a)	x (b) x (c) Interaction	2.6852	2,52	1.6852

** = $p < .01$

* = $p < .05$

Although there was a significant difference in reading ability between the two groups tested, this difference did not interact with the presentation conditions or the pre- and post-test measures. There was an interaction, however, between the conditions and the test factors.

The main effect of test indicates that treatment was effective in creating pre- and post-changes. In order to examine the difference between pre- and post-test performance for each condition for each subject group, two-tailed paired t-tests were performed. These are shown in Table 2 and Graph 1. As can be seen, all pre-post-test comparisons were highly significant. This shows that a significant amount of learning occurred for both subject groups in all conditions.

TABLE 2

THE MAIN EFFECT OF TEST (Pre vs. Post)

	Subject	Condition			
Paired T-Tests	(a) G.R.	-	S.S.	t(13) =	5.02, p<.0001
(Two-Tailed)	(b) G.R.	-	W.S.	t(13) =	4.96, p<.0001
	(c) G.R.	-	L.C.	t(13) =	4.53, p<.0005
	(d) P.R.	-	S.S.	t(13) =	4.08, p<.0005
	(e) P.R.	-	W.S.	t(13) =	3.36, p<.00025
	(f) P.R.	-	L.C.	t(13) =	4.49, p<.0005

G.R. = Good Reader

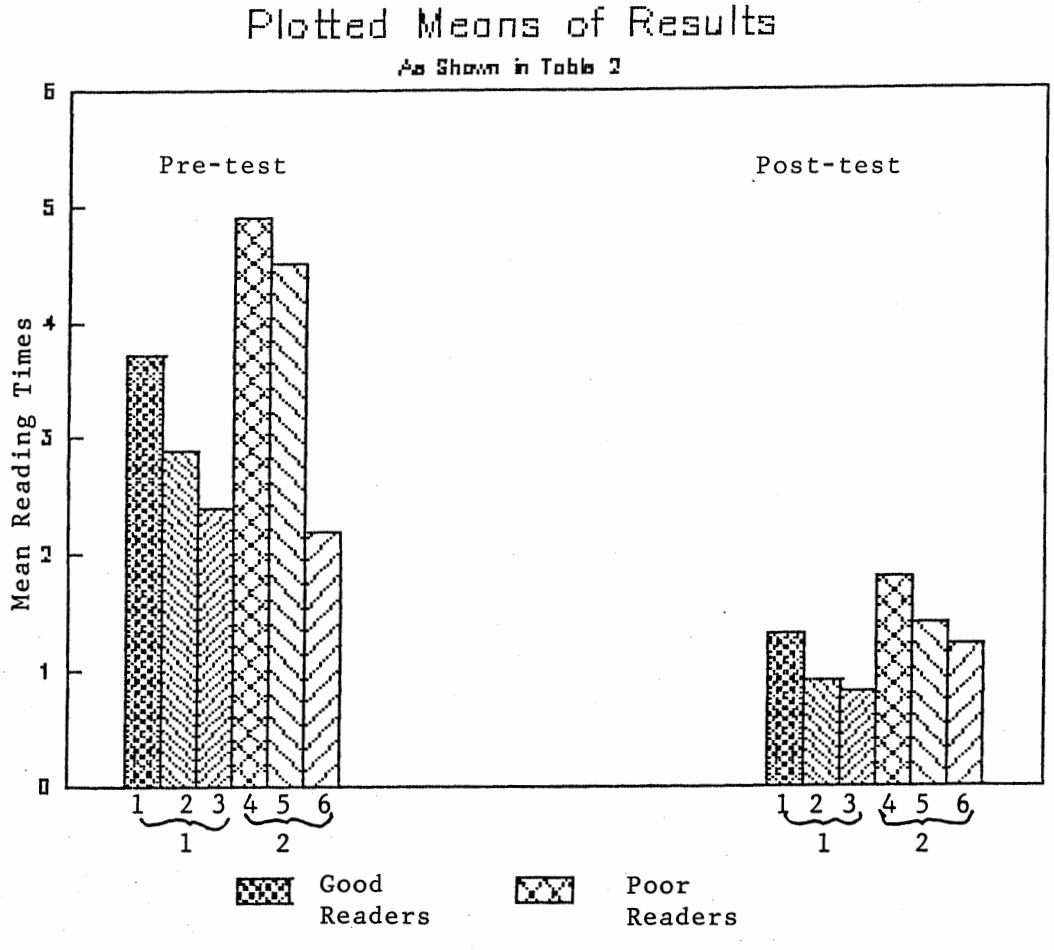
P.R. = Poor Reader

S.S. = Strong Sentence Condition

W.S. = Weak Sentence Condition

L.C. = List Condition

GRAPH 1



1. List Condition - Good Reader
2. Weak Sentence Condition - Good Reader
3. Strong Sentence Condition - Good Reader
4. List Condition - Poor Reader
5. Weak Sentence Condition - Poor Reader
6. Strong Sentence Condition - Poor Reader

There was also a main effect for treatment conditions. This indicated that there were differences in the effectiveness of the treatments. In order to examine the effect of treatment conditions, paired t-tests (Two-Tailed) were performed on each of the pre- and post-scores across conditions for good readers. These data are presented in Table 3, and Graph 2.

TABLE 3

MAIN EFFECT OF TREATMENT CONDITIONS - GOOD READERS

Paired T-Tests
(Two-Tailed)

Subjects	Conditions	Test	
(a) G.R. -	S.S. vs. W.S.	Pre-test,	t(13) = -.96, p<.356
(b) G.R. -	S.S. vs. W.S.	Post-test,	t(13) = -.93, p<.371
(c) G.R. -	S.S. vs. L.C.	Pre-test,	t(13) = -.217,p<.049
(d) G.R. -	S.S. vs. L.C.	Post-test,	t(13) = -4.25, p<.001
(e) G.R. -	W.S. vs. L.C.	Pre-test,	t(13) = -1.02, p<.328
(f) G.R. -	W.S. vs. L.C.	Post-test,	t(13) = -2.12, p<.054

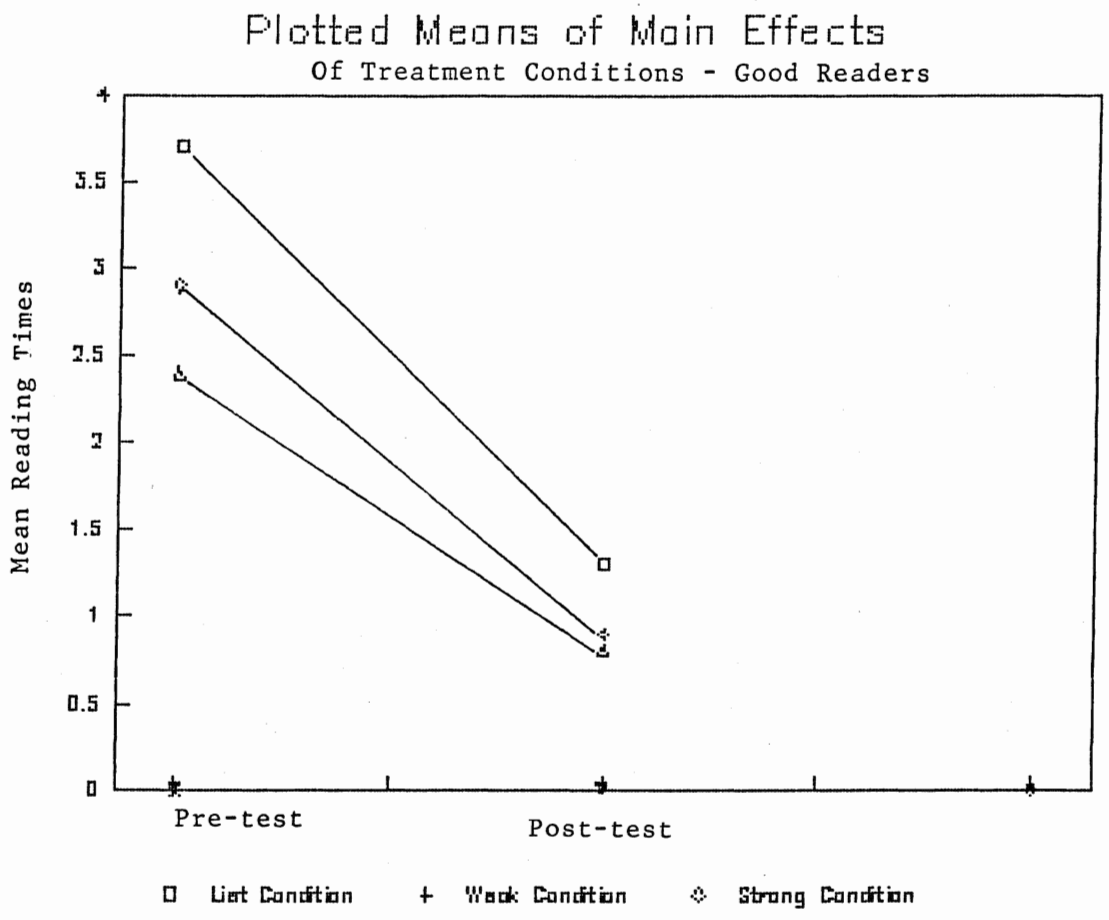
G.R. = Good Reader

S.S. = Strong Sentence Condition

W.S. = Weak Sentence Condition

L.C. = List Condition

GRAPH 2


Plotted Means of Main Effects
Of Treatment Conditions - Good Readers
Mean Reading Times
4
3.5
3
2.5
2
1.5
1
0.5
0
Pre-test
Post-test
List Condition
Weak Condition
Strong Condition

The first comparison of interest was the strong sentence versus weak sentence comparison. This showed no significant difference in either pre- or post-test scores. Therefore, for the good readers, there was no difference in learning across these two conditions.

The second comparison of interest was strong sentence versus list condition for good readers. This showed both pre- and post-test differences. This suggests that more learning was occurring in the list condition than in the strong sentence condition for the good readers.

The final comparison of interest was weak sentence versus list condition. This shows no difference in pre-test scores or post-test scores. However, the difference between post-test scores was approaching significance. This suggests that there was very little difference between the weak sentence condition and list conditions in terms of learning new words.

In order to examine the effect of treatment conditions on the poor readers, paired t-tests (Two-tailed) were performed on each of the pre- and post-scores of these subjects. These data are presented in Table 4 and Graph 3.

TABLE 4

MAIN EFFECT OF TREATMENT CONDITIONS - POOR READERS

Paired T-Tests
(Two-Tailed)

Subjects	Conditions	Test		
(a) P.R. -	S.S. vs. W.S.	Pre-test,	t(13) =	-2.23, p<.044
(b) P.R. -	S.S. vs. W.S.	Post-test,	t(13) =	- .70, p<.499
(c) P.R. -	S.S. vs. L.C.	Pre-test,	t(13) =	-3.37, p<.005
(d) P.R. -	S.S. vs. L.C.	Post-test,	t(13) =	-2.95, p<.011
(e) P.R. -	W.S. vs. L.C.	Pre-test,	t(13) =	- .41, p<.691
(f) P.R. -	W.S. vs. L.C.	Post-test,	t(13) =	-1.03, p<.321

P.R. = Poor Reader

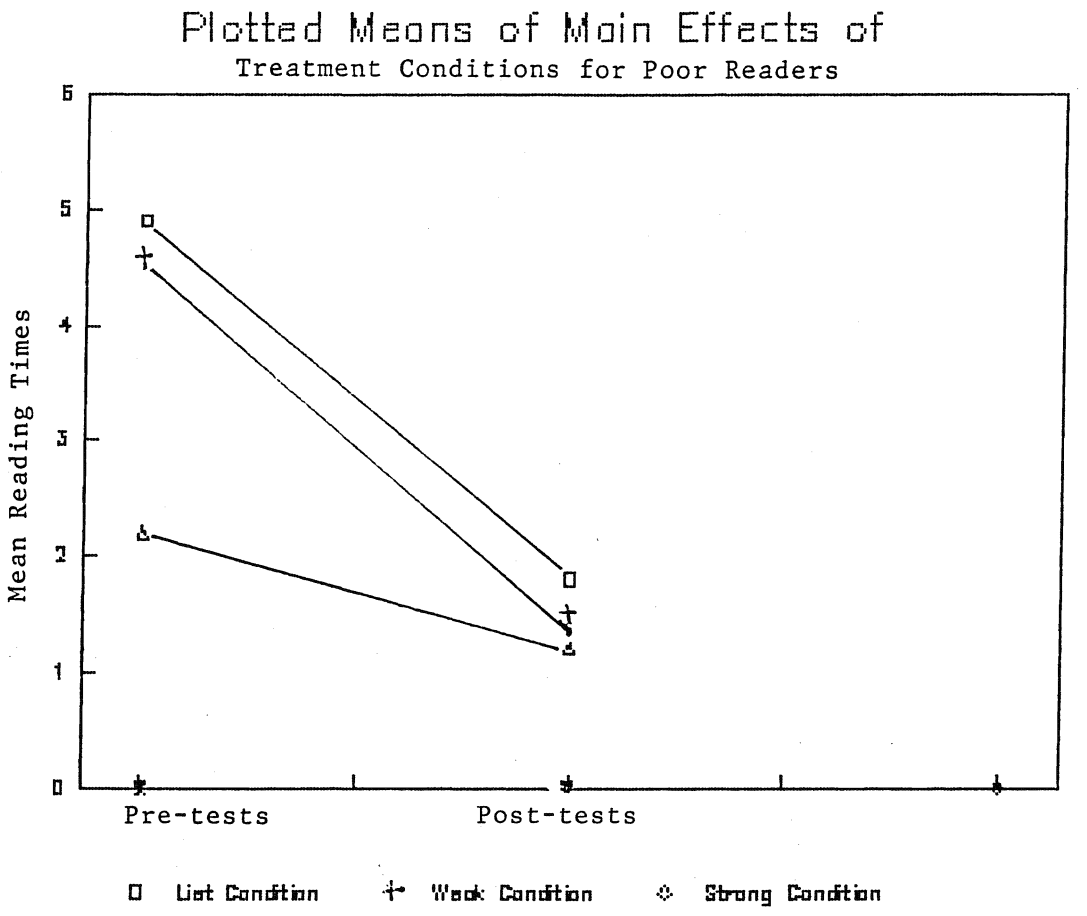
S.S. = Strong Sentence Condition

W.S. = Weak Sentence Condition

L.C. = List Condition

The first comparison for poor readers was the strong sentence versus weak sentence comparison. This showed a significant difference in the pre-test but not in the post-test. We take this to mean that significantly more learning was occurring in the weak sentence condition than in the strong sentence condition. This suggests that the poor readers learn more about words when sentence context is weaker.

GRAPH 3


Plotted Means of Main Effects of
Treatment Conditions for Poor Readers
Mean Reading Times
6
5
4
3
2
1
0
Pre-tests
Post-tests
List Condition
Weak Condition
Strong Condition

In the comparison of the strong sentence versus list condition, there was a significant difference at pre-test but not at post-test. This suggests that as context is reduced completely, as in the list condition, the poor readers learn more about the words.

The comparison between the weak sentences versus list condition showed no difference at either pre- or post-test. This suggested that the learning that occurred in the weak sentence condition and list condition were significantly the same for the poor readers.

There was also a main effect for reading ability indicating that the students with different reading abilities performed differently in terms of tests and treatments.

The final set of comparisons are with regard to differences in good and poor readers. Two-tailed t-tests were used to compare their performance in each of the conditions. These are shown in Table 5 and Graphs 4, 5, 6.

The first comparison of interest between pre- and post-test scores of good and poor readers in the strong sentence condition indicated that there was no difference in the pre-test but that there was a significant difference in the post-test scores. This suggests that the good readers may have benefitted more from the strong sentence condition than the poor readers.

TABLE 5

MAIN EFFECT OF READING ABILITY FOR GOOD AND POOR READERS

T-Tests
(Two-Tailed)

	Subjects	Conditions	Test			
(a)	S.S. -	G.R. vs. P.R.	Pre-test,	t(26)	=	- .53, p<.301
(b)	S.S. -	G.R. vs. P.R.	Post-test,	t(26)	=	-1.74, p<.047
(c)	W.S. -	G.R. vs. P.R.	Pre-test,	t(26)	=	-1.52, p<.073
(d)	W.S. -	G.R. vs. P.R.	Post-test,	t(26)	=	-1.73, p<.049
(e)	L.C. -	G.R. vs. P.R.	Pre-test,	t(26)	=	-1.40, p<.087
(f)	L.C. -	G.R. vs. P.R.	Post-test,	t(26)	=	-1.75, p<.045

S.S. = Strong Sentence Condition

W.S. = Weak Sentence Condition

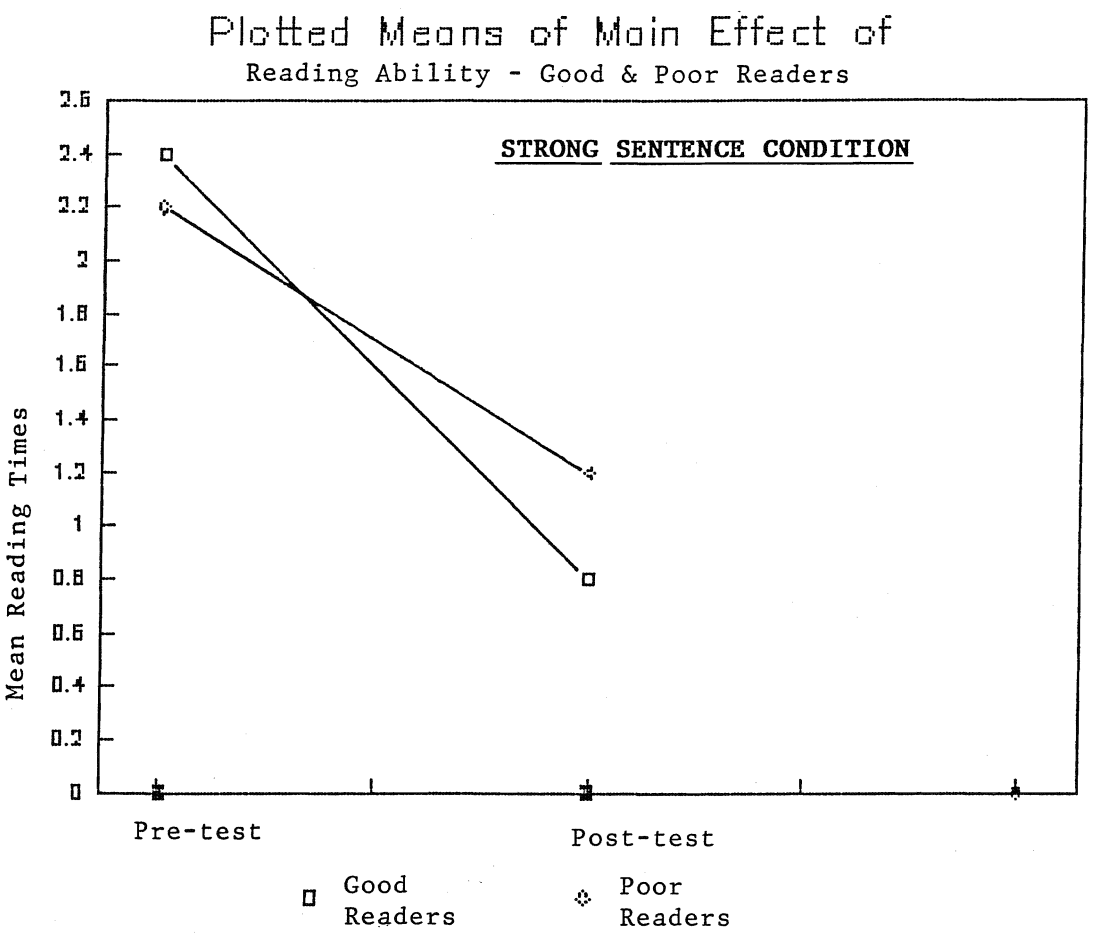
L.C. = List Condition

G.R. = Good Reader

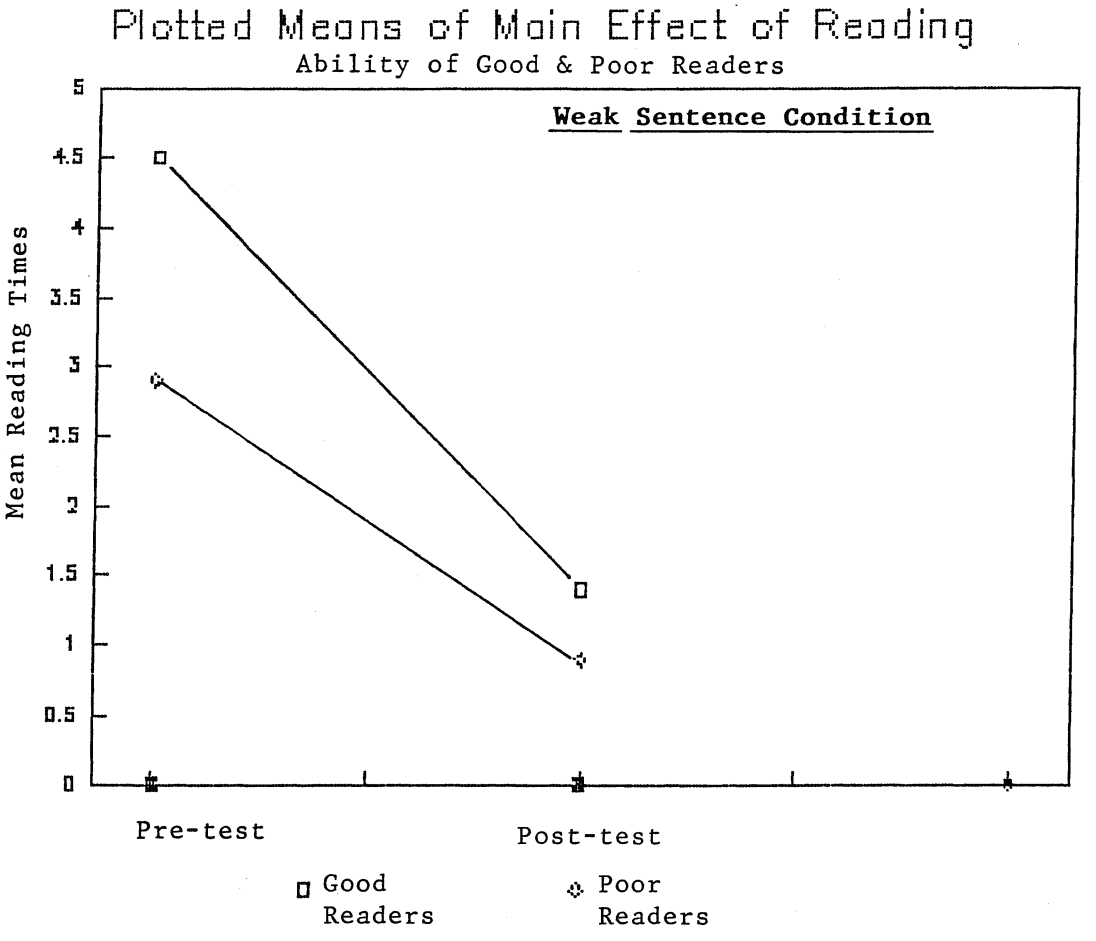
P.R. = Poor Reader

The second comparison was between the pre- and post-test scores of the good and poor readers in the weak sentence condition. There was no significant difference in the pre-test but there was in the post-test. Although this is difficult to interpret, an examination of the Standard Deviations showed that the poor readers (SD 3.37, 0.99) exhibited more initial variance than the good readers (SD 1.56, 0.54) and greater decreases in variance between pre- and post-tests. This suggests that the poor readers may have been learning more from the weak sentence condition than the good readers.

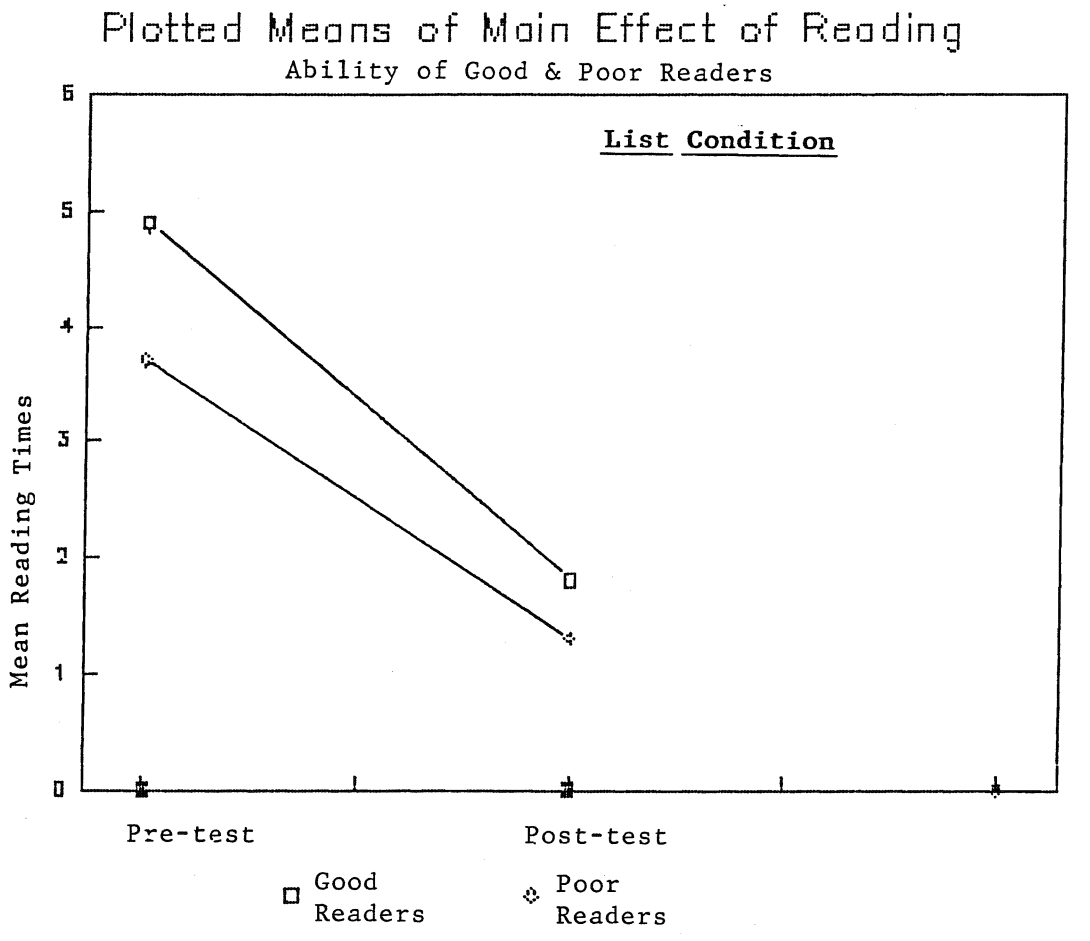
GRAPH 4


Plotted Means of Main Effect of
Reading Ability - Good & Poor Readers
STRONG SENTENCE CONDITION
Mean Reading Times
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Pre-test
Post-test
Good Readers
Poor Readers

GRAPH 5


Plotted Means of Main Effect of Reading
Ability of Good & Poor Readers
Weak Sentence Condition
Mean Reading Times
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Pre-test
Post-test
Good Readers
Poor Readers

GRAPH 6


Plotted Means of Main Effect of Reading
Ability of Good & Poor Readers
List Condition
Mean Reading Times
6
5
4
3
2
1
0
Pre-test
Post-test
Good Readers
Poor Readers

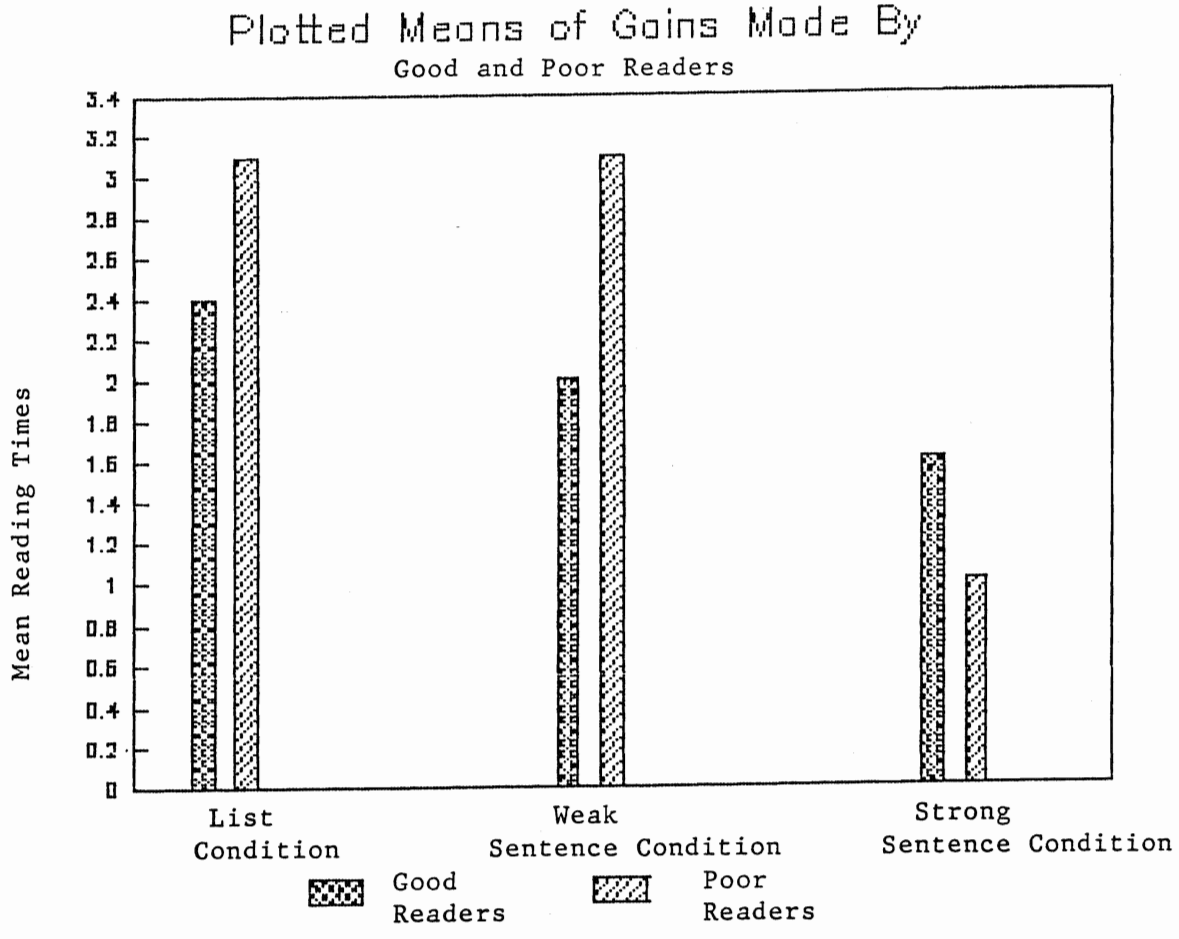
The final comparison between pre- and post-test scores of the good and poor readers in the list condition showed no significant difference in the pre-tests but there was in the post-test scores. Again, this is difficult to interpret. The poor readers (SD 2.69, 0.69) showed more initial variance than the good readers (SD 1.92, 0.56) and a greater drop in variance as a result of treatment. Again, this suggests that the poor readers may benefit more and learning more than the good readers in the list condition. There was an interaction between conditions and tests. This indicates that treatments may have had different effects in terms of pre- and post-comparisons.

In summary, the gains made by the good and poor readers are plotted in Graph 7. While all students had better reading times across the three conditions, the poor readers made more gains in the List Condition and the Weak Sentence Condition than the good readers.

The good readers made only a slight gain in reading time over the poor readers in the Strong Sentence Condition.

The overall results supported the findings that poor readers benefitted from a bottom-up model of reading instruction while the good reader benefitted from a top-down model of reading instruction in terms of learning to decode new words.

GRAPH 7


Plotted Means of Gains Made By
Good and Poor Readers
Mean Reading Times
3.4
3.2
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
List Condition
Weak Sentence Condition
Strong Sentence Condition
Good Readers
Poor Readers

CHAPTER 4

GENERAL DISCUSSION

This study examined the effectiveness of context on the acquisition of new vocabulary of good and poor readers. Central to the study were the issues related to the use of contextual and graphic information during the word recognition process.

Conclusion

Based on the data obtained from this study the following conclusions were made:

(1) Words were read faster in context than in isolation. This was true for both good and poor readers.

(2) Words in a list condition were better learned than words in a context condition by both subject groups. Students showed greater improvement in performance over repeated trials.

(3) Words read in the strong sentence context condition were read faster but with less orthographic learning than the words in the weak sentence context condition. Again, this was true for both good and poor readers.

(4) Words read in the weak sentence condition did result in faster responding than words in the list condition. It was also predicted that less learning would take place in the weak condition than in the list condition. This was true for the good readers who learned about words in the list condition. However, the poor readers learned equally well in both conditions.

(5) Poor readers did show slower responding times than the good readers in all three conditions. However, the poor readers learned significantly more about words in the list and weak sentence conditions than the good readers. It had been predicted that the good readers would learn more than the poor readers in all three conditions.

Discussion

Reaction times were always faster in context conditions than in the list condition. Context allowed for decreased dependency on visual information and reduced the amount of attention required processing the word. Therefore, the text could be more rapidly processed. Context provided strong associative and semantic relationships which served to increase the amount of contextual information available, thereby reducing the time required to process the target words. Context also provided a basis for predicting the identity of a word.

While words were read faster in a context condition, this did not mean that more learning took place in the context condition as opposed to the list condition. This will be discussed at more length further on in this chapter.

On the other hand, learning curves as interpreted by the pre and post comparisons showed a different picture. The less context the steeper the learning curves as indexed by the reaction times across trials. The best condition to focus visual attention on the printed word is the list condition in which words were presented in isolation. There is less distraction and the only cues the reader could attend to were the graphemic stimuli of the word itself. (Singer, Samuels, Spiroff, 1973-74). Words presented in isolation forced the reader to rely more heavily on the visual analysis of the word for its later perceptual identification (Jacoby, Craik, and Begy, 1977). The results of the data can be interpreted as follows: The difference in pre and post performance was highly significant. Table 2 indicated that learning occurred for both the good and poor readers in all three conditions. More learning and greater performance occurred in the list condition as opposed to the sentence conditions for both subject groups. The good readers learned more about words in the list condition than in the strong and weak sentence conditions (Table 3). The poor readers learned more about words in both the list and weak sentence conditions than in the strong sentence condition (Table 4).

When examining the performance of the good and poor readers within each of the test conditions, it was found that the good readers learned more about words in the strong sentence condition when compared to the poor readers. In the list condition, while both good and poor readers learned about words, the poor readers learned significantly more than the good readers. The poor readers also learned more about words in the weak sentence condition than the good readers (Table 5).

The identification of new words by good readers was affected to a greater degree by the strong sentence context than the poor readers. Semantic and syntactic identities of a word were more easily learned when the words were produced within strong sentence contexts. While this was true for both the good and poor readers, the good readers learned more about words in the strong sentence condition than the poor readers. The good readers may have been using whatever contextual information was available in a more efficient manner.

The good readers were better word predictors than the poor readers. In the strong sentence condition, the target word was highly predictable from the context of the sentence. The good readers appeared to be able to generate an accurate hypothesis as to the identity of the word. They also showed a greater willingness than the poor readers to alter their incorrect hypotheses when determining the word correct identity.

Data from Table 2 indicated that the poor readers were not completely lacking in their ability to use context. They were just not using contextual information to the same degree as the good readers. The poor readers were using the same skills as the good

readers but to a lesser degree. These skills may have been less organized and integrated than the good readers' (Schwantes, Boesl, and Ritz, 1980).

The slower response times for the poor readers allowed for semantic and syntactic processors to be activated to facilitate word learning. They relied on context to facilitate word recognition but it slowed the rate with which words were read. When word recognition slowed down, the conscious-attention mechanism had time to operate, thus providing additional facilitation from the contextual information (Stanovich and West, 1979).

Results (Table 2) clearly indicated the ability of the poor readers to use weak sentence context to facilitate word identification. The poor readers learned more about words from the weak sentence condition than the good readers. Weak sentence context did not interfere with the processing of the target word. Semantic context had a larger facilitation effect in word recognition when the context was degraded. Weak context placed fewer cognitive demands on the poor readers and allowed them to attend to the visual information presented by the target word. Weak context also provided enough information for the subjects to either accept or reject an hypothesis about the identity of the target word.

A weak sentence context made the poor readers attend to the individual letters in a word. Therefore, it was the sensory set and not the semantic set of the word that assisted the poor readers to verify their correct identification of the target word (Jacoby, Bartz, Evans, 1978; Becker, 1980). The weak sentence also provided

the poor readers with a context they could understand and the correct target word could be identified and verified within the context of the sentence. The good readers may have relied on the semantic set to process words in the weak sentence condition. The large semantic set defined by the weak sentence context had to be exhaustively sampled and this resulted in interference dominance (Becker, 1980). Sampling of the semantic-set would have involved an expectancy strategy which demanded the use of attention. Therefore, the weak sentence context did not facilitate word learning to the same degree as for the poor readers. It would seem that the role of context played different parts for each subject group.

The poor readers learned more about words in the list condition than the good readers. The superiority of the poor readers in the list condition can be explained by the fact that the only cues the poor readers attended to were the graphic stimuli for the word itself. Visual attention was an essential condition which was needed for learning to identify words. According to Samuels's (1967) focal attention hypothesis, the poor readers learned more about words in isolation because there was no context to distract them. They were able to focus their attention on the printed word. Reading words in a list assisted the readers to acquire appropriate responses to the graphemic features of the word. Reading words in lists facilitated the acquisition of word recognition responses. The accuracy of the word was verified by the word's sensory feature set (Becker, 1980).

If a single presentation of a word has long and lasting effects on memory and enhances its later perceptual recognition (Jacoby, 1983), permanent effects of perception may be gained through many repetitions of a word. Perceptual identification of words out of context depend totally on memory of graphemic information. The poor readers appeared to decode developed skills to a high degree of skill. They showed that they had reached the accuracy level of decoding and perhaps some had even reached the automaticity level. Automaticity and accuracy of the identification process resulted from extended practice (LaBerge and Samuels, 1974). The poor readers benefitted from isolated word training. They had more time to study words as separate units to note how letters map sounds, and then stored more complete word images in long-term memory. The poor readers had to think only minimally about syntax and meaning while reading words in lists. The good readers, on the other hand, also learned about words in the list condition but not to the same extent as the poor readers. Learning words in lists may have caused the conscious-attention mechanism to operate and inhibit some bottom-up processing for the good readers (Stanovich and West, 1979).

Implications for Teaching

The whole language approach is one of the current trends in reading instruction. Enriched context is stressed and many proponents of this style of reading instruction think that this is the better way for students to learn new words. However, not all children will benefit equally from this method.

It is clear from the data in this study that poor readers process and learn words at a slower rate than good readers and that

this has an effect on the way context is used. The good readers were more affected by sentence context than the poor readers. Poor readers learned more about words when they were presented in lists or in weak sentence context. They learned more about the structural attributes of the words. More learning and better performance occurred in the list condition as opposed to the strong sentence condition for both subject groups.

As context was degraded in the list and weak sentence conditions, more learning took place for the poor readers. Weak sentence context facilitated word learning. Fewer cognitive demands were placed on them and attention could be directed to visual information. Words were presented in isolation in the list condition. This proved to be the best condition to focus visual attention on the printed word. The poor readers appeared to learn decoding skills to a higher degree than the good readers. The poor readers benefitted from isolated word training. Therefore, for the poor readers an enriched sentence context did not seem to be the best learning environment.

This study suggests that the poor readers learn differently from the good readers. Therefore, readers who are at risk must be identified so that their special needs may be addressed. There is a definite need to assess children's learning on a continual basis. Effective evaluation assists a teacher to help each child develop his/her potential. Regular evaluation aids in identifying at the earliest possible time those areas where intervention is needed. Evaluation should be the basis for changes made in either programming or teaching strategies. The reading curriculum should

reflect the strategies necessary to accommodate the learning styles of good and poor readers as reflected in this study.

Effective grouping accomodates the learning styles of good and poor readers. Reading instructions can be organized on the basis of general achievement levels. These levels can be determined by either informal or formal assessment. In most reading classrooms there are usually two general achievement groups whose members read at about the same grade level. The subjects of this study, the good and poor readers, belong to two different general achievement groups.

When new word-learning skills are first presented, the entire group receives instruction. When specific problems arise within the general achievement group readers who share a common problem need to be temporarily grouped to remediate the word-learning difficulty. Once the problem has been resolved, the reader can return to his/her general achievement group. The length of time a reader remains in a subgroup will depend on how quickly the difficulties can be resolved. Effective subgrouping to remediate word-learning difficulties should be flexible. As a specific word-learning problem is resolved, the members of the group change and other readers take their place to remedy their specific word-learning difficulties. Occasionally, subgrouping does not meet the needs of a specific reader, then individual word-learning instruction is required.

Basal readers often form the basis for general achievement and subgroup reading instruction. A basal reader program is designed for children whose general reading ability is approximately at the

same level. This type of program can be effective as word-learning skills and taught sequentially and isolated word skills can be remediated as problems arise.

This study indicates that grouping played different roles for each subject group. Both the good and poor readers benefitted from general achievement group instruction. The best strategies for the good readers to remediate word-learning problems in a small subgroup setting should be centered around isolated word learning. As this study indicated, more learning and greater performance took place within the list condition for the good readers. The poor readers' word-learning difficulties could be remediated in subgroup instruction by using both weak sentence and isolated contexts similar to those used in the study. Weak sentence contexts had a greater facilitation effect for the poor readers as it placed fewer cognitive demands on them and their attention could be directed to the visual information presented by the word.

This study suggests that poor readers learn differently from good readers. General achievement grouping, with subgrouping to remediate learning difficulties, could be used to enhance their learning styles.

Reading experiences within the general achievement groups can be either oral or silent, depending on the specific purposes of the reading lesson. Oral reading is the vocalization of print and correct pronunciation and careful enunciation are essential. Silent reading is the subvocalization or the mental pronunciation of print.

Oral reading is one of the best means for practising effective word recognition skills. Many words are repeated and are,

therefore, reinforced. Oral reading should not be allowed to become tedious or laborious. Poor oral reading can be an indicator that the reader has not mastered word-learning skills while good oral reading affirms the reader that he/she can read.

Silent and oral reading are two different modes of the reading process. Their use in a reading lesson depends on the purpose of the task at hand.

In this study, sentences were read orally by good and poor readers in weak and strong contexts and word-learning was accomplished. However, if oral reading is not the best reading style for a reader, then perhaps opportunities to reinforce word-learning skills centered around silent reading exercises will be more beneficial to this reader.

The results of the research from this study raise several issues.

(i) Do poor readers need to learn words in isolation or would words presented in a weak sentence context be learned equally well? The results of this study indicate that the poor readers learned words equally well in both the list and weak sentence contexts. Learning words in a list context assisted the poor readers to acquire appropriate responses to the graphemic features of the word. The advantage of learning words in a list context resulted in automaticity and accuracy of word recognition. However, words that were learned in a weak sentence context had these advantages plus the facilitation of context. Word recognition response times were slower for poor readers in the weak sentence context than in the list context. This facilitated word recognition by allowing

semantic and syntactic processors to be activated. When word recognition slowed down the conscious attention mechanisms had time to operate and thus provide additional facilitation from the contextual information. Semantic context had a larger facilitation effect on word recognition for the poor readers when the context was degraded. Weak sentence context placed fewer cognitive demands on the poor readers and allowed them not only to attend to the visual information presented by the new word but it also provided the poor readers with a context they could understand. Words could then be identified and verified within the context of the sentence. Therefore, the weak sentence context would appear to be the better context for poor readers to learn new words.

(ii) Should poor readers be taught new words in a strong sentence context? The study showed that while words in the strong sentence context were read faster, this was done so at the expense of orthographic, semantic, and syntactic learning that could have occurred if these words had been placed in weak sentence or list contexts. Therefore, strong sentence context could be used to reinforce word learning and develop speed of word recognition after the new vocabulary has been presented in either weak sentence or list contexts.

(iii) Would the good readers benefit from weak sentence context in word learning? Results in the study indicated that the good readers learned more about words in the list context than in the weak sentence context. Therefore, the weak sentence context did not

facilitate word learning to the same degree as it did for the poor readers. Weak sentence context seems to have played different roles for each subject group. The large semantic set defined by the weak sentence context resulted in interference dominance for the good readers. Therefore, the good readers would not seem to benefit from weak sentence context in word recognition instruction as much as the poor readers.

(iv) If the number of trials were increased in the weak sentence context, would the learning that takes place equal the learning that takes place in a strong sentence context with fewer trials? Results of the study would not support this premise. The study indicated that the poor readers learned more about words in list and weak sentence contexts than in a strong sentence context. The strong sentence context allowed for faster reading but with less learning. If new words are placed in strong sentence context after they have been presented in weak sentence context and are successfully read, this would indicate that the word had been learned. Poor readers were not as good word predictors as the good readers in the strong sentence context. They had difficulty generating accurate hypotheses as to the identity of the word. Good readers showed more willingness to alter an incorrect hypotheses than the poor readers. Weak sentence context provided the basis for predicting the identity of a word for the poor readers as it provided strong associative and semantic relationships which served to increase the amount of contextual information available. Since weak and strong sentence context serve different purposes, there would be no advantage to

increase the number of weak context sentences to ensure equal learning if sentences were presented in strong sentence context.

Several instructional issues could also be addressed:

(i) Weak and strong sentence contexts are easy to manipulate but how would a classroom teacher do this to enhance his/her reading instruction? In a normal reading lesson, it is impossible to control the variable that reading selections contain strong sentence context. Reading instructors must accept that this variable cannot be controlled when commercially prepared reading programs are used. With some creativity, reading instructors could manipulate and modify their presentation of new reading vocabulary. Difficult words can be removed from the text and used in a series of five to eight weak context sentences. If a teacher understands the purpose and value of the different types of context, he/she could manipulate the type of context needed for a specific part of the reading instruction.

(ii) What order should the various types of context be presented in a reading lesson? A suggested order of vocabulary presentation could be as follows: Since both good and poor readers learned words best in the list condition, the new words in a reading selection could first be presented in isolation. Attention would then be drawn to the graphemic attributes of the words and the syntactic and semantic properties of the words could be explored. When these words are read in the strong sentence context of the reading lesson,

the instructor should make note which of the new words or any other words in the reading passage that presented difficulty to the reader(s). A follow-up to the reading lesson would be to take these troublesome words and place them in five to eight sentences of weak context to facilitate word learning. These words should then be returned to the strong sentence context to find out whether learning had transferred from one reading process to another.

(iii) Could computers be used effectively to time reading? Programs could be created and modelled on the experimental paradigm used in this study. New words and difficult-to-learn words could be reinforced in this way. Individualized computer print-outs would indicate reading times to the student and reading instructor. The advantage of this type of reading reinforcement is that it could be self-monitored or supervised through peer-tutoring. An editing component built into the program allows for demitting sentences in which vocabulary has been learned and for inserting additional sentences for new vocabulary. Sentences used in these programs can be taken from daily reading instruction or new sentences could be created to fit the needs of the program.

(iv) In what way does effective word-learning contribute to the literacy of the child? Effective word-learning is a vital component in the development of literacy. Literacy is the child's ability to read and write and is developmental by nature. Literacy begins when the child makes the connection between the spoken and the printed word. At this stage, the child is starting to build up a basic

sight-word vocabulary. During the next stage, developing literacy, the child becomes more competent with printed language while at the independent stage the child understands and practices the purposes for which he/she reads and/or writes.

The good and poor readers in this study were at different levels of the developing stage of literacy. To ensure that these readers will reach the independent stage of literacy, word-learning instruction should be centered around isolated word learning for the good readers, and for the poor readers word-learning instructions should be centered about weak sentences contexts and isolated word-learning. These were the best conditions for poor readers to focus their visual attention on the printed word. Words presented in strong sentence contexts will assist in reading fluency, and words were read faster in this condition than in the weak sentence or list conditions. Therefore, reading within a context helps to promote literacy.

Readers must not remain at the developmental stage of literacy or they will possess only a functional literacy. Readers at this stage can function in such everyday activities as reading signs, reading simple directions, and reading the daily newspaper. However, the ultimate goal of word-learning is to create independent readers.

Effective word-learning ensures literacy and gives the reader a feeling of self-worth and the endless wonders that reading can offer.

(v) How effective is practice in the learning of new words? Practice is effective in the learning of new words. It ensures that knowledge gained from word-learning techniques is transferred to the reading process. The results of this study indicated that practice effects were different for each of the subject populations. Extended practice resulted in faster responding and accuracy in word identification. Words practised in isolation were learned better by both the good and poor readers. There was a greater improvement in word-learning over repeated trials when words were presented in isolation. The poor readers also learned words equally well when words were repeated in weak sentence context which facilitated word-learning over repeated trials. Practice reading words in strong sentence contexts contributed to faster reading for both subject groups. Therefore, reading practice using words in strong sentence contexts should be used only to reinforce word learning after the new vocabulary has been presented as isolated words or in sentences of weak context structure.

The responses to the issues raised and discussed, reflect the research and conclusions of this study.

Implications for Research

This study supports both the contextual and word isolation approaches to word learning. Extended research based on the present study is needed to determine the following: The target words used in the strong sentence condition should also have been presented in the weak sentence condition and list condition. This would have determined whether the reader had accurately identified the target

word and was able to recognize the word both in and out of context. While context provides important cues for word identification, it is important to determine whether the reader can recognize the same word when it is presented in isolation. If the reader does not attend to the visual stimuli of the word when he/she reads it, he/she may not have learned to read the word accurately. Words learned in isolation should also be tested in context.

Testing target words in all conditions would determine if learning had been transferred from one learning process to another.

Limitations of Study

This study examines the effectiveness of context on the acquisition of new vocabulary of good and poor readers. The results indicate that learning did occur for both the good and poor readers in the three types of context presented in the test conditions. However, it becomes apparent from the study that several limitations should be mentioned.

The first limitation concerns the subject population. The number of boys and girls within the subject populations could have been more balanced. A total of seventeen boys and eleven girls participated in the testing program. Within the subject groups, the poor readers totalled twelve boys and two girls while within the good readers' group five boys and nine girls made up the subject population. There could have been a more even spread of girls within the subject population. It is a well-known fact that boys of the age of the boys in this study have more difficulty with fine motor control than girls of a similar age do. Therefore, it would

seem advisable to have a better division between the subject population to control for this type of behaviour.

Other possible limitations concern the use of the computer. The design of the experiment made for a monotonous bar-pressing procedure which lasted for approximately fifteen-twenty minutes per testing session. An incentive, such as an airplane flying along with each word as it appears on the computer monitor could be built into the testing program. This would increase the subjects' motivation and assist them to attend to task and prevent careless bar-pressing operation. Perhaps a time-frame could be built into the testing program to vary the time limit of each subject group. The poor readers could possibly be given a longer to read the garget word while the good readers would be allowed less time. The present study did not place any time limits on either subject groups to read the target words.

While these limitations do not affect the overall results of this study, their elimination would make for a more refined study.

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APPENDIX I

Example of a student's individualized testing program.

Poor Reader

1. Strong Sentence Condition:

   Target words: music, rain, whistle - 15 examples for each word.

   (a) The band is playing music for the parade.

   (b) Take an umbrella when it rains.

   (c) The train blows its whistle to warn us of danger.

2. Weak Sentence Condition:

   Target words; hike, flash, sprinkle - 15 examples for each word.

   (a) A hike can be fun.

   (b) A flash lit up the sky.

   (c) I will sprinkle all day.

3. List Condition:

   Target words: breakfast, dress, scare - 15 examples for each word group.

   (a) breakfast, brother, kitten, children, father.

   (b) here, back, dress, down, baby.

   (c) nurse, warm, seem, scare, race.

Good Reader:

1. Strong Context Condition:

   Target words; devour, inundate, accouterment - 15 examples for each word group.

   (a) The cat will devour the mouse.

   (b) The rains we've had lately inundated the alley.

   (c) She had a camera, a guidebook and all the accouterments of a tourist.

2. Weak Context Condition:

   Target words; saunter, millennium, foliage - 15 examples for each word.

   (a) A millennium is a long time.

   (b) Mother saunters downtown.

   (c) The sun cannot shine through the foliage.

3. List Condition:

   Target words; rapture, marsupial, canine - 15 examples for each word group.

   (a) writing, separate, stronger, captain, rapture.

   (b) courage, opponent, marsupial, subject, writing

   (c) circus, canine, answer, cream, season.

APPENDIX II

Random Order of Testing:

	1st Testing	2nd Testing	3rd Testing
Child I	Strong Sentence Condition	Weak Sentence Condition	List Condition
Child II	Weak Sentence Condition	List Condition	Strong Sentence Condition
Child III	List Condition	Strong Sentence Condition	Weak Sentence Condition

Children (IV, V, VI), (VII, VIII, IX) etc; followed the above order until all testing was completed.