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ABSTRACT

This study was designed to investigate the differences in effectiveness in teaching sight words to kindergarten children by using words only (no-picture group), words and simple pictures (simple-picture group), and words and complex pictures (complex-picture group). The subjects were 30 kindergarten children selected from two kindergarten classes. The children were randomly assigned to one of three experimental groups: ten children to the no-picture group, ten to the simple-picture group, and ten to the complex-picture group. A pretest was given to insure that the subjects could not read the four sight words used in the experiment. Comparisons were made of the mean number of correct responses during acquisition, test trials, and retention trials for the three treatment groups. During acquisition, significant mean differences among the training groups favored the picture groups, with simple-picture group scores significantly higher than either of the other groups. During both test and retention trials, non-significant differences favored the no-picture group. It was concluded that the use of pictures did not distract children from learning sight words. Pictures were facilitative in teaching sight words, especially those which began with the same consonant. (Author/WR)

THE EFFECT OF PICTURES ON THE ACQUISITION AND RETENTION OF SIGHT WORDS

A THESIS

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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The use of pictures to teach beginning reading is a common practice. Almost all primary basal reading series include many illustrations. Many teachers encourage the beginning reader to "look at the picture" when identifying new words. However, there is considerable controversy over the effect of pictures on learning to read.

Background of the Problem

Historically, pictures have been included in children's reading books. In seventeenth-century Europe, Comenius introduced the first illustrated textbooks in the schools. His book, Orbis Sensualium Pictus, attempted to teach about the natural and social environment through the use of pictures and words. As early as 1729 in America, the New England Primer introduced the beginning reader to stories with pictures.

The practice of incorporating pictures in books flourished as book publishers seemed to include more and more illustrations. Colorful pictures and photographs replaced earlier simple black-and-white drawings. Surprisingly enough, a fairly new beginning reading series

called Let's Read by Bloomfield and Barnhart (1963, in King & Muehl, 1965), innovated primary readers without any pictures.

Because of the extensive use of pictures in teaching reading, researchers have become concerned about the effect of pictures on acquiring a sight vocabulary. Since pictures are predominant in beginning reading materials, there are many arguments for and against the value of using pictures in teaching a child how to read.

The advocates of pictures suggested that pictures were helpful to introduce characters, to provide clues for new words, and to explain difficult concepts (Miller, 1938). As Russell (1961) pointed out, picture cards ". . . may be used many times until recognition of the word symbols is possible . . . [in King & Muehl, 1965, p. 163]."

By setting the background of a story, pictures may also develop a positive attitude towards reading in the young reader (Samuels, 1970). One group of investigators, Herman, Broussard, and Todd (1951, in Jenkins, Neale, & Deno, 1967), reported that pictures were learned faster than words. Favoring the use of pictures in reading, Smith (1963) stressed that pictures ". . . offer the child valuable assistance in making the transition from recognizing an object and naming it to recognizing a symbol

which stands for the object . . . [p. 168]."

Contrary to these views, some researchers have condemned the use of pictures because ". . . a picture may in fact present clues that tend to detract from or to contradict verbal descriptions [Otto, 1964, p. 246]." In addition, Braun (1969) and Samuels (1970) found that pictures tended to compete with words for the reader's attention. Concluding that too much emphasis is placed on pictures in reading primers, Dechant (1964) felt that reading became an exercise in picture reading rather than in identification and understanding of the word.

A study by Samuels (1967) sought to determine the effect of pictures on the acquisition of reading responses. Comparing responses from kindergarteners who saw pictures with words and those who saw words only, he found that the picture groups learned more words initially but the words-only group recognized more words upon subsequent testing. Samuels concluded that pictures were distracting stimuli that interfered with learning to read new words. He felt that distracting stimuli which competed for the reader's attention hindered the conditioning process of learning to read.

In their effort to analyze the reading process as a conditioning process, Anderson and Dearborn (in Barbe, 1965) stated that the reading process was a simple

associative learning process where the association was ". . . between the sight of the word and the child's response to the sound of it [p. 12]." They adapted the classical conditioning model of the Russian physiologist, Pavlov, to explain the "look-and-say" method of learning to read. As depicted in Figure 1, first the child was shown the word and it was pronounced for him. After repeated showings of the word, the response to the sound of the word became associated with the sight of the word. Soon, the stimulus of saying the word was omitted and the sight of the word alone elicited the correct response. Using this conditioning model, the sound of the word was considered the old or unconditioned stimulus while the sight of the word was the new or conditioned stimulus.

Anderson and Dearborn (in Barbe, 1965, p. 19) also discussed the "sight" or word-picture method of learning to read. As shown in Figure 2, a word was presented with an appropriate picture. The child associated his response to the picture with the appearance of the word. Using this conditioning model, the picture was considered the old or unconditioned stimulus while the sight of the word was the new or conditioned stimulus. Although Anderson and Dearborn tended to favor the word-picture approach, they were aware that a child may misname a picture as each picture conjured up several responses.

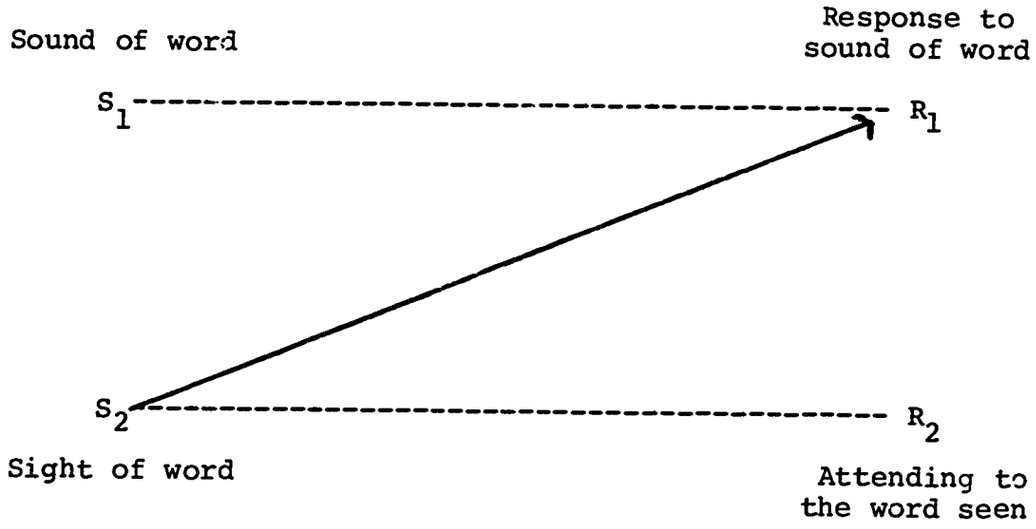


Fig. 1. Classical conditioning model used by Anderson and Dearborn (Barbe, 1965, p. 13) to explain the "look-and-say" method of reading.

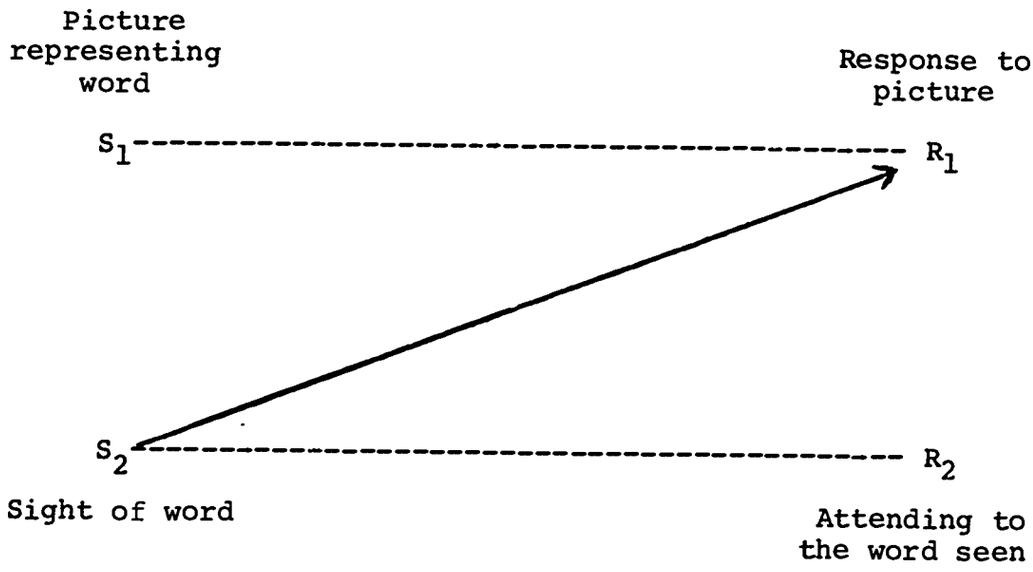


Fig. 2. Classical conditioning model used by Anderson and Dearborn (Barbe, 1965, p. 19) to explain the "sight" or word-picture method of reading.

In consideration of these conditioning models, the present investigator attempted to apply the conditioning process to the teaching of sight words. Using words and pictures, the present study was an effort to look at the stimulus-response interaction in the process of learning how to read.

Statement of the Problem

The present study was designed to replicate and extend Samuels' (1967) study.

Specifically, the following questions were explored:

1. When words and pictures are presented together, do pictures act as distracting or facilitating stimuli in the acquisition of sight words?

2. Does the use of pictures help or hinder in the retention of sight words after a delayed time period?

Hypotheses

Hypothesis 1. During acquisition trials, the use of pictures will produce significantly more correct reading responses than the use of words alone.

Hypothesis 2. During test trials, the use of pictures will produce significantly more correct reading responses than the use of words alone.

Hypothesis 3. After a delayed time period, the

picture groups will retain significantly more correct reading responses than the no-picture group.

Definition of Terms

For purposes of this study, the following definitions of terms were applied (listed in alphabetical order):

Acquisition. Acquisition referred to the stage in learning during which a new response was learned and gradually strengthened through repeated trials.

Classical conditioning. Classical conditioning referred to the experimental procedure used by Pavlov in which a conditioned stimulus was paired with an unconditioned stimulus (i.e., the pairing of a word with a picture).

Conditioned response. The response which was evoked by the conditioned stimulus after conditioning had taken place (i.e., the child's reading response to the printed word).

Conditioned stimulus. A stimulus, which when paired with an unconditioned stimulus, acquired the capacity to evoke a response similar to the one made to the unconditioned stimulus (i.e., a word, after being paired with a picture, was capable of eliciting a response to the word).

Conditioning. An experimental procedure in which

stimulus-response associations can be formed, strengthened, and weakened.

Feedback. If a correct reading response was not given within the four seconds of the acquisition trial, the investigator supplied the correct response as feedback for the reader.

Latent learning. Latent learning referred to that learning which may have taken place in the acquisition trials but did not manifest itself until subsequent test or retention trials.

Response. A response referred to an instance of observable behavior (i.e., a child's reading response to a word).

Retention. Retention referred to the number of previously learned words that were remembered after a delayed time period.

Sight vocabulary. A sight vocabulary is composed of those words which can be recognized immediately within or out of context and without need for word analysis. The sight words used in this study were included in Dolch's (1950, p. 269) list of 95 common nouns.

Stimuli. The stimuli were those pictures and words which created an occasion for a reading response.

Unconditioned response. The unconditioned response referred to the response that was made to the

unconditioned stimulus in classical conditioning (i.e., the child's response to the picture).

Unconditioned stimulus. The unconditioned stimulus referred to the stimulus that elicited the unconditioned response in classical conditioning (i.e., the picture).

Importance of the Study

In light of the diverse viewpoints about words and pictures, it became apparent that there was a need for further investigation about the effect of pictures in beginning reading.

Schoolchildren are achieving varying degrees of success in learning to read by the application of a variety of educational methods. However, teachers are still concerned about which method yields the best results. One method used is the association of pictures with words to help children in acquiring reading responses to printed words. By pairing words with appropriate pictures, teachers wonder if the child will make the necessary associations in order to respond to the words when seen alone. They question if these associations will be strong enough to be reflected in later recognition of the same words. Also, teachers wonder about the practicality of time and money spent in finding the appropriate pictures to pair with words. In a world that is so visually and pictorially

oriented, these questions have educational importance for the child who is learning to read.

Despite the fact that pictures are frequently used in the teaching of sight words, Samuels (1967, 1970) questioned the efficacy of such an approach. Therefore, because of the theoretical and practical importance of the relationship between words and pictures, a replication and extension of Samuels' (1967) study was undertaken. An examination of both the original acquisition and subsequent retention of reading responses were key issues in the process of learning to read sight words.

CHAPTER II

REVIEW OF THE LITERATURE

A survey of the pertinent literature revealed important background issues on the question of pictures in beginning reading:

1. Word stimuli and picture stimuli elicited different responses.

2. Picture stimuli were more easily remembered than word stimuli.

3. Different modes of presentation affected reading responses.

The following studies attempted to relate these issues to teaching a sight vocabulary.

Working with 125 adults, Otto (1964) investigated the differences in the kinds of responses given to verbal and pictorial representations of nouns. Seeing pictures flashed on a screen, the adults responded by writing a word to describe their "sense-impression" to each picture. Responses were categorized and compared with responses to word stimuli, previously compiled by Underwood and Richardson (1956a, in Otto, 1964). Otto observed that the picture of an object and the word-name of the same object may

elicit different responses. Specifically, color and size responses tended to be more prevalent with word stimuli while tactile responses were consistently more prevalent with picture stimuli. For example, the word "apple" tended to elicit the response "red" more often than did the picture. Also, the picture "teeth" tended to elicit the response "sharp" more often than did the word. Therefore, Otto suggested that certain kinds of concepts may be taught more readily from pictures while other kinds of concepts may be taught best with words.

Similarly, Reynolds and Palmatier (1969) found that the mode of presentation of a stimulus affected reading responses. Using 60 black illiterate adults, they compared responses to auditory, pictorial, and verbal stimuli for 20 words. Correlations of the frequency of responses to the words in the three modes were positive but low, and significant at the .005 level. Being the most abstract stimuli, the words tended to elicit the most unique responses. Therefore, Reynolds and Palmatier suggested that such responses may need to depend on another mode (pictures) to give meaning to the stimuli.

Also, as Jenkins et al. (1967) pointed out from their study with 120 college sophomores, pictures were remembered more easily than words. They attributed their results to their observation that pictures have distinctive

cues which distinguish them from other pictures. Words have fewer cues to make them distinguishable from other words.

Generally, most of the literature dealing with the use of pictures in reading could be divided into two major areas: (1) those studies which were concerned about the effect of pictures on acquisition of a sight vocabulary, and (2) those studies which considered the effect of pictures on comprehension of textual material.

The Effect of Pictures on Acquisition of Sight Vocabulary

According to Samuels (1967), when pictures and words were presented together, the pictures acted as distracting stimuli to interfere with reading responses. He randomly assigned 30 kindergarten children to three experimental groups in which they were to learn four sight words (boy, bed, man, car). For learning trials in the no-picture group, a word was presented without a picture For learning trials in the simple-picture group, a word plus a black-and-white drawing of the word was presented. And for learning trials in the complex-picture group, a word in addition to a colored illustration was shown. Ten acquisition trials were alternated with 10 test trials for each word. If a child did not give the appropriate response within four seconds, Samuels told him the word

during acquisition trials. However, on test trials, no pictures were shown and no feedback was given for all three groups.

Examining the mean responses for the three groups, Samuels found that on acquisition trials, the highest number of correct responses was given by the simple-picture group. However, on test trials, the children in the no-picture group gave significantly more correct responses. Samuels attributed his findings to the fact that the no-picture group was not distracted by the incidental cues in the pictures.

Using 240 low socioeconomic kindergarten children, Harris (1967) studied the rate of acquisition and retention of interest-loaded words. The children were randomly assigned to two methods: visual-auditory (no picture) and visual-visual auditory (picture) methods. Four sight words were to be learned as acquisition and test trials were alternated. Harris reported no significant differences in acquisition between the two groups, although he found generally higher acquisition scores for the no-picture group. Upon testing for retention of the acquired words 24 hours later, Harris concluded that the retention of the words learned was independent of the mode of presentation. Only the acquisition seemed to be influenced by the way in which words were presented.

In a replication of Harris' study, Braun (1969) observed significant mean differences in acquisition scores, favoring the no picture group. Both boys and girls showed these differences. However, upon retention, differences in mean scores showed significance for boys only in the no-picture group. Therefore, the researcher suggested that the kind of stimulus for retention tests may be more important in boys than in girls. Judging by his findings, Braun stressed that pictures may be distracting stimuli in the acquisition of sight words (especially for low ability groups).

Another effort to determine the use of pictures for teaching a sight vocabulary was Duell's comparison (1968) of prompted and unprompted training methods. When a word was prompted, it was paired with a picture representing the word. When a word was unprompted, it appeared alone. In the prompted method, the children had to match a word and its picture with an identical word and picture. But in the unprompted method, the children matched a word and a picture with a word only. Training 80 kindergarteners individually, the experimenter found the mean percents of correct responses in the unprompted training sequences superior to the prompted training sequences. Evidence from recall and matching posttests indicated that 40% of the words were learned in the unprompted training group as

compared with 11% in the prompted group. Duell stressed the advantage of the unprompted method as it forced the child to concentrate on cues (words) rather than to depend on prompts (pictures).

Most of the studies cited have been concerned with the idea that pictures interfered with the learning and retention of sight words. However, King and Muehl (1965) demonstrated that pictures were effective in learning to read words that were similar. Attempting to compare the outcome of using different sensory cues, they randomly assigned 210 kindergarteners to five training procedures (word and picture; auditory; picture and auditory; auditory and echoic response; and picture and auditory and echoic response). Each method was applied with similar words (doll, bell, ball, bowl) and dissimilar words (gate, drum, nest, fork).

Analyzing their results, King and Muehl found that:

1. There was a significant relationship ($p < .05$) between the kind of word and the training method. The picture method facilitated the learning of similar words; the auditory method facilitated the learning of dissimilar words.

2. There was a significant difference in the mean number of correct responses between kinds of words

($p < .001$). Fewer correct responses were made for similar words, thereby indicating that the use of pictures might increase the number of correct responses.

3. Pictures had neither a positive nor negative effect on learning words that were dissimilar.

In view of their findings, the researchers advised that pictures continue to be used in teaching sight words and in beginning reading books. They suggested that since so many words look similar to the new reader, pictures may be a necessary aid for learning and retaining new words.

The Effect of Pictures on Comprehension of Textual Material

Various studies have been conducted to determine the value of pictures in the comprehension of textual material. Some investigators contended that pictures were necessary for understanding of a story as the pictures increased the reader's ability to comprehend the story. Others claimed that pictures acted as interference in that they shifted attention away from the text.

Miller (1938) explored the problem of whether children who read a basal reader with illustrations would have greater comprehension than children who read the same reader without pictures. Working with 600 first-, second-, and third-graders, the researcher arranged them in equal ability groups based on scores

obtained on the Gates Primary Reading Test and the Stanford Achievement Test for Primary Grades. After reading the stories, both picture and non-picture groups were given posttests involving completion of sentences, sequencing of events, selecting key phrases, etc.

By analyzing posttest results, Miller (1938) found no significant differences in comprehension of those who read stories with pictures and those who read stories without pictures. He summarized his results by stating:

1. "Data not given here show that, of eighteen possible chances for statistically significant gains, the picture group made ten such gains and the non-picture group made twelve [p. 679]."

2. The absence of pictures did not cause the children to read with less comprehension than their indicated ability.

Miller concluded that the use of pictures may not be necessary for the comprehension of textual materials; however, the use of pictures may enhance interest in the materials.

In a series of more recent experiments, Vernon (1953) found that the use of pictures had neither a positive nor negative effect upon the understanding and recall of verbal material. Working with adolescents, she compared the number of details remembered immediately after

reading stories with pictures and without pictures. Boys who saw pictures seemed to score slightly higher than those who saw the text only. Five major details in the text directly illustrated by pictures were remembered significantly better than the same five details unillustrated by pictures. Vernon (1954) also discovered a slight tendency for isolated facts to be recalled better when represented by pictures, although she found no significant differences between the average number of items remembered by the picture and non-picture groups.

Another effort to examine the value of pictures in increasing comprehension was Weintraub's study (1960). He organized second-graders into three experimental groups: those who saw pictures only, those who saw text only, and those who saw both pictures and text. He reported that those children who saw text only had the greatest comprehension of the basal reader stories presented. However, he noted that those children who saw both text and pictures understood the stories better than those who saw pictures only. Weintraub also indicated that poor readers comprehended more material with text only while good readers seemed to understand equally as much with text or with pictures and text.

Using oral reading with 234 ten-year-olds, Halbert (1943) found that significantly more relevant ideas (42%)

were remembered from a text with pictures than from a text alone (37%). Therefore, she advocated the use of pictures as she observed that, "To the extent that memory for ideas is a measure of comprehension, to that extent pictures contribute to the comprehension of reading materials [p. 57]."

Consequently, it was observed that although most investigators discovered no significant differences in comprehension when pictures were present, one investigator found that more relevant ideas were remembered from a story with pictures. Another experimenter found that poor readers understood more material with text only while good readers seemed to understand equally as much with text only or with pictures and text. This finding seemed to support the contention that pictures may have acted as interference for some children in the comprehension of textual materials.

The bulk of the research favored a no-picture situation for learning a sight vocabulary. Most of the investigators supported this contention with their belief that pictures were distracting stimuli. However, one pair of investigators found pictures to be facilitating stimuli in teaching similar sight words.

These varied results and opposing views discussed in the review of the literature provided valuable background for the present study. In light of the research

findings, the present investigator formulated a study to explore further the effect of pictures in the acquisition and retention of a sight vocabulary.

CHAPTER III

PROCEDURES

In order to find out whether pictures are distracting or facilitating stimuli in learning to read sight words, a replication of Samuels' study (1967) was undertaken. The materials were duplicated and procedures were followed precisely. In addition, a test of retention was included in the present study.

This chapter describes the subjects used in the study, the training and testing procedures that were followed, the pilot study conducted prior to the study, and the way in which the recorded data were statistically analyzed.

Subjects

The subjects were 30 kindergarten children selected from two kindergarten classes at the Grandview School in the township of Piscataway, New Jersey. Heterogeneously grouped, the children were in their last month of kindergarten and their ages ranged from 5.8 years to 6.7 years. They were white as less than 1% of the 775 students in the school are black. According to the 1960 census, the median income for Piscataway was $7,124 as

compared to the county median income of $7,054.

The 30 subjects were chosen if they could not read any of the words presented in the pretest; then they were randomly assigned to one of three experimental groups. Ten children were randomly assigned to the no-picture group, 10 to the simple-picture group, and 10 to the complex-picture group.

Materials

The pretest materials consisted of four 5 x 8 inch unlined index cards with the word "boy," "bed," "man," or "car" typed on them.

The warm-up materials consisted of 12 5 x 8 inch unlined index cards with nonsense figures drawn on them. Only one figure was drawn on each card. The figures represented the numerals 1, 2, 3, and 4.

The acquisition materials consisted of 120 5 x 8 inch unlined index cards with the words boy, bed, man, or car typed at the bottom of each card. Only one word was typed on each card. Using the same four words, each of the three training groups had 40 acquisition cards.

For acquisition trials in the no-picture group, there was a word at the bottom of each card but no picture was present.

For acquisition trials in the simple-picture group, there was a simple black-and-white picture from a reading

primer, representing the word at the bottom of the card.

For acquisition trials in the complex-picture group, there was a colored picture representing the word at the bottom of the card. Clipped from a basal reading primer, the pictures were complex because they represented the word within a scene which included several other objects; in the simple-picture group, the word was depicted by an isolated object.

The test materials consisted of 120 5 x 8 inch unlined index cards with the words boy, bed, man, or car typed at the bottom of each card. One word was presented on each card and no pictures were used to represent the words in any of the three training groups. Using the same four words, each of the three training groups had 40 test cards.

The retention materials consisted of 40 5 x 8 inch unlined index cards with the words boy, bed́, man, or car typed at the bottom of each card. In testing for retention, one word was presented on each card and no pictures were used to represent the words for any of the three training groups.

A primary typewriter was used to type one lower case word on each card used in the experiment.

Pretest Procedures

A pretest was given to each child individually in order to eliminate those children who could already read the words used in the experiment. The investigator introduced the pretest by saying, "Today we are going to play a game. In this game, we are going to learn some words. First let us see if you already know what the names of the words are." The investigator showed the four words to each child; if he could read any of the words, he was not included as a subject in the training procedures.

Training Procedures

Warm-up trials. After the pretest, a warm-up task was given to each child to familiarize him with the training procedures. The investigator introduced the warm-up trials by saying, "Before we learn the new words, let us practice on some numbers. I will show you a card with a funny-looking number on it and I want you to tell me what the number is. If you don't know the number's name, I will tell you what it is. You should try to tell me what the number is before I tell you. Do you understand what we are to do? All right? Then what do you do when I show you a card with a number on it?"

Each card was shown to a child for four seconds. If he did not correctly identify the numeral within the allotted time, the investigator told him the numeral.

Each child was given three warm-up trials per numeral, for a total of 12 warm-up trials. The cards were randomly alternated as they were presented and the responses were recorded on a data sheet.

Acquisition trials. After the warm-up trials, the acquisition trials began. Working with each child individually, the investigator introduced the training procedure by saying, "All right, let us see how we can learn the new words. I will show you a card with a word on it and I want you to tell me what the word's name is. If you don't know the word's name the first time you see it, I'll tell you. You should try to tell me the name before I tell you. The second time you see the word, try to read the word's name to me. If you don't know the word's name, I will not tell you. Do you understand?"

Each card was presented for four seconds. If the child did not correctly identify the word within the allotted time, the investigator said the correct response as feedback for the child. For acquisition trials, a correct response was recorded on a data sheet if the child said the word before the investigator gave feedback.

Testing Procedures

Test trials. Throughout the experiment, each acquisition trial was alternated with a test trial on the same word. In the test trials, the test card was presented

for four seconds. If the child did not correctly identify the word within the allotted time, no feedback was given by the investigator. Words only were represented on the test cards for all three groups. Each child received 10 acquisition trials and 10 test trials per word; therefore, a total of 40 acquisition trials and 40 test trials were given for each child. All responses were recorded on a data sheet.

Retention trials. In an attempt to extend Samuels' study (1967), the investigator added a retention trial to the procedures. Brackbill, Wagner, and Wilson, and Sassenrath and Yonge (in More, 1969) had indicated that a greater amount of retention was discovered after a delayed time period. Also, as More (1969) contended, ". . . retention of what is learned is a primary objective of instruction and testing [p. 341]." Therefore, after each child had received 40 acquisition trials and 40 test trials for the four words, he was retested for retention of the words learned. For retention trials, 40 cards without pictures were used and the test procedures were followed again.

The retention trials were conducted in the following way:

One child received 12 warm-up trials, 40 acquisition trials, and 40 test trials in approximately 10 minutes. He then played with some toys in an adjoining room

as another child entered the testing room. The second child received 12 warm-up trials, 40 acquisition trials, and 40 test trials in the next 10 minutes. Afterwards, he joined the first child to play with the toys. Then, the third child entered the testing room and received 12 warm-up trials, 40 acquisition trials, and 40 test trials within the next 10 minutes.

Then, the first child reentered the testing room and received 40 retention trials within approximately 5 minutes. He returned to the playroom. The investigator allowed another 5-minute interval to elapse so that each child would be retested after an equal amount of time. The second child reentered the testing room and received 40 retention trials within approximately 5 minutes. He, too, returned to the playroom as another 5-minute interval elapsed. Finally, the third child reentered the testing room and received 40 retention trials in approximately 5 minutes. The investigator escorted the three children to their classroom and randomly selected three more subjects. This procedure was repeated until all 30 children were retested for retention of the words learned. Thus, each child was tested for his retention of the words he acquired after an approximate 20-minute interval.

The experiment was conducted in a 3-day period in which 10 children were trained and retested for retention per day.

Pilot Study

Prior to this investigation, a pilot study was conducted for one day in the Grandview School in Piscataway, New Jersey. Originally, nine kindergarten children were randomly selected to participate in the pilot study; however, one girl was eliminated as she was non-English-speaking. Therefore, a total of eight children participated: three children were assigned to the no-picture group, three to the complex-picture group, and two to the simple-picture group.

The materials used were the same as in the final experiment. Except for minor differences in the warm-up trials and the retention trials, the same training and testing procedures were followed. In the pilot study, 24 warm-up trials were given to each child; however, this proved to be unnecessarily too many to familiarize the children with the learning task. Therefore, only 12 warm-up trials were given to each child in the final study. In the pilot study, a 10-minute interval was allowed for retention. However, the results seemed to indicate that so short an interval showed little differentiation of retention scores among the three groups. Thus, a 20-minute interval was used for retention in the final experiment.

The results of the pilot study are represented in

Table 1. Examination of Table 1 reveals that on acquisition trials the mean number of correct responses for the no-picture group was 26.7, for the simple-picture group it was 40, and for the complex-picture group it was 37.7. Comparing the simple-picture group to the no-picture group during acquisition, the children in the simple-picture group gave more correct responses. Comparing the complex-picture group to the no-picture group, the children in the complex-picture group gave more correct responses. The children in the simple-picture group gave more correct responses than children in either the no-picture or the complex-picture groups.

On the test trials, where pictures were eliminated for the three groups, the no-picture group gave more correct responses than the other two groups. As seen in Table 1, the mean number of correct responses on test trials for the no-picture group was 35.3, for the simple-picture group it was 29.5, and for the complex-picture group it was 30.2. Comparing the simple-picture to the no-picture group on test trials, the children in the no-picture group recognized more words. Comparing the complex-picture group to the no-picture group, the children in the no-picture group recognized more words.

On the retention trials, in which pictures were eliminated for all three groups, the children in the

TABLE 1

MEAN SCORES OF THREE TRAINING GROUPS ON ACQUISITION, TEST, AND RETENTION TRIALS IN PILOT STUDY

	No-picture		Simple-picture		Complex-picture	
	N	Mean	N	Mean	N	Mean
Acquisition	3	26.7	2	40.0	3	37.7
Test	3	35.3	2	29.5	3	30.2
Retention	3	39.0	2	38.0	3	33.3

no-picture group remembered more words than the children in the other two groups. Table 1 shows that the mean number of correct responses given by the no-picture group was 39, for the simple-picture group it was 38, and for the complex-picture group it was 33.3. Comparing the simple-picture group to the no-picture group for retention of the words learned, the children in the no-picture group remembered more words. Comparing the complex-picture group to the no-picture group, the children in the no-picture group remembered more words. On retention trials, the children in the no-picture group remembered more words than children in either of the other groups.

The results of the pilot study seemed to confirm Hypothesis 1 as stated in Chapter I; during acquisition trials, the use of pictures produced more correct reading responses than the use of words alone. The results also paralleled the results obtained during acquisition and test trials conducted by Samuels (1967); during acquisition, the simple-picture group learned more words than either of the other groups and during test trials, the no-picture group remembered more words than either of the other groups. However, the results of the pilot study were not tested for statistical significance as the number of subjects in each group was too small to determine statistical significance.

As Samuels did not retest the groups for retention of the words learned, the results of the retention trials in the pilot study added a new dimension to the problem. The results seemed to indicate that the no-picture group surpassed the other two groups in remembering more words after a delayed time period.

Analysis of Data

Experimental design. The experimental design was the pretest-posttest randomized three group design (Campbell & Stanley, 1963) that is illustrated in Figure 3. The comparisons were among Experimental Group 1, the no-picture group, Experimental Group 2, the simple-picture group, and Experimental Group 3, the complex-picture group.

Statistical analysis. The major statistical analysis was concerned with comparisons of the mean number of correct responses among the three training groups. Separate analyses were computed for responses during acquisition trials, test trials, and retention trials. Statistical significance was evaluated by the *t* test to measure the differences among the mean scores of the groups.

For acquisition trials, *t* tests were used to compare mean scores between the no-picture group and the simple-picture group, between the no-picture group and the complex-picture group, and between the simple-picture group and the complex-picture group.

	Pretest	Training	Test	Posttest
No-picture	O	X_1	O	O
Simple-picture	O	X_2	O	O
Complex-picture	O	X_3	O	O

O = Observation (pretest, test, and retential trials).

X = Treatment (acquisition trials).

Source: D. T. Campbell and J. C. Stanley. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally, 1963.

Fig. 3. Research design.

For test trials, t tests were used to compare mean scores between the no-picture group and the simple-picture group, between the no-picture group and the complex-picture group, and between the simple-picture group and the complex-picture group.

For retention trials, t tests were used to compare mean scores between the no-picture group and the simple-picture group, between the no-picture group and the complex-picture group, and between the simple-picture group and the complex-picture group.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter presents an analysis of the data obtained in the present study in view of the questions raised in Chapter I. A discussion of these results and an analysis of the conditioning procedures used, including a comparison of the results with the findings of similar studies, will also be given in this chapter.

Acquisition Trials

The mean acquisition scores obtained by Samuels (1967) were compared with the mean acquisition scores obtained in the present study. Table 2 shows the mean number of correct acquisition responses for each of the three groups in both studies. As Table 2 indicates, for the no-picture group Samuels obtained a mean score of 25.3; the present investigator obtained a mean score of 25.6. For the simple-picture group, Samuels obtained a mean score of 39.4; the present investigator obtained a mean score of 39.9. For the complex-picture group, Samuels obtained a mean score of 36.9 while the present investigator obtained a mean score of 38.1. The high level of accuracy of replication shown in Table 2

TABLE 2

COMPARISON BETWEEN MEAN ACQUISITION SCORES OBTAINED IN SAMUELS' (1967) STUDY AND MEAN ACQUISITION SCORES OBTAINED IN PRESENT REPLICATION STUDY

Treatment	Mean acquisition scores		Accuracy of replication
	Samuels (1967)	Present study	
No-picture	25.3	25.6	98.8%
Simple-picture	39.4	39.9	98.7%
Complex-picture	36.9	38.1	96.9%

indicated that the rate of acquisition within the three groups could be considered stable when the conditions and procedures of the original study were followed.

The main question was concerned with which training group, the no-picture, simple-picture, or complex-picture group produced more correct reading responses in the acquisition of the four sight words.

The results of the acquisition trials for the three training groups are presented in Table 3. Table 3 reveals that on acquisition trials, the mean number of correct responses for the no-picture group was 25.6, for the simple-picture group was 39.9, and for the complex-picture group was 38.1. As noted in Table 3, mean differences favored the simple-picture condition in the acquisition of the four sight words. A t test of mean scores indicated that in comparing the simple-picture group to the no-picture group during acquisition, children in the simple-picture group gave significantly more correct responses ($t = 5.799$, $df = 18$, $p < .001$). Comparing the simple-picture group to the complex-picture group, children in the simple-picture group gave significantly more correct responses ($t = 7.095$, $df = 18$, $p < .001$). Also, a comparison between the complex-picture group and the no-picture group showed that children in the complex-picture group gave significantly more correct responses

TABLE 3

ACQUISITION, TEST, AND RETENTION MEAN SCORES OBTAINED BY NO-PICTURE, SIMPLE-PICTURE, AND COMPLEX-PICTURE GROUPS

	No-picture			Simple-picture			Complex-picture		
	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.
Acquisition	10	25.6	7.79	10	39.9	0.32	10	38.1	0.74
Test	10	38.6	1.71	10	36.9	4.23	10	35.9	4.86
Retention	10	32.5	7.44	10	26.7	8.42	10	31.3	9.08

($t = 5.051$, $df = 18$, $p < .001$). Therefore, it can be seen that the simple-picture group acquired a significantly greater number of correct responses than either the no-picture group or the complex-picture group. Similarly, the complex-picture group acquired a significantly greater number of correct responses than the no-picture group.

Test Trials

The main question was concerned with which training group, the no-picture, simple-picture, or complex-picture group, produced more correct reading responses in the test of the four sight words.

The results of the test trials for the no-picture group, simple-picture group, and complex-picture group are presented in Table 3. Table 3 indicates that, on test trials, the mean number of correct responses for the no-picture group was 38.6, for the simple-picture group was 36.9, and for the complex-picture group was 35.9. The mean differences slightly favored the no-picture condition in the testing of the four sight words. However, these mean scores were tested for significance with the t test and no significant differences were found among the three groups on test trials. This result was contrary to Samuels' (1967) finding that on test trials, the no-picture group gave significantly more correct responses than either the simple-picture group or the complex-picture group.

Therefore, the test results obtained in the present study were surprising for various reasons:

1. The test trials were alternated with the acquisition trials. Since significant differences were found for the acquisition trials, it was expected that significant differences would be reflected in the test trials as well.

2. Since the acquisition trials produced a high degree of accuracy of replication with Samuels' (1967) study, it was expected that the test trials would also display a high degree of accuracy of replication.

3. As Table 4 reveals, large discrepancies existed between the mean test scores obtained in Samuels' study and those obtained in the present study.

The investigator was unable to offer any possible explanation for the large discrepancies between Samuels' test results and those of the present study. However, further analysis of the test trial data will be presented in Figure 4.

Retention Trials

The major question under consideration was which training group, no-picture, simple-picture, or complex-picture group yielded more correct reading responses upon testing for retention of the four sight words.

Table 3 indicates the results of the retention

TABLE 4

COMPARISON BETWEEN MEAN TEST SCORES OBTAINED IN SAMUELS' (1967) STUDY WITH MEAN TEST SCORES OBTAINED IN PRESENT REPLICATION STUDY

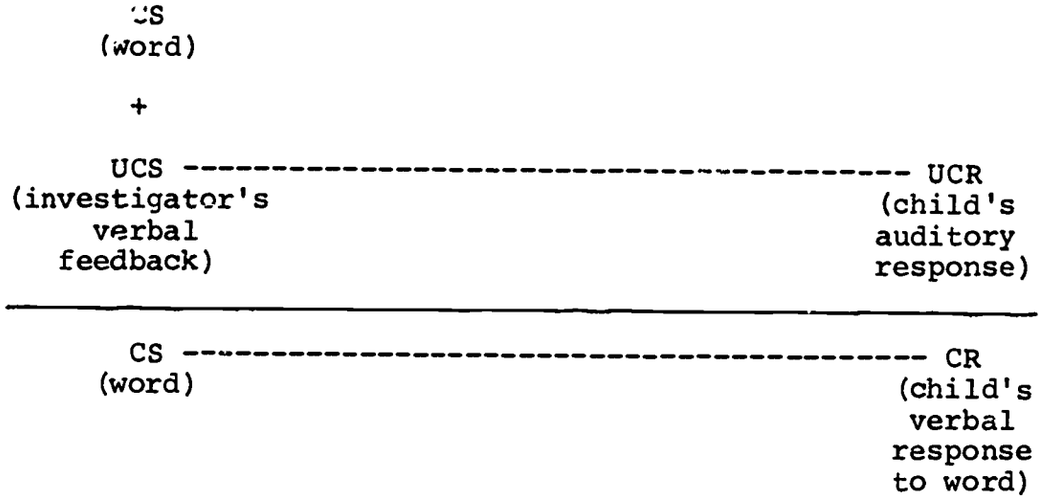
Treatment	Mean test scores		Accuracy of replication
	Samuels (1967)	Present study	
No-picture	19.2	38.6	+201%
Simple-picture	11.3	36.9	+327%
Complex-picture	11.6	35.9	+309%

trials for the no-picture, simple-picture, and complex-picture groups. As depicted in Table 3, on retention trials, the mean number of correct responses for the no-picture group was 32.5, for the simple-picture group it was 26.7, and for the complex-picture group it was 31.3. The mean differences slightly favored the no-picture condition in the retention of the four sight words. However, the t test revealed no significant differences among the three groups on the retention trials.

Analysis of the Conditioning Procedures Used

The investigator analyzed the present study in conditioning terms. Using the three experimental groups (no-picture, simple-picture, and complex-picture groups), the investigator viewed the process of learning to read sight words as a stimulus-response interaction. Essentially, the procedure called for the acquisition trials in the no-picture group to occur in response to the printed word alone, while the acquisition trials for the two picture groups occurred in response to a compound stimulus condition consisting of a picture and a printed word.

As seen in Figure 4, for the no-picture group, the conditioned stimulus was the printed word; the unconditioned stimulus was the investigator's verbal feedback of



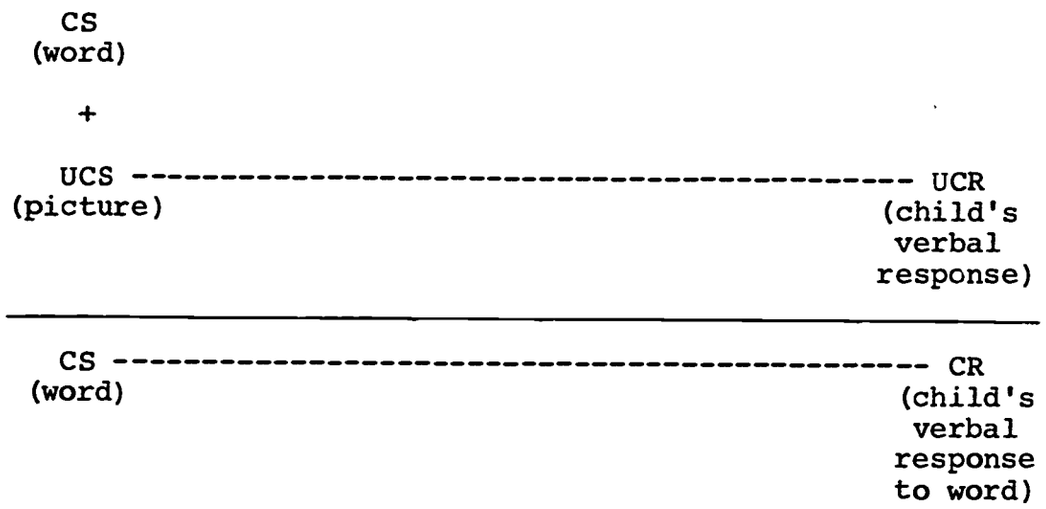
CS = Conditioned stimulus
UCS = Unconditioned stimulus
CR = Conditioned response
UCR = Unconditioned response

Fig. 4. Conditioning procedure used in the no-picture group.

the sound of the word; the unconditioned response was the child's auditory response to the unconditioned stimulus; the conditioned response was the child's verbal response to the printed word.

As seen in Figure 5, for the two picture groups, a different conditioning procedure applied. For both the simple-picture and complex-picture groups, the conditioned stimulus was also the printed word; however, the unconditioned stimulus was the picture, the unconditioned response was the child's verbal response to the picture, and the conditioned response was the child's verbal response to the printed word Therefore, in the no-picture group learning occurred in response to the investigator's saying the sight words while learning occurred within the two picture groups in response to pictures representing the sight words. It appeared that the present experiment tested the difference between learning an association between a printed word and a spoken word (no-picture group) and learning an association between a printed word and a picture (simple-picture and complex-picture groups).

A further look at the conditioning procedures used revealed interesting results in the test trial data. As may be seen in Figure 6, within the no-picture group, there was a sharp increase in the number of correct responses from the lowest mean acquisition score (25.6)



CS = Conditioned stimulus
UCS = Unconditioned stimulus
CR = Conditioned response
UCR = Unconditioned response

Fig. 5. Conditioning procedure used in the simple-picture and complex-picture groups.

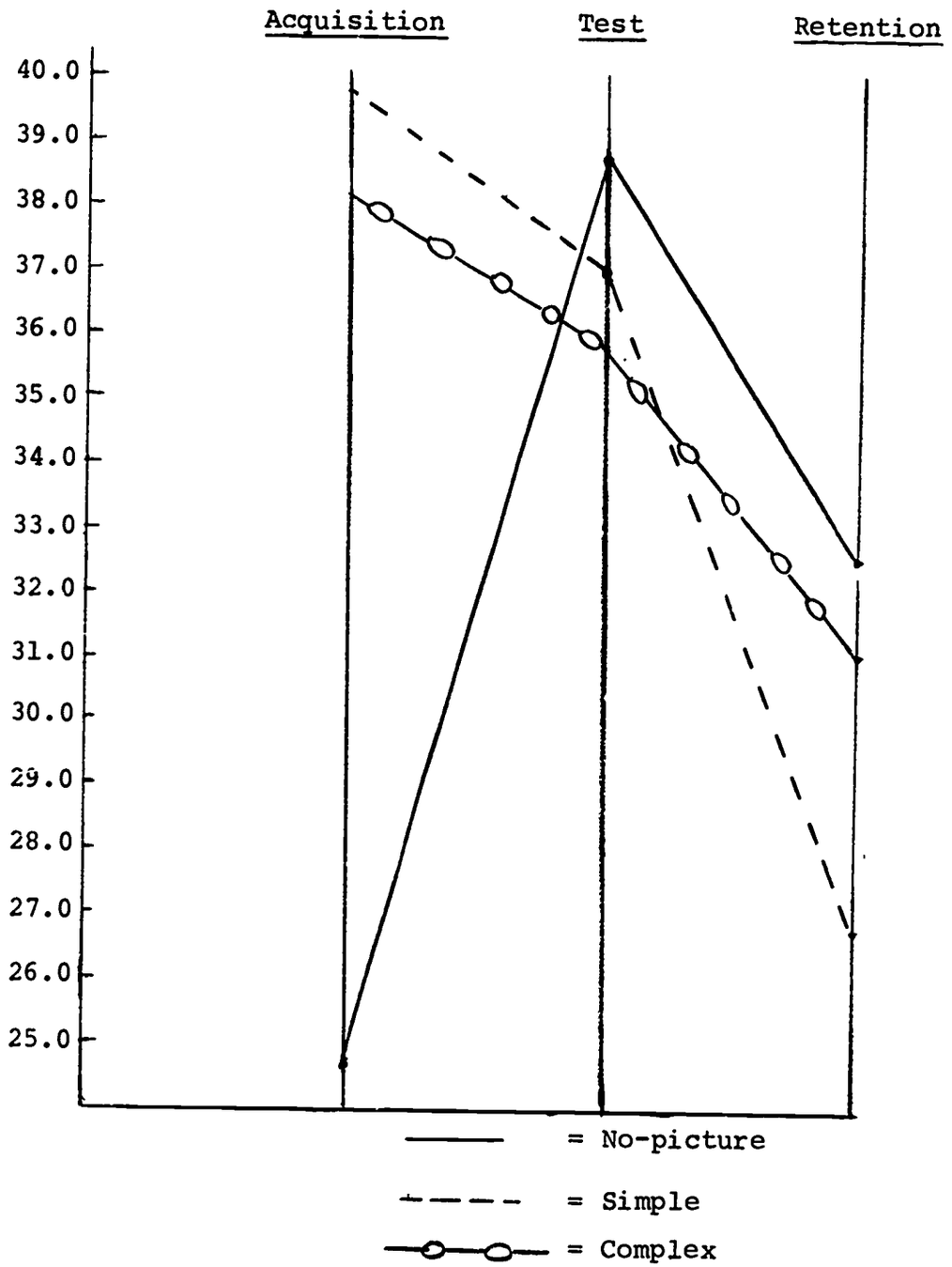


Fig. 6. Results of acquisition, test, and retention trials for the three training groups.

to the highest mean test score (38.6). At first glance, this increase could be explained as a kind of latent learning which was acquired during acquisition trials but did not show up until the test trials. However, a more adequate explanation for this sharp increase in the no-picture scores may be seen in terms of the conditioning procedure. The unconditioned stimulus for the no-picture group was seen as the investigator's verbal feedback of the correct response whenever either an error occurred or no response was made. Table 5 represents a simple analysis of the amount of feedback actually received by the three groups during acquisition.

As Table 5 indicates, the no-picture group received 142 of the total 162 verbal feedbacks given within the entire experiment; the number of feedbacks received by the no-picture group represented 88% of the total feedback received by the three groups. This large amount of feedback given to the no-picture group seemed to account for the sharp increase in the mean number of correct responses from acquisition to test trials. As acquisition and test trials were alternated, it was observed that 142 of the total 400 responses made during test trials by the no-picture group actually occurred immediately after the child had just been told the correct response by the investigator.

TABLE 5

AMOUNT OF VERBAL FEEDBACK GIVEN TO NO-PICTURE, SIMPLE-PICTURE, AND COMPLEX-PICTURE GROUPS DURING ACQUISITION TRIALS

Treatment	Number of verbal feedbacks	Percent of total feedback
No-picture	142	88
Simple-picture	1	1
Complex-picture	19	11
Total	162	100%

Since children may learn through direct imitation of adults, the problem remained over whether the children in the no-picture group had learned to read the sight words merely as a result of imitating the investigator's feedback. Therefore, the factor of imitation would have to be controlled for in future experiments in order to make any definitive conclusions about the value of the learning processes used to teach the four sight words.

Analysis of the Boy-Bed Confusion

In an attempt to determine whether pictures helped children to distinguish between words beginning with the same consonant, the investigator analyzed the confusion which the children displayed between the words "boy" and "bed."

Table 6 shows the frequency of boy-bed confusions for the no-picture, simple-picture, and complex-picture groups during acquisition trials. As Table 6 indicates, during acquisition, children in the no-picture group confused the words boy and bed 24 times as compared with no confusions within the simple-picture and complex-picture groups. An analysis of the chi-square test of independence revealed that the boy-bed confusions occurred with significantly greater frequency during acquisition within the no-picture group than in either of the picture groups. No significant differences were found during test or

TABLE 6

FREQUENCY OF BOY-BED CONFUSIONS MADE BY NO-PICTURE, SIMPLE-PICTURE, AND COMPLEX-PICTURE GROUPS DURING ACQUISITION TRIALS

Treatment	Number of boy-bed confusions	Number of non-confusions
No-picture	24	376
Simple-picture	0	400
Complex-picture	0	400

retention trials.

Thus, as it was observed that confusion between words beginning with the same consonant occurred significantly more often in the no-picture group than in the two picture groups, it seemed that pictures may be helpful in distinguishing words that begin with the same consonant.

Summarizing the results of the present study, it was seen that:

1. On acquisition trials, children in the simple-picture and complex-picture groups gave significantly greater numbers of correct responses than children in the no-picture group; children in the simple-picture group gave significantly more correct responses than children in either of the other groups.

2. On test trials, no significant differences were found among the three groups.

3. On retention trials, no significant differences were found among the three groups.

4. On test trials, there was a sharp increase in the number of correct responses given by the no-picture group.

5. On acquisition trials, the frequency of boy-bed confusions was significantly greater for the no-picture group than for the simple-picture and complex-picture groups.

Statement of the Problem

The major problem of the study was concerned with finding out whether when pictures and words are presented together, do pictures act as distracting or facilitating stimuli in the acquisition of sight words. Results of the acquisition trials seemed to indicate that pictures were facilitative in the acquisition of the four sight words used in the experiment.

The secondary problem of the study was concerned with finding out whether the use of pictures helped or hindered in the retention of sight words after a delayed time period. The results of the retention trials yielded no conclusive evidence of whether pictures were distracting or facilitating in the retention of the four words. Results seemed to indicate that none of the three conditions was superior for retention of the words acquired.

Hypotheses

The first hypothesis of this study was that during acquisition trials, the use of pictures will produce significantly more correct reading responses than the use of words alone. The data supported this hypothesis. The simple-picture group acquired a significantly greater number of correct responses than either the no-picture group or the complex-picture group.

The second hypothesis of this study was that

during test trials, the use of pictures will produce significantly more correct reading responses than the use of words alone. The data did not support this hypothesis. On the contrary, the no-picture group recognized more words than either of the picture groups. However, these differences were not large enough to be of statistical significance.

The third hypothesis of this study was that after a delayed time period, the picture groups will retain significantly more correct reading responses than the no-picture group. The data did not support this hypothesis. On retention trials, the no-picture group retained more words than either of the picture groups; however, these differences were not statistically significant.

Comparison with Similar Studies

Since the present study was a replication study, it was necessary to compare the results obtained with those of the original study. On acquisition trials, the results of the present study were almost equivalent with those found by Samuels (1967). As Samuels reported, the children in the simple-picture group acquired significantly more words than children in either of the other groups. A comparison of the mean scores obtained by Samuels (1967) during acquisition and the mean scores obtained in the present study during acquisition indicated

a 98.8% accuracy of replication for the no-picture group, a 98.7% accuracy of replication for the simple-picture group, and a 96.9% accuracy of replication for the complex-picture group. Thus, as far as acquisition trial results were concerned, it was seen that the present study faithfully replicated the original study.

However, the test results of the present study were contrary to Samuels' contention that pictures acted as distracting stimuli in that they drew attention away from the printed words. The failure to obtain statistical significance for differences among the three groups during test and retention trials indicated that Samuels' contention was not conclusively borne out in the present study.

In a similar study, Harris (1967) had reported no significant differences in acquisition between no-picture and picture groups; this finding was not in agreement with the results of the present study in which significant differences were found to favor the simple-picture group. However, the present investigator was in agreement with Harris' contention that the retention of the words learned was independent of the mode of presentation of the sight words. As the present study concurred, only the acquisition seemed to be significantly influenced by the way in which the words were presented.

Braun's (1969) study found significant mean

differences in acquisition scores, favoring the no-picture group. This finding did not agree with the finding of the present study in which the simple-picture group gave significantly more correct responses than the other groups during acquisition. Braun also found that upon retention, differences in mean scores showed significance for boys only in the no-picture group. This finding contrasted with the retention results of the present study, in which no significant differences were revealed among the three groups.

An important finding of the present study was in agreement with the study conducted by King and Muehl (1965), in which they found that pictures were effective in learning to read words that were similar. They had discovered a significant relationship between the kind of word and the training method used to teach the word. In the present study, it was discovered that two words beginning with the same consonant (boy and bed) were confused significantly more times in the no-picture group than in either of the other groups. Therefore, the present investigator agreed with the suggestion made by King and Muehl that pictures may facilitate the learning to read of similar words.

CHAPTER V

SUMMARY AND CONCLUSIONS

This chapter summarizes the present study, draws conclusions from the research results, and suggests areas for further study.

Summary

This study was concerned with the use of pictures to teach sight words to kindergarteners. The plan was to replicate and extend a study conducted by Samuels (1967) in which he concluded that pictures were distracting stimuli that interfered with learning to read words.

The subjects were 30 kindergarten children selected from two kindergarten classes at the Grandview School in the township of Piscataway, New Jersey. The children were randomly assigned to one of three experimental groups: 10 children to the no-picture group, 10 to the simple-picture group, and 10 to the complex-picture group.

Each group was trained to read four sight words (boy, bed, man, and car) which were typed on separate index cards. The no-picture group saw the words only; the simple-picture group and the complex-picture group

saw words and pictures. Using the same four words, each child received 40 acquisition trials and 40 test trials in approximately 10 minutes. After a 20-minute interval, each child was retested for his retention of the words he had acquired.

The main statistical analysis concerned comparisons of the mean number of correct responses among the three training groups. Statistical significance was evaluated by the t test to measure the differences among the mean scores obtained during acquisition, test, and retention trials. Comparisons were analyzed between mean scores obtained by Samuels (1967) and those of the present study. Also analyzed were the number of verbal feedbacks given by the investigator and the number of confusions made on words beginning with the same consonant.

During acquisition, mean differences among the training groups favored the picture groups, as did the statistically significant differences. Differences among the training groups were statistically significant at the .001 level; the mean acquisition scores of the simple-picture group were significantly greater than either the no-picture or complex-picture groups. During test trials, mean differences among the training groups favored the no-picture group; however, no significant differences were found among the three groups. During retention trials,

mean differences among the training groups favored the no-picture group; however, no significant differences were found among the three groups.

On test trials, there was a sharp increase from acquisition scores in the number of correct responses given by the no-picture group. This increase was attributed to the fact that children in the no-picture group received 88% of the total verbal feedback given by the investigator.

Also, on acquisition trials, the frequency of boy-bed confusions was significantly greater for the no-picture group than for the simple-picture and complex-picture groups.

Conclusions

Based on the findings of this study, the following conclusions may be drawn:

1. The use of pictures does not distract children from learning sight words; the pictures may, in fact, facilitate the learning of sight words. This implies that pictures may be paired with words in teaching reading to the beginning reader.

2. No one training method was superior when children were retested for word recognition. This implies that different children may be taught sight words through the use of different methods. The individuality of the

child and his learning style may create a need for teaching in various modalities.

3. Pictures were facilitative in teaching sight words which began with the same consonant. This implies that pictures may be useful in learning to read words that are similar.

4. All indications from the present study led the investigator to conclude that pictures acted in a positive and facilitory manner. There was no evidence for the conclusion that pictures may act as distractors in teaching children to read sight words.

Areas for Further Study

1. It is suggested that a similar study be conducted in which a test of learning style is given to each child. This would help the investigator to determine which training method would enable the child to learn more sight words in the classroom.

2. It would be desirable if a similar study were conducted in which the effects of the investigator's verbal feedback would be eliminated. This could be done by giving acquisition trials and verbal feedback to all groups before any test trials are given.

3. It is also recommended to conduct a similar study in which various manipulations of time intervals would be used to test for the retention of the words

learned.

4. It is suggested that a similar study be conducted, using a much larger population.

5. It is also suggested that a study could be designed in which sight words could be presented within the framework of a language experience story. This would enable the investigator to compare the efficacy of learning sight words in isolation with the efficacy of learning sight words within the context of a story.

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APPENDIX A

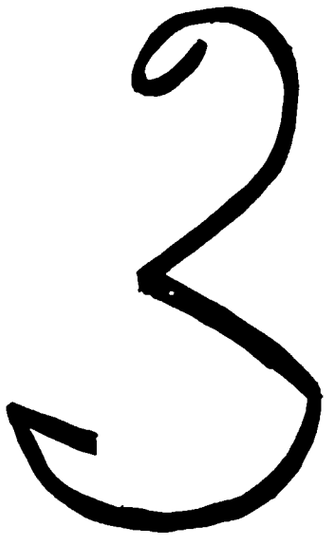
RANDOM ORDER OF SIGHT WORDS PRESENTED TO THREE TREATMENT GROUPS

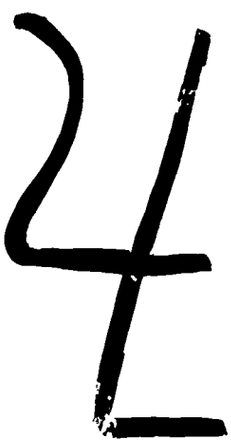
RANDOM ORDER OF SIGHT WORDS

boy	man
bed	bed
man	car
car	boy
bed	bed
car	man
boy	boy
man	car
car	boy
bed	car
man	man
boy	bed
man	man
car	boy
boy	car
bed	bed
man	car
boy	boy
car	man
bed	bed

APPENDIX B

NUMERALS USED IN WARM-UP TRIALS

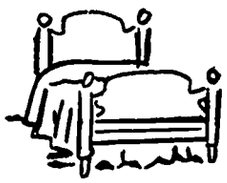




APPENDIX C

PICTURES USED IN SIMPLE-PICTURE GROUP

boy



bed

In the study, a primary typewriter was used.

man

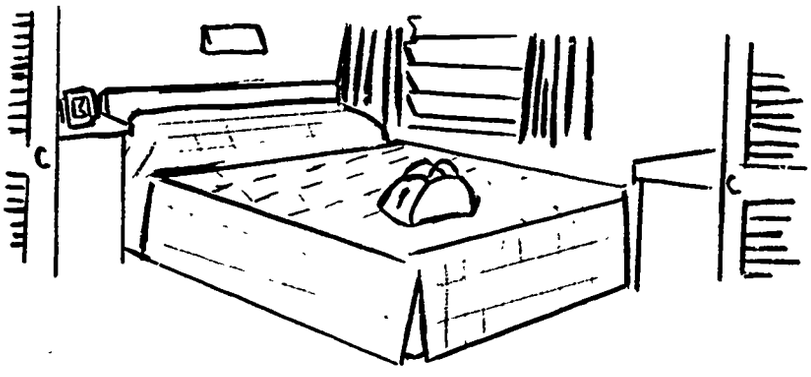
car

In the study, a primary typewriter was used.

APPENDIX D

PICTURES USED IN COMPLEX-PICTURE GROUP

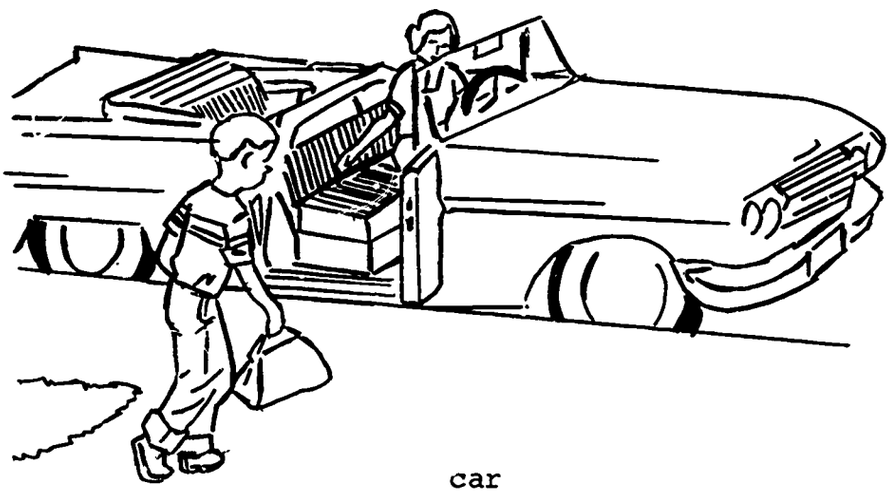
boy



bed

Colored pictures from basal reader.
In the study, a primary typewriter was used.

man



car

Colored pictures from basal reader.
In the study, a primary typewriter was used.

APPENDIX E

DATA SHEET

Warm-up	Acquisition and test	Acquisition and test	Acquisition and test	Acquisition and test	Retention	Retention
1.	1.	21.	41.	61.	1.	21.
	T	T	T	T		
2.	2.	22.	42.	62.	2.	22.
3.	3.	23.	43.	63.	3.	23.
	T	T	T	T		
4.	4.	24.	44.	64.	4.	24.
5.	5.	25.	45.	65.	5.	25.
	T	T	T	T		
6.	6.	26.	46.	66.	6.	26.
7.	7.	27.	47.	67.	7.	27.
	T	T	T	T		
8.	8.	28.	48.	68.	8.	28.
9.	9.	29.	49.	69.	9.	29.
	T	T	T	T		
10.	10.	30.	50.	70.	10.	30.
11.	11.	31.	51.	71.	11.	31.
	T	T	T	T		
12.	12.	32.	52.	72.	12.	32.
13.	13.	33.	53.	73.	13.	33.
	T	T	T	T		
14.	14.	34.	54.	74.	14.	34.
15.	15.	35.	55.	75.	15.	35.
	T	T	T	T		
16.	16.	36.	56.	76.	16.	36.
17.	17.	37.	57.	77.	17.	37.
	T	T	T	T		
18.	18.	38.	58.	78.	18.	38.
19.	19.	39.	59.	79.	19.	39.
	T	T	T	T		
20.	20.	40.	60.	80.	20.	40.
21.						
22.						
23.						
24.						

T = Test

COURSE WORK FOR MASTER'S DEGREE IN READING

		Instructor
Summer, 1971		
299:561	Foundations of Reading Instruction	Mrs. Kimberly
250:544	Background for Teaching Elementary School Mathematics II	Miss Putnam
Fall, 1971-1972		
290:501	Introduction to Educational Tests and Measures	Dr. Pascale
290:514	Introduction to Adolescent and Young Adult Years	Dr. Montare
299:564	Remedial Reading	Dr. Fry
610:581	Reading Materials for Children (K-6)	Dr. Van Orden
Spring, 1972		
290:525	Psychology of the Exceptional Child	Dr. Holowinsky
290:540	Introduction to Learning	Dr. Montare
299:515	Teaching Reading Improvement for Secondary, College, and Other Adult Students	Dr. Shew
299:566	Seminar in Reading Research and Supervision	Dr. Fry
Summer, 1972		
299:565	Laboratory in Remedial Reading	Dr. Zelnick
Fall, 1972-1973		
299:599	Master's Thesis Research	Dr. Montare