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I am submitting herewith a thesis written by Sheryl Diane Moran entitled "The Effect of Imagery in Learning Sight Vocabulary by Middle School Remedial Readers." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in English Education.

Brenda Kolker

Brenda M. Kolker, Major Professor

We have read this thesis
and recommend its acceptance:

J Estill Alexander

Thomas K. Lyon

Accepted for the Council:

L Evans Rod

Vice Chancellor
Graduate Studies and Research

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THE EFFECT OF IMAGERY IN LEARNING SIGHT VOCABULARY BY MIDDLE SCHOOL REMEDIAL READERS

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Sheryl Diane Moran

December 1978

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ABSTRACT

The purpose of this study was to determine the effect of imagery on the number of trials in learning sight vocabulary words by middle school remedial readers.

Fourteen students from Halls Middle School, Knoxville, Tennessee, in grades six, seven and eight were classified as remedial readers based on their performance on the Gates-MacGinitie Reading Test, Survey E, Form 1.

Words from the Paivio et al (1968) scale of 925 nouns were presented to the subjects in daily individual training sessions. Nouns on this scale have numerical values which allow them to be classified as high or low for the dimensions of imagery and concreteness. Words with a value greater than 6.0 were classified as high and words with values less than 4.3 were classified as low for the purposes of this study.

For each student, a deck of word cards was established which represented nouns they did not recognize by sight, but for which they knew the meaning. After initial presentation, six of these words were flashed for one second each, five times during each session. Correct and incorrect responses were recorded for each word for training trials, short term recall (24 hours) and delayed recall (48 to 72 hours). Only words committed to delayed recall were used in the analysis of the data. The analysis consisted of frequency counts and t-tests.

The fourteen subjects encountered 328 nouns in the course of the study, 290 of which were "learned" or recalled on a delayed basis. Of these 290 words, 64% were learned in five trials and 95% had been learned by fifteen trials.

In learning these 290 words, imagery was shown to affect the number of trials needed to recall them on a delayed basis. Nouns classified as high imagery (High I) and high concrete (High C) were learned with significantly fewer repetitions than words classified as low imagery (Low I) or low concrete (Low C).

These results indicate that middle school remedial readers respond to learning sight vocabulary by the sight word method and that the degree of imagery and concreteness of the individual words affects how readily the words are learned.

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CHAPTER I

INTRODUCTION

Establishing and maintaining an adequate sight vocabulary is an undisputed necessity in both beginning and remedial reading. Bond and Tinker (1973, p. 304) state that:

> The importance of forming the habit of rapidly recognizing known words, rather than studying each word as though it had never been seen before, cannot be emphasized too strongly. The child who fails to build a large sight vocabulary and who does not have the habit of recognizing these at a glance cannot hope to become an able reader.

Kennedy (1971, p. 244) considers sight vocabulary instruction to be the first step in teaching school age nonreaders to read and states that comprehension, independent word recognition, smoothness and speed in reading depend upon the initial learning of sight vocabulary. He further emphasizes that:

> It is difficult for remedial instruction to enjoy any significant measure of success unless it provides effective experiences in learning sight words.

Research in the area of sight vocabulary in the past ten years has been concentrated in two areas; investigation of ways in which children learn words and the creation of new word lists. This research has chiefly been concerned with the study of primary grade students and the basal reading materials which they use.

In current basal readers, most words are repeated at least thirty times to insure learning of the words. In 1941 editions of basal readers,

the basic sight words were repeated only half as many times (Spache and Spache, 1973). In addition, Barnard and DeGracie (1976) discovered that the average vocabulary load of new basal series has increased significantly over their predecessors. These changes in the number of words introduced and the number of times they are repeated appear to be arbitrary and are not necessarily supported by research. There is even more divergence in vocabulary in materials used to teach remedial reading.

Primary students are usually taught sight vocabulary through presentation of words on a flash card or the chalkboard. Remedial readers are often taught in much the same way. Both groups may also use a tachistoscope, although the value of mechanical training in teaching sight vocabulary is inconclusive (Spache, 1976). Both primary and secondary students are expected to recall a word after its initial presentation by the teacher.

Gates (1930) reported that a child's intelligence affects the number of repetitions necessary to learn a word, with brighter children requiring fewer repetitions. After evaluating the research of the time, he constructed a table which illustrated the average number of repetitions per word required for children of varying intelligence. He estimated that children with an IQ of 80-89 require forty-five repetitions, while those with an IQ of 110-119 require thirty repetitions to learn words. He also indicated that some words require more repetitions than others, but this point was not expanded.

In the past fourteen years, research has demonstrated the effect of word imagery as a facilitator in verbal learning. The result of part of the research has been the determination of numerical imagery values, ranging from one to seven for 925 nouns (Paivio et al., 1968).

These numerical values provide the educator with a scale with which to evaluate certain words in terms of imagery.

Words such as flower and window, with imagery values on the upper end of the scale (seven), produce a mental picture more easily than words such as chance and fact, with values on the opposite end of the scale (one). Values for abstractness/concreteness(one to seven) for the same 925 nouns are also included in the Paivio et al. (1968) list, and provide an additional evaluative tool.

Research Question

The concepts of imagery and concreteness were used to approach the question of how many repetitions are necessary to learn a word. The basic question to be answered was this: Will remedial readers in grades six, seven and eight require a greater number of trials to learn low imagery (Low I) and low concrete (Low C) words than they do to learn high imagery (High I) and high concrete (High C) words?

Background of study

This study is an outgrowth of a larger extended study presently being conducted at the University of Tennessee by Drs. Brenda Kolker and Paul Terwilliger to determine the effects of imagery in learning sight vocabulary by first grade students.

Studies of the function of imagery indicate that students use imagery as a mediator in selected verbal learning tasks. The results of the research conducted by Kolker and Terwilliger (1977) further indicated that first graders take fewer trials to learn words with a high imagery and concreteness value than to learn words with low imagery

and concreteness values. In addition, Hargis and Gickling (1978) discovered that kindergarten children learned high imagery words more readily than low imagery words and that the high imagery words remained in memory storage better.

Will this also be true with older remedial readers? This study sought to determine if the imagery and concreteness level of nouns affects the number of repetitions necessary to learn the nouns on a delayed basis.

Definition of Terms

For the purposes of this study, the following terms and definitions were used.

Remedial reader. A student whose reading level is estimated to be at least two years below actual grade level as determined by performance on the Gates-MacGinitie Reading Survey E, Form 1, Vocabulary and Comprehension Subtests (1965).

Learning trials. The initial introduction of a word to a subject. The process requires the correct pronunciation of the word by the examiner while it is being viewed by the subject and the subsequent correct pronunciation of the word by the subject. This occurs only once for each word.

Training trials. The process of flashing a word card before a subject for one second to elicit a verbal response to the word.

Criterion learning. Three consecutive correct responses to a word during the last three daily trials.

Short term recall. The demonstrated recognition of a word twenty-four hours after criterion learning.

Delayed recall. The demonstrated recognition of a word forty-eight to seventy-two hours after short term recall.

Trial stage. Words were considered to be in the trial stage if they were introduced in a learning trial but remained uncommitted to delayed recall.

High imagery (High I) or high concrete (High C) words. Words which have a numerical value on the Paivio et al. (1968) scale of greater than 6.0.

Low imagery (Low I) or low concrete (Low C) words. Words which have a numerical value on the Paivio et al. (1968) scale of less than 4.3.

Limitations

The study was limited to fourteen students in grades six, seven and eight at the Halls Middle School in Knoxville, Tennessee. The subjects consisted of four sixth graders, eight seventh graders and two eighth graders. The students were included in the study on the basis of their poor performance on a standardized reading test. No assessment was made of the subjects' overall verbal ability or their ability to succeed in other subject areas. It was not determined whether the students were mentally handicapped or suffered from any learning disability other than being poor readers.

Participation in the study required the subjects' regular attendance at daily testing and training sessions which lasted for a period of three weeks and three days, from April 13, 1978 to May 8, 1978.

Assumptions

This study was conducted under the following assuptions:

1. That imagery is a viable mediator in the learning of words.
2. That recall of a word can be demonstrated by pronunciation of that word when it is flashed before a subject.
3. That the number of trials taken to learn words in this study reflects the learning accomplished by subjects in the daily training sessions, rather than learning taking place in the classroom or at home.
4. That the numerical values for imagery and concreteness for nouns on the Paivio et al (1968) list are accurate.

Organization of Remainder of Study

The remainder of the study contains a review of related literature, methodsa and procedures, data presentation, summary, conclusions, discussion and implications, and appendixes containing vocabulary and comprehension scores, outline of procedures, sample record sheet and list of words learned by the subjects.

CHAPTER II

REVIEW OF RELATED LITERATURE

The effect of imagery as a facilitator in verbal learning tasks has been demonstrated in the research literature of the past fourteen years. These studies have been primarily restricted to psychological research concerned with paired associate learning.

Of particular interest is the work of Allan Paivio and his associates (Paivio, 1963, 1965, 1966, 1969; Paivio and Csapo, 1969, Paivio and Olver, 1964; Paivio, Smythe and Yuille, 1968; Paivio, Yuille and Madigan, 1968; Yuille and Paivio, 1967). Paivio's research, summarized in his book Imagery and Verbal Processes (1961) has led him to formulate his dual coding theory. In this theory, he suggests that imagery complements verbal representation in thought and memory and that the balance between the two is a function of the abstractness-concreteness of the material being used and the kind of task involved.

In this theoretical model, the units of the imagery system are memory representations which correspond to concrete things, while the units of the verbal system are comprised of representations corresponding to linguistic units. These coding units are at the same time independent and interconnected.

Independence of the code implies that either verbal or picture representations may be used in varying degrees at any particular time. Interconectedness implies that one code can be converted into the other, so that words evoke non-verbal mental pictures, and pictures can be named or described verbally. This does not imply a one-to-one correspondence

between a particular image and its verbal representation, but rather a sort of hierarchy wherein the images or verbal descriptions vary depending upon the subject's past experiences and the context of the situation.

Researchers are also able to provide the educator with reasonable estimates of the age at which various imagery strategies effectively mediate various tasks. Picture-word pairs have been found to bring about superior learning over two pictures or a combination of word-picture, word-word pairs in pre-school and first grade children (Dilley and Paivio, 1968; Rohwer, 1970). In reviewing other studies, Rohwer (1970) determined that imagery is more easily evoked in children four to nine years of age than in younger children. He concluded that much older children profit more form entirely visual representation and like Paivio, stated that concurrent storage of imagery with verbal representation facilitates learning.

Paivio (1970) reviewed a number of experiments which indicate that the image evoking value or concreteness of a word is a better predictor of how easily it is learned than its meaningfulness. Rating scales have been devised for nouns, and according to the scales, concrete nouns exceed abstract nouns in imagery (Paivio, 1965) and reaction time (Paivio, 1966). A positive correlation has been demonstrated to exist between concreteness and short-term memory in free recall (Borkowski and Eisner, 1968) and between concreteness and associative speed (Yuille and Paivio, 1967).

Additional research on concreteness suggests that it is more difficult to retrieve a response with abstract stimuli than with concrete stimuli

once an association has been established in a paired associate task (Humphreys and Yuille, 1973). Subjects also report using more images more often when the stimulus is concrete. Paivio has interpreted this as a difficulty in decoding the image back to a verbal response. The best results were acquired when both words in the pair were concrete (Paivio, 1965). Also, Morris and Stevens (1974) found that mental imagery improved free recall of university students through strengthening of associations.

Holmes and Langford (1976) have investigated the effects of concreteness at the stage of initial comprehension in classification of sentence meaning in a free recall task. It was found that concrete sentences were classified significantly faster than abstract sentences.

Giving instructions to form mental images prior to a task has also been found to facilitate learning when working with spelling, sentences and prose (Anderson and Hidde, 1971; Anderson and Kulhavy, 1972; Caban et al, 1978; Konzelman, 1975; Taylor and Joseberger, 1970).

Although the research on the effects of word attributes such as concreteness and imagery upon memory is plentiful, few studies exploring the effects of these variables on word decoding are available. Kolker and Terwilliger (1977) have explored imagery and its role in learning sight vocabulary by first graders and found that nouns rated as high in imagery and concreteness were easier for the children to learn. Hargis and Gickling (1978) observed similar results when working with kindergartern children in a comparable but much smaller and more restricted study.

Jorm (1977) has invesigated the effects of imagery in learning nouns relative to reader ability in three experiments conducted in the New South Wales, Australia school system.

His first experiment included twenty-seven poor readers aged eight to ten, learning seventy nouns taken from commonly used elementary reading texts. The subjects were classified as poor readers based on standardized test results placing them at least one year behind grade level in reading ability. Many of the nouns were scaled using the procedures of Paivio, Yuille and Madigan (1968) since they were not included in the published norms of imagery and concreteness values.

The nouns were presented to the children in lower case letters on sheets of paper. The children read aloud at their own pace and errors were recorded.

It was found that high imagery words were easier for poor readers to read than low imagery words. It should be noted, however, that the subjects read each word only once. The first experiment did not attempt to evaluate repetitions required for words but ease of initial recognition.

The two other experiments in this study were designed to evaluate the effects of word length and frequency in reading difficulty. It was found that high frequency words were easier to read, but that word length had little effect on reading difficulty.

CHAPTER III

METHODS AND PROCEDURES

The subjects for this study were fourteen students attending the Halls Middle School, Knoxville, Tennessee, in the sixth, seventh and eighth grades. Their ages ranged from twelve years to fourteen years, eleven months. Nineteen students were originally referred for the study by their language arts and reading teachers, however, absences and drop-outs reduced the final sample to fourteen. The basis for referral was the student's demonstrated retardation in reading. The classification of these students as remedial readers for the purposes of this study was confirmed by their performance on the Gates-MacGinitie Reading Survey E, Form 1, Vocabulary and Comprehension subtests (1965). The tests were administered to the students as a group on two consecutive mornings at the school.

Each of the subjects obtained a grade score of two or more years below their actual grade level on both the vocabulary and comprehension sections of the survey. For example, the seventh grade subjects performed at a level on or below what is designated on this test as appropriate for fifth grade readers. In addition, these grade scores represent a performance level in the twelfth percentile or below. See Appendix A.

The Paivio, Yuille and Madigan 925 nouns (1968) provided the source of the master deck that was used in both the initial testing for sight and meaning vocabulary and in the training trials. The 147 words selected were AA words designated by the Lorge-Thorndike List (1944) as appropriate for grades one and two. The nouns selected were randomized since they were

listed alphabetically on the Paivio et al.(1968) list. Each word was typewritten in primary lower case letters on a white unlined card measuring 2½" X 4". A training trials record sheet was used for recording correct and incorrect responses during the training trials segment of the study.

Two students who had taken the Gates-MacGinitie (1965) survey declined further participation in the study, thus reducing the number of students beginning the initial testing for sight and meaning vocabulary from nineteen to seventeen.

Each of the remaining subjects was alloted a master word deck and record keeping sheets which were kept in the possession of the examiner. Daily sessions from 8:45 A.M. to 11:00 A.M. were scheduled in a small tutoring room adjacent to the library. Students left their individual classrooms and, depending upon the task for a particular day, spent from five to twenty minutes per day with examiner, returning to the classroom after the session.

The initial screening to determine each individual's sight and meaning vocabulary was schedlued for five consecutive days. Following this, the training trials were conducted during the following two weeks (Monday through Friday) plus one Monday. The additional Monday was required to accommodate words carrying over from the previous week. No new words were introduced on the last day.

During the initial screening, words from the master deck were flashed before the student for one second. Words were categorized as (a) recognized: those words the subject could identify by pronouncing immediately upon seeing the flashed card, and (b) unrecognized: those the student could not identify by pronouncing.

The directions given for this and all other screening and training procedures were the same for all students. These procedures were developed by Kolker and Terwilliger (1977) for use in their study and are outlined in Appendixes B and C.

After establishing two decks of recognized and unrecognized words for each student, the recognized words were eliminated from the study. The unrecognized words provided a deck of sight vocabulary words which was used to determine each subject's meaning vocabulary.

The examiner pronounced each unrecognized word to the student, who indicated, either by describing, defining or using the word in a sentence, that he understood the meaning. These words provided a deck of meaning vocabulary words which became the source for the training trials. Each subject, therefore, had established a deck of cards which represents words he did not recognize immediately when flashed before him, but for which he knew the meaning.

The training trials began the following Monday. From the subject's training trials deck, the examiner randomly selected six words for use in that day's training. Six words were maintained in the daily training trials deck for the remainder of the study. Each word introduced received one learning trial, during which the examiner exposed the word, pronounced it and asked the student to repeat the word. Following this instruction, each word received five training trials, which consisted of a one second flashed exposure and the pronunciation of the word by the student. A correct student response was followed by the examiner responding with as positive word such as "good." An incorrect response was followed by the examiner pronouncing the word. The responses were marked with a plus sign, check

mark or zero. The method of scoring responses is illustrated in the sample training trials record sheet in Appendix D.

Criterion learning for a given word was designated as three consecutive correct final responses (trials 3-5) in one day. If a student did not achieve this criterion for a word, that word card was reinserted into the training trials deck for use in the following day's trials.

Short term recall of words was recorded if the student correctly responded to a word twenty-four hours after criterion learning. Due to the weekends, delayed recall ranged from forty-eight to seventy-two hours after short term recall. Words missed in either short term or delayed recall trials were reinserted into the training trials deck and that error trial was counted as daily training trial number one.

After each student's daily training trials session, the words in the training deck were regrouped for training trials, short term recall and long term recall based on the student's recorded responses.

CHAPTER IV

PRESENTATION OF DATA

Words on the Paivio et al. (1968) scale, which served as the source of words for this study, are classified by number for the variables I (imagery) and C (concreteness). Prior to this study, words within each category were arbitrarily designated as high, low or middle. It was decided that words with a numerical value of greater than 6.0 would be considered high concrete (High C) or high imagery (High I) because these words approach the upper end of the scale (seven). Those with a numerical value of less than 4.3 were considered low concrete (Low C) or low imagery (Low I). A numerical value of 4.0 was originally considered as the cut-off point for the lower end of the scale, but it was decided to increase it to 4.3 to provide more low valued words for the analysis of the data. This was necessary because the Paivio et al. (1968) list contains substantially more words which fall into the high range for both imagery and concreteness.

The middle group, words with a numerical value between 4.3 and 6.0, were presented to the subjects along with words in the high and low groups, but middle group words were not used in the analysis of the data. Analysis of the data is based upon delayed recall trials (learned words). Frequency and t-tests were used in this analysis.

Absences of subjects from school necessitated the elimination of three sets of data, reducing the number of usable sets from seventeen to fourteen. These remaining fourteen subjects committed 290 words to delayed recall, fifteen words to short term recall. Twenty-three words remained in the

trial stage, uncommited to either delayed or short term recall.

Table I illustrates the number of words encountered and learned by each student.

TABLE I

NUMBER OF WORDS LEARNED BY SUBJECTS

STUDENT	DELAYED	SHORT TERM	TRIAL	TOTAL
1	14	2	6	22
2	28	0	2	30
3	23	4	1	28
4	16	2	2	20
5	23	0	2	25
6	26	0	1	27
7	20	4	2	26
8	14	0	0	14
9	22	1	2	25
10	7	0	1	8
11	23	0	0	23
12	20	1	1	22
13	31	0	3	34
14	23	1	0	24
	290	15	23	328

Approximately 64% of the 290 words were committed to delayed recall or "learned" in five trials and over 95% had been learned by fifteen trials. The following table (Table II) reveals that the subjects took no longer than thirty trials to commit a word to delayed recall and only four words took twenty-five or thirty trials.

TABLE II

TOTAL NUMBER OF TRIALS TO DELAYED RECALL

N of TRIALS	N of WORDS	%	CUMULATIVE %
5	185	63.79	63.79
10	66	22.77	86.56
15	25	8.62	95.18
20	10	3.45	98.63
25	3	1.03	99.66
30	1	.34	100.00

The three words which took twenty-five trials to delayed recall were opinion, party and position. The word which took one subject thirty trials to commit to delayed recall was present.

Table III presents the data for High I versus Low I words. The subjects learned High I words with significantly fewer repetitions than Low I words. More errors and correct responses were made with Low I words. The t-tests for total trials and errors were significant at the .001 level, while the t-tests for correct responses were significant at the .02 level.

TABLE III

MEAN TRIAL DIFFERENCE BETWEEN
HIGH I AND LOW I WORDS

WORDS	N of WORDS	N of TRIALS	$\bar{x}$	SD	t
Total High I	36	1405	7.14	4.00	3.31*
Total Low I	17	480	9.41	5.63	
Errors High I		137	.70	1.32	4.42*
Errors Low I		94	1.84	2.56	
Correct Responses High I		1268	6.44	2.88	2.41**
Correct Responses Low I		386	7.57	3.41	

*significant at the .001 level
**significant at the .02 level

A similar result was found when High C and Low C words were compared in terms of total trials, errors and correct responses as seen in Table IV. The subjects learned High C words with significantly fewer repetitions than Low C words, while making significantly more errors and correct responses to this same group of Low C words. T-tests for total trials, errors and correct responses were all significant at the .001 level.

TABLE IV

MEAN TRIAL DIFFERENCE BETWEEN
HIGH C AND LOW C WORDS

WORDS	N of WORDS	N of TRIALS	$\bar{x}$	SD	t
Total High C	32	1215	6.99	3.66	4.15*
Total Low C	23	775	9.34	5.36	
Errors High C		124	.72	1.37	4.66*
Errors Low C		150	1.79	2.31	
Correct Responses High C		1091	6.27	2.58	3.38*
Correct Responses Low C		625	7.56	3.39	

*significant at the .001 level

In summary, it was found that the subjects learned 64% of the 290 words in five trials and 95% of the words had been learned by fifteen trials. It was also shown that high imagery and high concrete words were learned with significantly fewer repetitions than low imagery and low concrete words.

CHAPTER V

SUMMARY, CONCLUSIONS, DISCUSSION AND IMPLICATIONS

Summary

This study sought to determine the effect of imagery on the number of trials in learning sight vocabulary by middle school remedial readers.

Fourteen students in grades six through eight attending Halls Middle School, Knoxville, Tennessee, were classified as remedial readers as a result of their performance on the Gates-MacGinitie Reading Survey E, Form 1.

Nouns from the Paivio et al. (1968) list, which provides numerical concreteness and imagery values for each word were presented to the students in daily sight vocabulary training sessions. Prior to the study, the 147 words used for the master deck were classified as high (above 6.0), low (below 4.3) or middle (4.3 to 6.0) for the dimensions of imagery and concreteness.

The words were presented to the students in an initial screening activity which established for each subject a deck of word cards representing nouns for which they knew the meaning, but did not recognize by sight.

Six word cards were taken from this deck, and after one learning trial, they were flashed for one second each, five times per session. Responses to each trial were recorded for training trials, short term recall (24 hours) and delayed recall (48 to 72 hours). Only words committed to dealyed recall were used in the data analysis, which consisted of frequency counts and t-tests.

The fourteen subjects encountered 328 nouns in the course of the study, 290 of which were "learned" or recalled on a delayed basis. Of these 290 words, 64% were learned in five trials and 95% had been learned by fifteen trials.

In learning these 290 words, imagery was shown to affect the number of trials needed to recall them on a delayed basis. Nouns classified as high imagery (High I) and high concrete (High C) were learned with significantly fewer repetitions than words classified as low imagery (Low I) or low concrete (Low C).

These results indicate that middle school remedial readers respond to learning sight vocabulary by the sight word method and that the degree of imagery and concreteness of the individual words affects how readily the words are learned.

Conclusions

This study explores the effects of imagery and concreteness on the number of trials to learn basic sight words by remedial readers. The findings indicate that middle school remedial readers can learn nouns if thay are taught in a systematic fashion.

The nouns presented are considered appropriate for grades one and two. The subjects learned 95% of the nouns by fifteen trials. The majority of them (64%) were learned in just five trials. To restate this, the subjects recalled 48 to 72 hours later most of the words presented to them after only five one second flash exposures.

The findings also indicate that middle school remedial readers take fewer trials to learn low I and low C nouns. In other words, nouns such

as flower and animal will be learned more readily than words such as chance and hope. This is in agreement with theoretical postulations and the finding of other research.

All of the nouns presented to the subjects were part of their meaning vocabulary, so using imagery as a mediator appears to be one way these students learned words. Subjects took a greater number of trials to learn words like opinion which had a low imagery and concreteness rating yet were familiar to the subjects. For these words, the subjects appeared to rely upon a mediator(s) other than imagery.

Discussion

The students involved in this study readily accepted the task and often regarded it as a word game which they were eager to play. They would sometimes enter the tutoring room vocalizing the previous day's list of words. They quickly began to think of the words they were learning as their words.

Facial expressions, attention to the task and disappointment at missing a word revealed that they felt involved and interested in learning. They volunteered apologies for absences and during the course of the sessions began to reveal themselves by sharing interests and experiences. The eagerness, lack of anxiety and willingness to learn may be due to the absence of penalties for errors. The students realized that their efforts would be accepted and errors would simply mean additional practice with the word.

Many students verbalized their use of logical connections between words on the list as aids to remembering them. Examples of this can be seen between the words chief-village, iron-board, ocean-shore, and

fire-forest. Frequently, the subjects would respond to the stimulus word with another word in that day's stack or pronounce a word with the same initial letter or general configuration or sound. Examples of the latter include length-strength, forest-first and leader-letter.

As mentioned previously, only four words, opinion, party, position and present, took twenty-five or thirty trials to delayed recall. Half of the students in the study encountered these four words at some time. Errors with these words frequently caused them to appear together in one day's stack of six to be practiced. This caused the student even more confusion, especially between the words opinion and position because of their obvious similarity and between present and position becuase of the same initial letter. All of the above words except present also fell into the group which took twenty trials to learn. This group also included board, corner, forest, pleasure, skin and square.

After the first few sessions as the examiner got to know each student more personally, different learning patterns were observed among individuals. Some students would concentrate on learning two or three words from each day's six, giving no answer or saying "I don't know" to the others in the stack. Then two more words would be selected for learning and the pattern would be repeated. One student learned most words in five trials, while others methodically took fifteen to twenty trials per word. This same methodical learner might, however learn some abstract words more quickly because they were more interesting to him.

Classroom teachers did not have a list of the nouns used in this study. Unless the subjects discussed with teachers the words he or she was learning, there was no classroom practice of the nouns. If the subjects

practiced outside the classroom, it would have been at home, however the subjects reported no practice of this kind.

Implications

The following implications for instruction can be discerned from this study:

1. In the beginning stages of reading, regardless of age, imagery appears to mediate in learning sight vocabulary.
2. Observations of confusion with similar words (Example: length-strength) would indicate better results if confusable words were not presented together.
3. Using the sight word method in teaching sight vocabulary to remedial readers is effective and not time consuming for the results achieved.
4. Using this method would possibly become routine if used too frequently for too long a time.
5. The sight word method of teaching sight vocabulary could be employed by using other students or aides in the examiner's role.
6. Awareness of imagery and concreteness values for certain words, along with awareness of the effects of imagery in learning sight words, allows for adjustment in teacher expectancy of the number of repetitions necessary to learn them.

7. The possibility exists of redisigning readability formulas to include the concepts of imagery and concreteness.

Suggestions for Further Research

A study similar to this one should include a larger sample of students in order that a broader range of age, grade and reading ability levels could be included in the analysis. It might be fruitful to control which words are presented together to eliminate confusable words or those beginning with the same letter. This additional control might affect the number of trials taken to learn the words. A study of this type might also include an investigation of other encoding systems that remedial readers use.

Investigation of sex differences in learning sight vocabulary should be considered, as well as research with words other than nouns.

Finally, since this study revealed a substantial variation in the number of repetitions necessary to learn words compared to the Gates (1930) review, it might be beneficial to investigate the effect of a child's intelligence in learning sight vocabulary.

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APPENDIXES

APPENDIX A

VOCABULARY AND COMPREHENSION SCORES

GATES-MACGINITIE READING SURVEY E, FORM 1

TABLE V

VOCABULARY AND COMPREHENSION SCORES

STUDENT NUMBER	ACTUAL GRADE LEVEL	GRADE SCORES VOCABULARY	COMPREHENSION
1	7.7	3.9	2.7
2	7.7	4.6	3.1
3	6.7	3.9	2.8
4	8.7	below 3.2	2.9
5	7.7	below 3.2	2.8
6	7.7	4.1	2.8
7	6.7	3.6	3.6
8	7.7	3.6	3.9
9	7.7	3.9	below 2.6
10	8.7	3.4	2.8
11	7.7	3.4	2.6
12	6.7	3.2	2.8
13	7.7	below 3.2	3.4
14	6.7	4.4	2.8

APPENDIX B

OUTLINE OF PROCEDURES

INITIAL TESTING

I. Sight Recognition. Each subject will be administered the Master words deck in the following manner.

A. Examiner: "Hello, I am _____. What is your name?
Subject: Response.
Examiner: "You and I are going to work together for several days. We will do several things with words. I will tell you what to do each time."
Pause: Subject may respond.
Examiner: "I am going to show you a word on a card very quickly. Please tell me very quickly what you think the name of the word is."

B. Test Word Number 1 (Total time: 5 seconds)
Examiner: "What is the name of this word?" Show the word card. (1 second exposure)
Subject response: (3 second maximum)
Examiner records: (1 second maximum)
1. If the subject gives a correct response, the examiner will place the word card in a "recognized" pile.
2. If the subject gives an incorrect response or no response, the examiner will place the word card in an "unrecognized" pile.

C. Test Words Numbers 2-N
The testing procedure will be followed through the total Master deck of 147 word cards. The word piles will be labeled and a rubber band put around each.

II. Meaning Vocabulary. Each subject will be given an opportunity to use in a sentence each of the words previously placed in the "unrecognized" pile during the sight vocabulary test.

A. The examiner will shuffle the word cards placed in the "unrecognized" pile. He selects the top word card but does not show it to the subject.

B. Test Word Number 1
Examiner: "Use the word _____ in a sentence."
Subject response: (10 second limit)
Examiner records:
1. If the subject's sentence response or other verbal response indicates that he knows a meaning of the word, the examiner will place the word in a "familiar" pile.

2. If the subject's sentence response or other verbal response indicates that he does not know the meaning of the word, the examiner will place the word card in an "unfamiliar" pile.

C. Test Words Numbers 2-N

Same procedure as above. The words falling into the "familiar" pile will become the subject's Training Trials Deck.

APPENDIX C

OUTLINE OF PROCEDURES

TRAINING TRIALS

I. Learning Trials. Six word cards are randomly selected from the training trials deck. These words comprise the training trials words for the daily sessions.

General Directions:
Examiner: "I am going to show you a word card and say its name. I want you to look at the word and say its name to me. You must say its name before I take the word card away."

A. Learning Trials. Word Number 1.
Examiner: Shows a word card and says the name of the word.(1 second)
Subject: Says the name of the word. (3 seconds)
Examiner: Takes the word card away (1 second)

B. Words Numbers 2-6. Same procedure as above. Each response receives a plus sign on record sheet.

II. Training Trials.

A. Trial 1
Examiner: The examiner shuffles the six word cards and says: "I am going to show you a word. Tell me its name as quickly as you can." Shows word (1 second).
1. Correct subject respose: The examiner says "Good," takes the word card away from the subject's view and places a check mark on the subject's record sheet for the trial.
2. Incorrect subject response: The examiner says "The word is_____" and then takes the word card away from the subject's view and marks a zero on the record sheet for the trial.
3. No response or "I don't know." is recorded the same as for an incorrect response.
4. The word presentation, response and examiner's remarks should not exceed 5 seconds.
5. Examiner shows the next word card and continues the training trial procedures for the remaining word cards in the training deck.

B. Trials 2-5
Examiner: Shuffles the six word cards in the training deck and follows the procedure described in Trial 1.
1. At the end of trial 5, the examiner will thank the subject for his efforts and remind him that the next session will be the next school day.
2. A new subject will enter the room.

III. Evaluation of Subject's Training Trials for a Daily Session

A. Any word card which the subject names correctly during the final three consecutive trials in a daily session will be considered a temporarily learned word and will be presented the following day as a short term memory item. This word will be presented first the next day.

B. If the subject does not respond correctly to the temporarily learned word, the word card remains in the training deck and this first presentation will be considered Trial 1.

C. If the subject responds correctly to the temporarily learned word, the word card will be removed from the training trials deck and presented as a delayed recall item in 48 to 72 hours.

D. Evaluation by the examiner begins the first day. At the end of the daily session, the examiner will select a new word which may be a replacement for each temporarily learned word.

E. If the subject responds correctly to the delayed recall item, it will be noted and the word retired.

F. If the subject does not respond correctly to the delayed recall item, the word will be reinserted into the training trials deck and the daily training trials continued. This first presentation is considered Trial 1.

G. Learning and training trials will be continued on each Monday as a continuous series of trials from the previous week.

APPENDIX D

SAMPLE RECORD SHEET

Student _____ School _____

Day	Monday								Tuesday								Wednesday								Thursday								Friday							
Words \ Trials	Delayed	Short term	Learning	Training 1	2	3	4	5	Delayed	Short term	Learning	Training 1	2	3	4	5	Delayed	Short term	Learning	Training 1	2	3	4	5	Delayed	Short term	Learning	Training 1	2	3	4	5	Delayed	Short term	Learning	Training 1	2	3	4	5
1. fire	+																																							
2. flower	+																																							
3. gentleman	O				✓	✓	✓	✓		+																							+							
4. trouble	O				O	✓	✓	✓		+																							+							
5. position											+	O	O	O	✓	O				✓	✓	O	✓	O				O	✓	✓	✓	O			O	✓	✓	✓	✓
6. present											+	O	✓	✓	✓	✓				O	O	✓	✓	✓		+														
7.																																								
8.																																								
9.																																								
10.																																								
11.																																								
12.																																								

APPENDIX E

WORDS COMMITTED TO DELAYED RECALL

Imagery and Concreteness Values

LOW I LOW C
Less than 4.3

chance
cost
effort
fact
honor
hope
hour
knowledge
law
length
moment
opinion
position
silence
soul
trouble
truth

HIGH I HIGH C
Greater than 6.0

animal
board
building
church
college
corner
fire
flower
forest
gentleman
grass
iron
judge
lake
letter
meat
money
mountain
newspaper
ocean
officer
picture
plant
railroad
ship
shore
skin
village
window

MID I 4.3-6.0
LOW C Less than 4.3

dream
month
pleasure
power
present
strength

MID I 4.3-6.0
HIGH C Greater than 6.0

journal
material

MID C 4.3-6.0
HIGH I Greater than 6.0

chief
circle
friend
party
square
winter

VITA

Sheryl D. Moran was born in Berea, Ohio, on January 24, 1951. She was educated in the Palm Beach County, Florida, public schools. After graduation from Palm Beach High School in 1968, she entered the University of Florida and received a Bachelor of Arts degree in secondary education in August, 1972. While at the University of Florida, she was a member of the marching, concert and symphonic bands.

Ms. Moran taught remedial reading for two years at Pahokee Junior-Senior High School in Florida and after her move to Knoxville in 1976, taught language arts and reading at Halls Middle School.

In June 1977, she entered the University of Tennessee to pursue her Master's degree. During this time, she has been employed at the University Music Library as a student assistant and has also worked as a graduate assistant at the University of Tennessee Reading Center.

After graduation, she will continue tutoring at the Reading Center and working at the Music Library while seeking a full time professional position.