

To the Graduate Council:

I am submitting herewith a thesis written by Juanita Buchanan Foster entitled "A Comparison of the Rate of Learning of Low Imagery Nouns by First Grade Girls and First Grade Boys." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Specialist in Education, with a major in Curriculum and Instruction.

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A COMPARISON OF THE RATE OF LEARNING OF
LOW IMAGERY NOUNS BY FIRST GRADE GIRLS
AND FIRST GRADE BOYS

A Thesis
Presented for the
Specialist in Education
Degree
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ABSTRACT

The purpose of this study was to compare the number of trials which beginning first grade girls took to learn low imagery nouns with the number of trials which beginning first grade boys took to learn low imagery nouns.

Forty pupils, twenty girls and twenty boys from South Rossville Elementary School, Rossville, Georgia, were included in the initial population of the study.

Words from the Paivio et al. (1968) scale of 925 nouns were presented to the students in individual training sessions. Nouns on the scale have numerical values which allow them to be classified as high or low for the dimensions of imagery and concreteness. For the purposes of this study, nouns with values of 4.0 and less were classified as low imagery.

For a three-week period each pupil was presented with word cards which represented nouns they did not recognize by sight but for which they knew the meaning. After initial presentation, six of these nouns 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).

The final population of twenty-seven (27) pupils was presented a total of 300 nouns during the course of the study; included were 131 nouns of this total in delayed recall. The thirteen girls learned (delayed recall) almost twice as many words (86 words) as did the fourteen boys (45 words). The girls learned 53% of the words presented to them; whereas, the boys learned only 33% of the words presented to them. The girls took 1575 trials to learn the 86 words while the boys took 880 trials to learn the 45 words.

The results indicated that beginning first grade girls and boys could learn low imagery nouns by the flash card method and that the girls learned more words than did the boys.

In learning a word (delayed recall) the girls made fewer error responses than the boys and conversely a greater number of correct responses.

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CHAPTER I

INTRODUCTION

Many reading authorities agree that a pupil's competency in beginning reading depends on his acquisition of an adequate sight vocabulary. Kennedy (1974, p. 234) stated that:

A suitable sight vocabulary is the most obvious competency a reader can have. Pupils who can recognize a large number of words instantly are usually fluent readers and, in some instances, are considered to be capable students even though they may have other deficiencies. Basically, the sight vocabulary is responsible for a pupil's initial success in reading, for his later ability to learn and use the independent word recognition skills, and for the development of smooth, accurate reading.

Berry, Barrett and Powell (1969, p. 184) cited an article by Chambers who considered sight vocabulary as a broad category of word recognition and as implying word meaning regardless of the grade level span one considers. They further emphasized that:

Lacking an adequate sight vocabulary, the child is without word recognition skills and necessarily then, without word meaning. When meaning is not present neither are comprehension and/or recall. The effect of the absence of an adequate sight vocabulary is also reflected in incorrect, inadequate phrasing or word-by-word reading resulting, then, in poor oral reading.

Over the past decade, research in sight vocabulary has had two main emphases: the formulation of new word lists and the investigation of ways in which children learn words.

Most of the research in this area has dealt with primary reading pupils and basal reading materials.

In the early primary grades children are expected to recall words in the classroom setting as presented by teachers on the chalkboard, on flash cards, or by use of contextual clues. Frequently at this level, the basal readers repeat words many times in order to insure the pupil's acquisition of words. Spache and Spache (1973) noted that words presented in a preprimer were deliberately repeated an average of eleven times. In primers, the average new word was repeated eighteen times; in first readers, fifteen times; and in second readers, nineteen times.

Bernard and DeGracie (1976) investigated the changes in the beginning reading vocabularies at eight different basal reading systems which occurred in the previous decade. They noted that the vocabulary load differed significantly among publishers and that the new words were introduced at different rates at the different levels. The average vocabulary load of the eight programs investigated was 551 words through the first reader. The reason for reported changes in repetitions of words over the past thirty-year time span has not been explained definitively in the literature.

Literature on reading achievement in the primary grades abounded with examples of the superior reading achievement

of girls as compared with boys. Gates (1961a) reported the results of a study of more than 13,000 children in grades two through eight. He compared the girls' and boys' mean scores on three subtests (Speed, Vocabulary, Comprehension) at each grade level. Gates concluded that in each of the twenty-one comparisons, the mean raw score for girls was higher than the mean raw score for boys, and that most of the differences were significant.

It seems apparent that some sex differences do exist in learning to read. As to the causes of these differences, opinions generally fall into two broad categories. Some researchers believe the sex differences in reading (favoring the girls) are caused by "physiological-biological-maturational" factors, while others attribute the differences to "societal-cultural-educational" factors (Johnson, 1976). One factor which has not received much attention is the investigation of sex differences in learning sight words.

Concerns with the effects of word imagery in verbal learning have resulted in the development of a special word list published in 1968. This word list consisted of 925 nouns with numerical values which ranged from one to seven. Paivio, Yuille, and Madigan (1968) scaled the nouns, which were taken from the Thorndike-Lorge List (1944), on dimensions of imagery (I), meaningfulness (M) and abstractness-concreteness (C).

High imagery of a word implies, in part, as to how easily a mental image may be formed. Words that arouse mental images very quickly (dog, tree, house) are examples of words with high imagery value while those which arouse a mental image more slowly, or not at all, are words with low imagery value (opinion, time, dream). Scaled values for the 925 nouns were included in the Paivio et al. (1968) word list.

Research Question

Imagery and sex factors were selected to test the general question of whether there is a difference in the number of trials elementary school girls and boys need to learn a word.

The specific question was: Will there be a difference between the number of trials first grade girls take in learning low imagery nouns and the number of trials first grade boys take in learning low imagery nouns?

Background of Study

This study was a duplication, in part, of a study conducted by Drs. Brenda Kolker and Paul Terwilliger in 1977. Their study sought to determine the effects of imagery in learning sight words by first grade pupils.

Studies had indicated that imagery is an important factor in learning to recognize words. Kolker and

Terwilliger (1977) found that the first grade pupils took fewer trials to learn words with high imagery and concreteness values than they took to learn words with low imagery and concreteness values. These investigators duplicated their study using beginning second grade pupils and concluded that imagery (or concreteness) is a viable mediator for learning sight words via the flash card method (Kolker and Terwilliger, 1978). These two studies were in agreement with a study by Hargis and Gickling (1978) who reported that kindergarten children learned high imagery words more readily than low imagery words.

Moran (1978), in a master's thesis, concluded that middle school remedial readers took fewer trials to learn high imagery and high concrete nouns than low imagery and low concrete nouns. Nouns such as flower and animal were learned more readily than words such as chance and hope. Moran further stated that the investigation of sex differences in learning sight vocabulary should be considered, as well as research with words other than nouns.

The overall purpose of this study was to compare the number of trials which beginning first grade girls took to learn low imagery nouns with the number of trials which beginning first grade boys took to learn low imagery nouns.

Specific questions posed for study were:

1. *Will there be a difference between the number of trials made by beginning first grade girls*

in learning low imagery nouns and the number of trials made by beginning first grade boys in learning low imagery nouns?

2. *Will there be a difference between the number of correct trials made by beginning first grade girls in learning low imagery nouns and the number of correct trials made by beginning first grade boys in learning low imagery nouns?*
3. *Will there be a difference between the number of error trials made by beginning first grade girls in learning low imagery nouns and the number of error trials made by beginning first grade boys in learning low imagery nouns?*
4. *Will there be a difference between the pattern of the learning trials made by beginning first grade girls in learning low imagery nouns and the pattern of learning trials made by boys in learning low imagery nouns?*
5. *Will there be a difference between the number of low imagery nouns beginning first grade girls learn and the number of low imagery nouns beginning first grade boys learn?*
6. *Will there be a difference in the number of low imagery nouns beginning first grade girls place in stages of learning and the number of low*

*imagery nouns beginning first grade boys place
in stages of learning?*

Need for Study

Like many other facets of reading instruction, the task of vocabulary development continues to undergo reexamination and reevaluation. The drill procedures, ways in which children learn, generating new word lists, word calling or matching words and definitions are being questioned; however, less attention has been given to the investigation of sex differences in learning sight vocabulary. The importance of the findings in this study should help teachers to better adjust instruction to individual needs since sight vocabulary is important for successful reading.

Definition of Terms

During the course of this study, the following terms and definitions were used.

Flash Card: A word card 2-1/2" × 4" with a printed word in primary size.

Paivio Word List: The 925 nouns indexed according to level of imagery and concreteness.

AA Paivio Words: Words listed as suitable for first and second grade according to the Thorndike-Lorge word list.

Master Word Deck: Forty-one words taken from the Paivio word list rated as AA words.

Recognized: Words recognized by a pupil within a one-second flash presentation.

Familiar: A pupil indicated meaning knowledge of an unrecognized word spoken by the examiner.

Training Trials Word Deck: Words that were unrecognized but whose meaning was known.

Learning Trial: The introduction for each new word which required a three-second exposure; the examiner said the word and the pupil repeated it.

Training Trial: One of five daily word presentations of one-second duration.

Short Term Recall: A correct response twenty-four hour time lapse after three final consecutive correct responses.

Delayed Recall: A correct response forty-eight to seventy-two hour time lapse after short term recall.

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

Low Imagery (I): Words which have a numerical value of 4.0 or less on the word list of Paivio et al. (1968).

Limitations

This study was limited to forty first grade pupils randomly selected from the South Rossville Elementary School, Rossville, Georgia, during the fall school term, 1978-79. The study was limited further to the flash card method in

developing the visual aspect of sight vocabulary using forty-one (41) low imagery nouns taken from the Paivio, Yuille, and Madigan 925 word list (1968).

CHAPTER II

REVIEW OF RELATED LITERATURE

A volume of research, much of it appearing in the last two decades, has demonstrated the effect of imagery as a facilitator in verbal learning tasks. Most of the research in this area, however, has been confined to psychological studies of a paired-associate nature.

A large portion of the evidence relating to this research has been reported by Paivio and his associates (Paivio, 1969, 1970; Paivio, Yuille and Madigan, 1968; and Dilley and Paivio, 1968).

According to Lachman, Lachman and Butterfield (1979) there are separate representational systems for verbal and nonverbal information. These psychologists explained an existence of an analogue system which was specialized for encoding, transforming, and processing information about concrete objects and events while containing perceptual knowledge. Lachman, Lachman and Butterfield (1979, p. 285) claimed that there is a verbal system to deal with linguistic units and that the two systems can be accessed independently—one by picture, and the other by language; but they affect communication, because words can be transformed into images and images into words.

Based on this model, Sheehan (1972) offered the following discussion: High imagery conditions are so effective in learning and memory that they increase the probability that both imaginal and verbal processes will play a mediational role in item retrieval. This offers a parsimonious explanation of the superiority of pictures over concrete words in various memory tasks. Thus, in free recall of pictures, the subject presumably will implicitly name at least some of the items during input. Such items may be stored in both codes. Concrete words are more likely to arouse images during input than are abstract words, enhancing the probability of dual coding and recall in the case of the former (Sheehan, 1972, p. 263).

One outcome of imagery studies which has surprised some of the investigators is that the use of imagery has a greater facilitating effect for older children than previously expected. Dilley and Paivio (1968) found that the efficacy of pictures in paired-associate tasks increased significantly with age for nursery school, kindergarten and first-grade children. Rohwer (1968) obtained corresponding results with kindergarten, first-grade and third-grade children. The generalization that the superiority of pictures over words increases with age during early childhood has received varying interpretations. Reese (1970) offered six plausible explanations, preferring the explanation that younger children are

not able to "read" pictures. He suggested that, for young children, pictures do not arouse meaning that facilitate learning.

Other studies indicated that imagery is one of the strongest predictors of a word's learnability (Bower and Clark, 1969; Bugelski, 1962; Paivio, 1969) and that there was a difference of six magnitudes in favor of imagery treatment. When imagery and concreteness of words were compared, Yuille (1968) concluded that imagery defined the effective attribute better than concreteness. When imagery and association value (M) were compared, Paivio (1967) reported that imagery was a considerably more potent source of variance.

The effects of word imagery have been recently applied to the study of reading. In the first of two studies, Kolker and Terwilliger (1977) explored imagery and its role in learning sight vocabulary using beginning first graders. They found that nouns rated as high in imagery and concreteness were easier for children to learn. In the second study, Kolker and Terwilliger (1978) replicated their first-grade study and procedures with beginning second graders. They concluded that imagery (or concreteness) can be predicted as being a viable mediator for learning sight words and that when a flash card method is used to develop sight vocabulary, a beginning second grader can be expected to learn words, which have a high level of imagery for him, in a fewer number

of flash presentations than words which have a low level of imagery. Moran (1978) observed similar results when working with seventh and eighth-grade remedial readers. Hargis and Gickling (1978) supported the thesis that imagery is an important factor in learning to recognize words and that high imagery words are more readily learned as sight words.

Few studies are available on the relationship between imagery and sex differences. According to Christiansen (1969) and Stewart (1965) these sex differences have been essentially overlooked in recent investigations. There is some evidence that imagery and sex differences are relevant to incidental learning. Earnest (1968) found that these two factors significantly interacted in paired-associate learning tasks such that differences between high and low imagery were greater for females than males. Moreover, high imagery was positively related to learning in the female sample; whereas, the converse was found with males. Similar results were discovered by Earnest and Paivio (1971) who used introductory psychology students to explore the relationship between imagery and sex differences. They found better incidental memory on an item-recognition task for females (but not males) with high imagery scores.

Sex Differences in Reading Achievement

Research data compiled over the past few decades have reported conclusive evidence that girls, as a group, achieve

significantly higher in beginning reading than do boys as a group. The literature on early achievement in reading indicated that sex differences have been significant topics for study by those who were interested in pupils as readers. The report of research that follows is representative of data available on the topic.

Studies at the readiness or beginning reading levels indicate differences or no differences between girls and boys depending on the skill or ability being measured. For example, Weintraub (1966) cited a study by Goins who studied children early in the first grade on fifteen tests of visual perception. She found that only one, a test of visual memory, gave statistically significant differences between sexes. On the other hand, Carroll (1948) found differences in reading readiness areas at the beginning of grade one and then measured achievement in reading at the end of this grade. She concluded that there were no statistical significant differences between girls and boys at the beginning of first grade; however, at the end of first grade, Konski's (1951) study showed that girls performed significantly better on a reading achievement test than did boys. Barlow (1963) in a study of 151 boys and 151 girls with equivalent I.Q.'s found that girls were superior to boys in a reading readiness test. However, when reading readiness was held constant, using an analysis of covariance, no significant differences were found

between the reading achievement of girls and boys at the end of grade one.

Other studies comparing different approaches to beginning reading instruction have found sex differences in reading. Hahn (1966), using first-grade children, examined the relative effectiveness of three approaches for beginning reading and concluded that girls and boys had comparable test scores on group data, but boys lagged behind the girls in reading achievement. Furthermore, Tanyzer and Alpert (1966) studied the effects of three different basal reading systems in reading achievement of first-grade pupils according to sex and different levels of intelligence. They concluded that sex was not a factor producing differential results among any of the three reading groups. That is, no one basal series seemed to produce better results with boys than with girls, or vice versa. In each of the three systems, the girls achieved higher mean scores than did the boys. Significant differences between the girls and boys occurred on the Spelling and Paragraph Meaning subtests. Tanyzer and Alpert (1966) suggested that in first grade, girls and boys should be instructed separately, regardless of the basal reading system used. They also suggested that greater delay in teaching boys to read may be useful.

Schneyer (1966) investigated the comparison of reading achievement of first-grade children taught by the linguistic

approach with the reading achievement of first-grade children taught by the basal reader approach. On five of seven criterion measures, the girls scored significantly higher than the boys. This finding substantiated those of Hahn (1966) and Tanyzer (1966) that sex differences in reading achievement favor girls.

The twenty-seven first-grade reading studies were supported by grants from the U.S. Office of Education during the school year 1964-65. Analyzing the data from these studies, Bond and Dykstra (1967) reported that girls rated higher than boys on both readiness measures and reading achievement at the end of grade one. During the following year, fifteen of these studies were continued into grade two. Dykstra (1968) reported that girls maintained their superiority in reading achievement at the end of grade two.

A large scale study was reported by Stroud and Lindquist (1942, p. 665). Over three hundred schools with 50,000 pupils provided the source of the data. The data was collected using the *Iowa Every-Pupil Basic Skills Test*. In this program, pupils in grades three through eight were tested in reading comprehension, vocabulary, word study skills, basic language skills, and arithmetic skills. The authors stated that:

Girls have maintained a consistent, and on the whole, significant superiority over boys in the subjects tested, save in arithmetic, where small significant differences favor boys.

Studies have contributed data which have suggested that age and the milieu of the school, including instruction, might play a significant role in producing sex differences in early reading performance. For example, Anderson et al. (1956) reported findings collected at the University of Michigan Laboratory School, where children were in a setting in which they started reading as they were ready, rather than in a structured situation in which everyone was introduced to reading in the first grade. A child was considered to have learned to read when he achieved a score of 84 months on the Gates Primary Test. The study noted sex differences in the chronological age at which this score was attained. On the average, girls learned to read more than six months earlier than boys. Over half of the girls learned to read at an age when children are normally in first grade, as compared to only about one-third of the boys. The authors stated, "Girls tended to read earlier than boys and there were fewer extreme delays in reading among girls than boys." In a second study Anderson et al. (1957) found that sex differences in age of learning to read tended to disappear among children of high intelligence; whereas, in the lower intelligence group, boys started later than girls.

In another study, Prescott (1955) tested over seven thousand girls and seven thousand boys, who were beginning first grade, with the Metropolitan Readiness Test to

determine whether or not this test showed sex differences. He reported that when chronological age is equated, the performance of girls was superior to that of boys.

One frequent suggestion has been that boys should enter school at a later chronological age than girls. Thus one could have six-year old girls and seven-year old boys in first grade. Tanyzer and Alpert (1966) suggested a variation of this when they advocated greater delay in teaching boys to read and separate instruction for boys and girls. Smith and Dechant (1961) pointed out that such recommendations are based on group averages but do not solve the problem of individual differences. They felt that the solution lay in a delay of formal reading instruction until the child was ready for it and in an early provision of experiences that would prepare him for reading.

Heilman (1966, p. 622) conducted an intensive in-service program in which participating teachers studied and discussed research data relevant to sex differences in learning to read. These teachers made a number of classroom and teaching adjustments. Boys taught by these teachers had higher mean scores on each of the subtests of the Stanford Achievement Test at the end of grade one than did boys taught by control teachers in the same community. The author stated that:

In-service training which resulted in teacher awareness of sex differences in learning to read appears to have evoked classroom practices which tended to enhance the performance of boys.

Flaherty and Anderson (1966) felt that the school could provide a more challenging curriculum for boys through the judicious selection of a wide and varied assortment of reading materials. Such a selection would involve awareness of various interests of both girls and boys in classrooms with subsequent provisions for free reading books and other materials to meet these different interests.

Preston (1979) studied the reading achievement of 984 German fourth-grade girls and boys. He explored the relationships between sex of the student and sex of the teacher. It was hypothesized that the reading achievement of boys that had male teachers for the first four years of schooling would outdistance that of boys who had female teachers for the same period. Preston further hypothesized that the reading achievement of girls under female teachers during that period would surpass that of girls with male teachers and found that test scores of boys were negligibly higher than those of girls.

Developing and Expanding Sight Vocabulary

Developing sight vocabulary is one of the most important goals in the primary reading program. The pupil who fails to do so will not become a proficient reader. Pupils in the first grade will meet several hundred words on experience charts, on bulletin boards and in basal readers.

Current basal readers repeat words many times in order to increase the pupil's acquisition of words. Spache and Spache (1973) noted that vocabulary control has shown a constant trend toward greater repetition and smaller vocabularies in all levels of primary readers for the past thirty or more years. The reason for the change in repetitions of words over a thirty-year time span has not been explained in the literature. Experimental findings could point directions for future textbook writing with vocabulary control.

The important basic research on vocabulary control was reported by Gates in a series of investigations covering a wide span of years.

In one of his earlier studies Gates (1930) noted that children varied markedly according to intelligence levels in terms of repetitions of a word needed in acquiring a reading vocabulary. He noted that repetitions ranged from 55 for children with I.Q.'s of 60 to 69, down to 20 repetitions for those with I.Q.'s of 120 to 129. He reported that the number of repetitions varied with the particular words as well as the degree of interest and motivation of the reader.

Somewhat later, Gates and Russell (1938) studied three groups of children who had been introduced to varying numbers of different words in first grade. The groups were

approximately equal with respect to readiness test scores, mental age, and sex distribution. On standardized tests using words not taught to them, the children who had encountered the smallest number of different words scored higher in both word recognition and paragraph comprehension than the children encountering the largest number of different words in grade one reading instruction.

Moreover, when these pupils were divided into ability levels on the basis of readiness scores, the following findings were noted:

1. Children in the highest readiness score group, given the medium amount of vocabulary diversity, obtained the highest scores on the four reading tests administered.
2. Of the children scoring in the middle readiness ranges, the group receiving the restricted vocabulary scored highest on all four reading measures.
3. Among children in the low readiness group, the restricted vocabulary classes received the highest scores.

Clark and Monahan (1955), reported on two Master's studies which yielded results contradictory to those of Gates and Russell. In one of the studies, the stories, which used the words from four series of readers, were

written at the preprimer, primer, and first reader levels. At the preprimer level only a small number of children were able to read orally the words in the story that had not been included in their particular basal reader. At the primer level and beyond a number of children were able to read words not previously taught in the reader in which they had been working. Clark and Monahan concluded that vocabulary control did not seem necessary beyond the preprimer level. They failed to note, however, that they were dealing with a comparatively gifted group. When this factor was taken into account, their findings tended to agree with those of Gates and Russell.

More recently, Gates (1961) reported investigations beyond the first grade. In one study he found that third grade children of average ability or better had little difficulty in recognizing and grasping the meaning of words in the fourth grade book. Brighter pupils in the latter part of grade two experienced little difficulty with new words taken from third and fourth-grade readers. Gates (1962) reported a supplementary study of end-of-the-year second grade children of approximately average intelligence on measured word meaning ability of samples of words taken from books covering grades one through four. Almost half of the children knew most of the words. Because there were pupils who scored low on the test, Gates commented that it

behooves us "not to be too hasty in discarding every form of 'vocabulary control' in the basal readers of lower grades."

The present chapter presented a brief review of literature on the concept of imagery, particularly with reference to its postulated role in learning sight vocabulary. This review was followed by a general overview of research data on early achievement in reading and its relationship to sex differences, vocabulary development, and vocabulary control.

CHAPTER III

METHODS AND PROCEDURES

The initial population of this study was forty pupils evenly distributed according to sex; twenty girls and twenty boys. The pupils were randomly selected from sixty pupils enrolled in two first grade classes in South Rossville Elementary School, Rossville, Georgia. The pupils' ages ranged from six years to eight years. Absences and incomplete sets of data reduced the final population from forty pupils to twenty-seven pupils with a girl-boy sex distribution of thirteen (13) to fourteen (14). No attempt was made to determine whether any of the selected pupils had specific reading problems. Regular attendance was required for each of the pupils who participated in the study.

The investigator conferred with the principal and first grade teachers two months prior to the study and received permission to conduct the research. The purpose and general design of the study was explained; however, the procedure to be used with the pupils was not explained to them. The principal and teachers were informed that the basic sight vocabulary recognition method to be used would not conflict with the pupils' regular reading program and that data collected would be available at the conclusion of the study.

Two aides in the schools participated in the study as daily pupil examiners. These aides were experienced classroom teacher aides. One was currently enrolled as a student at the University of Georgia. Four one-hour orientation sessions were held to familiarize the aides with the procedures to be followed during the pretesting and training trials periods (Appendix D). During the orientation sessions, each aide was given a Master Word Deck which contained the forty-one word cards. The investigator explained and demonstrated the methods, pacing of presentation, administration of the training trials, and marking procedure. At the conclusion of the four-day orientation period, both aides were able to implement the procedure. The investigator concluded that the four sessions proved adequate for the aides to become competent daily pupil examiners.

The Paivio, Yuille and Madigan 925 nouns (1968) provided the source of the words which were used during pretesting and the training trials sessions. Forty-one low imagery words with values of 4.0 and below, coded with an AA and designated by the Thorndike-Lorge List (1944) as appropriate for grades one and two, comprised the word decks. Since the words on this list were in alphabetical order, the basic word deck was randomized. The words in each pupil's word deck were arranged in the same order for initial presentation (Appendix C). Each word was typewritten in primary lower case letters on a 2-1/2" x 4" white unruled card.

Each pupil was allotted a Master Word Deck and a folder containing two record keeping sheets which were kept with the examiner and which were maintained daily. The daily sessions were scheduled from 10:00 a.m. to 12:00 noon. The sessions continued for three weeks plus the final Monday. The first week was for pretesting and the remaining two weeks were for the training trials sessions.

During the first week, pupils from the two classrooms were initially screened with the Master Word Deck on the dimensions of Sight Recognition and Meaning Vocabulary. Words from the Master Word Deck were exposed for one second. Those which the pupil could immediately identify were designated as Recognized words; those words which the pupil could not identify were designated as Unrecognized words. For a more detailed explanation of the Kolker, Terwilliger (1977) procedure, see Appendix D. The Recognized words were deleted from the study and the Unrecognized words provided the deck for the pupil's meaning vocabulary. From the Unrecognized Deck, the examiner pronounced the word for the pupil. The pupil indicated to the examiner knowledge of the word's meaning by defining or using it in a sentence. This procedure was used for all of the remaining words. These words which the pupil had not recognized but indicated knowledge of their meanings provided the word deck which became the source for the daily training trials deck.

Sessions for the training trials began the second week and continued two weeks plus a final Monday. Six cards were randomly selected from the pupil's training trials deck for initial daily use. This number was maintained throughout the study. During the one learning trial for each new word, the examiner exposed the word, pronounced it and requested the pupil to repeat it. The word received five training trials per day with a one-second exposure for each trial followed by the pronunciation of the word by the pupil. A sample of the scoring method is presented in Appendix F.

Evaluation of the pupil's training trials for a daily session included the following: Any word card which the pupil named correctly during the final three consecutive trials in a daily session was considered a temporarily learned word and was presented the following day as a short term recall word. This word was presented first the next day. If the pupil did not respond correctly to the temporarily learned word, the word card remained in the training deck and this first presentation was considered Trial 1.

If the pupil responded correctly to the temporarily learned word (short term recall), the word card was removed from the training trials deck and presented as a delayed recall item in forty-eight or seventy-two hours. This time was determined by the day of the week in regard to the weekend.

At the end of the daily session, the examiner selected a new word from the Master Word Deck to replace each temporarily learned word only if the pupil gave its correct name the following day.

If the pupil responded correctly to the delayed recall item, it was noted and the word retired. If the pupil did not respond correctly to the delayed recall item, the word was reinserted in the training trials deck and the daily trials continued. The first presentation was considered Trial 1. The flowchart (Appendix E) presents the total procedural design of the study.

Neither the regular classroom teachers nor their teacher aides had access to a list of the nouns the pupils were learning. Therefore, unless the pupils discussed the words with their teachers and parents the words they were learning, there was no opportunity for practice at home or at school.

The collected data were treated to determine simple percentage ratios and means of the number of trials for each stage of learning (delayed recall, short term recall, and trials only recall). A comparison of these ratios and means was made to reflect any existing differences between the number of word trials made by the girls and boys.

CHAPTER IV

PRESENTATION OF DATA

The forty-one low imagery words taken from the Paivio et al. (1968) scale, served as a source of words for this study. Prior to this study, it was decided that words with a numerical value of 4.0 and below would be considered low imagery words.

Absences of subjects from school necessitated the elimination of thirteen sets of data, reducing the number of usable sets from forty to twenty-seven. These remaining twenty-seven pupils, thirteen girls and fourteen boys, committed one hundred thirty-one words to delayed recall and twenty-one words to short term recall. One hundred forty-eight words remained in the trials only recall stage uncommitted to either delayed or short term recall.

Specific questions were defined for this study. The collected data were treated to determine the percentage ratios and the means of the number of trials for each stage of learning (delayed recall, short term recall and trials only recall). Comparisons of learning trials for each stage of learning are found in the tables according to the order of the following questions:

I. Delayed Recall Stage of Learning

Question #1: *Will there be a difference between the number of total trials made by beginning first grade girls in learning low imagery nouns and the number of total trials made by beginning first grade boys in learning low imagery nouns?*

Table I presents the data for the responses to the low imagery nouns learned by beginning first grade girls and boys. The girls took 1575 trials to learn 86 words with a mean of 18.3 trials; the boys took 880 trials to learn 45 words with a mean of 19.6 trials. There appears to be little difference between the number of trials the girls made in learning a low imagery noun and the number of trials the boys made in learning low imagery nouns.

TABLE I

NUMBERS, PERCENTAGES, AND MEANS OF TOTAL TRIALS FOR
DELAYED RECALL OF LOW IMAGERY NOUNS: BEGINNING
FIRST GRADE GIRLS AND BOYS

	No. of Words	Total Trials	Mean of Total Trials	Percent of Total Trials
Girls	86	1575	18.3	100
Boys	45	880	19.6	100
Total	131	2455	18.7	100

Question #2: *Will there be a difference between the number of correct trials made by beginning first grade girls*

in learning low imagery nouns and the number of correct trials made by beginning first grade boys in learning low imagery nouns?

The data on Table II indicate that beginning first grade girls made 721 correct trials with a mean of 8.4 trials while the boys made 374 correct trials with a mean of 8.3. The girls' correct percentage ratio of 46% compared with the boys' correct percentage ratio of 43% suggested little difference in the number of correct trials for the low imagery nouns learned.

TABLE II

NUMBERS, PERCENTAGES, AND MEANS OF CORRECT TRIALS
FOR DELAYED RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Correct Trials	Mean of Correct Trials	Total Trials	Percent of Total Trials
Girls	86	721	8.4	1575	46
Boys	45	374	8.3	880	43
Total	131	1095	8.3	2455	45

Question #3: *Will there be a difference between the number of error trials made by beginning first grade girls in learning low imagery nouns and the number of error trials made by beginning first grade boys in learning low imagery nouns?*

The data on Table III indicate that beginning first grade girls made 854 errors with a mean of 9.9 trials while the boys made 506 errors with a mean of 11.2 trials. The girls' error percentage ratio of 54% compared with the boys' error percentage ratio of 58% suggested little difference in the number of error trials for the low imagery nouns learned.

TABLE III

NUMBERS, PERCENTAGES, AND MEANS OF ERROR TRIALS FOR
DELAYED RECALL OF LOW IMAGERY NOUNS: BEGINNING
FIRST GRADE GIRLS AND BOYS

	No. of Words	Error Trials	Mean of Errors Trials	Total Trials	Percent of Total Trials
Girls	86	854	9.9	1575	54
Boys	45	506	11.2	880	58
Total	131	1360	10.4	2455	55

II. Short Term Recall Stage of Learning

Question #1: *Will there be a difference between the number of total trials made by beginning first grade girls in placing low imagery nouns in short term recall and the number of total trials made by beginning first grade boys in placing low imagery nouns in short term recall?*

The data on Table IV indicate that the beginning first grade girls made 275 trials with a mean of 34.4 trials on their eight words in the short term recall stage of learning

while the boys made 380 trials with a mean of 29.2 trials on their thirteen words. The direction of the small difference in the number of trials for the few words in the short term recall stage of learning was opposite to the direction of the difference in number of trials made by both groups in the delayed recall stage.

TABLE IV

NUMBERS, PERCENTAGES, AND MEANS OF TOTAL TRIALS
FOR SHORT TERM RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Total Trials	Mean of Total Trials	Percent of Total Trials
Girls	8	275	34.4	100
Boys	13	380	29.2	100
Total	21	655	31.2	100

Question #2: *Will there be a difference between the number of correct trials made by beginning first grade girls in placing low imagery nouns in short term recall and the number of correct trials made by beginning first grade boys in placing low imagery nouns in short term recall?*

The data on Table V indicate that the beginning first grade girls made 109 correct trials with a mean of 13.6 trials for their short term recall words, while the boys made 163 correct trials with a mean of 12.5 trials for their words. The girls' percentage ratio was 40% and the boys'

percentage ratio was 43%. There appeared to be little difference in the number of correct trials the girls made and the number of correct trials the boys made for the low imagery words in the short term recall stage of learning. Although very small, the difference in the mean number of correct trials was similar with the difference in the mean number of correct trials made by both groups in the delayed recall stage of learning; however, the pattern of difference of the percentage ratio was slightly opposite.

TABLE V

NUMBERS, PERCENTAGES, AND MEANS OF CORRECT TRIALS
FOR SHORT TERM RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Correct Trials	Mean of Correct Trials	Total Trials	Percent of Total Trials
Girls	8	109	13.6	275	40
Boys	13	163	12.5	380	43
Total	21	272	13.0	655	42

Question #3: *Will there be a difference between the number of error trials made by beginning first grade girls in placing low imagery nouns in short term recall and the number of error trials made by beginning first grade boys in placing low imagery nouns in short term recall?*

The data on Table VI indicate that beginning first grade girls made 166 error trials with a mean of 20.8 trials

for their short term recall words while the boys made 217 errors with a mean of 16.7 trials for their words. The girls' percentage ratio was 60% and the boys' percentage ratio was 57%. There appeared to be little difference in the number of error trials the girls made and the number of error trials the boys made for low imagery words in the short term recall stage of learning. The direction of the small difference was opposite to the trials made by both groups in the delayed recall stage of learning.

TABLE VI

NUMBERS, PERCENTAGES, AND MEANS OF ERROR TRIALS
FOR SHORT TERM RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Error Trials	Mean of Error Trials	Total Trials	Percent of Total Trials
Girls	8	166	20.8	275	60
Boys	13	217	16.7	380	57
Total	21	383	18.2	655	58

III. Trials Only Recall Stage of Learning

Question #1: *Will there be a difference between the number of total trials made by beginning first grade girls in placing low imagery nouns in trials only recall and the number of total trials made by beginning first grade boys in placing low imagery nouns in trials only recall?*

The data on Table VII indicate that beginning first grade girls made 2275 trials with a mean of 33.5 trials on their 68 words in the trials only recall stage of learning, while the boys made 3370 trials with a mean of 42.1 trials on their 80 words. The difference in the number of trials was greater in the trials only recall stage of learning than in the delayed recall or short term recall stage of learning. The pattern of difference was more similar to the delayed recall stage of learning, in that, the girls made fewer trials than the boys.

TABLE VII

NUMBERS, PERCENTAGES, AND MEANS OF TOTAL TRIALS
FOR TRIALS ONLY RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Total Trials	Mean	Percent of Total Trials
Girls	68	2275	33.5	100
Boys	80	3370	42.1	100
Total	148	5645	38.1	100

Question #2: *Will there be a difference between the number of correct trials made by beginning first grade girls in placing low imagery nouns in trials only recall and the number of correct trials made by beginning first grade boys in placing low imagery nouns in trials only recall?*

The data on Table VIII indicate that the beginning first grade girls made 440 correct trials with a mean of 6.5 trials for their trials only recall words, while the boys made 409 correct trials with a mean of 5.1 trials for their words. The girls' percentage ratio was 19% and the boys' percentage ratio was 12%. The pattern of small difference in the number of correct trials in the trials only recall stage of learning was similar to both the delayed recall and short term recall stages of learning; however, the pattern of the percentage ratio agreed with the delayed recall words and appeared slightly opposite to the short term recall words, as shown below in Table VIII.

TABLE VIII

NUMBERS, PERCENTAGES, AND MEANS OF CORRECT TRIALS
FOR TRIALS ONLY RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Correct Trials	Mean of Correct Trials	Total Trials	Percent of Total Trials
Girls	68	440	6.5	2275	19
Boys	80	409	5.1	3370	12
Total	148	849	5.7	5645	15

Question #3: *Will there be a difference between the number of error trials made by beginning first grade girls in placing low imagery nouns in trials only recall and the*

number of error trials made by beginning first grade boys in placing low imagery nouns in trials only recall?

The data on Table IX indicate that beginning first grade girls made 1835 error trials with a mean of 27.0 trials for their trials only recall words while the boys made 2961 error trials with a mean of 37.0 trials for their words. The girls' percentage ratio was 81% and the boys' percentage ratio was 88%. The difference in the number of error trials made by the girls and boys in the trials only recall stage of learning was greater than either the delayed recall or short term recall learning stage. The pattern of the percentage ratios agreed with the delayed recall words and appeared slightly opposite to the short term recall words.

TABLE IX

NUMBERS, PERCENTAGES, AND MEANS OF ERROR TRIALS
FOR TRIALS ONLY RECALL OF LOW IMAGERY NOUNS:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	Error Trials	Mean of Error Trials	Total Trials	Percent of Total Trials
Girls	68	1835	27.0	2275	81
Boys	80	2961	37.0	3370	88
Total	148	4796	32.4	5645	85

IV. Total Stages of Learning: Delayed, Short Term,
and Trials Only Recall

Question #1: *Will there be a difference in the number of total trials made by beginning first grade girls in learning low imagery nouns and the number of total trials made by beginning first grade boys in learning low imagery nouns?*

The data on Table X indicate that beginning first grade girls made a total of 4125 trials with a mean of 25.5 trials for their 162 words in the delayed recall, short term recall and trials only recall stages of learning. The boys made a total of 4630 trials with a mean of 33.6 trials for their 138 words in all of the stages of learning. The girls' total number of trials for all of the words presented was slightly less than the boys' total number of trials.

TABLE X

NUMBERS, PERCENTAGES, AND MEANS OF TOTAL TRIALS FOR
DELAYED, SHORT TERM, AND TRIALS ONLY RECALL OF
LOW IMAGERY NOUNS: BEGINNING FIRST GRADE
GIRLS AND BOYS

	No. of Words	Total Trials	Mean of Total Trials	Percent of Total Trials
Girls	162	4125	25.5	100
Boys	138	4630	33.6	100
Total	300	8755	29.2	100

Question #2: *Will there be a difference between the number of correct trials made by beginning first grade girls*

in learning low imagery nouns and the number of correct trials made by beginning first grade boys in learning low imagery nouns?

The data on Table XI indicate that the beginning first grade girls made a total of 1270 correct trials with a mean of 7.8 trials for their words in delayed recall, short term recall, and trials only recall stages of learning. The boys made a total of 946 correct trials with a mean of 6.9 trials for their words in all of the stages of learning. The girls' percentage ratio of total correct trials was 31% and the boys' percentage ratio was 20%. Although the girls' percentage ratio of total correct trials was slightly greater than the boys' total percentage ratio, the number of total correct trials was rather small for both groups.

TABLE XI

NUMBERS, PERCENTAGES, AND MEANS OF CORRECT TRIALS
FOR DELAYED, SHORT TERM, AND TRIALS ONLY RECALL
OF LOW IMAGERY NOUNS: BEGINNING FIRST
GRADE GIRLS AND BOYS

	No. of Words	Correct Trials	Mean of Correct Trials	Total Trials	Percent of Total Trials
Girls	162	1270	7.8	4125	31
Boys	138	946	6.9	4630	20
Total	300	2216	7.4	8755	25

Question #3: *Will there be a difference between the number of error trials made by beginning first grade girls in learning low imagery nouns and the number of error trials made by beginning first grade boys in learning low imagery nouns?*

The data on Table XII indicate that the beginning first grade girls made a total of 2855 error trials with a mean of 17.6 trials for their words in delayed recall, short term recall, and trials only recall stages of learning. The boys made a total of 3684 error trials with a mean of 26.7 trials for their words in all of the stages of learning. The girls' percentage ratio of total error trials was 69% and the boys' percentage ratio was 80%. Although the girls' percentage ratio of total error trials was slightly less than the boys' percentage ratio, their average number of total error trials per word was substantially less than the boys' average number of total error trials.

TABLE XII

NUMBERS, PERCENTAGES, AND MEANS OF ERROR TRIALS FOR
 DELAYED, SHORT TERM, AND TRIALS ONLY RECALL
 OF LOW IMAGERY NOUNS: BEGINNING
 FIRST GRADE GIRLS AND BOYS

	No. of Words	Error Trials	Mean of Error Trials	Total Trials	Percent of Total Trials
Girls	162	2855	17.6	4125	69
Boys	138	3684	26.7	4630	80
Total	300	6539	21.8	8755	75

Comparisons of the number of words which the beginning first grade girls and boys placed in the various stages of learning are presented in the following tables and discussions.

Table XIII indicates the number of words that the twenty-seven beginning first grade girls and boys placed in each of the three stages of learning, delayed recall, short term recall and trials only recall.

TABLE XIII

NUMBER OF WORDS BEGINNING FIRST GRADE GIRLS AND BOYS
PLACED IN THE DELAYED RECALL, SHORT TERM RECALL,
AND TRIALS ONLY RECALL STAGES OF LEARNING

	No. of Pupils	Delayed Recall No. of Words	Short Term Recall No. of Words	Trials Only Recall No. of Words	Total No. of Words
Girls	13	86	8	68	162
Boys	14	45	13	80	138
Total	27	131	21	148	300

Question #1: *Will there be a difference in the number of low imagery nouns presented to the beginning first grade girls and the number of low imagery nouns presented to the beginning first grade boys?*

The data on Table XIV indicate that the thirteen beginning first grade girls were presented 162 words with

an average of 12.5 words per girl. The fourteen boys were presented 138 words with an average of 9.9 words per boy.

TABLE XIV

NUMBERS, PERCENTAGES, AND MEANS OF TOTAL WORDS PRESENTED
FOR DELAYED, SHORT TERM, AND TRIALS ONLY RECALL:
BEGINNING FIRST GRADE GIRLS AND BOYS

	No. of Words	No. of Total Words	Mean of Total Words	Percent of Total Words
Girls	13	162	12.5	100
Boys	14	138	9.9	100
Total	27	300	11.1	100

Question #2: *Will there be a difference in the number of low imagery nouns placed in delayed recall by beginning first grade girls and the number of low imagery nouns placed in delayed recall by beginning first grade boys?*

The data on Table XV indicate that the beginning first grade girls placed 86 words in the delayed recall stage of learning with an average of 6.6 words per girl while the boys placed 45 words in the delayed recall stage of learning with an average of 3.2 words per boy. The average number of words placed in delayed recall by the girls doubled that of the boys.

TABLE XV
NUMBERS, PERCENTAGES, AND MEANS OF WORDS PLACED
IN DELAYED RECALL: BEGINNING FIRST
GRADE GIRLS AND BOYS

	No. of Pupils	No. of Delayed Recall Words	Mean of Delayed Recall Words	Total Words	Percent of Total Words
Girls	13	86	6.6	162	53
Boys	14	45	3.2	138	33
Total	27	131	4.9	300	44

Question #3: *Will there be a difference in the number of low imagery nouns placed in short term recall by beginning first grade girls and the number of low imagery nouns placed in short term recall by beginning first grade boys?*

The data on Table XVI indicate that the beginning first grade girls placed 8 words in the short term recall stage of learning with an average of less than one word per girl while the boys placed 13 words in the short term recall stage of learning with an average of less than one word per boy. There was little difference between the average number of words a member of each group placed in short term recall.

TABLE XVI
NUMBERS, PERCENTAGES, AND MEANS OF WORDS PLACED
IN SHORT TERM RECALL: BEGINNING FIRST
GRADE GIRLS AND BOYS

	No. of Pupils	No. of Short Term Recall Words	Mean of Short Term Recall Words	Total Words	Percent of Total Words
Girls	13	8	.6	162	5
Boys	14	13	.9	138	9
Total	27	21	.8	300	7

Question #4: *Will there be a difference in the number of low imagery nouns placed in trials only recall by beginning first grade girls and the number of low imagery nouns placed in trials only recall by beginning first grade boys?*

The data on Table XVII indicate that the beginning first grade girls placed 68 words in the trials only recall stage of learning with an average of 5.2 words per girl, while the boys placed 80 words in the trials only stage of learning with an average of 5.7 words per boy. There was little difference between the average number of words a member of either group placed in trials only recall.

TABLE XVII

NUMBERS, PERCENTAGES, AND MEANS OF WORDS PLACED
IN TRIALS ONLY RECALL: BEGINNING FIRST GRADE
GIRLS AND BOYS

	No. of Pupils	No. of Trials Only Recall Words	Mean of Trials Only Recall Words	Total Words	Percent of Total Words
Girls	13	68	5.2	162	42
Boys	14	80	5.7	138	58
Total	27	148	5.5	300	49

The systematic presentation of the low imagery nouns provided the following pupil responses. The twenty-seven (27) pupils were presented a total of 300 nouns during the study. The girls and boys placed 131 in delayed recall.

The girls learned (delayed recall) almost twice as many words (86 words) as did the boys (45 words). The girls learned 53% of the 162 words presented to them; whereas, the boys learned only 33% of the 138 words presented to them. The girls continued daily trials on 47% of their words while the boys continued daily trials on 67% of their words. The girls took 1575 trials to learn the 86 words while the boys took 880 trials to learn the 45 words. The average number of trials which a girl took to learn a word was 18.3 trials while the average number of trials a boy took was 19.6 trials.

The pattern of learning words (delayed recall) was very similar for both girls and boys as seen by the ratio of errors and correct responses. The girls had a 54% error ratio with a mean of 9.9 trials. The boys had a 58% ratio of error with a mean of 11.2 trials. The girls' mean number of trials for the delayed recall words was 18.3 trials; the boys' mean number of trials was 19.6 trials. The girls' and boys' mean number of trials for correct responses were 8.4 and 8.3 respectively.

The pattern of responses with the short term recall words was similar for both girls and boys. The error responses exceeded the correct responses; however, the mean number of trials in each category differed in that the boys ($\bar{X} = 16.7$) made fewer error responses per word than the

girls ($\bar{X}$ = 20.8). The number of words in short term recall was small (girls 8, boys 3).

The pattern of responses with the trials only recall words was similar for both girls and boys. The error responses substantially exceeded the correct responses; the girls' mean number of error trials was quite smaller than the boys' mean number of error trials (girls: $\bar{X}$ = 27.0; boys: $\bar{X}$ = 37.0). However, the mean number of correct trials was very similar (girls: $\bar{X}$ = 6.5; boys: $\bar{X}$ = 5.1).

The pattern of responses with all the training trials was similar for both girls and boys with the error responses exceeding the correct responses. Girls made fewer errors per word ($\bar{X}$ = 17.6) than boys ($\bar{X}$ = 26.7). The difference in correct responses was not as great (girls: $\bar{X}$ = 7.8; boys: $\bar{X}$ = 6.9). When the girls' and boys' error and correct trial responses were combined, the pattern of learning was 3:1 (error 75%, correct 25%).

The thirteen girls retired (delayed recall) 86 words or 6.6 words per girl. The fourteen boys retired (delayed recall) 45 words or 3.2 words per boy. A similar difference in the number of words each girl or boy placed in delayed recall did not appear for the average number of words they placed in short term recall or trials only recall. Each girl and boy appeared to maintain the same number of words in these latter categories of learning.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS FOR RESEARCH

Summary

This study was designed to compare the number of trials to criterion learning of low imagery nouns made by beginning first-grade girls and beginning first-grade boys. The initial population was forty first-grade pupils, twenty girls and twenty boys, randomly selected from South Rossville Elementary School, Rossville, Georgia. Absences from school and incomplete sets of data reduced the final population to thirteen girls and fourteen boys.

The Paivio, Yuille, and Madigan 925 nouns (1968) provided the source of words for the Master Word Deck. The words selected appeared as AA words ($N = 41$) designated by the Thorndike-Lorge List as appropriate for grades one and two. Since the words were in alphabetical order on the list, they were randomized before being assigned to the pupils.

The words were presented to the pupils in an initial screening activity with the Master Word Deck on the dimension of Sight Vocabulary and Meaning Vocabulary (Appendix C).

Six words were randomly selected for each daily trials session from the initially screened words. The daily trials consisted of one learning trial only for each new word

introduced and five training trials per day for each unlearned word. There was a one-second exposure for each trial. Responses to each trial were recorded for training trials, short term recall (24 hours) and delayed recall (48 to 72 hours). Words committed to delayed recall, short term recall and trials only recall were used in the data analysis which consisted of percentage ratios and arithmetical mean scores for trials.

The pupils who participated in this study accepted their tasks with great enthusiasm. During the training session, they were eager to take part and would sometimes find it difficult to make a decision on taking turns in the order in which they were to enter the training area. Prior to the closing of the training sessions, many of the children began to think of the word cards as their own and expressed a desire to take them home.

Conclusions

The major objective of this study was to determine whether there was a difference between the number of trials beginning first-grade girls made in learning low imagery nouns and the number of trials beginning first-grade boys made in learning low imagery nouns.

The general conclusions for each of the defined stages of learning were as follows:

I. Delayed Recall Stage of Learning

There appeared to be little difference between the number of trials a girl made in learning a low imagery sight vocabulary word and the number of trials a boy made in learning a low imagery sight vocabulary word.

There appeared to be little difference between the number of correct trials (or error trials) a girl made in learning the low imagery sight vocabulary word and the number of correct trials (or error trials) a boy made in learning a low imagery sight vocabulary word.

II. Short Term Recall Stage of Learning

There appeared to be little difference between the number of trials a girl made on the words she placed in short term recall and the number of trials a boy made on the words he placed in short term recall; however, this small difference was in the opposite direction as for the trials noted in the delayed recall and trials only recall stages of learning. A girl would be expected to make a greater number of trials for a word she placed in short term recall than would be a boy.

There appeared to be little difference between the number of correct trials (or error trials) a girl made on the words she placed in short term recall and the number of correct trials (or error trials) a boy made on the words he placed in short term recall. The small difference was

in the opposite direction as for the similar type of trials noted in the delayed recall and trials only recall stages of learning. A girl seemed to make a larger number of error trials per word than did a boy.

III. Trials Only Recall Stage of Learning

There appeared to be some difference between the number of trials a girl made on the words she retained in the trials only recall stage and the number of trials a boy made on the words he retained in the trials only stage. The greater difference in the number of trials occurred in the error trials. A girl made substantially fewer errors on the words she retained in trials only recall than did a boy. There was little difference in the average number of correct trials made by either a girl or boy.

IV. Total Words Presented

The number of total words presented to a girl was slightly larger than the number of total words presented to a boy. However, a girl placed a much greater number of the words in delayed recall than did a boy.

The findings indicate that there was little difference in the average number of trials either a girl or boy made in learning a low imagery noun; however, since the beginning first-grade girls retained (delayed recall) over half of the words presented to them, the probability of a girl's learning a known but unrecognized word with the daily flash card

method was greater than one out of two; whereas, the beginning first-grade boy's responses indicated that he learned one out of three words presented to him. Within the same period of flash card drills a first-grade teacher may expect that girls will learn a greater number of sight vocabulary words with a low imagery rating than boys will learn. The boys will make approximately the same number of errors as the girls will make per word they place in delayed recall; however, they will make a substantially larger number of error responses on the other words presented to them.

Both girls and boys will probably make a larger number of error responses than correct responses in learning low imagery words with the flash card drill method as used in this study. Once a pupil begins giving consecutive responses to a word, his chances in placing that word in delayed recall greatly improves.

The results indicated that beginning first-grade girls and boys responded favorably in learning low imagery sight vocabulary by the sight flash card method, and that the girls made substantially fewer total errors for all the words than did the boys. Conversely the girls made a greater number of correct responses than did the boys. The number of trials probably reflects how readily a word is learned.

Implications for Research

The first grade teacher may expect the girls may learn a greater number of low imagery nouns as sight words than the boys may learn within the same time period with the use of flash card drills. The basic pattern of learning a word, according to the number of trials and type of response (correct or error), seems to be quite similar with low imagery nouns. A replication of this study using high imagery nouns is suggested to determine if the level of imagery and/or sex differences are related to patterns of learning sight words.

This study did not attempt to control the pupil's basic learning ability; therefore, future research may investigate the relationships of learning ability, sex differences, imagery, and number and pattern of flash card trials in the first-grade pupil's learning of sight vocabulary.

The relationship between the number of trials a beginning first-grade girl or boy makes in learning a sight word and scores recorded on a reading achievement test seems merited.

Replication of the study with a larger pupil population and a more extensive word list may provide more reliable sources of data for interpretation.

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APPENDIXES

APPENDIX A

NUMBER OF LOW IMAGERY WORDS AND TRIALS FOR BEGINNING FIRST GRADE GIRLS

TABLE A-1

NUMBER OF LOW IMAGERY WORDS AND TRIALS FOR BEGINNING FIRST GRADE GIRLS

Child	Delayed Recall				Short Term				Trials Only			
	Words	E	C	T	Words	E	C	T	Words	E	C	T
1	7	114	76	190					1	53	2	55
2									6	293	37	330
3	3	39	21	60	1	1	4	5	5	223	37	260
4					2	71	19	90	6	240	10	250
5	8	102	78	180					6	102	43	145
6	1	5	5	10	3	63	57	120	6	181	39	220
7	18	80	170	250					5	40	35	75
8	10	103	72	175					6	106	49	155
9	1	25	5	30					6	287	13	300
10	9	91	89	180	1	22	8	30	5	58	47	105
11	7	70	45	115					6	133	52	185
12	7	89	56	145	1	9	21	30	4	62	43	105
13	15	136	104	240					6	57	33	90
Totals	86	854	721	1575	8	166	109	275	68	1835	440	2275

APPENDIX B

NUMBER OF LOW IMAGERY WORDS AND TRIALS FOR BEGINNING FIRST GRADE BOYS

TABLE B-1

NUMBER OF LOW IMAGERY WORDS AND TRIALS FOR BEGINNING FIRST GRADE BOYS

Child	Delayed Recall				Short Term				Trials Only			
	Words	E	C	T	Words	E	C	T	Words	E	C	T
14	3	21	34	55					6	246	29	275
15	1	7	3	10					6	292	28	320
16	10	77	73	150					6	169	16	185
17									6	328	2	330
18	7	120	60	180	2	31	39	70	4	62	18	80
19	1	9	11	20	1	22	18	40	6	198	47	245
20	1	6	9	15	1	16	9	25	6	241	59	300
21	5	27	33	60	2	50	20	70	6	167	43	210
22	1	8	12	20					6	206	74	280
23	5	51	34	85	1	4	16	20	6	198	32	230
24	2	37	18	55	4	53	42	95	5	179	16	195
25									6	305	25	330
26	1	20	20	40	1	25	15	40	6	257	8	265
27	8	123	67	190	1	16	4	20	5	113	12	125
Totals	45	506	374	880	13	217	163	380	80	2961	409	3370

APPENDIX C

MASTER WORD DECK

- | | |
|---------------|---------------|
| 1. length | 22. interest |
| 2. cost | 23. direction |
| 3. idea | 24. position |
| 4. method | 25. history |
| 5. amount | 26. hour |
| 6. fact | 27. spirit |
| 7. truth | 28. present |
| 8. soul | 29. love |
| 9. chance | 30. silence |
| 10. opinion | 31. dream |
| 11. hope | 32. time |
| 12. knowledge | 33. power |
| 13. law | 34. death |
| 14. answer | 35. pleasure |
| 15. effort | 36. heaven |
| 16. thought | 37. life |
| 17. honor | 38. health |
| 18. trouble | 39. joy |
| 19. duty | 40. strength |
| 20. mind | 41. month |
| 21. moment | |

APPENDIX D

OUTLINE OF PROCEDURES

Brenda Kolker and Paul Terwilliger
College of Education
University of Tennessee, 1976

I. Initial Testing

Stage 1. Sight Recognition

Each subject will be administered the Master Word Deck in the following manner.

Procedure:

- A. Examiner: "Hello! I am _____. What is your name?"
Subject: Response
Examiner: "You and I are going to work together for several days. We shall do several things with words. I shall 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 No. 1 (Total time - 5 sec.)
Examiner: "What is the name of this word?"
Show the word card. (1 sec. exposure)
Subject response: (3 sec. maximum)
Examiner records: (1 sec. maximum)
(a) If the subject gives a correct response, the examiner will place the word in a "recognized" pile.
(b) If the subject gives an incorrect response, the examiner will place the word card in an "unrecognized" pile.
- C. Test Word No. 2 - 41

The testing procedure will be followed through the total Master Word Deck of 41 word cards. A check list of specific words (which the subject recognized or did not recognize)

will be noted for the words presented to the subject. The word piles will be labeled and a rubber band put around each. Then, a master check list will be completed following the daily session with the subjects.

Stage II. Meaning Vocabulary

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

Procedure:

- 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 No. 1

Examiner: "Use the word _____ in a sentence."

Subject response: (10 sec. limit)

Examiner records:

(a) If the subject's sentence response or other verbal response indicates that he knows the meaning of the word, the examiner will place the word card in a "familiar" pile.

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

- C. Test Words No. 2-n

Same procedure as above.

II. Training Trials Deck

Six word cards are randomly selected from the Training Trials Deck. These word cards comprise the initial training trial words for the daily sessions.

General Directions:

Examiner: "I am going to show you a word 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."

Learning Trial

A. Word No. 1

Examiner: Shows a word card and says the name of the word 1 sec.

Subject: Says the name of the word 3 sec.

B. Words No. 2-3-4-5 and 6

Same procedure as above

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."

Examiner: Shows word (1 sec.)

(a) Correct subject response: The examiner says "Good," takes the word card away from subject's view, and places a check mark on the subject's record sheet for the trial.

(b) Incorrect subject response: The examiner says the word is _____; and then takes the word card away from the subject's view and does not credit as correct the word on the subject's record sheet for the trial.

(c) No response of "I don't know." Same as incorrect response.

(d) The word card presentation, response and examiner's remarks should not exceed 5 sec.

(e) 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: The examiner shuffles the six words in the training deck and follows the procedure described in Training Trials, Trial 1,

- (a) At the end of the Trial 5 the examiner will thank the subject for his efforts and remind him that the next training session will be the next school day.
- (b) A new subject will enter the room.

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

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 or immediate recall item. This word will be presented first the next day.

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

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 72 hours.

Thus, evaluation by the examiner begins the first day. At the end of the daily session, the examiner will select a new word from the master check sheet which may be a replacement for each temporarily learned word.

If the subject responds correctly to the delayed recall item, it will be noted and the word retired. If the subject does not respond correctly to the delayed recall item, the word will be reinserted in the training trial deck and the

daily training trials continued. This first presentation is considered Trial 1.

Note: Classroom activity is interrupted by a week-end. This interruption will be noted on the master checksheet for analysis. Learning trials and training trials will be continued on each Monday as a continuous series of trials from the previous week.

APPENDIX E

GENERAL PROCEDURE: FLOW CHART

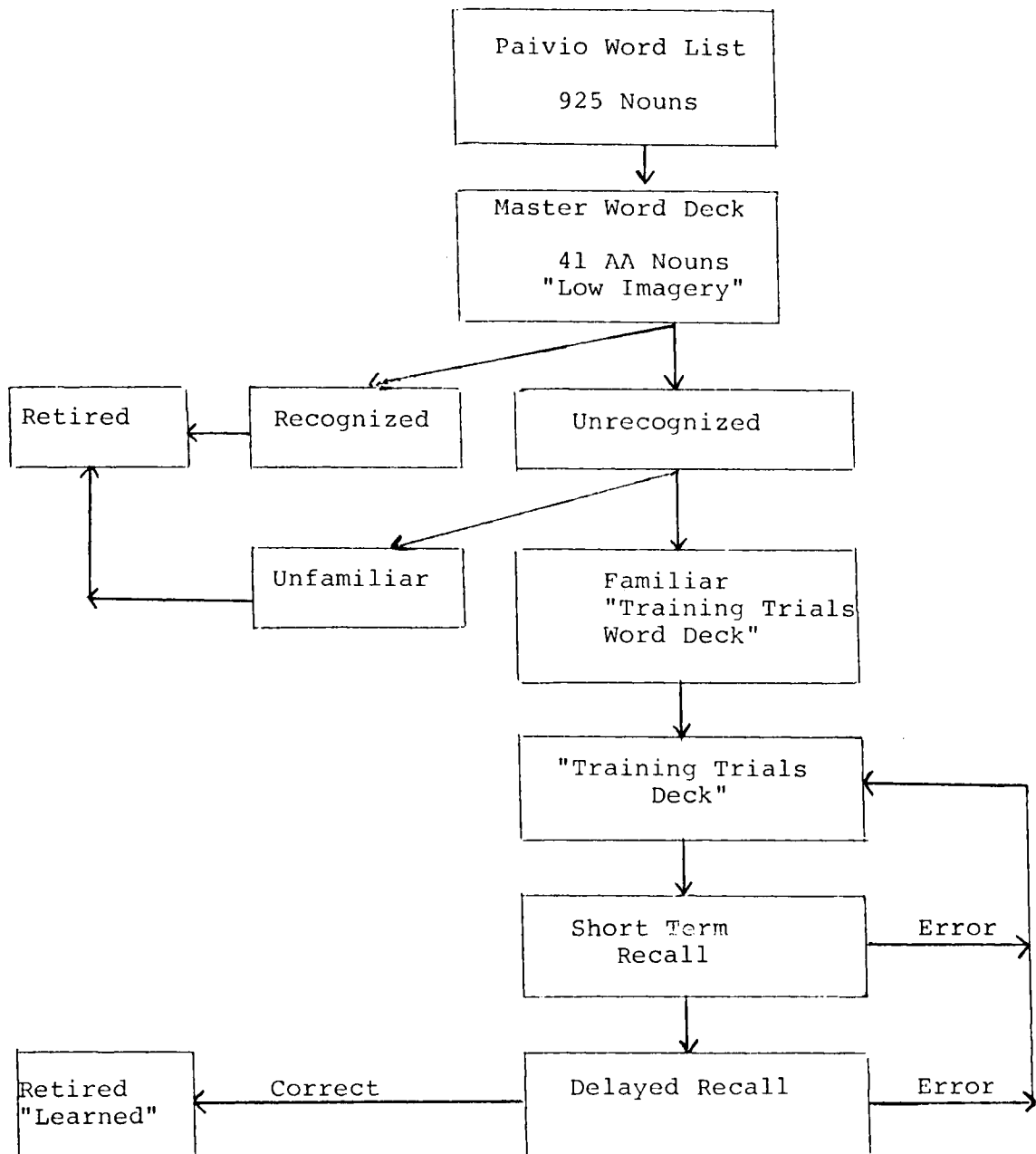


Figure E-1. General Procedure: Flow Chart.

APPENDIX F

TRAINING TRIALS RECORD

Pupil		School			
Last	First				
Day	Words	Trials			
		1.	1	1	1
		2.	1	1	1
		3.	1	1	1
		4.	1	1	1
		5.	1	1	1
		6.	1	1	1
		7.	1	1	1
		8.	1	1	1
		9.	1	1	1
		10.	1	1	1
		11.	1	1	1
		12.	1	1	1
Delayed Recall					
Short Term Recall					
Learning					
Training					
1					
2					
3					
4					
5					
Delayed Recall					
Short Term Recall					
Learning					
Training					
1					
2					
3					
4					
5					
Delayed Recall					
Short Term Recall					
Learning					
Training					
1					
2					
3					
4					
5					
Delayed Recall					
Short Term Recall					
Learning					
Training					
1					
2					
3					
4					
5					

Scoring Key: + = correct response o = incorrect response or no response weekend
 *Prepared by Brenda Kolker and Paul Terwilliger, Professors of Education, University
 of Tennessee, 1976

APPENDIX G

HUMAN SUBJECTS COMMITTEE, DEPARTMENT OF
CURRICULUM AND INSTRUCTION

Committee Review

1. Name of Investigator
2. Identification of Project
3. Title of Project

Comments/Recommendations

Signatures

DATE

FORM B

CRP# _____

Date Received _____

THE UNIVERSITY OF TENNESSEE, KNOXVILLE

Application for Review of Research Involving Human Subjects (in accordance with general institutional assurance dated July 15, 1975, as amended November 25, 1975)

I. Identification of Project: Educational Specialist's Thesis

Project Director: Paul N. Terwilliger
Co-Director: Juanita B. Foster

Title of Project: "A Comparison of the Rate of Learning of Low Imagery Nouns by First Grade Girls and First Grade Boys"

Department: Curriculum and Instruction

Collection of Data: Start - October 23, 1978
Completion - November 13, 1978

II. Objective of the Project: The objective of this study is to determine whether there is a significant difference between the number of trials first grade boys take in learning low imagery nouns and the number of trials first grade girls take in learning low imagery nouns.

III. Description of Subjects: From the South Rossville Elementary School, Rossville, Georgia, twenty (20) first grade boys and twenty (20) first grade girls will be selected at random. The school's daily morning class scheduling will determine the boy-girl distribution in the two training groups of twenty (20) pupils. Enrollment in the first grade will be the basic criterion for each of the pupils' participation in the study. No additional data from the school's records are required.

A specially trained clinician will work with each pupil for approximately eight minutes

every morning for a period of three weeks, plus a final Monday. Interference with a pupil's regular classroom learning will be minimized through cooperative scheduling of daily training sessions and the use of common sight word teaching procedures.

- IV. Methods of Procedure: During the first week of the experiment, all forty pupils will be screened with the Low Imagery Word Deck (n=41). The words will be selected as AA words on the Thorndike-Lorge List as appropriate for grades one and two, which have been coded on the Paivio List. This initial screening with the Low Imagery Word Deck will be on the dimension of Sight Recognition and Meaning Vocabulary before the learning trials begin. For the sight recognition, the pupils will have one second to respond to a flash presentation of a word. Words will be separated into recognized and unrecognized groups. The unrecognized words, for which the pupils know the meanings, will be designated as the Learning Deck or the words to be taught to the pupils.

Six words will be selected randomly from the Learning Deck for presentation the first day. The word number for each day will be kept as six for the two-week training period. Each word will have a learning trial (if it is a new word) and five training trials per day. As one word is learned another will be inserted. There will be a one-second exposure for each trial. Three consecutive final responses on one day will qualify a word to be "learned." A 24 hour short-term recall trial will follow and then a 48 or 72 hour delayed recall trial. When words are missed on either short-term or delayed recall, the training trials will begin all over. Record sheets will be kept for each pupil with each word being coded as correct or incorrect for each daily trial, short term, and delayed recall. The coded data will be analyzed using t-tests.

- V. Protection Measures: Each pupil's training record will be assigned a number and its data coded for statistical treatment. The pupil's identity will become embedded in the mass of numerically coded data. The researcher will keep no record of the listing of the names for the pupils' numbers. Therefore, the pupil will be assured anonymity.

VI. Method of Obtaining "Informed Consent" from Subjects:

The parents of all subjects will be given a consent form (attached) which explains the nature of the project and the procedures which will be followed. They will be informed that the pupil's voluntary participation will not be subject to any punitive measures by either the researcher or classroom teacher. The pupil may discontinue his participation at any time. The possible benefits of the research will be explained.

VII. Responsibility of Project Director:

By compliance with the policies established by the University Committee on Research Participation, the Project Director subscribes to the broad principles stated in "The Declaration of Helsinki" and standards of professional ethics in all research, development and related activities involving human subjects under the auspices of the University of Tennessee, Knoxville.

- a. When appropriate, Form DHEW 596 will be completed and returned to the Office of the Vice Chancellor for Graduate Studies and Research, 404 Andy Holt Tower.
- b. Approval will be obtained from the University Committee prior to instituting any change in project protocol.
- c. Development of any unexpected risks will be reported to the University Committee.
- d. Signed consent statements will be kept for the duration of the project and for at least three years thereafter.
- e. A status report (Form D) will be submitted at 12 month intervals, or as requested, attesting to current status of the project.

Signatures:

Project Director: _____

Co-Director: _____

Date: _____

VIII. Departmental Review:

COMMENTS/RECOMMENDATIONS

The application described above has been subjected to departmental review and has been approved.

Signatures:

Department Head _____ Date: _____

Chairman, Departmental
Committee _____ Date: _____

CONSENT FORM

Dear Parents:

Your child is being considered as a participant in a reading project. The purpose of the project is to help children learn sight words using the sight word method of instruction in an individualized setting. This method will not interfere with your child's reading program at school since he/she will be learning words which will reinforce skills learned in the regular classroom.

The project will last three weeks. Your child will meet with a trained teacher for approximately eight minutes per day, five days a week on an individualized basis.

To achieve the highest level of effectiveness of this project, each child should be encouraged to attend all sessions. However, a child may discontinue his participation at any time without any fear of punishment from the classroom teacher or me.

The information collected will be used as part of my research requirements for an advanced degree in elementary education. At the conclusion of the study, all information will be available to you and your child's classroom teacher if you desire.

In order for your child to participate in the project, you should sign the statement below and return it to your child's classroom teacher as soon as possible. If you have any questions at any time, please call me. My home telephone number is 622-9643.

I sincerely feel that children at South Rossville Elementary School will benefit from this educational experience and that learning will take place. The importance of the findings in this project will help teachers to better adjust instruction to individual needs since sight vocabulary is important for successful reading.

Your support and cooperation will be appreciated in this venture.

Sincerely,

Juanita B. Foster

STATEMENT OF CONSENT

I have read the description and understand the intent of the reading project.

I grant permission for my child to participate in the reading project.

Child's Name: _____ Parent or
Guardian _____

Date _____

I do not grant permission for my child to participate in this reading project.

Child's Name: _____ Parent or
Guardian _____

Date _____

VITA

Juanita Buchanan Foster was born in Chattanooga, Tennessee, on October 2, 1933. She attended elementary schools in Chattanooga and Rossville, Georgia (Dewberry). She was graduated from Miller High School, Detroit, Michigan, in June, 1951. The following September she entered Knoxville College, and in June, 1955, she received a Bachelor of Arts degree in Elementary Education. In the fall of 1957 she accepted a teaching position at Wallaceville Elementary School and began study toward a Master's degree in 1969. This degree was awarded in June, 1971.

Four years later she entered The University of Tennessee, Knoxville, to pursue her Specialist in Education degree in Curriculum and Instruction. During this time, she has been employed at Rossville Junior High School in Walker County, Rossville, Georgia.

The author is a member of St. Paul A.M.E. Church, Zeta Phi Beta Sorority, and the National Education Association.

She is married to Theodore Franklin Foster and has a son, Theodore Franklin Foster, Jr.