## ABSTRACT

AN EVALUATION OF THE EFFECTS OF STIMULUS OR RESPONSE FAMILIARIZATION ON THE SIGHT WORD LEARNING PROCESS IN KINDERGARTEN CHILDREN

By

Linda A. Patriarca

This study was designed to determine what effect, if any, focusing young children's attention on particular aspects of the visual (i.e., written word) stimulus or focusing their attention on particular aspects of the verbal response (i.e., name) would have on the subsequent sight word learning process. The study was conducted using 60 randomly selected subjects from the kindergarten population of one Michigan school district. These subjects were stratified by sex and then randomly assigned to one of three treatment groups: (1) familiarization with the visual component/written word; (2) familiarization with the auditory component/name; and (3) control with no familiarization. Sight words (from the Harder Half of the Dolch word list) were randomly selected for use in this study.

A program sequence was developed for each of the three groups in which the general format remained the same, but the specific verbal directions varied (only to the extent that the procedure used with Group A dealt with

the printed aspect of the word and the one used with Group B dealt with the verbal aspect of the word). Each subject was administered the identical program sequence twice, the only exception being that in each session five different sight words were presented. Upon completion of each program sequence the examinee was tested. After the first session each subject was administered the Match to Name test (i.e., a recognition task, in which the subject was asked to point to the word being named by the examiner) and after the second session a Naming test (i.e., a recall task, in which the subject was asked to name the word being shown by the examiner) was administered.

No significant treatment or sex main effect occurred on the Match to Name variable. In addition, no significant treatment effect, sex main effect, or interaction effect occurred on the Naming variable. A significant ($p<.1$) interaction effect, however, occurred on the Match to Name variable. From these results it was concluded that:

1. Both boys and girls clearly prefer familiarization to no familiarization as measured on a recognition task.
2. Each preferred a different type of familiarization. Boys responded best to stimulus familiarization, next best to no familiarization and least to response familiarization. And girls, on the other hand, responded best to response

familiarization, next best to either stimulus or no familiarization.

3. The sex by treatment interaction effect occurred only on the recognition measure and not on the recall measure because the latter may have been too difficult (considering the length of exposure and the nature of the task).

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By

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Dedicated to:

Jerry L. Hall

for taking the time and energy to care

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# CHAPTER I

## INTRODUCTION

One of the primary goals of beginning reading instruction is to develop a large sight vocabulary. The child who is a good reader develops a large fund of quickly recognized words whereas the child who is a poor reader does not. This task, in part, requires some degree of associative learning. In learning sight words, this simply means that the child must connect the appropriate verbal label to a particular visual array of letters (e.g., came = k-$\bar{a}$-m).

While there are numerous ways to help children acquire sight vocabulary, one method may be to "familiarize" the child with the visual component and/or response element of the word to be learned, prior to direct instruction. This might help the child make the appropriate associations more easily and more rapidly. It is realized that familiarization with the stimulus/response is a traditional variable in verbal learning. The effort in this study is to use this concept in an attempt to uncover successful teaching strategies in the area of initial sight word learning.

Before reading this dissertation, though, the writer believes that this quote by Samuels is in order:

> . . . it is important to caution the reader that the model of associational learning is neither a model of the reading process or of learning to read and should not be viewed in either light. Although associational learning is involved in learning to read, by no stretch of the imagination can the model be considered a model of reading.[1]

## The Problem

### Statement of the Problem

The purpose of this research is to evaluate the effect of stimulus versus response familiarization on a paired-associate learning task (specifically sight word learning).

Generally, this study will attempt to determine what effect, if any, focusing young children's attention on particular aspects of the visual (written word) stimulus or focusing their attention on particular aspects of the verbal response (name) will have on the subsequent associative process that links them.

Specifically, it will attempt to determine whether familiarization with the stimulus or with the response will result in superior performance for the following:

A. one experimental group over the other (Group 1 [those familiarized with the visual

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[1]S. J. Samuels, "Success and Failure in Learning to Read: A Critique of the Research," Reading Research Quarterly 8 (Winter 1973): 203-39.

stimulus] vs. Group II [those familiarized with the auditory response]).

B. either experimental group over the control group (Group I and/or Group II vs. Group III).

C. one sex over the other in either of the experimental groups (boys vs. girls in Group I; boys vs. girls in Group II).

D. one sex over the other in the control group (boys vs. girls in Group III).

E. boys in one of the three groups over boys in the other two groups (boys in Group I vs. boys in Group II vs. boys in Group III).

F. girls in one of the three groups over girls in the other two groups (girls in Group I vs. girls in Group II vs. girls in Group III).

Three independent experimental conditions will exist:

1. stimulus (visual) familiarization followed by presentation of the paired-associate;
2. response (name) familiarization followed by presentation of the paired-associate; and
3. presentation of the paired-associate without prior familiarization.

Learning will be tested in two ways: (1) via a recognition task (which requires the child to select the correct visual representation as the word is being said by the

examiner), and (2) via a recall task (which requires the child to look at the visual representation of the word and name it).

## Background to the Problem

> Initial reading requires that the child learn a complicated, arbitrarily organized system of visual signs and symbols which must become intimately associated with a previously learned auditory-vocal language system according to a rigidly prescribed and sometimes contradictory set of rules.[2]

Learning to discriminate and name words is one of the crucial requirements in this process.

In the very beginning stages of sight word learning, the child needs to make associative links between a visual representation and its spoken equivalent. In order to make constructive associations (i.e., those based upon sound cognitive strategies) she/he needs to know what aspects of a particular visual array distinguish it from others and which matching response is appropriate. If the child's early associations are not based upon sound cognitive strategies, she/he will not be able to generalize them successfully or build new (and possibly more elaborate) strategies from old ones. Therefore, it would seem that, in these cases, future word learning would be inhibited.

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[2] Ira Belmont, "Requirements of the Early Reading Task," Perceptual and Motor Skills 38 (April 1974): 527-37.

We know that many children do not succeed in this paired-associate stage of word learning. Recent models[3] indicate that paired-associate learning is a multistage phenomenon. These models fractionate the association process into overt attention, perceptual learning, memory, mediation and response learning stages. Thus, it could be that the child who is failing is experiencing difficulty with one or more of the components in this multistage process.[4]

As this study will be examining a paired-associate learning task, it seems logical to review the pertinent literature related to these component processes, beginning with ATTENTION.

The whole notion of attention can best be summarized in the words of James:

> . . . My experience is what I agree to attend to . . . . Only those items which I notice shape my mind . . . . Focalization, concentration of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others. It makes us: (a) perceive; (b) conceive; (c) distinguish; (d) remember--better than otherwise we could . . . . Clearness, so far as attention produces it, means distinction from other things and internal analysis or subdivision. These are essentially the products of intellectual discrimination, involving

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[3] G. Keppel, "Verbal Learning and Memory," Annual Review of Psychology 19 (1968): 169-202.

[4] S. J. Samuels and R. H. Anderson, "Visual Recognition, Memory, Paired-Associate Learning and Reading Achievement," Journal of Educational Psychology 65 (1973): 169-67.

> comparison, memory, and perception of various relations. The attention, per se does not distinguish and analyze and relate. The most we can say is that it is a condition of our doing so . . . .[5]

Several researchers have found a relationship between attention and learning. Silverman, Davids, and Andrews[6] found that low achieving students seem to be more distractable than high achieving students. When comparing good and poor readers on a reading task, Samuels found that when distracting pictures were present, the poor readers were more distracted by them and learned less than the good readers.[7] According to Zeaman and House, one of the reasons why retardates and normals differ in learning ability is because the retardate does not know where to focus attention during the initial learning stage.[8]

More specifically, research exists which relates attention and reading achievement. In a study by

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[5]William James, The Principles of Psychology [1890], (London: Dover Press, 1950).

[6]M. Silverman, A. Davids, and J. M. Andrews, "Powers of Attention and Academic Achievement," Perceptual and Motor Skills 17 (1963): 243-49.

[7]S. J. Samuels, "Attentional Processes in Reading: The Effect of Pictures on the Acquisition of Reading Responses," Journal of Educational Psychology 58 (1967): 337-42.

[8]D. Zeaman and B. J. House, "The Relation of I.Q. and Learning," in Learning and Individual Differences, ed. R. M. Gagne (Columbus, Ohio: Charles E. Merrill, 1967), pp. 192-217.

Lahaderne,[9] a significant correlation between attention and reading achievement in a fifth grade class was found. Even after the influence of intelligence was partialed out, a significant relationship between these two was still found. Samuels and Turnure have found that attentiveness (i.e., visual orienting behavior or direction of gaze as Turnure describes it) is related to beginning reading. They also found that increasing degrees of attention were related to superior word recognition.[10]

PERCEPTUAL LEARNING is the name given to the second stage of paired associate learning. Gibson and Levin define it as:

> . . . learning to extract the relevant information from the manifold available stimulation, that is, the invariant information that specifies the permanent layout of the environment, the distinctive features of things that populate and furnish the environment . . . it is not response learning . . . it is not association of a response with a stimulus . . . it is not problem solving . . . it is, rather an increase of specificity of discrimination to stimulus input, an increase in differentiation of stimulus information.[11]

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[9] H. M. Lahaderne, "Attitudinal and Intellectual Correlates of Attention: A Study of Four Sixth-Grade Classrooms," Journal of Educational Psychology 59 (1968): 320-24.

[10] S. J. Samuels and J. E. Turnure, "Attention and Reading Achievement in First Grade Boys and Girls," Journal of Educational Psychology 66 (February 1974): 29-32.

[11] E. J. Gibson and H. Levin, The Psychology of Reading (Cambridge, Mass.: The MIT Press, 1975), p. 13.

Thus, it is obvious that the whole notion of discrimination is central to this area.

However, the research relating difficulty in form discrimination to poor reading is not very promising. For example, Vernon[12] and Critchley[13] as well as Bonsall and Dornbush[14] have found no correlation between form discrimination and reading achievement. In addition correlations between tests of visual perception on the Frostig materials and word recognition are low.[15,16] So, this brief review will concentrate on distinctive feature learning and training of letter and letter-like forms.

A widely accepted theory of how children learn to distinguish variants of one visual pattern from variants of another is that they learn to detect and attend to

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[12] M. D. Vernon, Backwardness in Reading: A Study of Its Nature and Origin (New York: Cambridge University Press, 1957).

[13] M. Critchley, Developmental Dyslexia (London: William Heinemann, 1964).

[14] C. Bonsall and R. L. Dornbush, "Visual Perception and Reading Ability," Journal of Educational Psychology 60 (1969): 294-99.

[15] A. V. Olson, "School Achievement, Reading Ability, and Specific Visual Perception Skills in the Third Grade," Reading Teacher 19 (1966): 490-92; and C. I. Rosen, "A Study of Visual Perception Capabilities of First Grade Pupils and the Relationship between Visual Perception Training and Reading Achievement" )Ph.D. dissertation, University of Minnesota, 1965).

those features distinguishing one form from another (i.e., (relevant features) and to ignore irrelevant features.[16]

Furth and Youniss also believe that effective perceptual activity requires the capacity to direct attention toward particular aspects of the forms presented for discrimination or identification.[17]

Samuels trained kindergarteners to note the distinctive features of "b," "d," "q," and "p," and then trained them to name these letters. He found that the group which received distinctive feature training (which is a process of differentiation by learning the specific features of a set member which distinguish it from other members within its own set [i.e., the letter "u" is open; the letter "o" is closed]) as opposed to just discrimination training (which is a process of differentiation by making a broad distinction between two members of a set [i.e., two letters, numbers, etc.] because attention is not directed to the distinctive features) learned the names faster and with fewer failures.[18]

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[16] E. J. Gibson, Principles of Perceptual Learning and Development (New York: Appleton-Century-Crofts, 1969); and U. Neisser, Cognitive Psychology (New York: Appleton-Century-Crofts, 1967).

[17] H. G. Furth and J. Youniss, "Sequence Learning: Perceptual Implications in the Acquisition of Language," in Models for the Perception of Speech and Visual Form, ed. Wathen-Dunn (Cambridge, Mass.: The MIT Press, 1967).

[18] S. J. Samuels, "An Experimental Program for Teaching Letter Names of the Alphabet," Report of Project No. 9-F-009 (Washington, D.C.: United States Office of Education, 1970).

Pick[19] found that kindergarten children made fewer discrimination errors (than their control group peers) on a transfer task containing stimuli which were dissimilar in appearance but contained the same distinctive features as found in the training forms if they noticed the distinctive features of the letter-like forms.

Thus, distinctive feature training seems to be superior to discrimination training for the reason that Furth and Youniss mentioned--namely, it directs the youngster's attention to the most identifiable aspects of the form.

MEMORY comprises the third component of the paired-associate learning paradigm. Norman[20] believes that human memory is comprised of three major components--a visual information store, an auditory information store (known as short term memory) and long term memory. Information lasts about one second in the visual information store and approximately 15 seconds in short-term memory if it is not recoded or rehearsed.[21] Long-term memory preserves information for an extended period of time.

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[19]A. D. Pick, "Improvement of Visual and Tactual Form Discrimination," Journal of Experimental Psychology 69 (1965): 331-39.

[20]D. A. Norman, Memory and Attention: An Introduction to Human Information Processing (New York: John Wiley and Sons, Inc., 1969).

[21]N. C. Waugh and D. A. Norman, "The Measurement of Interference in Primary Memory," Journal of Verbal Learning and Verbal Behavior 7 (1968): 617-26.

Many believe that impaired visual memory causes reading problems.[22] Bernbach, in his study, established a relationship between visual recognition memory for the stimulus and stimulus-response association.[23] On an auditory-auditory paired associate task, Martin found that auditory memory was a crucial factor in associational learning.[24]

Anderson and Samuels found that visual memory correlated with paired-associate learning and reading achievement. However, their data suggested that the superiority of good readers was due to their ability to attend to and identify the distinctive features. They go on to say:

> . . . One can argue that improvements in visual memory may largely result from improved strategies of focal attention, perceptual learning and coding. In fact, individual differences in visual memory may largely reflect differences at the perceptual learning stage;

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[22]A. L. Benton, "Dyslexia in Relation to Form Perception and Directional Sense," in Reading Disability, ed. J. Money (Baltimore, Md.: John Hopkins Press, 1962); and R. D. Rabinovitch, "Dyslexia: Psychiatric Considerations," in Reading Disability, ed. J. Money (Baltimore, Md.: John Hopkins Press, 1962).

[23]H. A. Bernbach, "Stimulus Learning and Recognition in Paired-Associate Learning," Journal of Experimental Psychology 75 (1967): 513-19.

[24]E. Martin, "Relation between Stimulus Recognition and Paired Associate Learning," Journal of Experimental Psychology 74 (1967): 500-05.

> that is, differences in memory output may reflect different levels of perceptual learning input.[25]

Regarding the child who is experiencing difficulty, the above suggests that the teacher should focus on increasing attention and improving perceptual learning rather than the "remediation" of memory.

MEDIATION, OR HOOK-UP is the fourth component in the process of paired-associate learning. In reading, this hook-up is between the visual stimulus (i.e., the printed word) and the auditory response (i.e., the verbal label). Samuels states:

> . . . The research on the hook-up stage includes mediational strategies, imagery, the use of mnemonics, and syntactic elaboration. The function of these strategies may simply be to facilitate the learning and recall of the S-term and the R-term. The actual linkage, hook-up or association between the visual and auditory stimuli may actually depend upon neurochemical processes.[26]

In the early sight word learning process, the child is expected to attend to two sources of stimuli. In order to create an associative hook-up between these stimuli in reading, the visual becomes the stimulus and the auditory becomes the response. Hence, RESPONSE LEARNING refers to the auditory counterpart of the visual

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[25]Samuels and Anderson, "Visual Recognition Memory, Paired-Associate Learning and Reading Achievement," pp. 160-67.

[26]Samuels, "Success and Failure in Learning to Read," pp. 203-39.

letter, word, phrase or sentence. When associational learning is complete, the presentation of the visual stimulus should lead to the learner giving the appropriate verbal response.[27]

In summary, as one reads the literature on associational learning several themes begin to emerge.

Theme 1: Directing one's attention is an important aspect of the learning process.

Theme 2: In order to identify the stimulus reliably and quickly, it is necessary to learn its distinctive features.

Theme 3: Memory is influenced by the processes which come before--namely attention, and perceptual learning.

Theme 4: Strategies may help to facilitate stimulus and response learning and recall. The actual association may depend upon neurochemical processes.

Theme 5: Several of these processes seem amenable to direct instruction.

There is little research available on specific teaching techniques which are known to be effective in developing these initial stimulus/response associations.

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[27]Ibid., p. 234.

If one were given the task to introduce some new sight words to a child, would a brief familiarization with the new material facilitate learning? Furthermore, would familiarizing the child with the visual stimulus (i.e., written word) first or familiarizing the child with the verbal response (i.e., name) first produce any differences in subsequent associational performance and sight word recognition? These are the major questions this study would like to answer.

## Significance of the Study

A brief review of the research on each of the stages of paired associate learning (i.e., overt attention, perceptual learning, memory, mediation and response learning) has been conducted. Attempts were made to cite research which related each of these components to the reading process.

Although in some areas, little has been done, we know that a definite positive relationship exists between many of these stages and initial reading progress. Yet, there is a dearth of information on how these stages can be fostered, or what teaching techniques might be effective in activating the above named processes which seem so necessary in beginning sight word learning.

This study is intended to provide data regarding the effect of familiarizing the child with the written

word (perceptual learning stage) and/or the verbal response (response learning stage) on subsequent sight word learning (associational stage).

This data will provide educators with empirical evidence upon which to base objective decisions regarding the use of familiarization as a teaching technique in the sight word learning process. In addition, it might shed some light as to which stage of paired associate learning, if any, familiarization might be most aptly used. This study should also provide additional insights into some of the variables under consideration and the ways in which they might be manipulated in order to enhance paired associate learning tasks.

## Definition of Terms

Familiarization: A technique whereby the subject undergoes a pretraining phase with the terms which later become the stimuli/or response during paired-associate acquisition.[28]

Match to Name: As the examiner names the word, the subject selects it from a group of five words.

Naming from Memory: As the subject is presented with the written word, he makes the appropriate verbal response.

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[28]Alfred Baumeister and Albert Maistro, "Interactive Effects of Age and Familiarization in Paired-Associate Learning," Developmental Psychology 10 (1974): 657-60.

Response/Verbal Equivalent/Response Element: The name (i.e., the oral language equivalent) of the word to be learned.

Stimulus/Visual Array/Visual Component: The printed expression (i.e., the written language equivalent) of the word to be learned.

## Assumptions and Limitations

The following assumptions underlie this study:

1. it is assumed that, in its initial stages, sight word learning is mainly an associative process;
2. it is assumed that if these initial associations are based upon sound cognitive principles, the use of higher order cognitive strategies will be facilitated;
3. it is assumed that the stimulus familiarization process and the response familiarization process are equivalent procedures;
4. it is assumed that it is important for the subject to be able to match to name; and
5. it is assumed that it is important for the subject to be able to name words.

The following limitations underlie this study:

1. findings of this study will be limited to the tasks under investigation, or similar tasks;

2. findings of this study will be limited to this population or similar populations;
3. findings of this study will be limited to situations in which the same or similar materials are employed; and
4. findings of this study will be limited to situations in which the same or similar learning environments are employed.

## Design of the Study

The population of this study consisted of all kindergarten children enrolled in the Holt School System, Holt, Michigan.

A total of 60 children participated in the training program. The children were randomly selected and assigned to one of three treatment groups--the only criterion being that each group contain an equal number of boys and girls. Thus, each group contained 20 children--10 boys and 10 girls. A training program was developed in which only the presentation of the familiarization procedure varied among the three treatments. In Group A, the children were familiarized with the word to be learned through its visual form; in Group B, through its verbal form; and, in Group C (which is the control group) there was no familiarization of either the visual or auditory form. Each child was post-tested on two tasks: matching word to name and naming the words.

The results were tabulated by treatment group, sex, and by the interaction between treatment and sex to determine whether the null hypotheses were to be rejected or not.

## Hypotheses

The hypotheses, stated as null hypotheses, are as follows:

### Hypothesis 1

Given the task of Match to Name (Measure I), there will be no significant mean score differences ($p < .1$) between Treatment A (stimulus familiarization), Treatment B (response familiarization) or Control C (no familiarization).

### Hypothesis 2

Given the task of Match to Name (Measure I), there will be no significant mean score differences ($p < .1$) between boys and girls.

### Hypothesis 3

Given the task of Match to Name (Measure I), there will be no significant interaction effect ($p < .1$) between treatment and sex.

### Hypothesis 4

Given the task of Naming (Measure II), there will be no significant mean score differences ($p < .1$) between Treatment A (stimulus familiarization), Treatment B (response familiarization) or Control C (no familiarization).

### Hypothesis 5

Given the task of Naming (Measure II), there will be no significant mean score differences ($p < .1$) between boys and girls.

Hypothesis 6

Given the task of Naming (Measure II), there will be no significant interaction effect ($p < .1$) between treatment and sex.

Hypothesis 7

Given the Total Post-test score (Measure III), there will be no significant mean score differences ($p < .1$) between Treatment A (stimulus familiarization), Treatment B (response familiarization), or Control C (no familiarization).

Hypothesis 8

Given the Total Post-test score (Measure III), there will be no significant mean score differences ($p < .1$) between boys and girls.

Hypothesis 9

Given the Total Post-test score (Measure III), there will be no significant interaction effect ($p < .1$) between treatment and sex.

## Organization of the Remainder of the Dissertation

Chapter II is a presentation of the review of pertinent literature. Particular emphases are given to sight word learning (especially as it relates to the effects of direct instruction and strategies of word recognition); sex differences (related to modes of instruction and reading achievement); and familiarization (as it affects paired-associate learning).

Chapter III contains a description of the study design as well as a report of all materials and procedures employed in this study.

Chapter IV provides a discussion of the data collected, treated and analyzed for the study.

Chapter V provides a summary of the study and draws appropriate conclusions. Implications of this study and suggestions for future research are also included.

# CHAPTER II

# REVIEW OF THE LITERATURE

## Introduction

The purpose of this chapter is to review existing research in three major categories:

1. Decoding (emphasizing sight word learning): especially as it is influenced by direct teaching, the introduction of strategies, etc.
2. Familiarization/pre-training: especially as it effects subsequent paired-associate learning.
3. Sex differences: especially as it relates to reading achievement.

A search of the literature in these three categories will provide the reader with the following information. The research on decoding will provide a framework for devising the specific familiarization procedures used in this study. The experiments on familiarization will furnish an understanding as to why it was chosen as a specific teaching strategy. The studies on sex differences will lend insight into the reason why the experimenter chose sex as one of the independent variables in this design.

## Decoding

The process starts with a printed stimulus. Through discrimination learning, the individual selects cues and develops responses to them which are stored in long term memory. Subsequently, selected cues go into short term memory and are recognized through the visual process, perhaps in association with the auditory system. Next the cues enter long term memory and then are ready for "hook up" with available responses and integrated or blended with previous responses to cues. Thus, when the reader has selected and recognized a cue, has hooked up the cue with its response, and blended it with previously paired cues and responses, she/he is able to recognize or say the word.[1]

This is the organization of mental structures and processes involved in word recognition according to Samuels.

Singer seems to lend support for this view of word recognition by stating that perceptual training for reading should focus on discrimination, abstraction, and generalization of printed letters and word forms.[2] He also

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[1]S. J. Samuels, "Modes of Word Recognition," in Theoretical Models and Processes of Reading, eds. H. Singer and R. B. Ruddell (Newark, Del.: International Reading Association, 1972), pp. 23-38.

[2]Harry Singer, "Conceptualization in Learning to Read," in New Frontiers in College-Adult Reading, eds. G. Schick and M. May (Milwaukee, Wisc.: National Reading

believes that performance in the initial stages of reading, in part, is a function of what has been specifically taught and emphasized.[3]

Barr concurs and adds that she believes many children need special instruction to help them become aware of the systematic relationships that exist within whole words, between word parts or letters, and speech. She states that many basal reading programs are designed so that new words are introduced gradually and repeated frequently. This design may foster word memory in the initial stages of reading but may also interfere with the development of skills needed to identify unfamiliar words. Because few new words are introduced in each story and because the new words generally differ considerably in pattern from words learned previously, children are not encouraged to form generalizations about relationships between parts of printed words and speech.[4]

From the above it seems obvious that, to some degree, the successful teaching of sight words depends

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Conference, 1966); and Harry Singer, "Theoretical Models of Reading: Implications for Teaching and Research," in Theoretical Models and Processes of Reading, eds. H. Singer and R. B. Ruddell (Newark, Del.: International Reading Association, 1972), pp. 147-182.

[3]Harry Singer, "Research That Should Have Made A Difference," Elementary English 47 (January 1970): 27-34.

[4]Rebecca Barr, "Processes Underlying the Learning of Printed Words," The Elementary School Journal 75 (January 1975): 258-68.

upon developing ways to show the child what is important (i.e., to what she/he must attend) and to build in ways to ensure that the child does this.

In order to discriminate among words, though, what cues, specifically, do children use? Do they build up a kind of model or memory image of each word through repeated experiences? Do they discover a core of special features which they then transfer to new words? Or, do they do both?

Marchbanks and Levin studied the cues on which children recognize words and found that, generally, the first and last letter of the word was the most salient cue. However, some did not follow this pattern. The kindergarten boys often based their judgment of similarity on the last letters of the word, using the first letter as the second cue. Many first grade girls used the first letter as most salient, the second letter as next in importance, and the third letter as third important, etc. The girls tended to say the names of the letters outloud, in order from left to right.[5]

According to Samuels, if there is anything which discrimination studies indicate, it is that children select the easiest cue for recognition, and the easiest

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[5]Gabrielle Marchbanks and Harry Levin, "Cues by Which Children Recognize Words," Journal of Educational Psychology 56 (1965): 57-61.

cue is frequently just a single letter of a word or some incidental detail. Children do not ordinarily attend to total patterns nor to all the letters in a word. It is only when single letter cues fail to distinguish one word from another that children attend to all the letters.

He goes on to say that very often the initial rate of learning is rapid because numerous simple strategies provide cues for word recognition. Only so many words can be recognized by length, shape, and single letters before the strategies prove ineffective.[6]

But, then what cues should children be using as a basis for word recognition? Williams[7] isolates three major categories. She believes that:

1. The graphemic characteristics of the word provide an important category of cues for word recognition. However, before a child can utilize these cues she/he must have learned to some degree how to differentiate the written symbols or graphemes she/he finds on the page. Gibson has suggested that one way to enhance such visual discrimination of letters is to learn the distinctive

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[6]Samuels, "Modes of Word Recognition," p. 27.

[7]Joanna P. Williams, "Reactions to Modes of Word Recognition," in Theoretical Models and Processes of Reading, eds. H. Singer and R. B. Ruddell (Newark, Del.: International Reading Association, 1972), pp. 38-46.

features of the forms to be discriminated, i.e., those dimensions of difference that distinguish the stimuli.[8]

2. The second general basis for word recognition lies in the relationship between the graphic characteristics and the nature of the spoken language. It appears that clusters of letters do have more stable relationships with sound patterns than single letters, and it has been suggested that these "spelling patterns" are critical units for perception.

3. The third general category of cues that is used in word recognition is the context in which the word appears.

Thus it seems that some sound principles for word recognition have been identified.

Knowing this, the next question which comes to mind is, what factors, if any, will influence the strategies children use in their attempt to acquire a sight vocabulary?

In reviewing the literature a few studies have been found which investigate the effect that the method of instruction has on the strategies that children adopt.

For example, Barr examined the short term learning for 41 prereading first grade children taught by two

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[8]Eleanor J. Gibson et al., "A Developmental Study of the Discrimination of Letter-Like Forms," Journal of Comparative and Physiological Psychology 55 (1962): 897-906.

instructional methods. She found that different teaching methods (such as sight words vs. phonics) lead to different oral reading-response patterns.[9]

In a follow-up study Barr examined word identification responses from 32 first graders in December and May. Half of the subjects were instructed by a phonics method and half with a sight word emphasis. On the basis of the results she drew the conclusions that: (1) it is possible to determine the strategies that beginning readers use for translating print to speech; and (2) strategies are influenced significantly by the class instruction (as most children who initially form a strategy different from the class instructional emphasis change their strategy to accord with the class method and/or materials by the end of the first grade).[10]

In addition to the method of instruction, the teacher's verbal directions (i.e., what she/he says to the children) seem to also have quite an influence on what strategies/cues the children develop and use.

Cohen analyzed individual differences in the use of organizing strategies and considered their relation to

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[9]Rebecca Barr, "The Influence of Instructional Conditions on Word Recognition Errors," Reading Research Quarterly 7 (Spring 1972): 509-29.

[10]Rebecca Barr, "The Effect of Instruction on Pupil Reading Strategies," Reading Research Quarterly 10 (1974-75): 555-82.

retention performance on low and high meaningful paired-associates. One of the main conclusions she reached was that orienting instructions exert a potent influence on retention performance.[11]

Visual recognition of nonsense shapes by preschool subjects was tested under unfilled delay (i.e., nothing was said to the subjects) and under conditions in which the subjects were told to "visually rehearse" the standard. The instructions significantly increased recognition accuracy which may suggest that the effect of the instruction was to maintain visual attention.[12]

Caldwell and Hall studied the effect of simple instructions on children's attention to letter features. One group was told that if the forms differed in orientation, they should be judged to be different. A second group was instructed that orientation differences between forms should be ignored in making judgments. A third group was uninstructed about orientation. Following the training, all of the groups were given a test requiring discrimination among geometric forms. The group instructed to ignore orientation differences made the most errors;

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[11]Shelby Ruth Cohen, "Influence of Organizing Strategies and Instructions on Short Term Retention," Journal of Educational Psychology 64 (April 1973): 199-205.

[12]S. Millar, "Effects of Instructions to Visualize Stimuli During Delay on Visual Recognition by Pre-School Children," Child Development 43 (1972): 1073-75.

the group instructed to attend to them made the fewest errors; the uninstructed group made an intermediate number of errors. Thus, instructions and practice in making discriminative judgments on the basis of orientation differences clearly affected whether the children viewed this as a relevant difference.[13]

From the research cited so far we can derive that in order to develop a sound instructional sequence for beginning sight word recognition the teacher must act as a guide, focusing the child's attention on what is relevant. In order to accomplish this, the instructor must know which cues are relevant (i.e., which ones will aid the child in distinguishing among words, which ones are highly similar, which ones the child will be able to use to decode unknown/new words, which ones will provide a maximum amount of information with a minimum amount of error rate).

Assuming this were done, then the next problem to ponder is, where should one place the emphasis--on the stimulus aspects or on the response aspects of the word to be learned? Traditionally, it seemed that most of the attention has been focused on the visual array, the response element being almost incidental by comparison. However, some researchers have questioned this practice.

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[13]E. Caldwell and V. Hall, "The Influence of Concept Training on Letter Discrimination," Child Development 40 (1969): 63-71.

Underwood and Schultz point out that the subject does not have to produce the stimulus but does have to produce the response; thus implicating response availability as the major factor in paired associate difficulty.[14]

Asso and Wyke investigated children's ability to discriminate spatially confusable letters (e.g., d, b, p, q). Four different tasks were used: copying, matching, naming, and writing to dictation. Naming was shown to be the most difficult followed by writing, matching, then copying.[15]

Marsh, Desberg, and Farwell's findings exhibited similar results. In attempting to determine whether children's relatively poor performance on grapheme-phoneme correspondence tasks was primarily a function of stimulus or response concreteness, they derived four combinations: high-high (stimulus and response items were both familiar pictures); high-low (stimulus was a picture and the response was a letter sound); low-high (stimulus was a letter and the response was a picture); and low-low (stimulus was a letter and the response its appropriate letter sound). The results indicated that the major factor was response availability. It made no significant

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[14]B. J. Underwood and R. W. Schultz, Meaningfulness and Verbal Learning (Philadelphia: J. B. Lippincott Co., 1960).

[15]D. Asso and M. Wyke, "Discrimination of Spatially Confusable Letters by Young Children," Journal of Experimental Child Psychology 11 (1971): 11-20.

difference if the stimuli were graphemes or familiar pictures, but it made a large difference in performance if the responses were phonemes as opposed to picture names.[16]

McNeil and Keislar investigated the value of an oral response in beginning reading. The program of words in their study was presented orally and visually. The oral group was instructed to say the words; the "non-oral" group to look at the words. A follow-up silent reading test showed better performance by the "oral" group.[17]

Since there seems to be some question as to whether or not the stimulus or response aspects of the word to be learned need more emphasis, the logical choice would be to investigate both and then compare.

However, the recognition of a sight word demands that the child pair the stimulus and response aspects of the word. How, then, would it be possible to look at these two without contaminating their effect upon each other, yet still gauge the effects, if any, on paired

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[16]G. Marsh, P. Desberg, and L. K. Farwell, "Stimulus and Response Variables in Children's Learning of Grapheme-Phoneme Correspondences," Journal of Educational Psychology 66 (1974): 112-16.

[17]J. D. McNeil and E. R. Keislar, "Value of the Oral Response in Beginning Reading: An Experimental Study Using Programmed Instruction," British Journal of Educational Psychology 33 (1963): 162-68.

associate learning? In other words, how would it be possible to separate them out, yet still join them together in order to measure the results of the study?

Well, let's assume for the moment that the children were to be familiarized with one aspect of the sight word to be learned, i.e., their attention would either be focused on the stimulus or the response properties of the word to be learned in specific and equal ways. After this brief exposure, the stimulus would be paired with the response (or the response with the stimulus) and the child would be allowed to practice the word using a traditional look-say method. What would be the result on later sight word learning measures?

The basic inquiry here, then, is: Would this act of pointing the child in the right direction (i.e., attempting to show him/her what to focus in on) have any bearing on subsequent paired associate learning?

## Familiarization

In this area the research seems generally favorable although the issue regarding the benefits of prior familiarization on subsequent paired associate learning is by no means a closed case.

Horowitz and Larsen,[18] Jung,[19] Orlowski and Walsh[20] and Underwood, Runquist, and Schultz[21] observed facilitative effects on paired associate tasks that followed stimulus and response availability training.

Looking specifically at the studies in the area of stimulus pretraining, we find that researchers have investigated the effects of different types of stimulus discrimination pretraining on performance in a subsequent learning task. An analysis of this research by Spiker[22] as well as the findings of Kurtz[23] indicated that stimulus differentiation pretraining does result in positive

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[18]L. Horowitz and S. Larsen, "Response Interference in Paired Associate Learning," Journal of Experimental Psychology 65 (1963): 225-32.

[19]J. Jung, "Two Stages of Paired Associate Learning as a Function of Intra-List Response Similarity and Response Meaningfulness," Journal of Experimental Psychology 70 (1965): 371-78.

[20]W. Orlowski and J. Walsh, "The Effect of Stimulus Familiarization Procedure on Paired Associate Verbal Learning," Psychonomic Science 8 (1967): 435-36.

[21]B. Underwood, W. Runquist, and R. Schultz, "Response Learning in Paired Associate Lists as a Function of Intra List Similarity," Journal of Experimental Psychology 58 (1959): 70-78.

[22]C. Spiker, "Experiments with Children on the Hypothesis of Acquired Distinctiveness and Equivalence of Cues," Child Development 27 (1956): 253-61.

[23]K. Kurtz, "Discrimination of Complex Stimuli: The Relationship of Training and Test Stimuli in the Transfer of Discrimination," Journal of Experimental Psychology 50 (1955): 283-92.

transfer to a second task employing the same visual stimuli but different responses as used in the pretraining task.

Muehl, using kindergarten subjects, showed that visual discrimination pretraining using the same words to be read in a subsequent word list facilitated learning the word list when compared to discrimination pretraining with different words or pretraining with geometric forms.[24]

Support for Muehl's findings can be found in the research of others who have demonstrated that prior exposure to discriminative stimuli (words, alphabet letters, etc.) through the process of discrimination pretraining increases the rate of learning in beginning reading situations.[25]

McDowell and Youth investigated the effects of discrimination pretraining upon the intralist similarity

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[24]S. Muehl, "The Effects of Visual Discrimination Pretraining on Learning to Read a Vocabulary List in Kindergarten Children," Journal of Educational Psychology 51 (1960): 217-21.

[25]L. Hendrickson and S. Muehl, "The Effect of Attention and Motor Response Pretraining on Learning to Discriminate "b" and "d" in Kindergarten Children," Journal of Educational Psychology 53 (1962): 236-41; E. King, "Effects of Different Kinds of Visual Discrimination Training on Learning to Read Words," Journal of Educational Psychology 55 (1964): 325-33; H. Wheelock and N. Silvaroli, "An Investigation of Visual Discrimination Training for Beginning Readers," Journal of Typographic Research 21 (1967): 147-56; and H. Wheelock and N. Silvaroli, "Visual Discrimination Training for Beginning Readers," Reading Teacher 21 (1967): 115-20.

phenomenon in developing beginning reading skills (e.g., a list of words which include a large number of different letters is defined as being low in intralist similarity). The findings showed that the high intralist-similarity groups required more learning trials than the low intralist-similarity groups regardless of whether or not pretraining was used. Discrimination pretraining did, however, increase the rate of learning in beginning reading; that is, it reduced the number of training trials to criterion for both high and low similarity words.[26]

Richards and Platnick assessed the influence of a pretraining session on the recognition of English words. They found that the effect of pretraining frequency was greatest for words at low levels of natural-language frequency and disappeared entirely for words at the highest level of natural-language frequency.[27] This, however, seems reasonable, because if a word has been experienced frequently and is highly meaningful, then it would already be processed quickly and easily. Thus, no change in recognition threshold would occur as a result of pretraining. This statement might be interpreted to say that

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[26]E. McDowell III and R. Youth, "Effects of Discrimination Pretraining upon Intralist Similarity Phenomenon in Developing Beginning Reading Skills," Perceptual and Motor Skills 36 (1973): 1039-45.

[27]L. Richards and D. Platnick, "On the Influence of Pretraining Thresholds for English Words," American Journal of Psychology 84 (1974): 579-92.

children should not have any difficulty learning sight words because the Dolch 220 Sight Word List is based on natural language frequency. This is not true, though, for two reasons: (1) many of the words are common but are low in meaningfulness (i.e., the words "of," "and," "the," etc.), and (2) learning to read sight words requires that the child recognize particular arrangements of visual symbols (e.g., the word "more" is M-O-R-E, nor M-A-R-E or R-O-M-E, etc.) and these are virtually unknown to beginning readers.

In attempting to examine the effects of response pretraining on the recognition of visually presented words or pseudowords, the researcher quickly found that there was a paucity of applicable research. However, in the few studies which were available, contradictory conclusions have been reached.

Forrest[28] reported strong significant effects due to auditory pretraining, while Sprague[29] found no effect and Postman and Rosenweig[30] reported only small and insignificant effects.

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[28]D. Forrest, "Auditory Familiarity as a Determinant of Visual Threshold," American Journal of Psychology 70 (1957): 634-36.

[29]R. Sprague, "Effects of Differential Training on Tachistoscopic Recognition Thresholds," Journal of Experimental Psychology 58 (1959): 227-31.

[30]L. Postman and M. Rosenweig, "Practice and Transfer in the Visual and Auditory Recognition of Verbal Stimuli," American Journal of Psychology 69 (1956): 209-26.

Kellas and Butterfield reported that response pretraining facilitated the paired associate learning of their third grade subjects, and the magnitude of the facilitation was directly related to the rated pronounciability of the trigrams.[31]

Richards and Hempstead in a later study concluded that auditory pretraining had little effect on visual recognition of pseudowords, even when as many as 50 pretraining exposures had been provided.[32] If the study were replicated with "real" words would the effect be the same?

As was found with stimulus pretraining, Schultz and Martin[33] have demonstrated that there is no facilitation, beyond warm-up, from relevant pretraining under conditions of high response meaningfulness, indicating once again that increments in frequency representations are not infinitely accumulated.

To summarize, it seems beneficial to familiarize the subject with the stimulus to be learned if:

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[31]G. Kellas and E. Butterfield, "The Interaction of Pronounciability and Response Pretraining on the Paired Associate Performance of Third Grade Children," Journal of Experimental Child Psychology 9 (1970): 265-71.

[32]L. Richards and J. Hempstead, "Auditory Pretraining as a Determinant of Visual Thresholds for Pseudowords," American Journal of Psychology 86 (1973): 325-29.

[33]R. Schultz and E. Martin, "Aural Paired Associate Learning: Stimulus Familiarization, Response Familiarization, and Pronouncibility," Journal of Verbal Learning and Verbal Behavior 3 (1964): 139-45.

a. the stimulus is unfamiliar;

b. the stimulus is not highly discriminable.

The role that response familiarization plays in paired associate learning is still unknown, as the research results are highly equivocal.

Since the whole notion of focusing attention on the relevant dimensions of what is to be learned is being examined quite closely in relationship to beginning reading, the concept of familiarization can be examined in a new light. Would this technique be an effective tool that teachers could use to direct a child's attention on what she/he needs to know in order to be successful at a given task? Would it be more effective to familiarize the child with the stimulus component or the response element of the sight word to be learned? This piece of research chose to look for some answers in these directions.

## Sex Differences

Before finalizing this as a research problem, the question was raised, "What other variables might be influential in beginning sight word learning that could be easily controlled?

One which came readily to mind was the sex of the child. A search of the literature was undertaken to determine if one could justify controlling for this.

Hirst identified factors at the kindergarten level which related to future academic success. The relationship of kindergarten measures of intelligence, readiness, maturity development, creativity, sociometric relationship, physical skills, social-emotional growth, perceptual development, and family background variables with academic achievement were studied in a three year longitudinal study. The researcher reasoned that if sex were a variable in first grade reading success, prediction measures may be different for each sex. Regression equations were computed on each measurement with achievement at the end of the first grade as the dependent variable. She found that sex was a predictor variable for first grade reading.[34]

A study was made of grades three and seven to determine the relationship of certain specific factors to reading (i.e., race, sex, father works/mother works, occupation of principal wage earner) and found that at the third grade level, females achieved significantly higher than males. At the seventh grade level, these differences were not significant; the means of the female

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[34]W. Hirst, "Sex as a Predictor Variable for Success in First Grade Reading Achievement," Journal of Learning Disabilities 2 (June 1969): 316-21.

groups, however, were greater than the means of the male groups.[35]

One of the largest research projects on sex differences in school achievement was conducted by Stroud and Lindquist with 50,000 pupils in more than 300 schools in Iowa. Students in grades three through eight were tested on Reading Comprehension using the Iowa Every Pupil Basic Skills Test. The researchers stated ". . . girls have maintained a consistent, and on the whole, significant superiority over boys in the subjects tested, save arithmetic where small insignificant differences favor boys."[36]

Maccoby reports findings from eighteen studies of sex differences in reading. Ten of the studies found significant sex differences favoring girls, seven reported no significant differences and only one favored boys. The researcher concludes, then, that girls are superior to boys in primary reading ability. Boys, however, seem to "catch-up" by the intermediate grades.[37]

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[35]B. Calloway, "Relationship of Specific Factors to Reading," in Reading and Realism, ed. J. A. Figurel (Newark, Del.: International Reading Association Conference Proceedings) 13 (1969): 689-91.

[36]J. Stroud and E. Linguist, "Sex Differences in Achievement in the Elementary and Secondary Schools," Journal of Educational Psychology 33 (1942): 657-67.

[37]E. Maccoby, The Development of Sex Differences (Stanford, Calif.: Stanford University Press, 1966).

In May, 1961, Gates published his findings about sex differences in reading ability. He analyzed the reading test scores of 6,646 boys and 6,468 girls in grades two through eight. The participants were approximately typical in intelligence, scholastic aptitude, and other pertinent factors. The results showed that the scores of the girls were significantly higher than those of the boys at all grade levels. Gates felt, however, that the poorer showing by the boys on the test indicated an environmental rather than hereditary explanation. He said it could be possible that more girls (than boys) pursue a kind of life in which more respect, more incentives, and more opportunities for reading appear earlier and persist longer. Consequently more boys may find little or no early need for learning to read. These boys fall behind the girls at the beginning and a large number of them remain conspicuously behind.[38]

Stanchfield's work appears to support the explanation put forth by Gates that environmental differences could account for the difference between the achievement of boys and girls. In her research she arranged eight pairs of first grades so that the eight experimental classes contained three-fourths boys or three-fourths girls. In the four classes containing a majority of boys,

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[38]A. Gates, "Sex Differences in Reading Ability," Elementary School Journal 61 (May 1961): 431-34.

the teachers taught reading to groups of boys in the morning and to mixed boy-girl groups in the afternoon. In the remaining four classes, the teachers taught reading to groups of all boys in the afternoon and to mixed boy-girl groups in the morning. The same procedure was carried out in the classes containing a majority of girls. At the beginning and end of the school year, the Harsh-Solberg Survey of Primary Reading Development was administered. Analysis of variance revealed no significant differences at the end of the year, either in achievement or in gain scores made by the sex-segregated or co-educational groups. However, as a group, the girls achieved significantly more than the boys on the post-test. Moreover, the girls demonstrated significantly greater reading growth (growth measured as the difference between pre- and post-test scores).

Although the main effect of Stanchfield's research showed that boys did not learn to read better in sex-segregated groups, the teachers found basic areas of difference in all-boy and all-girl groups. They are:

1. Boys were found to be more aggressive and less conforming;
2. Boys appeared to have a lower frustration level for boredom and were less able to attend to and tolerate the monotony of regular classroom routines;

3. Boys were more concerned with doing something which interested them. Girls wanted to please teachers and parents; and
4. Boys demonstrated more difficulty than girls in coping with changes in the learning process and adapting to new stimuli.[39]

The evidence points to consistent achievement differences between boys and girls. However, some researchers believe that these disparities can be easily explained.

Lahaderne,[40] Cobb and Hops,[41] as well as Samuels and Turnure[42] found that overt task relevant orienting behavior was related to scholastic achievement. Furthermore, this relationship was obtained in beginning reading before a long history of academic failure had been established. Thus, it appears that the sex difference

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[39]J. Stanchfield, "Differences in Learning Patterns of Boys and Girls," in Self and Society, ed. M. P. Douglass (Claremont, Calif.: Yearbook of the Claremont Reading Conference) 32 (1968): 218-27.

[40]H. M. Lahaderne, "Attitudinal and Intellectual Correlates of Attention: A Study of Four Sixth Grade Classrooms," Journal of Educational Psychology 59 (1968): 320-24.

[41]J. A. Cobb and H. Hops, "Effects of Academic Survival Skill Training on Low Achieving First Graders," Journal of Educational Research 67 (1973): 108-13.

[42]S. J. Samuels and J. E. Turnure, "Attention and Reading Achievement in First-Grade Boys and Girls," Journal of Educational Psychology 66 (1974): 29-32.

favoring girls frequently found in reading achievement seems to be mediated by an attentional variable.

Some natural questions to ponder now are: What effect would the stimulus vs. response familiarization procedure have on the achievement of boys? of girls? Would the achievement difference between the sexes remain or would it be eradicated? Would one sex prefer one treatment and the other another?

These are questions focused upon in the present research.

Summary. Each study reviewed in the previous sections of this paper generally fell into one of three broad categories; decoding, familiarization and sex differences.

The studies reviewed on decoding (emphasizing sight word learning) demonstrated that the child usually chooses the easiest cue or the one that is incidental when first learning sight vocabulary. In fact, Marchbanks and Levin found that first and last letters of words seemed to be most frequently used as cues. Williams isolated three categories of cues which children should use to be successful in word recognition. They are: (1) the graphemic characteristics of the word; (2) the graphemic-phonemic relationships of the word and (3) the context of the word. However, it is unclear whether emphasis should be put on the graphic display or the response element of the sight word to be learned. In other words, do many of

the children experience difficulty learning sight words because they don't know what they look like or because they can't attach a name to what they see? Traditionally the visual component of the sight word has always been introduced first. Underwood and Schultz, as well as Marsh, Desberg and Farwell challenged this assumption. Among all of the studies in this entire first section one central idea stands out particularly strongly, that is, the teacher can make the difference. It is her/his responsibility to be aware of the cues which generate sound cognitive strategies and then direct the child to them.

The studies reviewed on familiarization attempted to clarify what its role was in stimulus discrimination, response learning and paired associate learning. As there was such a wide range of familiarization tasks (from familiarization of straight lines, to familiarization of pictures, to familiarization of words, etc.), it was difficult, at times, to compare studies. In addition, there was a paucity of research relating familiarization to the reading act. This notwithstanding, some major themes do emerge. Generally, stimulus discrimination pretraining facilitated subsequent paired associate learning. This seemed to be especially true if the stimulus were totally unfamiliar and not highly discriminable between/among other stimuli to be learned. The effect

of response pretraining on subsequent paired associate learning was highly equivocal.

The studies surveyed with regard to sex differences concluded that in the first six grades girls achieve better than boys in virtually all of the academic school subjects. Stanchfield found that teachers report boys to be more aggressive, less conforming; to have a lower frustration level for boredom; to be more concerned with doing something which interested them; and to have more difficulty coping with change and adapting to new stimuli. The research surveyed did not attempt to explain why these attitudinal and achievement differences exist except to say that they suspected environment rather than heredity as the cause.

To summarize, then, the themes which emerge from the review of the literature are that:

1. The child usually chooses the easiest cue or the one that is incidental when first learning sight words rather than the one which most clearly identifies that word from every other.
2. The teacher's primary role is one of directing the child to attend to the most useful information about what she/he is to learn so that the child can more easily and efficiently select the cues she/he needs.

3. Familiarizing the subject with the stimulus to be learned facilitated paired associate learning especially if the stimulus was highly unfamiliar and/or not easily discriminable between/among other stimuli. The little work done in response pretraining has yielded mixed results.
4. Sex differences, favoring girls, exist in overall academic achievement (for the first six grades) and specifically in reading. Environmental causes, rather than heredity, are being questioned.

After reviewing the research it became clear that no study attempted to take these themes and weave them into a major research question, although it seemed logical to do so.

Thus, the researcher began by devising a procedure which would familiarize/introduce the subject to what was to be learned in a direct way, that is, one that would show the learner where to look (or how to listen) and one which would maximize the use of her/his attention by focusing it on the relevant aspects of what was to be learned. Furthermore, since questions existed regarding the benefits of stimulus and response pretraining, it was decided that there should be two experimental groups: a stimulus familiarization group and a response

familiarization group (as well as a control group). Lastly, since the sex of the child seemed to be an important variable, the experimental and control group subjects were separated according to sex, so that each group contained an equal number of boys and girls.

All considered, this study attempted to clarify the role that stimulus v.s. response familiarization plays in subsequent sight word learning and to determine whether boys or girls showed distinct preferences for one or the other.

# CHAPTER III

# THE EXPERIMENT

## Introduction

This research was designed to experimentally determine whether familiarizing the subject with the printed word (i.e., stimulus) or with the name (i.e., response) would affect the learning of sight words by treatment (Group A vs. Group B vs. Group C), by sex (boys vs. girls) or by an interaction of the two (sex and treatment).

## Design of the Experiment

In order to test the effect of familiarization on sight word learning, this experiment used three treatment groups. In Group A, each subject was familiarized with the stimulus in three ways and then subsequently told its name. The sight word was then practiced. In Group B, the examinee was familiarized with the response in three ways and then was shown the printed equivalent. It was then practiced. Group C was presented with the printed word and its name simultaneously, thereby eliminating any familiarization with the stimulus or response elements of the sight word before it was taught. Each subject in Group A, Group B or Group C was seen twice. He/she was taught

five sight words on the first day and then post-tested, followed by the same teaching-testing procedure (using five different sight words) on a succeeding day.

The general instructional format remained the same for all three groups. Verbal instructions varied only to the extent that one familiarization procedure dealt with the visual aspect of the word; the other with the spoken aspect of the word. In every other way the instructions were identical. This was done to reduce the number of intervening variables and, thus, more adequately evaluate the effect of familiarization on sight word learning.

Sixty kindergarten children from five elementary schools were randomly assigned to one of the three treatment groups--the only rule being that each one contain an equal number of boys and girls. Thus there were twenty children (ten boys and ten girls) in each group, totaling sixty children (thirty girls and thirty boys) in all.

No pre-program participation measures were administered as the effect of random sampling was to equalize the groups. Post-participation measures were collected from each student. From these scores post-participation means were computed.

## Materials and Procedures

### Stimuli

The ten sight words to be learned were selected from the more difficult half of the two hundred twenty

(220) word basic sight vocabulary list developed by Edward W. Dolch, Ph.D. (see Appendix A).

The reason for selecting words from the more difficult half of the Dolch list was that there would be less chance of kindergarten children knowing them.

Eighty-nine of the one hundred ten (110) words in the more difficult half of the Dolch list were found to be inconsistent (i.e., each letter in the word does not have a corresponding sound [e.g., came]). Fifty-five (55) of the one hundred ten (110) words on the easier list were found to be inconsistent as well. So, in the two hundred twenty (220) basic sight words, one hundred forty-four (144) of them are inconsistent.

Therefore it was felt that the ten words to be learned in this experiment should include only the inconsistent ones as they comprise the overwhelming majority of the Dolch list.

To summarize, then, the ten sight words to be learned were randomly selected from the eighty-nine inconsistent words in the more difficult half of the Dolch two hundred twenty (220) word basic sight vocabulary list.

The Dolch words were selected (rather than nonsense words or ones comprised of a contrived alphabet) in order to insure a more realistic approximation of the classroom sight word learning environment.

The words which were presented in the teaching and testing trials were taken from Popper Words,[1] a commercially printed Dolch word card set. This was done to insure comparability of the visual stimuli presented in all three groups. Appendix B lists the words selected and gives the order in which they were presented to each child.

## Apparatus

In each of the five schools a small room, separate from the classroom, was made available for the experiment. The researcher sat at a low table and the subject sat directly across from her.

## Procedures

In each kindergarten room the experimenter spent the first half day observing and participating in classroom activities. This was done to familiarize the experimenter with the subjects and they with her. On the second half day, the researcher began part one of the program sequence which consisted of teaching the first five sight words and then testing the subject. On the third day, and subsequent days, a variety of activities took place. The examinees who were given part one of the program sequence the day

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[1]Edward W. Dolch, Popper Words, Set Two (Harder Half of 220 Basic Sight Vocabulary), (Champaign, Ill.: Garrard Publishing Company, 1953).

before were administered part two, which entailed teaching and testing the second five sight words. Other activities included administering part one of the program sequence to other youngsters, and participating in classroom activities.

Each program sequence began with the researcher spending a few moments talking with each subject, after which time the general directions for the program sequence were presented (see Appendix C). This was immediately followed by the specific program sequence.

## The Program Sequence

The program sequence consisted of teaching ten sight words to each subject. This was done in two sittings. On the first day the child was taught five sight words and then tested. On the following day, the child was presented with five additional words and tested on them.

While the time taken to complete each program sequence varied, the average time spent, per sitting, with each subject was around seven to nine minutes. Thus, the total program completion time ranged from approximately fourteen to eighteen minutes for each subject.

The final development of the program sequence was influenced by the results of a pilot study which was done on a randomly selected group of youngsters in the Holt school system. This pilot study provided crucial

information regarding: (1) number of sight words presented, (2) length of the program, (3) motivation and attention variables, (4) specific verbal directions used in the general and specific directions sections of the program sequence, and (5) testing procedures.

Number of Sight Words Presented and Length of the Program

Originally, eight sight words were selected for the experiment. These were to be taught and tested in one session. During the pilot study it was found that the program sequence alone took eleven to fourteen minutes to complete, and the testing which followed required an additional three minutes. This brought the total program time to between fourteen to seventeen minutes, which the experimenter noted, exceeded most kindergarten children's attention span.

Initially, this presented a problem as the research consultants wanted to increase the number of sight words in the program from eight to ten for statistical reasons. To solve this dilemma, it was decided that the program sequence would be spread out over two sessions, thus allowing for the additional two word increase without sacrificing the interest of the children. In summary, then, each subject was seen twice by the examiner--each time being taught and tested on five sight words.

Motivation Procedures

As the task was such a difficult one for most kindergarten children the whole question of adult support (via verbal praise, concrete rewards, etc.) became an issue. Initially, the researcher had planned a system of aural reinforcers such as "Very Good!" and "You did a great job!" into the verbal directions given each subject. During the pilot study, however, some children seemed to become discouraged and frustrated when they were unable to respond correctly to any word. Others just did not seem to be satisfied with verbal praise. The experimenter decided that a more concrete reward, such as raisins, might reduce these problems. So raisins were available for children if and when they wanted them or seemed to need some encouragement during the teaching-testing tasks. After the entire session was completed, the children were offered raisins for a "job well done."

Testing Procedures

In order to measure the subject's learning, the experimenter chose to test the subjects via a recall task (which consisted of showing the subject one word at a time and asking him/her to supply its name).

The pilot study uncovered that this recall task was too challenging, as a "floor" effect was developing. In essence, this means that the children's scores were not

spreading evenly from zero correct to all correct, but were, instead, clustering at the lower end of the scale.

The researcher decided to try a recognition task as a test measure for the first five words and to keep the recall task as the test measure for the second five words. The recognition task consisted of placing all five printed words on the table in front of the child, and asking him/her to point to the word being said. The position of each word in the testing series was randomly determined.

This test sequence was tried and proved successful. Both scores were combined to give one total score, which resulted in a wider score distribution, thus significantly reducing the "floor" effect. In addition, the scores were examined separately which gave the experimenter an opportunity to examine two processes of memory measurement--namely, recognition and recall. Appendix D displays the left to right order in which each word was placed in the recognition task. Appendix E furnishes the serial order of presentation for each word in the recall task.

To summarize, as a result of the pilot study, two test measures were developed. After the first five words were taught, the examinee was tested via a recognition task, which consisted of placing all five printed words on the table and asking the child to point to the one being said. In the second session, the subject was post-tested by way of a recall task. She/he was shown one word at a

time and asked to supply its name. The scores were combined to give one total score, but were also inspected separately.

For a complete transcript of the verbal directions used in the recognition test see Appendix F; for the recall test see Appendix G.

Specific Verbal Directions Used in the General and Specific Directions Sections of the Program Sequence

The pilot study was responsible for a very important addition to the general directions section of the program sequence. It made clear to the examiner that the only way she could be assured that the subject understood the general directions was to ask him/her particular questions regarding what had been said. Hence, the experimenter built two questions into the general directions section. (In Appendix C, these are underlined.) This seemed to serve a two-fold purpose--that of assuring comprehension and increasing attentiveness.

In the specific verbal directions section of the Group B (auditory familiarization) and Group C (control) program sequences, another very important insight was gained (see Appendix J and Appendix K for the specific verbal directions used in the Group B and Group C program sequences). Immediately following the initial verbal presentation of the word to be learned, it was found that

using the word in a sentence drastically reduced any chance of auditory misperception (such as calling the word "sink" instead of "sing"; or "think" instead of "thank"). Therefore, this addition was adopted into the specific verbal directions section of the program sequences. (Appendix H displays the sentences which were developed to reduce the chances that the words might be auditorily misperceived because they were presented in isolation.)

Due to the nature of the experiment, the specific verbal directions in each of the program sequences varied (although every effort had been made to keep the form and content constant). Consequently, a detailed description of each group's program sequence will be presented below.

Experimental Group A Program Sequence.--In this group the children were familiarized with the visual stimulus/written word in three distinct ways (prior to being told what the word's name was).

First, the subject was shown the word and told to look at it carefully. The child was then asked to close his/her eyes and picture the word.

Secondly, the subject was given the word broken apart into letters and scrambled up (commercial letter cards were used for this activity).[2]

e.g. c m e a

The child was requested to put these letters together to make the word that he/she had just seen. If the child completed the word incorrectly, the examiner placed the word card before the child and allowed him/her to use it as a reference.

Thirdly, the subject was shown three similar word cards, e.g.

| cake | came | cape |
|---|---|---|

She/he was asked to point to the word that was being learned.

Immediately following this familiarization, the child was shown the word card again, but this time the experimenter told the child its name. The word was then used in a sentence.

The child was asked to repeat its name while looking at the word.

The instructor pointed to the word and repeated its name. Once again the child was asked to name the word.

The experimenter then moved on to another word card and the entire sequence was repeated.

During this program sequence raisins were available if the children wanted or needed them. These seemed to serve as rewards and/or incentives for many children. In

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[2]No. 2470 Letter Cards (commercially prepared box of individual letters), (Oak Lawn, Ill.: Ideal School Supply Company).

addition, periodically throughout the program sequence the child was told, "You're really working hard!"

After the first five words had been completed in this fashion, the child was tested on them via a recognition task (which required the child to point to the word being named by the examiner out of the five choices available).

On a subsequent day, the same program sequence was used to teach the remaining five sight words and the subject was then tested via a recall task (which required the child to name the word being shown to him/her by the examiner).

After each testing session, the subject was offered some raisins and told that he/she could take a handful for a job well done. (See Appendix I for verbatim verbal directions presented to Group A subjects.)

Experimental Group B Program Sequence.--In this group, the subject was familiarized with the verbal response/name of the word in three distinct ways (prior to being shown what the word looked like).

First, the subject was told the word, and then the word was used in a sentence. The child was then requested to close his/her eyes and say the word to himself/herself three times.

Secondly, the instructor broke the word apart and said it by sound and/or syllable (e.g., K - $\bar{A}$ - M). After the instructor said it in this manner the child was requested to say it in the same "funny" way that the examiner did. After the child did this, the instructor asked the youngster to tell her what the word was. If the child completed the word incorrectly the instructor asked her/him to say the word with her, first by sounds, and then as a whole word.

Thirdly, the subject was asked to identify the word she/he was learning from among similar sounding words,

e.g., "Is the word cake?"
"Is the word cape?"
"Is the word come?"
"Now tell me, what is the word?"_____

Immediately following this familiarization the subject was shown the written word as the name was being said.

The child was asked to look at the word carefully and say its name.

The instructor then pointed to the word and repeated its name. Once again, the child was asked to name the word.

The experimenter proceeded on to another word card and the entire sequence was repeated.

As in Group A, raisins (which seemed to serve as rewards and/or incentives) were available if the child

wanted or needed them. In addition, the examiner periodically reinforced the child verbally by saying, "You're really working hard!"

After the first five words had been completed in this fashion, the child was tested on them using a recognition task (which required the subject to point to the word).

As in Group A, the same sequence was employed to teach the remaining five sight words on a subsequent day, and each subject was tested via a recall task (which required the subject to name the word).

Once again, each subject was offered some raisins after the testing session while being told that it was for a job well done (see Appendix J for verbatim verbal instructions presented to Group B).

Control Group C Program Sequence.--In this group the subject was not familiarized either with the stimulus or with the response per se, but instead was shown the stimulus/written word and told its name simultaneously. The word was then used in a sentence.

Next, the stimulus/written word was presented to the child and he/she was asked to supply its name.

This two step sequence was done three times in all to create six exposures with the sight word to be learned--the same number of exposures in both Group A and Group B

(i.e., the experimental groups both contained three familiarization tasks and three learning trials).

As in the experimental groups, this procedure was repeated until the child had been exposed to the first five words, at which time she/he was tested via a recognition task.

Once again, raisins were available to the child throughout the session. In addition, she/he was intermittently told, "You're really working hard!"

On another day, after the second set of five sight words had been learned, the child was again tested. As in the other groups a recall task was used as the test measure.

Once again raisins were presented to the child at the end of each testing session for a job well done (see Appendix K for verbatim instructions presented to Group C).

## Sample of the Study

### Subjects

The subjects used in this study were sixty kindergarten children. Samples were randomly drawn from the kindergarten population of Dimondale, Elliott, Midway, Sycamore and Wilcox Elementary schools in the Holt Public School District. These subjects were stratified by sex and then randomly assigned to one of three treatment groups. No subject was disqualified.

Thirty males and thirty females participated in the experiment and this sample was distributed throughout the elementary schools in the district as illustrated in Figure 1.

| SCHOOL | MALES | FEMALES | TOTAL NUMBER |
|---|---|---|---|
| Dimondale | 6 | 7 | 13 |
| Elliott | 4 | 8 | 12 |
| Midway | 9 | 6 | 15 |
| Sycamore | 5 | 7 | 12 |
| Wilcox | 6 | 2 | 8 |
| TOTAL NUMBER | 30 | 30 | 60 |

Figure 1.--Subjects Participating in Study: By Sex and by School Location.

## The Schools

All five of the elementary schools in the Holt Public School System contain kindergarten through sixth grade. Dimondale, Elliott and Midway elementary schools each have three half-day kindergarten classes. Sycamore elementary school has four half-day kindergarten classes and Wilcox elementary school houses two half-day kindergarten classes. Thus, there are fifteen half-day kindergarten classes in the Holt Public School System, totalling 333 youngsters. The total school population served in

Holt, including elementary, junior and senior high schools, is approximately 4,420 students.

## The Student Population

The student population for this experiment was drawn from the community of Holt, Michigan, a midwestern charter township, which is considered to be both suburban and rural in nature. This area is comprised, primarily, of white, middle class, blue collar workers (i.e., blue collar being defined as factory, technical and trade workers) although there is a sizeable minority of white collar workers (i.e., white collar being defined as professional, that is, workers whose jobs do not involve manual labor) and a handful of farm families.

## The Treatment of the Data

### Experimental Design

The primary statistical procedure employed to analyze this data was a two way analysis of variance. The analysis of variance was used because it:

> . . . is a method for the analysis of data yielded by experiments in which randomization and manipulation of at least one independent variable have been used.[3]

The design, shown in Table 1, included two independent variables--the familiarization procedures used in

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[3]Fred N. Kerlinger, Foundations of Behavioral Research, 2nd ed. (New York: Holt, Rinehart and Winston, Inc., 1973), pp. 147-148.

TABLE 1.--Design Matrix.

| | | Ss | $M_1$* | $M_2$** | $M_3$*** |
|---|---|---|---|---|---|
| Treatment A (Stimulus Familiarization) | BOYS | | | | |
| | GIRLS | | | | |
| Treatment B (Response Familiarization) | BOYS | | | | |
| | GIRLS | | | | |
| Control C (No Familiarization) | BOYS | | | | |
| | GIRLS | | | | |

*$M_1$ - sight vocabulary measure which asks the child to point to the word (out of five displayed before him/her) that the researcher is saying (i.e., recognize the word).

**$M_2$ - sight vocabulary measure which asks the child to name the word as the examiner shows him/her the printed word card (i.e., recall the word).

***$M_3$ - M plus M = total number of correct responses derived by adding the scores on both post-test measures.

the program sequence, and the sex of the child. The dependent variables were: (1) the Match to Name test score (Measure I); (2) the Naming test score (Measure II); and (3) the Total test score (which was derived by combining the scores on the Match to Name and Naming tests) (Measure III). The design is balanced, which means each cell contains the same number of subjects (ten in this particular case). Hence, all assumptions for this model have been met.

## Statistical Procedures

In order to look at the treatment effect factor ($T_A$ vs. $T_B$ vs. $T_C$) on Measure I, Measure II and Measure III, the sex effect factor (boys vs. girls) on Measure I, Measure II and Measure III, as well as the interaction effect between sex and treatment (TXS) on Measure I, Measure II and Measure III, a two way analysis of variance was conducted on each of the dependent variables.

If any significant effect was found in the two way analysis of variance, then the Tukey post hoc comparison would be used to further investigate the difference.

## Summary

This study was conducted to evaluate the effect of familiarization on subsequent sight word learning in kindergarten children. To this end, the study used sixty kindergarten children, thirty girls and thirty boys enrolled

in kindergarten classrooms in one Michigan public school district.

Subjects were randomly selected, stratified by sex and assigned to one of three treatments--namely, stimulus familiarization (Group A), response familiarization (Group B), or the control (Group C). Each subject was seen twice, each time completing a program sequence designed to teach him/her five sight words. Upon completion of the first program sequence, each child was tested via a recognition task. He/she was asked to point to the word (which was among four other alternatives) being named by the examiner. After the second program sequence was completed, each child was tested via a recall task. The subject was asked to name the word that he/she was being shown on a word card by the examiner.

A two-way analysis of variance was used to determine whether there was:

1. a significant treatment effect factor;
2. a significant sex effect factor; or
3. a significant interaction effect factor between treatment and sex.

The Tukey Post Hoc Comparison measure would be used to pinpoint any significant differences which were found.

The results of these analyses are reported in Chapter IV.

# CHAPTER IV

# RESULTS

## Introduction

This study was designed to determine whether familiarizing the subject with either the stimulus or response component of a sight word would affect the subsequent learning of it by treatment (Group A vs. Group B vs. Group C); by sex (boys vs. girls) or by an interaction of the two (sex and treatment). A program sequence was developed to measure the effect of familiarization in three treatment conditions. These were: (1) familiarization with the visual component/written word; (2) familiarization with the auditory component/name; and (3) control with no familiarization.

The sixty subjects (30 boys and 30 girls) in this study were randomly selected, stratified by sex, and randomly assigned to one of the three treatment groups. They were drawn from the 1975-1976 school year kindergarten populations of the five elementary schools in the Holt Public School District, Holt, Michigan.

Each subject was administered the identical program sequence twice--the only exception being that in each session five different sight words were presented. Upon

completion of each program sequence, the child was administered a post-test. After the first session, each subject was given the Match to Name post-test. After completing the second session, each child was administered the Naming post-test. For both measures a score of one was given for each correct answer, with a maximum score of five for each measure or ten totally.

Specifically, this study was designed to test the following hypotheses:

Hypothesis 1

> Given the task of Match to Name (Measure I), there will be no significant mean score differences ($p < .1$) between Treatment A (stimulus familiarization), Treatment B (response familiarization) and Control C (no familiarization).

Hypothesis 2

> Given the task of Match to Name (Measure I), there will be no significant mean score differences ($p < .1$) between boys and girls.

Hypothesis 3

> Given the task of Match to Name (Measure I), there will be no significant interaction effect ($p < .1$) between treatment and sex.

Hypothesis 4

> Given the task of Naming (Measure II), there will be no significant mean score differences ($p < .1$) between Treatment A (stimulus familiarization), Treatment B (response familiarization) and Control C (no familiarization).

Hypothesis 5

Given the task of Naming (Measure II), there will be no significant mean score differences ($p < .1$) between boys and girls.

Hypothesis 6

Given the task of Naming (Measure II), there will be no significant interaction effect ($p < .1$) between treatment and sex.

Hypothesis 7

Given the Total Post-test score (Measure III), there will be no significant mean score differences ($p < .1$) between Treatment A (stimulus familiarization), Treatment B (response familiarization), and Control C (no familiarization).

Hypothesis 8

Given the Total Post-test score (Measure III), there will be no significant mean score differences ($p < .1$) between boys and girls.

Hypothesis 9

Given the Total Post-test score (Measure III), there will be no significant interaction effect ($p < .1$) between treatment and sex.

## Determining Whether Significant Differences Exist

### Rationale

The two way analysis of variance is a statistical technique which, simply stated is:

> . . . a method of identifying, breaking down, and testing for statistical significance variances that come from different sources of variation. That is, a dependent variable has a total amount of variance, some of which is due to the experimental treatment, some to error, and some to other

> causes. Analysis of variance's job is to work with these different variances and sources of variance.[1]

The first step in the analysis of this data was to carry out three two-way analyses of variance in order to test the hypotheses. In this analysis, the two independent variables were treatment and sex. Three dependent variables existed: (1) Match to Name Post-test; (2) Naming Post-test; and (3) Total Score Post-test.

The results of this analysis of variance indicated no significant main effect for the treatment variable. In other words, there were no significant differences between Treatment A (stimulus familiarization); Treatment B (response familiarization); or Control C (no familiarization on either Measure I (Match to Name), Measure II (Naming), or Measure III (Total score).

These two way analyses of variance were also conducted to determine whether any significant effect occurred for the sex variable, and there was none. This means that there were no significant differences between boys and girls on Measure I (Match to Name), Measure II (Naming) or Measure III (Total score).

Lastly, the results of these two-way analyses of variance also indicated whether there was a significant interaction effect of the two independent variables. The

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[1]Ibid., p. 147.

results indicated that there was a significant difference ($p < .1$) between the post-test scores on Measure I (Match to Name) when the sexes were compared. No significant effect was found, however, on either Measure II (Naming) or Measure III (Total score).

A Tukey post hoc comparison was then applied to further specify the effect.

The following sections report the results of the two way analyses of variance and the Tukey post hoc comparison.

## Results of the Two Way Analysis of Variance on the Match to Name Variable (Measure I)

This section reports the results of the univariate analysis of variance as applied to the treatment and sex variable on Measure I (Match to Name Post-test).

TABLE 2.--ANOVA Table: Measure I.

| Source of Variation | Mean Square | df | F | Significance Level |
|---|---|---|---|---|
| Treatments | 1.53 | 2 | .6347 | .5341 |
| Sexes | .075 | 1 | .0312 | .8605 |
| Treatment x Sexes | 6.47 | 2 | 2.6948 | .0767* |
| Error | 2.40 | 54 | | |

*Significance level = .1

For the treatment effect on Measure I, the table illustrates an F-ratio of .6347 with 2 degrees of freedom, thus, signifying a p level of less than .5341, indicating no main effect for the treatment variable. Therefore, on the basis of this two way analysis of variance test, Hypothesis 1 was not rejected.

On the sex variable, an F-ratio of .0312 with 1 degree of freedom, had a significance level of p less than .8605, indicating no main effect for the sex variable on Measure I. Thus, Hypothesis 2 was not rejected on the basis of the two-way analysis of variance.

In contrast, when considering the interaction between treatment and sex, an F-ratio of 2.6948 was obtained which, with 2 degrees of freedom had a significance level of p less than .0767. Hence, Hypothesis 3 was rejected.

In summary, the two way analysis of variance displayed that there was no significant treatment or sex main effect on Measure I. It did, however, provide evidence that, with 90% confidence, a significant interaction effect occurred on the Match to Name Post-test.

Figure 2 presents a graph of the significance interaction effect for the Match to Name post-test. The graph, which plots each cell mean, clearly demonstrates that boys prefer Treatment A and girls prefer Treatment B. The second choice treatment for boys is Control C, with

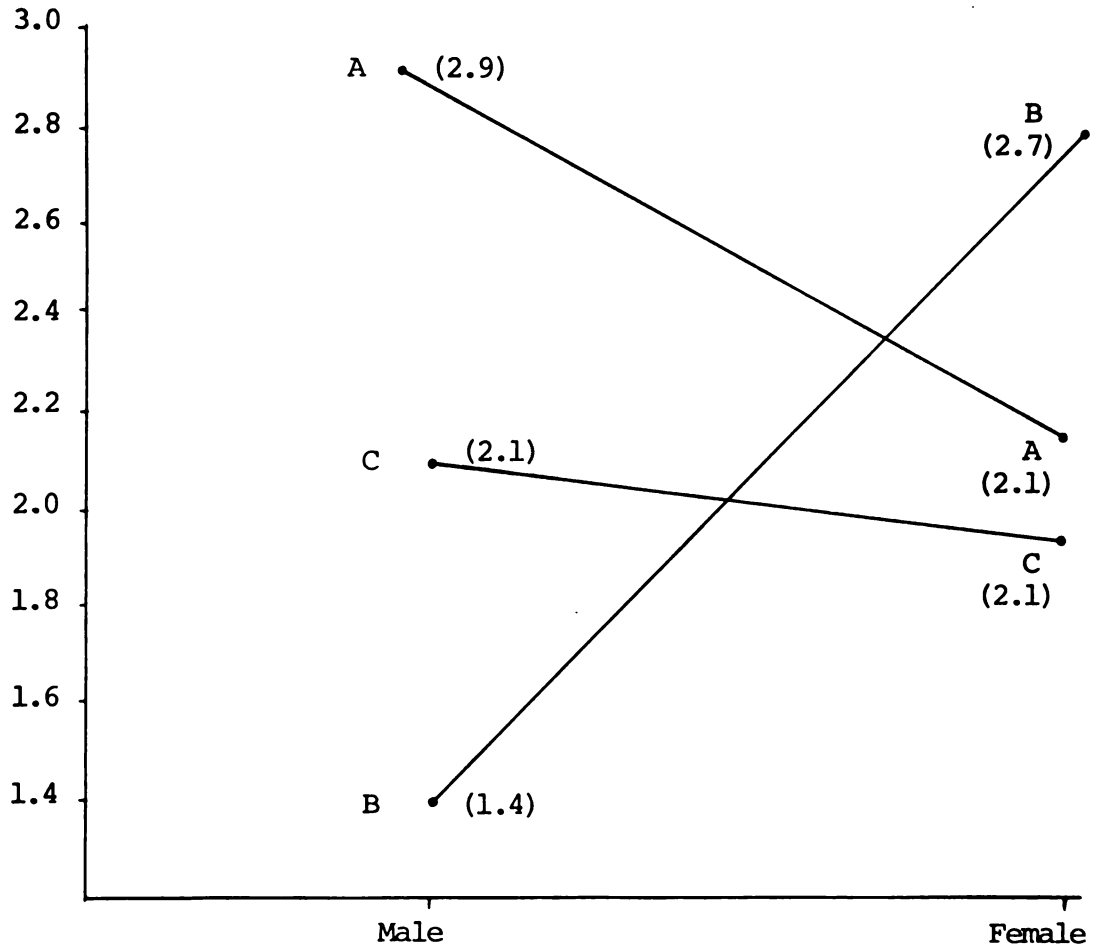


Figure 2.--Graph of Significant Interaction Effect for Measure I.

Treatment B distinctly last. The second and third choices for girls are not so vividly marked.

Thus, a Tukey Post Hoc Comparison[2] was then applied to statistically test the differences between the Measure I scores for females in Group A and the Measure I

[2]Gene V. Glass and Julian C. Stanley, Statistical Methods in Education and Psychology (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1970).

scores for females in Group C. This was done to determine which, if either, treatment was preferred by girls.

Figure 3 presents the results.

| -.618 | $F_A - F_C$ | 1.042 |
|---|---|---|

Figure 3.--Tukey Post-Hoc Comparison on Females in Treatment A vs. Females in Treatment C.

As these results range from a minus .618 to a plus 1.042 and include zero as a value, they are not significant. Hence, girls do not seem to exhibit a distinct preference for Treatment A or Treatment C.

Results of the Two-way Analysis of Variance on the Naming Variable (Measure II)

This section reports the results of the two way analysis of variance as applied to the Naming variable.

Table 3 presents the results of the two way analysis of variance on the dependent variable Naming. This table illustrates that on Measure II, the main effect for the treatment variable had an F-ratio of .7667 which, with 2 degrees of freedom, yielded a significance level of p less than .4696. As this was larger than .1 (the p value specified), Hypothesis 4 on the Naming variable was not rejected.

TABLE 3.--ANOVA Table: Measure II.

| Source of Variation | Mean Square | df | F | Significance Level |
|---|---|---|---|---|
| Treatments | .93 | 2 | .7667 | .4696 |
| Sexes | 1.88 | 1 | 1.5541 | .2180 |
| Treatments x Sexes | 1.88 | 2 | 1.5541 | .2207 |
| Error | 1.20 | 54 | | |

Examining the sex effect on Measure II, an F-ratio of 1.5541 with 1 degree of freedom, was found to have a significance level of p less than .2180, indicating no main effect for the sex variable. Consequently, on the basis of the two way analysis of variance, Hypothesis 5 was not rejected.

When considering the interaction between treatment and sex on Measure II, an F-ratio of 1.5541 was obtained with 2 degrees of freedom, indicating a significance level of p less than .2207. As these results are greater than the specified p value (of .1), Hypothesis 6 was not rejected.

Given no significant F-ratios on Measure II for either the treatment effect, the sex effect, or the interaction effect in the two way analysis of variance, it was unnecessary to conduct a Tukey Post Hoc Comparison on the Naming variable.

Results of the Two Way Analysis of Variance on the Total Post-test Score (Measure III)

This section reports the results of the two way analysis of variance as applied to the Total Post-test score variable.

Table 4 presents the results of the two way analysis of variance on the Total Post-test score variable.

TABLE 4.--ANOVA Table: Measure III.

| Source of Variation | Mean Square | df | F | Significance Level |
|---|---|---|---|---|
| Treatments | 4.30 | 2 | .9176 | .4057 |
| Sexes | .82 | 1 | .1756 | .6769 |
| Treatments x Sexes | 10.90 | 2 | 2.3369 | .1064 |
| Error | 4.66 | 54 | | |

Table 4 illustrates that the main effect for the treatment variable on Measure III, yielded an F-ratio of .9176 which, with 2 degrees of freedom, had a significance level of .4057. Since this was larger than the p level specified (.1) this means that no significant differences existed between treatments on the Total Post-test score variable. Hence, Hypothesis 7 was not rejected.

Considering the Measure III sex variable, an F-ratio of .1756 was obtained, which, with 1 degree of

freedom, produced a significance level of p less than .6769. This indicates that there is no main effect for the sex variable. Therefore, on the basis of the two way analysis of variance, Hypothesis 8 was not rejected.

On Measure III, interaction between treatment and sex variable, an F-ratio of 2.3369, with 2 degrees of freedom was found to have a significance level of p less than .1064. As the specified p value was .1, it was not found to be significant. So, on the basis of the two way analysis of variance, Hypothesis 9 was not rejected.

Given no significant F-ratio on Measure III, for either the treatment effect, the sex effect, or the interaction effect in the two way analysis of variance, conducting a Tukey Post Hoc Comparison was deemed unnecessary.

## Summary

In this 3x2 design, a two way analysis of variance was conducted on each of the three dependent variables, which were: (1) Match to Name test (Measure I); (2) Naming test (Measure II); and (3) Total test score (Measure III).

The two way analysis of variance on the dependent variable Match to Name (Measure I), indicated no significant treatment or sex main effect at the $p < .1$ level. A significant interaction effect ($p < .1$) between treatment and sex did occur, however, on the Match to Name variable.

The Tukey Post Hoc Comparison was performed to identify whether or not any significant differences ($p < .1$) existed between the Match to Name post-test scores for females in Group A and those same scores for females in Group C. No significant differences between these two were found.

The two way analysis of variance applied to the Naming variable (Measure II) indicated no significant main effect ($p < .1$) for either the treatment variable, the sex variable, or the interaction (between treatment and sex) variable.

Lastly, the two way analysis of variance was conducted on the Total test score variable (Measure III). The results revealed no significant main effect ($p < .1$) for either the treatment variable, the sex variable, or the interaction (between treatment and sex) variable.

# CHAPTER V

# SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

## Introduction

This research was designed to experimentally study the effects of familiarizing the subject with the visual component of a sight word (i.e., the graphic array) or the response element of a sight word (i.e., the verbal label) on the subsequent learning of that sight word by kindergarten children.

A review of the research on decoding illustrated that the child usually chooses the easiest cue or the one that is incidental when first learning sight vocabulary. Disagreement exists over whether or not the printed word (i.e., stimulus), the verbal label (i.e., response) or both (i.e., printed word and verbal label) should be emphasized in the initial stages of sight word learning. However, all seemed to agree that the teacher can make the greatest difference if she/he is aware of the cues which provide a sound basis for hypothesis testing and then directs the child's attention to them.

The research review on familiarization demonstrated that stimulus pretraining facilitates subsequent

paired associate learning--especially if the stimulus is highly unfamiliar to the subject and is not easily discriminated from the other stimuli presented. The few appropriate research studies focusing on response pretraining yielded ambiguous results.

The studies reviewed on sex differences demonstrated that boys and girls do not possess the same attitudes toward school-work, toward conformity, etc., nor do they achieve the same (generally or in reading) in the first six years of their school career. The research points out the differential, which favors girls, but does not attempt to explain why--except to say that it must be caused by the environment rather than by heredity.

## Summary

### The Study

To evaluate the effects of familiarization on sight word learning, a basic program sequence was developed for all three groups, in which the subject was exposed to each sight word to be learned six times before testing. In Group A and Group B, this meant that each word was "familiarized" in three ways, and then practiced three times. In Group C, this meant that each word was practiced six times, rather than being familiarized first and then practiced. The general format of the program sequence remained the same for all three groups. The

specific verbal directions varied only to the extent that the familiarization procedure used with Group A dealt with the printed aspect of the word and the one used with Group B dealt with the verbal aspect of the word.

The ten sight words to be learned were randomly selected and ordered from the eighty-nine inconsistent (i.e., each letter in the word does not have a corresponding sound [e.g., came]) words in the more difficult half of the Dolch two hundred twenty (220) word basic sight vocabulary list.

The program sequence was used with sixty children (30 boys and 30 girls) enrolled in the kindergarten classes of one Michigan school district. Each subject was administered the identical program sequence twice--the only exception being that in each session five different sight words were presented. Upon completion of each program sequence the examinee was administered a test. After the first session, each subject was administered the Match to Name Test. After the second session, each child was given the Naming Test.

In order to determine whether significant differences existed among the three treatment groups ($T_A$ vs. $T_B$ vs. $T_C$) the two sexes (boys vs. girls) or as a result of the interaction between treatment and sex (T x S) on Measure I (Match to Name Test); Measure II (Naming Test); or Measure III (Total Test Score);

three two way analyses of variance were applied to the data.

The Results

On the Match to Name variable (Measure I), the results of the two way analyses of variance indicated that no significant ($p < .1$) treatment effect occurred. That is, no significant differences were found between Treatment A (stimulus familiarization); Treatment B (response familiarization); or Control C (no familiarization) on Measure I.

Similarly, no significant ($p < .1$) sex effect occurred. This means that there were no significant differences between boys and girls on Measure I as measured across treatments.

The analysis of variance did indicate a significant ($p < .1$) interaction effect on Measure I. In other words, a significant difference occurred between the sexes on the test scores as measured by treatment. Boys clearly preferred Treatment A as their first choice, Control C as their second choice, and Treatment B as their last choice. Girls clearly preferred Treatment B as their first choice, but their second and third choices were not clearly delineated.

Therefore, a Tukey Post Hoc Comparison was applied to statistically test the differences between the Measure I scores for females in Group A and the Measure I scores

for females in Group C. The results were not significant, hence, females do not seem to exhibit a distinct preference for either Treatment A or Treatment C.

On the basis of these results, then, Hypotheses 1 and 2 were not rejected. Hypothesis 3, however, was rejected.

On the Naming variable (Measure II), no significant ($p < .1$) differences were found among the treatments (Treatment A [stimulus familiarization] vs. Treatment B [response familiarization] vs. Treatment C [no familiarization]) or between the sexes (boys vs. girls) across treatments on this variable.

Similarly, no significant interaction effect occurred. This means that there were no significant differences between boys and girls on Measure II, by treatment.

Therefore, on the basis of the results of the two way analysis of variance, Hypotheses 4, 5, and 6 were not rejected.

For the Total Test score variable (Measure III), significant differences were not found on the treatment variable. In other words, there were no significant ($p < .1$) differences between the test scores on Treatment A vs. Treatment B vs. Treatment C. Likewise, no significant sex effect occurred, meaning that no significant differences were found between males and females

on this dependent variable across treatments. Lastly, the results of the two way analysis of variance revealed that no interaction effect occurred. This means that on the Total Test score, by treatment, no significant differences were found between boys and girls.

Consequently, Hypotheses 7, 8 and 9 were not rejected on the basis of the results of the two way analysis of variance.

## Conclusions

The results of this study point to six major conclusions. These are that the use of familiarization:

1. does not significantly enhance kindergarten children's initial learning of sight words as measured on a match to name task (i.e., when the child is provided with the name of the word, he/she is to choose the appropriate written word from among five options);
2. does not significantly enhance kindergarten children's initial learning of sight words as measured on a naming task (i.e., when the child is shown the written word and he/she is required to name it);
3. does not significantly enhance the initial learning of sight words for either boys or girls as measured on the match to name task;

4. does not significantly enhance initial sight word learning for girls or boys as measured on the naming task.

It does show, however that:

5. familiarizing the boys with the stimulus (i.e., visual aspects) significantly enhances the learning of sight words as measured on a match to name task;
6. familiarizing the girls with the response (i.e., auditory aspects) significantly enhances the learning of sight words as measured on a match to name task.

## Discussion and Implications

This research was done to determine if familiarization with the stimulus or response aspects of a sight word would facilitate the learning and recall of that sight word.

The results of this study indicate that, when measuring initial sight word learning by asking the child to point to the appropriate written word (out of five presented) as the examiner said the name of the word, both boys and girls prefer familiarization to no familiarization. However, each preferred a different type of familiarization. Boys responded best to stimulus familiarization and least to response familiarization.

Girls, on the other hand, responded best to response familiarization, next best to either stimulus or no familiarization.

This is in agreement with the findings of several researchers who have produced evidence that modality preferences may be sex related (Watson,[1] Simner,[2] May and Hutt[3]).

May and Hutt presented (auditorily or visually) a list of nouns to sixty 9-year old students and then asked them to perform both recall and recognition tasks. They found that boys receiving the auditory presentation recalled less than the visual boys or either group of girls. In looking over Figure 2 in Chapter III of this dissertation, it becomes apparent that the same effect held for this study--namely, Group B boys performed below Group A boys and either Group A or Group B girls.

This finding may be explained via Samuel's work in attention. The superior performance by boys on the recognition task may have been due to increased attention. It is possible that the stimulus familiarization procedure

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[1]J. S. Watson, "Operant Conditioning of Visual Fixation in Infants under Visual and Auditory Reinforcement," Developmental Psychology 1 (1969): 508-16.

[2]M. L. Simner, "Newborn's Response to the Cry of Another Infant," Developmental Psychology 4 (1971): 136-50.

[3]R. B. May and C. Hutt, "Modality and Sex Differences in Recall and Recognition Memory," Child Development 45 (March 1974): 228-31.

which required the child to visually discriminate among look-alike words, as well as manipulate individual letters (e.g., [a] [t] [e] [k] ) to make a real word held the boys' attention better, thus resulting in Group A boys' superior performance. This might also account for the wider spread between boys' scores (i.e., boys clearly preferred Treatment A first, Control C second and Treatment B last). The response familiarization procedure which required only listening may have bored or disinterested the boys, consequently affecting their attention. Control C, which required both looking and listening, probably maintained their interest somewhat better.

Techniques which maintain interest and attention are especially crucial where boys are concerned. Participating teachers in Stanchfield's study reported that:

1. boys appeared to have a lower frustration level for boredom and were less able to attend and tolerate the monotony of regular classroom routines;
2. boys were more concerned with doing something which interested them;
3. girls, on the other hand, were desirous of learning to read to please teachers, parents, other relatives.[4]

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[4]Stanchfield, "Differences in Learning Patterns of Boys and Girls," pp. 218-27.

The other interesting feature of this research revolves around the tests. The sex X treatment interaction effect only occurred on the recognition measure, not on the recall measure.

This fact is not surprising as it is in accord with empirical evidence regarding memory reviewed by Kintsch. No matter what model of memory one employs (i.e., strength or two-process) a distinction is drawn between recognition and recall. He states: ". . . Recall differs from recognition in that it involves a retrieval phase . . . that is, recall is implicit retrieval plus recognition."[5]

If Kintsch is correct, then the results may speak to the nature of the treatment versus the difficulty of the test. Considering the length of exposure (i.e., two 7-9 minute sessions), the recall test may have been too difficult, thereby creating a floor effect. In addition, the small number of words presented and tested (i.e., five) may have also severely limited the variability of the results.

The recognition test, on the other hand, being an easier task, may have been more sensitive to the subtle changes taking place among the groups.

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[5]W. Kintsch, "Models for Free Recall and Recognition," in Models of Human Memory, ed. D. A. Norman (New York: Academic Press, 1970), pp. 331-373.

No significant differences were found among the three treatment groups when comparing the total test scores (which are derived by adding together the recognition and recall test scores).

In looking at the tests separately, there were no differences in recall among the three groups but there were differences in recognition. In combining these test scores and then comparing them across treatments, no significant differences were found. This is due to the nature of the interaction between sex and treatment. In Group A, boys performed relatively well and girls relatively poorly, thus neutralizing any overall treatment effect. In Group B, girls performed well and boys performed very poorly--once again combining to cancel out any treatment effect. In Control C, both boys' and girls' scores were mediocre (see Figure 2, Chapter IV).

When comparing the scores of the 30 girls versus those of the 30 boys in the study, neither one performed significantly better than the other. Once again, this can be explained by the neutralizing effect of the interaction between sex and treatment described above.

## Observations and Reflections

Before suggesting specific teaching and/or research recommendations it seems appropriate to include some personal observations and reflections regarding this

research endeavor. This section will, hopefully, serve as a balance between the controlled impersonal design and the objective statistical results.

As each child was being taken through the particular familiarization procedure it became readily apparent that:

1. Each child is unique and does bring her/his own personal concept of the world, special skills, personality, etc. with her/him. Thus, the data that was being acquired could never adequately be shown on a group comparison basis. Following along this theme it does seem important to remind the reader that simply because the group mean scores showed boys favored stimulus familiarization, it does not mean that all boys should be exposed to (or will respond favorably to) sight words presented in this manner. Obviously the same logic holds true for girls.

2. The stimulus familiarization pretraining procedure which required the youngster to take the individual letter cards which were put down in front of her/him (e.g. [a] [y] [m] ) and move the letters around to make the word she/he was just shown (namely, [may] ) provided numerous diagnostic insights regarding the strategies being used by the child. Some children completed the task correctly but consistently went from right to left, putting down, for example, the "y" first, then placing the

"a" to the left of it and finally setting the "m" down to the left of the "a". Other children seemed to assemble the letters in a random fashion. For example, on one word they may put down the middle letter first, then lay down the last letter, placing the first letter down last. On another occasion they might stick the first letter down first, then place the third letter down, and lastly squeeze in the second letter. Yet others seemed to consistently proceed from first letter to last letter and never know quite what to do with the "left over" middle letters. All of these children are using scanning strategies which may prove to be an obstacle to later sight word learning success. As the response pretraining procedure does not lend itself to this kind of scrutiny (due to the fact that nothing is observable), one cannot begin to predict the less than adequate strategies which may be occurring. The kind of information just described could never be reflected in a group mean score.

3. The sex differences which have been so clearly pointed out in the research may begin to fade as the behavior and achievement expectations become more equalized for boys and girls. It almost seems as if in the early years parents expect their boys to be more active, more rowdy, less book oriented than their girls. This hypothesis, in the writer's opinion, is exemplified by the common statement, "He's a typical boy!" Apparently, this phrase

is supposed to conjure up some visual image of American boyhood. A similar phrase does not exist for girls in that to say, "She's a typical girl!" somehow does not seem fitting. Thus it may be interesting to replicate the Stanchfield study (or this one) ten to twenty years hence and compare the results to see how they might differ.

## Recommendations

The recommendations offered here fall into two separate categories: (1) recommendations for those who teach reading; and (2) recommendations for further research.

### Recommendations for Those Who Teach Reading

The results of this study either uncovered or reemphasized some general principles regarding sight word learning/teaching. Those who teach reading should realize that:

1. Generally, there is a need to develop appropriate and differentiated teaching techniques which consider the attentional, perceptual, and behavioral differences in children.

2. Specifically, when teaching sight words to children one must take special care to insure that the method is, in subtle ways, directing the child to attend to and make the necessary discriminations, etc. For example, giving the child individual letter cards

[a] [y] [m] and asking him/her to "make" the word being shown [may] , not only forces the child to look at each letter but also provides diagnostic insights into the strategies being used (is she/he going from right to left, or putting m y down and then squeezing in the letter a ?) to examine the words. This knowledge may provide the teacher with future instructional considerations.

3. Sex differences, especially as they relate to attention and learning need to be considered when planning lessons around sight word learning. For example, the teacher should be aware that, as a group, boys preferred stimulus familiarization and girls preferred response pretraining. Possibly she/he could single out those who proved to be exceptions in each group and then provide a slightly different focus for each of the groups as she/he teaches the same lesson. Or, include both emphases in each lesson so that every child's needs may be more fully met. Furthermore, since the research points to attentional variation as being a crucial variable in early learning success (especially where boys are concerned) a concerted effort might be made (on the teacher's part) to devise activities which require the child to be involved physically (such as the children were with the individual letter cards used in the stimulus familiarization pretraining). This may increase many of

the boys' chances of succeeding in early reading tasks, simply because there is increased attention to the task.

4. There are two methods by which sight word learning could be measured--namely recognition and recall. As was stated earlier, Kintsch[6] believes that recall is implicit retrieval plus recognition. Therefore, it appears that showing the child a sight word and asking him/her to recall the name is more difficult and will, most likely, require more learning trials than a task involving recognition. So, if a child is unable to respond correctly on a sight word recall task, the teacher could provide her/him with the same words, this time asking the child to point to (i.e., recognize) the word as it is being named. Utilizing both measures will provide information regarding the degree of learning which has taken place, as well as the decoding strategies being used by the child.

## Recommendations for Further Research

Further study is needed in the area of sight word learning, especially as it is affected by various teaching techniques and individual learner strategies.

If this study were to be replicated, the following alterations and additions would be recommended:

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[6]Kintsch, "Models for Free Recall and Recognition," p. 337.

1. The number of sight words presented and tested (by either recognition or recall) should be increased. This would allow for a variability in test scores which was not possible in this study.

2. Choose one test measurement (i.e., either recognition or recall) if deciding to combine scores as they measure different stages of sight word learning and thus, should most likely, not be combined.

3. The number of word learning trials should be increased if a recall task is to be used as the test measurement. Otherwise, one might not have much behavior to observe and compute as the task may prove to be much too difficult, thereby creating a floor effect.

4. Increase and extend the familiarization procedures and word learning trials so that instead of looking solely at test scores, a more thorough examination of the kinds of errors (i.e., non-response, word substitutions, etc.)[7] could be made. This would move us in the direction of matching teaching methods to learning needs.

5. Extend the familiarization procedures and word learning trials, constructing a learning curve for each subject. This would allow the experimenter to measure the number of trials it takes each subject to move

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[7]Barr, "The Influence of Instructional Conditions on Word Recognition Errors," pp. 509-29.

from recognition of the word to recall to automaticity. (See LaBerge and Samuels[8] for a discussion of the movement from recognition to recall to automaticity in the reading act.)

6. Use "distractible" (as measured on some observational scale) kindergarteners to replicate this study. This would provide additional evidence supporting or refuting the conclusion that boys received their highest scores in Group A because stimulus familiarization procedures captured and maintained their attention. This may also provide further insights into the teaching techniques needed to enhance the sight word learning of distractible children.

7. Provide half the subjects with information regarding the nature of the test and the other half with no information (e.g., "When we are finished, I will show you a word [like this--said while giving the child an example] and you must tell me what it says"). This may key the youngster into what he/she needs to learn and thus produce achievement differences.

8. Examine and compare the effects of familiarization on words of high similarity (either visually and/or auditorily [cake, came]) as opposed to those of low auditory or visual similarity (e.g., gone, cake).

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[8]D. LaBerge and S. J. Samuels, "Toward a Theory of Automatic Information Processing in Reading," Cognitive Psychology 6 (1974): 293-323.

9. Use the familiarization procedures with third grade students who are failing in reading (i.e., they are one to two grade levels behind) to determine whether this might be an effective teaching technique with these children.

# APPENDICES

# APPENDIX A

## A BASIC SIGHT VOCABULARY OF 220 WORDS

# APPENDIX A

**A BASIC SIGHT VOCABULARY OF 220 WORDS**
**Edward W. Dolch, Ph.D.**
**Professor of Education, Emeritus**
**University of Illinois**

1. **Since these 220 words make up from 50% to 75% of all ordinary reading matter they should be recognized instantly by sight.**
2. **"Tell" these words as wholes. Do not allow spelling or sounding.**
3. **Use word cards for teaching, not words in a list.**

EASIER 110

| | | | | | |
|---|---|---|---|---|---|
| a | going | over | about | hurt | six |
| after | good | | again | just | sleep |
| all | green | | always | keep | small |
| am | | play | any | | start |
| an | had | put | ask | kind | |
| and | has | | ate | | take |
| are | have | | | | tell |
| around | he | ran | because | laugh | thank |
| as | help | red | been | let | that |
| at | her | ride | before | light | their |
| away | here | round | best | live | them |
| | him | run | better | long | then |
| be | his | | both | | there |
| big | | said | bring | many | these |
| black | I | saw | buy | much | they |
| blue | if | see | | must | think |
| brown | in | she | clean | myself | those |
| but | into | so | could | | today |
| by | is | some | cut | never | together |
| | it | soon | | new | try |
| call | its | stop | does | now | |
| came | | | done | | upon |
| can | jump | ten | draw | off | us |
| carry | | the | drink | once | use |
| cold | know | this | | only | |
| come | | three | eight | open | very |
| | like | to | every | or | |
| did | little | too | | our | walk |
| do | look | two | fall | own | want |
| don't | | | far | | warm |
| down | made | under | first | pick | wash |
| | make | up | five | please | well |
| eat | may | | found | pretty | were |
| | me | was | four | pull | when |
| fast | my | we | full | | where |
| find | | went | | read | which |
| fly | no | what | gave/goes | right | white |
| for | not | who | got | | why |
| from | | will | grow | say | wish |
| funny | of | with | | seven | work |
| | old | | hold | shall | would |
| get | on | yellow | hot | show | write |
| give | one | yes | how | sing | |
| go | out | you | | sit | |
| | | your | | | |

# APPENDIX B

## WORDS SELECTED IN THEIR ORDER OF PRESENTATION

# APPENDIX B

## WORDS SELECTED IN THEIR ORDER OF PRESENTATION

PART ONE

Word #1. use
Word #2. thank
Word #3. hurt
Word #4. keep
Word #5. pick

PART TWO

Word #6. give
Word #7. sing
Word #8. found
Word #9. read
Word #10. buy

# APPENDIX C

## GENERAL DIRECTIONS

# APPENDIX C

## GENERAL DIRECTIONS

"I'm trying to find out how kids learn. Today, we're going to learn to read five words."

"What are we going to learn?" (Pause, wait for answer).

(If the child answers correctly) "Yes, we are going to learn five new words."
(If the child does not answer or answers incorrectly) "Listen carefully, as I tell you again. We are going to learn to read five words."

"I'm going to teach you these words by:

(for Group A): showing you how they look."
(for Group B): saying them to you."
(for Group C): showing and saying them to you."

"Learn as many as you can because later on I will want to see how many you can remember."

Later on, what will I want to see? (Pause, wait for an answer.)

(If the child answers correctly) "Yes, I will want to see how many you can remember.
(If the child does not answer or answers incorrectly) "Well, I'm going to see if you can remember these words that we learn."

"Are you ready?"

# APPENDIX D

## LEFT TO RIGHT ORDER PRESENTATION FOR WORDS IN RECOGNITION TEST

# APPENDIX D

## LEFT TO RIGHT ORDER PRESENTATION FOR WORDS IN RECOGNITION TEST (Measure I)



| | | | | |
|---|---|---|---|---|
| use | thank | hurt | keep | pick |

# APPENDIX E

## SERIAL ORDER PRESENTATION FOR

## WORDS IN RECALL TEST

# APPENDIX E

## SERIAL ORDER PRESENTATION FOR WORDS IN RECALL TEST (Measure II)

1. found
2. buy
3. give
4. sing
5. read

# APPENDIX F

## VERBAL DIRECTIONS FOR

## MEASURE I

## (Recognition Test)

# APPENDIX F

## VERBAL DIRECTIONS FOR

## MEASURE I

## (Recognition Test)

| | |
|---|---|
| GENERAL INTO: | "Now, let's see how many words you can remember. Don't worry if you don't remember all of them. This is very hard work." |
| STEP #1 | The evaluator then places all five word cards on the table in front of the child. These are arranged in a left to right sequence. (See Appendix D.) |
| STEP #2 | "See these words I've put out on the table. We spent some time today trying to learn to read these words. Would you point to the word that says 'hurt'? Is it this one, this one, this one, this one or this one? (Pause) (The examiner says this as she points to each word.) Fine." |
| STEP #3 | "Now point to the word that says, 'thank.' Is it this one, this one, this one, this one or this one? (Pause) (The examiner says this as she points to each word.) |
| STEP #4 | "O.K., now show me the word that says, 'use.' Is it this one, this one, this one, this one or this one?" (Pause) (The examiner says this as she points to each word.) |
| STEP #5 | "All right, could you now point to the word that says 'keep?' Is it this one, this one, this one, this one, or this one?" (Pause) (The examiner says this as she points to each word.) |

| | |
|---|---|
| STEP #6 | "And, now, last of all, point to the word that says 'pick.' Is it this one, this one, this one, this one or this one? (Pause) (The examiner says this as she points to each word.) |
| STEP #7 | "Well, we're all finished for today. You did a good job. Thank you so much for working with me." (The evaluator says this and then offers the child some raisins for a "job well done.") |

# APPENDIX G

## VERBAL DIRECTIONS FOR

## MEASURE II

## (Recall test)

## APPENDIX G

### VERBAL DIRECTIONS FOR

### MEASURE II

### (Recall test)

| | |
|---|---|
| GENERAL INTRO. | "Now, let's see how many words you can remember. Don't worry if you don't remember all of them. This is very hard work." |
| STEP #1 | The evaluator then places the card with the word "FOUND" printed on it, (on the table) in front of the child. |
| STEP #2 | "See this word that I've put out on this table?" Tell me, what does this word say?" (Pause) (If the child is unable to remember, the examiner says, "It doesn't hurt to guess. Take a guess.") |
| STEP #3 | (The examiner places the word card "BUY" on the table.) "O.K., tell me now, what does this word say?" (The child is encouraged to guess of she/he cannot remember the word.) |
| STEP #4 | (The evaluator places the word card "GIVE" on the table.) "Take a good look at this word now. Tell me, what does this word say?" (Guessing is encouraged if the word cannot be remembered.) |
| STEP #5 | (The word card "SING" is now placed on the table before the child.) "Can you tell me what this word says?" (Once again, the child is encouraged to guess if she/he is unable to remember the word.) |

| | |
|---|---|
| **STEP #6** | (The word card "READ" is placed before the child on the table.)<br>"This is the last word.<br>Can you remember what it says?"<br>(As always, the child is encouraged to guess if she/he is unable to remember the word.) |
| **STEP #7** | "Well, we're all finished.<br>That was very hard stuff!<br>You did a good job.<br>Thank you so much for working with me."<br>(The evaluator says this and then offers the child some raisins for a "job well done.") |

# APPENDIX H

## SIGHT WORDS USED

## IN SENTENCES

APPENDIX H

SIGHT WORDS USED

IN SENTENCES

PART ONE

1. USE : I use my pencil in school
2. THANK : Please thank him for being so nice.
3. HURT : I fell down and got hurt.
4. KEEP : Keep your boots in the closet.
5. PICK : Pick up all the papers on the floor.

PART TWO

6. GIVE : I want to give my Mom a big kiss.
7. SING : Do you like to sing?
8. FOUND : I found a puppy that was lost.
9. READ : Do you want to learn to read?
10. BUY : I buy hot lunch here at school.

# APPENDIX I

## VERBAL DIRECTIONS FOR

## GROUP A PROGRAM SEQUENCE

## (Stimulus Familiarization Group)

# APPENDIX I

## VERBAL DIRECTIONS FOR

## GROUP A PROGRAM SEQUENCE

## (Stimulus Familiarization Group)

| | |
|---|---|
| **VERBATIM INTRO.** | SEE APPENDIX C |
| **STEP #1** | "This is the first word we're going to learn. (Shows child word card - e.g., [came] ) Give this word a good close look. (Pause) Close your eyes and try to picture the word. (Pause) Try to remember exactly what it looks like. Very good!" |
| **STEP #2** | "Now I'm going to put down all these letters. (e.g., [c] [m] [e] [a] ) Put them together to make the word that you have just seen." (Pause) |
| | **IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #3.**<br>**IF THE CHILD FAILS, GO TO ALTERNATE STEP #2.** |
| **ALTERNATE STEP #2** | "Let's look at the word again. (The examiner then shows the child the word card, leaving it in sight.) Now, you take your letters and make that word. Fine!" |
| **STEP #3** | "This is a tricky one, so look carefully. Here are three words. (The child is shown three similar looking words. e.g., [cake] [came] [cape] ) Please point to the word that we are learning." |
| | **IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #4.**<br>**IF THE CHILD FAILS, GO TO ALTERNATE STEP #3.** |

| | |
|---|---|
| ALTERNATE STEP #3 | "That was a good guess but this is the word we are learning." (The evaluator shows the child the word and then points to it.) |
| STEP #4 | "Now, let's find out what the word's name is. (The examiner again shows the card to the child, this time supplying its name.) The word we are learning is_____." (The evaluator then uses the word in a sentence.) |
| STEP #5 | "Look at this word again and tell me its name. (Pause)" |

IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #6.
IF THE CHILD FAILS, GO TO ALTERNATE STEP #5.

| | |
|---|---|
| ALTERNATE STEP #5 | The examiner simply says, "The word is _____." |
| STEP #6 | (The instructor then points to the word and asks the child to supply its name.) "Once again, this word says _____." |
| STEP #7 | "You did a great job! Let's learn another one." (The procedure is then repeated). |

# APPENDIX J

## VERBAL DIRECTIONS FOR

## GROUP B PROGRAM SEQUENCE

## (Response Familiarization Group)

APPENDIX J

VERBAL DIRECTIONS FOR

GROUP B PROGRAM SEQUENCE

(Response Familiarization Group)

| | |
|---|---|
| VERBATIM INTRO. | SEE APPENDIX C. |
| STEP #1 | "The first word we're going to learn today is (insert word name) _____. (The evaluator then uses the word in a sentence.) Listen real carefully as I say the word again. (The evaluator repeats the word.) Close your eyes and whisper the word to yourself three times. (Pause) Very Good!" |
| STEP #2 | "Now I'm going to say the word very slowly. (The examiner then breaks the word apart, saying it one sound or sound family at a time. e.g., K-Ā-M). You say it like I did in that funny way." (Pause) |
| | IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #3. IF THE CHILD FAILS, GO TO ALTERNATE STEP #2. |
| ALTERNATE STEP #2 | "Let me say the word that funny way again. This time you say it with me. (Say it together.) Fine." |
| STEP #3 | "This is a tricky one, so listen carefully. I'm going to say three words. Tell me which one we are learning. Is the word _____? Is the word _____? Is the word _____? Now tell me, what is it?" (Three very similar sounding words are presented to the child). Now tell me, what is it?" |

IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #4.
IF THE CHILD FAILS, GO TO ALTERNATE STEP #3.

| | |
|---|---|
| ALTERNATE STEP #3 | "That was a good guess but the word we are learning is _____." |
| STEP #4 | "Now, let's find out what this word looks like. (The examiner then shows the card to the child as she says the name). The word we are learning is _____." |
| STEP #5 | "Look at this word again and tell me its name." (Pause) |

IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #6.
IF THE CHILD FAILS, GO TO ALTERNATE STEP #5.

| | |
|---|---|
| ALTERNATE STEP #5 | The examiner simply says, "The word is _____." |
| STEP #6 | (The examiner then points to the word and asks the child to supply its name.) "Once again, this word says _____." |
| STEP #7 | "You did a great job! Let's learn another one." (The procedure is then repeated.) |

# APPENDIX K

## VERBAL DIRECTIONS FOR

## GROUP C PROGRAM SEQUENCE

## (Control Group)

# APPENDIX K

## VERBAL DIRECTIONS FOR

## GROUP C PROGRAM SEQUENCE

## (Control Group)

| | |
|---|---|
| **VERBATIM INTRO.** | SEE APPENDIX C. |
| **STEP #1** | "The first word we're going to learn today is _____." (The examiner shows the child the word while simultaneously telling him/her its name.) (The evaluator then uses the word in a sentence.) |
| **STEP #2** | "Now I'm going to show you the word again. (The examiner shows the child the written word.) Tell me, what does this word say? (Pause) Very Good!" |

IF THE CHILD IS SUCCESSFUL, GO ON TO STEP #3.
IF THE CHILD FAILS, GO TO ALTERNATE STEP #2.

| | |
|---|---|
| **ALTERNATE STEP #2** | "Let's look at that word again. Say it with me. The word is _____. Fine." |
| **STEP #3** | "We're going to learn the word _____ today. (The examiner says this while showing the child the card.) Point to this card for me, will you?" (Pause) |
| **STEP #4** | "Now can you tell me what the name of our new word is once again?" (Pause) (The examiner points to the word while asking the question.) |

IF THE CHILD IS SUCCESSFUL, TO ON TO STEP #5.
IF THE CHILD FAILS, GO TO ALTERNATE STEP #4.

**ALTERNATE STEP #4** "Good guess, but the word we are learning is _____."

**STEP #5** "Once again, what is the new word we're learning?" (Pause)
(The examiner points to the word once again.)

REGARDLESS OF ANSWER, MOVE ON TO STEP #6.

**STEP #6** "Our new word is _____."
(The examiner says this while holding up the word card.)

**STEP #7** "You did a great job! Let's learn another one." (The procedure is then repeated).

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