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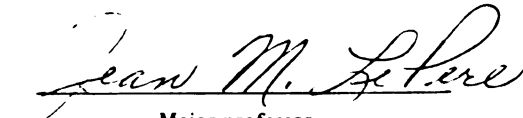
A STUDY OF THE EFFECT ON PERFORMANCE OF CUING
FIRST GRADE CHILDREN TO THE DIFFICULTY OF
A PAIRED-ASSOCIATE LEARNING TASK

presented by

June Carlotta Green

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Elementary and
Special Education


Major professor

Date March 15, 1978

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A PAIRED-ASSOCIATE LEARNING TASK

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June Carlotta Green

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ABSTRACT

A STUDY OF THE EFFECT ON PERFORMANCE OF CUING
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A PAIRED-ASSOCIATE LEARNING TASK

By

June Carlotta Green

The Problem

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This study was designed to test whether cuing first graders to the difficulty of a paired-associate learning task would affect their performance on the task. The subjects were 205 first grade children from two public schools in Detroit, Michigan. Students were randomly assigned to one of four treatment groups: (1) being told prior to attempting a task that it will be "hard" (PAH), (2) being told prior to attempting a task that it will be "easy" (PAE), (3) being told during a task that it is "hard" (DPAH), and (4) being told nothing about the task (control group or NPA).

Two pre-tests, Match to Form and Match from Memory, were administered to the subjects before they began the program sequence. The program sequence was developed to be used with an audio-flashcard reader in order that the directions would be identical for all treatment groups. The program sequence was a paired-associate task

which required matching the appropriate consonant-vowel-consonant oral trigram with its corresponding graphic figure. The Naming task, which required the recording of the number of figures correctly identified during the final trial of the program sequence, was administered as a post-test prior to the other two post-tests: Match to Form and Match from Memory.

Major Findings

Three multivariate contrasts were constructed to determine whether significant differences existed between the four treatment groups. The three contrasts were: (1) the differences between the population mean of the Psychological Attender Hard group (PAH) and no Psychological Attender (NPA); (2) the difference between the population mean of the Psychological Attender Easy (PAE) group; (3) the comparison between the population mean of the Delayed Psychological Attender Hard (DPAH) group and the average of the population means of the Psychological Attender Hard (PAH) group, the Psychological Attender Easy (PAE) group and the no Psychological Attender (NPA) group. The third contrast proved to be significantly different from the other treatment groups.

A series of univariate F-tests were used to determine which of the three dependent variables measured the significance (at the .01 level) for the treatment main effect and the achievement main effect. Results of the

univariate F-test revealed that only the Naming task measured the significance of the treatment main effect. The Match to Form and Match from Memory measured the significance of the achievement main effect.

Summary

It was concluded that being told that the task is hard after it has been attempted, proved to be a more effective motivator for increasing achievement than (1) being told that the task is hard prior to attempting it (the PAH group); (2) being told that the task is easy prior to attempting it (the PAE group); or (3) being told nothing about the task. Neither the two achievement levels nor the sexes responded significantly different to the Psychological Attenders. The Delayed Psychological Attender Hard was the treatment that significantly increased the performance of both low and high achievers as well as girls and boys.

DEDICATION

Each measure of success that is achieved can be attributed to the influence of some very special people.

The very special people in my life are:

Rev. and Mrs. Havius Vinson Green

and

Mr. Charles Anthony Rivers

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CHAPTER I

INTRODUCTION

When teaching a child a task, motivation becomes very important. Numerous techniques or strategies have been recommended. Hewett, Taylor, and Artuso (1969) used a token system as part of their engineered classroom design to enhance task attention and academic achievement of emotionally disturbed children.¹ Sloane and Jackson (1974) stated that,

In the younger grades, children's behavior may be maintained mostly by praise, attention, and other behaviors of their teachers or their parents, or by certain concrete things to do with the learning materials such as manipulative fun of handling some of the aids used to teach "new math," or the pictures in the text, or the game aspects of various school activities.²

Motivational strategies may include such alternatives as challenging the child by saying, "I don't think that you can do this" to making the task a game that is fun

¹W. C. Stainback; J. S. Payne; S. B. Stainback; and R. A. Payne, Establishing a Token Economy in the Classroom (Ohio: Charles E. Merrill Publishing Company, 1973), p. 917.

²Howard W. Sloane, Jr., and Donald A. Jackson, A Guide to Motivating Learners (New Jersey: Educational Technology Publications, 1974), p. 11.

to learn. Sometimes these strategies are successful in creating attending behavior and sometimes they are not.

Such motivating techniques may fail because of a child's low self-image. According to Purkey (1970), ". . . many students have difficulty in school not because of low intelligence, poor eyesight, poverty, or whatever, but because they have learned to see themselves as incapable of handling academic work . . ." ³ Zimmerman and Allebrand (1965) studied an urban population of poor readers in the fourth and fifth grades of middle to lower socio-economic background. These students "lacked sufficient sense of personal worth, freedom, stability, and adequacy to the extent that they avoided achievement." ⁴

If the student has failed many times before, he may be afraid to attend to the task; the student sees himself as a poor learner and does not wish to be reminded of it. This child may protect his self-esteem by reacting in one of two ways. First, the child may not pay attention in order to rationalize that failure occurred not because of a lack of ability, but because of the lack of attention. This is substantiated by the failure studies of Birney, Burdick, and Teevar (1969) who concluded that ". . . some

³William Watson Purkey, Self-Concept and School Achievement (New Jersey: Prentice-Hall, Inc., 1970), p. 2.

⁴Ibid., p. 22.

students fear failure so much that they avoid achievement whenever they can and when they cannot, do not try to succeed."⁵ Second, refusal to attend to the task may be motivated by the fact that the child really feels incapable and that there is not any sense in attempting a task that will result in failure.

It has been hypothesized that children with low self-image may be more attentive if they view the task to be learned as nonthreatening. Thus, this study was designed to test the effectiveness of a strategy intended to enhance and protect the self-concept of the learner by removing the psychological threat of failure to learn.

Statement of the Problem

Teachers often tell children that a task to be learned is easy, thinking that they are encouraging the child to attend. The basic rationale of this study, however, is just the opposite. Rather than telling a child that a task is easy, perhaps he/she should be told it is hard. It may be hypothesized that telling a child with a poor self-image that a task is easy could leave him with little protection. Thus, if he fails at an easy task, he may be reaffirming his "dumbness." Telling him it is hard, on the other hand, protects him since it is not a disgrace to fail a task which is difficult. Consequently, this

⁵Sloane and Jackson, Guide to Motivating Learners, p. 51.

study was designed to determine whether telling lower socioeconomic first grade children that a task was easy or hard would influence their performance on a particular task.

Research Questions

The major questions considered in this study were:

1. Will one treatment group achieve a significantly higher performance than other treatment groups with reference to being told tasks are "easy" or "hard"?
2. Will low and high achievers perform the same across all treatment groups?
3. Will girls and boys perform the same across all treatment groups?
4. Will high achievers perform better than low achievers on all tasks?

The Significance of the Study

At a time when the issue of whether teachers should be held accountable for the learning of students, how to command the attention of each child becomes significant. Teachers use numerous "gimmicks" to get their students interested in the task that is to be learned. Sometimes teachers find that there are students who do not respond to the "gimmicks" because these students have experienced failure numerous times before and are afraid of failing again. These students need a "psychological set" that will remove the fear of once more appearing "dumb." For

these children, a technique or strategy is needed that will modify the child's behavior by changing his attitude toward himself as a learner.

Duffy-Sherman (1972) have suggested using a technique called the "Psychological Attender." The strategy of the Psychological Attender is to inform the child that the task to be learned is difficult and that many people "make a mess of it" the first time they try it, thereby protecting a child's self-esteem if he fails the task. Some people may challenge the idea of telling a student that a task is difficult lest it discourage the student from attempting the task because he/she "knows" that he cannot do anything hard. While this concern is valid, what happens if the child is told that the task is easy? Duffy and Sherman say that the challenge is removed and in effect the child is being told he/she is defective if he/she does not succeed at such a simple task. The argument against telling the student that a task is easy can be best summed up by a quote from Duffy-Sherman, "If you do the performance successfully, it really isn't worth doing in the first place because it was easy, whereas if you fail the first time, it is because of a defect in you since everyone can do it."⁶

⁶Gerald G. Duffy and George B. Sherman, Systematic Reading Instruction (New York: Harper and Row Publishers, 1972), p. 22.

The position of Duffy and Sherman is supported by Atkinson (1957) who states that, "pride in accomplishment is believed to be limited when a task is perceived as easy and relatively intense when the task is perceived as difficult," and "the degree of shame experienced followed non-attainment of an achievement-related goal is believed to be minimal when the task is perceived as difficult and great when task is easy."⁷

Much research has been and is being done in the area of attributional theory and achievement motivation which deals with how students react to success or failure and the factors to which their successes or failures may be attributed. Weiner (1971) and others state that individuals attribute success or failure to four variables: ability, effort, task difficulty and luck. Ability and effort are viewed as internal factors and task difficulty and luck are viewed as external factors. According to Bar-tal (1974) "attributions to good luck or the task's being easy produce considerable lessened pride."⁸ This statement further supports the contention that it is better to tell the child that a task is hard rather than easy.

⁷B. Weiner and A. Kukla, "An Attributional Analysis of Achievement Motivation," Journal of Personality and Social Psychology 15 (1970):1-29.

⁸Daniel Bar-tal, Irene Frieze, and Martin S. Greenberg, "Attributional Analysis of Achievement Motivation: Some Applications to Education," paper presented at the American Educational Research Association Annual Meeting, Chicago, April 1974, p. 7.

The results of attributional research indicate that students with high achievement motivation attribute their success to internal factors and their failure to external factors, while students with low achievement motivation attribute their success to external factors and their failures to internal factors. Bar-tal (1974) states that "failures attributed to the lack of ability results in shame as well as decreased trying since one assumes that the ability will not increase greatly and, therefore, that future performances will show little improvement."⁹

The psychological attender could be used to shift the locus of control from internal factors to external factors, especially for low achievement motivation students. Davis (1972) holds that by adopting an external orientation these individuals (referring to low achievement motivation students) are able to maintain self-esteem by attributing negative events to forces beyond their control.¹⁰

While some research seems to support the notion of pointing out the difficulty of a task, other research indicates its adverse effects. Weiner and Sierad (1975) concluded in their study that having an external excuse for failure improved the performance of those with low

⁹Ibid., p. 2.

¹⁰William L. Davis and Elaine D. Davis, "Internal-External Control and Attribution of Responsibility for Success and Failure," Journal of Personality 40 (March 1972):123-36.

achievement motivation while it decreased the performance of those with high achievement motivation.¹¹ Theories by Atkinson and Feather (1966) suggest that an "achievement-orientated person prefers or is attracted to or challenged by tasks of moderate difficulty." On the other hand, "failure threatened individuals choose easy tasks to assure success or tasks so difficult that he has a socially acceptable excuse for failing."¹² Based on the findings of Weiner and Sierad, the Psychological Attender which shifts the locus of control from internal to external factors may prove to be successful in motivating low achievement students but not high achievement motivation students. However, some research in the area of achievement motivation indicated that failure-threatened subjects selected an easy task as frequently as they selected a very difficult one. Therefore the Psychological Attender may prove to be of little benefit for some students.

While there are some differences of opinion concerning the attributional theory, most researchers in that field agree with the notion that by adopting an external orientation, certain individuals are able to protect their

¹¹Bar-tal et al., "Attributional Analysis of Achievement Motivation," p. 5.

¹²E. Stewart Marlow III, "Need for Achievement, Fear of Failure and Attribution Processes in Goal Setting" (Ph.D. dissertation, Pennsylvania State University, December 1971), p. 122.

self-image. Birney et al. (1969) commented that "if failure is to have any meaning for an individual, it must be assumed that the individual who is afraid of failing is taking some responsibility for his nonattainment."¹³ The purpose of the Psychological Attender is to prevent fear of failure.

Although the Psychological Attender might not serve as a positive strategy for all students, the purpose of this study was to discover characteristics (achievement level and sex) of students who might be motivated by the Psychological Attender.

The findings of this study should provide a significant contribution to those who work with children for the following reasons:

1. The results may have serious implications for both parents and teachers in terms of modifying a child's attitude towards achievement.
2. Most of the research in the area of achievement motivation and attributional theory has been done with college students. This study used first graders since it could not be assumed that first graders and college students would respond in the same manner to motivation in terms of success and failure.

Overview of the Study

Population

The population of this study consisted of first grade students from a public school system in a large metropolitan area in Michigan.

¹³Ibid., p. 129.

The two schools that were selected were located in the general vicinity of each other. They have grades kindergarten through fifth with a predominately black lower socio-economic status student body. Both schools receive Chapter 3 and Title I funds. One school with an enrollment of approximately 890 has had a gradual decline in its enrollment over the last few years. The community surrounding this school is not very mobile, with a significant percentage of the population consisting of second, third, and fourth generation residents. The other school and surrounding community is experiencing the opposite trend. The enrollment since the mid 1970s has swelled to approximately 800. The neighborhood in which the school is located was transient and about four years previous to the time of the study its population and that of the school was predominately white.

Procedure

All first graders at each of the two elementary schools were considered as possible subjects for this study, with the exception of those students who were retained in the first grade because of unsuccessful academic achievement. On the basis of a checklist used to measure reading and math readiness skills, subjects with a score above forty were labeled high achievers and those with a score below forty were labeled low achievers. The subjects were then randomly assigned to the four treatment groups.

The Psychological Attender Hard and the Psychological Attender Easy treatment groups received a Psychological Attender during the initial instructions and just prior to the third and the sixth trials. The PAH group was told that, "This is really hard, so don't feel bad if you can't remember all the names." The PAE group was told that, "This is really easy, so I'm sure you can do it." The subjects in the DPAH group were told, "This is really hard, so don't feel bad if you can't remember all the names," after attempting the task (fourth trial). The control group (NPA) received instructions without a Psychological Attender.

Two pre-tests measuring the subjects' ability to Match to Form and Match from Memory were administered. Match to Form and Match from Memory are skills which were involved in the program sequence of this study. The pre-test achievement measures were employed as covariates in an attempt to eliminate the possibility of differences between treatment groups prior to exposure to the program sequence. The day following the pre-test, the program sequence was presented to each subject, one at a time. All experimental groups and the control group received the same program. The program was presented on an Audio-Flashcard Reader so that each subject received the same presentation. Seventy-two audio-flashcards with two sound tracks affixed to each card were fed into the Audio-Flashcard Reader. The audio-flashcard had a stimulus

figure on it and appropriate information pertaining to the figure. The child's task was to pair the nonsense oral trigram with a representative graphic figure and then to recall the association.

Four pairs of figures were paired with a CVC Tri-gram randomly ordered to reduce serial learning. An introductory trial was included at the beginning of the program sequence to correct the enunciation of a trigram, if necessary. The first trial following the introductory trial was a learning trial. The learning trials provided the trigram paired with the figure and directed the subject to focus on a particular feature of the stimulus figure. The second trial following the introductory trial was a test trial. The test trials asked the subject to "name" the figure. Each subject was directed to push a button on the machine to check the correctness of his answer. The eight teaching and testing trials were alternated, with the final trial serving as a post achievement measure for naming task. During this trial, the verbal responses were recorded on each subject's score sheet.

After the program sequence, the Match to Form and Match from Memory post-tests were administered. The total time of the program and post-tests were approximately twenty minutes.

The stimulus figures used and the procedures for presenting them were the same as those used by

Allington¹⁴ in a study which determined that learning of paired associate tasks was enhanced by the use of vanishing color cues.

Treatment of the Groups

1. The Psychological Attender Hard (PAE) Group

As a part of the directions and just prior to trial three and six, the experimenter told the subjects that "This is really hard, so don't feel bad if you can't remember all the names."

2. The Psychological Attender Easy (PAE) Group

As a part of the directions and just before trials three and six, the experimenter told the subjects that "This is really easy, so I'm sure you can do it."

3. The Delayed Psychological Attender Hard (DPAH) Group

After the fourth trial, the experimenter said, "This is really hard, so don't feel bad if you can't remember all the names."

4. The Control Group

The control group was given only the directions so how to perform the task.

Hypotheses

The major hypotheses to be tested in this study emerged from the questions which were explored:

1. There will be no difference between the four treatment groups as measured by the three dependent variables: Match to Form, Match from Memory, and Naming.

¹⁴Richard L. Allington, "An Evaluation of the Use of Color Cues to Focus Attention in Discrimination and Paired-Associate Learning" (Ph.D. dissertation, Michigan State University, 1973).

2. There will be no interaction effect between achievement levels and treatment as measured by the three dependent variables.
3. There will be no interaction effect between sex and treatment as measured by the three dependent measures.
4. There will be no difference between the performance of High and Low Achievers on the three dependent variables.

Definition of Terms

1. Psychological Attender: A method to create an appropriate psychological set for learning which acknowledges the difficulty of a task as a means for removing the fear of failure so that the task will be attempted again if necessary.
 - a. Psychological Attender Hard: A method to create an appropriate psychological set for learning which acknowledges the difficulty of a task as a means for removing the fear of failure so that the task will be attempted again if necessary.
 - b. Psychological Attender Easy: A method to create an appropriate psychological set for learning which acknowledges that a task is easy as a means for encouraging the child to attempt the task.
 - c. Delayed Psychological Attender Hard: A method to create an appropriate psychological set for learning by allowing the child to discover that the task is hard and then confirming for the child that the task is indeed difficult.
2. Matching from Memory: Following a presentation and removal of a stimulus figure, the subject selects that figure from a group of four figures.
3. Match to Form: In the presence of a stimulus figure, the subject selects that figure from a group of four figures.
4. Naming: In the presence of a figure, the subject makes the appropriate verbal response.

5. High Achievers: Those students who received a score of above 40 on a checklist measuring academic achievement in the area of reading and math readiness skills.
6. Low Achievers: Those students who received a score below 40 on a checklist measuring academic achievement in the area of reading and math readiness skills.
7. Low socio-economic status: This designation usually refers to people in occupations which require little or no education. This category primarily includes such occupations as: taxi drivers, janitors, bar tenders, restaurant waiters and sanitation workers.¹⁵

Assumptions

The following assumptions underlie this study:

1. It is important for first graders to be motivated to attend to a given task if they are to learn specific skills;
2. It is important for first graders to be able to match to form in order to distinguish between words that are alike and different;
3. It is important for first graders to be able to visually discriminate in order to identify correctly words that look alike;
4. It is important for first graders to be able to match from memory in order to identify words by sight when reading;
5. It is important for first graders to be able to recognize and identify the figure; and
6. Naming the figures is equivalent to naming letters of the alphabet or words.

¹⁵ Robert W. Hodge; Paul M. Siegel, and Peter H. Rossi, "Occupational Prestige in the U.S.; 1925-1963," in Class Status and Power Social Stratification in Comparative Perspective, ed. Reinhard Bendix and Seymour Martin Lipset (New York: New York Free Press, 1966).

Limitations

This study has the following limitations:

1. The findings of this study were limited to the population used or similar populations.
2. The findings of this study were limited to situations in which the same or similar learning environments are employed.
3. The findings of this study were limited to the type of learning tasks used in this study.
4. The findings of this study were limited to the way in which the Psychological Attender is used within this study.

Analysis of the Data

Multivariate analysis of variance (MANOVA) with a 2 x 2 x 4 factorial design was used in this study. The independent variables were the treatments (which involved the use of the psychological attender), achievement levels, and sex. The covariates were the pre-test scores for the Match-to-Form and the Match-from-Memory. The dependent variables were the two post-tests Match to Form, Match-from-Memory, and the Naming task. The Naming task was the criterion measure for the paired-associate learning task.

Organization of the Dissertation

In Chapter II a review of pertinent literature will be presented.

Chapter III will contain a description of all materials and procedures employed in this study. The design of the study is also presented in detail.

Chapter IV will include the presentation of the data collected, treated and analyzed for the study.

A summary of the study and appropriate conclusions are provided in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter is to review existing research related to the effect on performance of cuing first graders to the difficulty of a paired-associate learning task.

Relevant research on the psychological control or manipulation of the learner and the learning environment in order to increase academic achievement will be divided into two sections for discussion. The first section will discuss the theory of achievement motivation and research related to it and the second section will discuss techniques and strategies used to control and manipulate the learner and the environment of the learner in order to increase academic achievement.

The Theory of Achievement Motivation

Educators generally agree that motivation is a significant factor that influences academic achievement. The word motivation has been used loosely here because of the numerous and various ways it has been perceived and defined in the field of psychology. The numerous

theoretical positions such as the homeostatic model, self-actualization, hedonic, and others do not concern themselves with educational situations or relate to the purposes of this study.

Furthermore, the occasional application of psychological theory to education has not typically eventuated in a theory of academic motivation nor a unified and coherent body of information. As a result, there is very little in the way of motivation theory which is clearly of help to the classroom teacher or to education in general.¹

In order to get a perspective that was more in line with the purposes of this study and addressed itself to educational concerns, literature in the area of achievement motivation became the focus of this review.

McClelland et al. pointed out the two important factors of achievement motivation: (1) that it is learned; and (2) that it involves a standard of excellence.

. . . all motives are learned, that they develop out of repeated affective experiences connected with certain types of situations and types of behavior. In the case of achievement motivation, the situations should involve "standards of excellence, presumably imposed on the child by the culture, or more particularly by parents as representatives of the culture, and the behavior should involve either "competition" with those standards of excellence or attempts to meet them which, if successful, produce positive affect, if unsuccessful, negative affect.²

¹Martin L. Maehr and Douglas D. Sjogren, "Atkinson's Theory of Achievement Motivation: First Step Toward A Theory of Academic Motivation?" Review of Educational Research 41 (1971):143-61.

²David C. McClelland; John W. Atkinson; Russell A. Clark; and Edgar L. Lowell, The Achievement Motive (New York: Appleton-Century-Crofts, Inc., 1953).

This definition, at least in part, contradicts some motivational theories which view motivation as innate and not learned. It was crucial to the philosophy of this study that achievement motivation be defined as learned, otherwise it would not be subject to control or manipulation. If achievement motivation cannot be controlled or manipulated, then educators could never hope to make a significant impact on the learner or the learning environment.

The theory of achievement motivation developed by Atkinson provides hope and may be of assistance to those involved in the educational process.

The work of several theorists has shown promise of evolving postulates and hypotheses relevant to the teaching-learning process. Prominent among these is the theory of achievement motivation particularly as formulated by Atkinson (1957, 1964, 1965, Atkinson and Feather, 1966). This theory has provided a productive approach to a variety of behavioral phenomena; thus it has been suggested (e.g., Atkinson, 1966; Weiner, 1967) that it may also give direction to educationally relevant research.³

Two important assumptions resulting from Atkinson's theory of achievement motivation that should be emphasized because they relate to the purpose of this study are:

(1) achievement situations are situations which require skill and competence; and (2) achievement situations create a motive to approach success or a motive to avoid failure.

³Maehr and Sjogren, "Atkinson's Theory of Achievement Motivation," p. 143.

Achievement-Oriented and
Failure-Threatened
Subjects

The major hypothesis that resulted from Atkinson's theory of motivation was that in achievement situations achievement-oriented subjects responded differently from failure-threatened subjects to tasks of varying difficulty. Subjects whose tendency to approach success was greater than the tendency to avoid failure (achievement-oriented subjects) exhibited lowest motivation when the probability of success was $P_s = 0.00$ or 1.00 because the task was easy or very difficult. However, motivation was highest when $P_s = 0.50$ because the task was of moderate difficulty. The opposite existed for the failure-threatened subjects. Such persons exhibited highest motivation when the task was easy or very difficult. Motivation was lowest when the task was of moderate difficulty.⁴

Research designed to test the hypothesis stated above has all involved older subjects; in fact most of the studies used college students. The results of a study by Karabenick and Youssef (1974) somewhat supported the hypothesis of Atkinson's theory of achievement motivation. In order to measure the motive to achieve success (M_s) the Thematic Apperception Test (TAT) was administered to male students in a psychology class. Also, the Test Anxiety

⁴John W. Atkinson, An Introduction to Motivation (Princeton: Van Nostrand, 1964).

Questionnaire TAQ was administered to measure the motive to avoid failure. Based on the results from the two tests, the subjects were assigned to one of four groups: (1) the motive to achieve was greater than the avoidance motive group ($M_S > M_{AF}$); (2) the motive to avoid failure was greater than the motive to achieve success group ($M_{AF} > M_S$); (3) the students who scored high on both the TAT and TAQ; and (4) the students who scored low on both the TAT and the TAQ. The paired-associate learning task involved words that were color-coded to indicate their level of difficulty (easy, moderately difficult, and difficult). The subjects had from ten to thirty trials to learn the list of words that they selected. The subjects designated as $M_S > M_{AF}$, performed better than the subjects designated as $M_{AF} > M_S$ at tasks of intermediate difficulty. The performance of the two groups were not significantly different from each on the tasks that were either easy or difficult. However, the subjects designated as $M_{AF} > M_S$ performed better than their counterparts on easy or difficult tasks than at those designated as being of intermediate difficulty. The $M_{AF} > M_S$ showed a relative aversion for items of moderate difficulty, although not to the degree found in previous studies.⁵ This trend may not have been evident in previous

⁵Stuart A. Karabenick and Zakour I. Youssef, "Performance as a Function of Achievement Motive Level and Perceived Difficulty," in Motivation and Achievement, ed. J. W. Atkinson and Joel O. Raynor (Washington: Winston, 1974), pp. 83-90.

studies (Atkinson, 1958c, Atkinson and Litwin, 1960) because college populations have changed through the years.^{6,7}

The results of a study by Moulton (1965) were similar to the Karabenick and Youssef study. Male junior and senior high students were administered a n Achievement test and a Test Anxiety Questionnaire in order to divide them into $M_S > M_{AF}$ and $M_{AF} > M_S$ groups. The Similarities subtest of the WISC was also administered. Students were asked to select from folders of varying difficulty (easy, moderately difficult, and hard). In these folders was an activity which required that letters be unscrambled in order to make words. The subjects were asked to select a folder of whatever difficulty desired, but first they had to do a task of moderate difficulty, and were then given feedback on their performance. Following this, each subject was allowed to select a folder of his/her choosing. Findings indicated that the avoidance-oriented group chose either easy or a difficult task with greater frequency than the approach-oriented group, although in previous

⁶J. W. Atkinson, "Toward Experimental Analysis of Human Motivation In Terms of Motives, Expectancies, Incentives," in Motives in Fantasy, Action, and Society, ed. J. W. Atkinson (Princeton: Van Nostrand, 1958c).

⁷J. W. Atkinson and G. H. Litwin, "Achievement Motive and Test Anxiety Conceived as Motive to Approach Success and Motive to Avoid Failure," Journal of Abnormal Social Psychology (1960):52-63.

studies, the subjects in the avoidance group chose easy tasks as often as they chose the difficult ones.⁸

A study using a population of lower socioeconomic Blacks had results similar to the other studies that tested Atkinson's hypothesis. These results were surprising since lower socioeconomic Blacks were not expected to respond in the same way as the middle-class and white subjects. First, the achievement motivation and a children's form of the measure of powerlessness (Bialer, 1961) was administered to fifth, sixth, and seventh grade students. The experiment involved the use of spelling and mathematics tasks divided into six levels of difficulty. The subjects were tested on their performance on these skills. Then the subjects had a choice of materials from six levels of difficulty from which to work. The subjects predicted what they thought their performance would be and then were awarded points on the basis of the number of items that were performed correctly. The results indicated that both boys and girls high in n achievement were more inclined to select a moderately difficult task, while those low in n achievement were more inclined to select an easy or very difficult task. These findings held true for both spelling and mathematics. According to de Charms:

⁸Robert W. Moulton, "Effects of Success and Failure on Level of Aspiration as Related to Achievement Motives," Journal of Personality and Social Psychology 1 (1965): 399-406.

It is also possible that the effect of achievement motivation may be more clearly evident in the culturally disadvantaged environment than the high competitive middle class culture where the range of achievement scores may be skewed toward high achievement.⁹

The studies reported in this study and numerous others support Atkinson's theory in that there was a differential orientation toward moderate success levels on the part of failure-threatened and achievement-oriented subjects. These same results existed regardless of whether the subjects were boys or girls, or from lower socioeconomic or middle-class environments.

Low and High Achievement Need
Subjects Who Attribute Their
Success or Failure to Four
Causal Elements

Atkinson's theory of achievement motivation concerns itself only with the personality of the subject and the characteristics of the particular achievement task. However, the attributional theory adds another dimension to Atkinson's theory by developing a theory that concerns itself with the subject's perception of the causes of his/her success or failure.

Whereas Atkinson's approach places great emphasis on effective reactions as mediators of achievement-related behavior more recent theorizing suggests that cognitive variables may have even more

⁹ R. de Charms and V. Carpenter, "Measuring Motivation in Culturally Disadvantaged School Children," in Research and Development Toward the Improvement of Education, ed. H. J. Klausmeir and T. T. O'Hearn (Madison, Wisconsin: Dembar Educational Services, 1969), p. 39.

potential for explaining apparent motivation differences with regard to achievement behavior.¹⁰

According to Weiner et al., individuals allocate their successes and failures to four causal elements: ability, effort; task difficulty, and luck. These elements are classified in terms of locus of control and/or stability.

Ability and effort are causes within the person (internal locus), while task difficulty and luck are outside of the person (external locus). Ability and task difficulty are relatively unchangeable as a person reattempts the same task again and again and are thus considered highly stable; whereas, effort and luck are highly variable and are thus considered less stable. These dimensions of locus of control and stability have been found to be important in understanding respectively the affective reactions to the success or failure and the changes in perceived probability of success for future outcomes (Weiner, Heckhausen, Meyer, and Cook, 1972). For example, in a success situation, people feel maximum pride when they can attribute their high performance to either their ability or effort. Attributions to good luck or the task's being easy produce considerably lessened pride. Furthermore, when one perceives high success as caused by good luck, the resulting expectancy is that failure will occur in the future since luck is an unstable factor which is believed to fluctuate over time. Similar implications are found for attributions about the causes of failure. Failure attributed to lack of ability result in shame as well as decreased trying since one assumes that his ability will not increase greatly and therefore that future performance will show little improvement. Lack of effort attribution, although causing shame, also result in increased rather than lessened trying since the implication is that performance would have been better if more effort had been

¹⁰Bar-tal et al., "Attributional Analysis of Achievement Motivation," p. 1.

exerted. Attributions to a very difficult task or bad luck as being the cause of the failure result in little shame since no personal responsibility is taken for failure.¹¹

Just as Atkinson's theory of motivation and data related to it supported the hypothesis that achievement-oriented subjects responded differently from failure-threatened subjects to tasks of varying difficulty, empirical studies in the area of attributional theory have indicated that contrasting achievement motive groups ascribe their failure or success to different causal elements.

Individuals high in achievement needs relative to those low in achievement motivation attribute success to their ability and effort, and their failures to lack of effort or external factors. Individuals low in achievement needs ascribe their failures more to lack of ability, success to external factors, and in general perceive themselves as low in ability.¹²

A study by Weiner and Kukla (1970) supported the hypothesis of the attributional theory. Their study involved students from grades three through six and from high school. The subjects, both male and female (none of the high school students were female), were from a middle-class environment. The elementary students were administered the Elementary Intellectual Achievement Responsibility (IAR) and the Children's Achievement Scale.

¹¹Bar-tal et al., "Attributional Analysis of Achievement Motivation," p. 2.

¹²Ibid., p. 3.

The TAT, TAQ, IAR, and the Mehrabian Achievement Risk Preference Scale (MARPS) were administered to the high school students. This study concluded that individuals classified as high in resultant achievement motivation tend to attribute success in achievement-oriented situations to themselves more than individuals low in resultant achievement motivation. The mean differences in all of the seven independent male and female comparisons were in the predicted direction, although the findings were most convincing for males past the fourth grade. The relative weakness of the finding was among the female subjects, which was not entirely unexpected since similar studies did not have conclusive findings for females.¹³

Another study by Weiner and Kukla involved only males from an introductory psychology class. These subjects, in order to be assigned to a low achievement-oriented group or a high one, were administered a modified version of a self-report developed by Mehrabian (1969). The students had to guess whether a 0 or 1 would be present each time a number was selected from a list of fifty numbers. Each subject was asked whether performance on this task could be attributed to skill, effort, or chance. Then the subjects were assigned to a success, failure, or an intermediate group based on their performance. The conclusion of this study was that individuals high in

¹³Weiner and Kukla, "Attributional Analysis of Achievement Motivation," pp. 1-20.

achievement motivation are more internal with respect to success. They also perceive that they have more ability and expend more effort, than the subjects low in achievement motivation. The data indicate that:

. . . high achievement group perceives the task outcome as primarily determined by skill, and hence is likely to believe that success in this situation is internally controlled. The negative recency effect displayed by subjects in the L group reveals that they perceived success to be strongly influenced by good luck, or externally controlled.¹⁴

Kukla (1972) investigated the relationship between achievement level and attribution of success and failure. The subjects, undergraduate male psychology students, were engaged in a digit-guessing task. Prior to engaging in the task, the subjects were given the Revised and Condensed Achievement Scale for Males (Mehrabian). After the task was completed each subject filled out a questionnaire concerning his performance. Results indicated that high achievers attributed their outcome to a combination of ability and effort; intermediate achievers considered ability and luck to be determinants of their outcome; and low achievers attributed success or failure to ability.

An important concern is that attribution may influence academic performance:

. . . if attribution determines behavior, then a change in attribution will result in a corresponding change in behavior. Thus, if a high

¹⁴Ibid., p. 15.

achiever acts the way he does because of the manner in which he typically attributes causality, then any operation which increases the likelihood of such an attribution will also increase the likelihood of the behavior known to be characteristic of high achievers. More specifically, it would be expected that any set of conditions which favor the attribution of outcome to effort will result in high-achiever-like behavior; conversely, conditions which discourage the perception that effort determines outcome will lead instead to low-achieverlike behavior.¹⁵

Therefore Kukla conducted another experiment to test the above hypothesis. The subjects were administered the Revised and Condensed Achievement Scale for Males (Mehrabian) and then divided into two groups. Group A was told that to unscramble twenty anagrams was a measure of ability. Group B was told that the task was a measure of effort more than ability. Only the high-achievers were influenced by the ability-effort treatment. Kukla concluded that his strategy was unable to change the negative effect associated with failure.¹⁶

The experimenter was unable to locate any research that investigated whether Blacks and/or lower-class students attributed their successes and failures to the same causal elements as white or middle-class students.

Lefcourt (1966) and Rotter (1966) stated that Blacks have lower internality than Whites. A study by

¹⁵ Andy Kukla, "Attributional Determinants of Achievement Related Behavior," Journal of Personality and Social Psychology 21 (1972):169.

¹⁶ Ibid.

Bartel (1971) investigated the locus of control and achievement for middle- and lower-class students from grades one, two, four, and six. It was not indicated whether the sample included any Black students. The conclusions were that "lower- and middle-class children enter school not measurably different from one another in locus of control, but by the time they reach the sixth grade, they are significantly different from one another on this characteristic."¹⁷ Middle-class children become significantly more internally controlled from grades one to six, while lower-class children remain at relatively the same level of external control from grades one to six. From these results, one might conclude that Black and/or lower-class children as a whole would assume the characteristics of the low n achievement students and attribute their success to chance and their failure to ability.

The first section of this chapter dealt with:

- (1) achievement-oriented and failure-threatened subjects and how they responded to tasks of varying difficulty and
- (2) low achievement need and high achievement need subjects who attribute their failure or success to four causal elements. The second section will review and discuss theories and research that deal with the control and

¹⁷ Nettie Bartel, "Locus of Control and Achievement in Middle- and Lower-Class Children," Child Development 42 (October 1971):1099-1107.

manipulation of the learner and the learning environment in order to increase academic achievement.

Techniques and Strategies that Control and
Manipulate the Learner and the
Environment of the Learner

When discussing the issue of how to improve academic performance, educators frequently refer to students in terms of whether they are intrinsically or extrinsically motivated. Intrinsic motivation has been defined as an integral, autonomous energy source inherent in the organism. Extrinsic motivation has been viewed as an external energy source, or stimuli in the environment influencing the organism to behave in a certain manner.¹⁸

Some persons in the field of psychology disagree with educators about the theory of two types of motivation. For Avila and Purkey (1966):

There is only one kind of motivation, and that is the personal, internal motivation that each and every human being has at all times, in all places, and when engaged in any activity.¹⁹

Many educators classify those students who are not intrinsically motivated as being unmotivated. Combs disagrees with this premise (1962):

¹⁸Donald L. Avila and William Watson Purkey, "Intrinsic and Extrinsic Motivation--A Regrettable Distinction," Psychology in the Schools 3 (1966):206.

¹⁹Ibid.

. . . people are always motivated; in fact they are never unmotivated. They may not be motivated to do what we would prefer they do, but it can never be truly said that they are unmotivated.²⁰

Comments of a classroom teacher indicated that the teacher realized that an "unmotivated" student was motivated:

Galt is motivated from within. He's all over the classroom making things at the workbench, building with blocks, playing with puppets. But Galt doesn't know his letters or his numbers, and he doesn't care to learn them. I find it difficult to motivate him to learn these important first grade skills. Yet he's a totally motivated kid. I watch this child making fantastic creations at the workbench, and I wonder what to do.²¹

Combs feels that people are motivated because of a need:

. . . an insatiable need for the maintenance and enhancement of the self; not the physical self--but the phenomenal self, of which the individual is aware, his self concept.²²

Avila and Purkey agreed with Combs but added another dimension to his philosophy:

For the teacher, this is a given, a basic drive toward self-fulfillment. It may be inherent, or learned, but in either case, it is present by the time the child enters school; it is a built in advantage, a force that comes from within the

²⁰A. W. Combs, Perceiving, Behaving, Becoming, Yearbook of the Association for Supervision and Curriculum Development, 1962, p. 85.

²¹Walter Drew, Anita R. Olds, and Henry F. Olds, Jr., Motivating Today's Students (Palo Alto, California: Learning Handbook, 1974), p. 43.

²²A. W. Combs, "Some Basic Concepts in Perceptual Psychology," paper read at American Personnel and Guidance Association Convention, Minneapolis, April 1965.

individual that, by school age cannot be appreciably altered. No human being can ever motivate another, no matter what the situation or how strong the desire. . . . The teacher is the external force, and a strong force, yet not as a motivator, but as a manipulator of his charges. He does not motivate, but he controls an environment in which he manipulates himself and other classroom variables in such a way that what he is trying to teach appears to be self-enhancing to his students. He casts the situation and himself in such way that the information and knowledge he is presenting is personally meaningful and enhancing to the student.²³

Atkinson's theory of achievement motivation and the theory of attribution both pointed out the importance of controlling and manipulating "the learner and the learning situation so that the learner will perceive both the materials being taught and the learning situation as being self-enhancing."²⁴ In order to improve learning in the classroom, it is felt that some manipulation must be done.

Although educators are concerned with individual differences in response to environmental events, the exigencies of education make it incumbent that they be more concerned with how environmental variables have a greater or lesser effect on all students regardless of individual differences. It is difficult, if not impossible at present, to create a specialized environment for each student. A theory of academic motivation must tell the educator how to manipulate environments in order to obtain the greatest over-all effects. Thus the question of concern to the educator is how do I manipulate the school environment so that I can

²³Avila and Purkey, "Intrinsic and Extrinsic Motivation," pp. 206-7.

²⁴Ibid., p. 208.

maximize motivation in all students regardless of personality differences?²⁵

Self-Concept and Motivation

The significance of the influence of self-concept on academic achievement warrants the inclusion of a review of the literature on the self-concept of the learner.

In predicting academic achievement, many factors may be considered in determining an individual's potential or capacity for learning. Among such factors are IQ scores; performance on kindergarten readiness tests; socioeconomic background; racial background; social and physical maturity; language development; self-concept; and numerous others. However, research studies indicate that there is a correlational relationship between self-concept and academic achievement and that this relationship is significant in predicting a student's academic performance.

There is some indication that self-concept may be equal to or superior to IQ scores in predicting a student's success or failure in school. Lamy (1965) found that perceptions of kindergarteners about themselves and their world obtained from inferences made by trained observers, gave as good a prediction of later reading achievement as intelligence test scores. In concluding her study, Lamy suggested that the perceptions of a child about the world

²⁵Maehr and Sjogren, "Atkinson's Theory of Achievement Motivation," p. 154.

were not only related to, but may in fact be causal factors in subsequent reading achievement.²⁶

In another study, Wattenburg and Clifford (1964) obtained measures of the kindergarten children's self-concept based on self-referent statements obtained as the children drew pictures of their families and as they responded to incomplete sentences. From the self-references, two aspects of self-concept were noted: (1) feelings of competence; and (2) feelings of goodness. Two-and-a-half years later, reading achievement was measured and self-concept measures repeated. The results indicated that the self-concept phenomenon was antecedent to and predictive of reading achievement.²⁷

Numerous studies (Campbell, 1967; Bledsoe, 1967; Irwin, 1967; Gill, 1969) support the fact that academic achievement is influenced by self-concept. One of the ideas communicated to students in a study by Brookover et al. (1965) was that the limits of ability, though affected by innate and other factors, are rarely attained in one's performance. In addition, the students were told

²⁶M. W. Lamy, "Relationship of Self-perception of Early Primary Children to Achievement in Reading," in Human Development: Readings in Research, ed. I. J. Gordon (Chicago: Scott Foresman, 1965).

²⁷William W. Wattenburg and Clare Clifford, "Relation of Self-Concepts to Beginning Achievement in Reading," Child Development 35 (June 1964):461-67.

that too often one speaks of "ability" as if it were a fixed, unchangeable attribute which determines one's performance in school. Besides these wide limits of potential, there are several other important factors which influence one's performance. Such factors as how one feels about a subject, interest in it, or whether one defines a subject as an appropriate area for goal achievement, are not constant factors, but rather they are related to one's social milieu and self-perceptions.²⁸

A brief discussion of the development of self-concept would clarify why self-concept has such a significant influence on achievement in school. The development of the learner's self-concept is predicated on the individual's experiences. Interaction with the environment and "significant others," be it positive or negative, influences how the child is to feel about himself.

As far as we can tell, the newborn baby is unaware of his existence as a unique and separate entity. But as the days pass he experiences continuous changes in his internal and external environments. Through layer after layer of direct experience with smells, sights, sounds, tastes, feelings, and pressures, he begins to organize a coherent mental organization of his world and adapt to the external environment. It is this cauldron of experiences, this process

²⁸Wilbur B. Brookover; Jean M. LePere; Don E. Hamachek; Shailer Thomas; Edsel L. Erickson, Self-concept of Ability and School Achievement, II, Report of Cooperative Research Project No. 1636, U.S. of Education, entitled "Improving Academic Achievement through Self-Concept Enhancement," College of Education, Michigan State University, October 1965.

of mental organization and adaption, which forges the self.²⁹

George Mead in Mind, Self, and Society, views the concept of self from a social perspective. His theory is that the "functional limits" of one's ability to learn are determined by his self-conception of his ability as acquired in interacting with "significant others."³⁰

Snygg and Combs also pointed out the importance of the role of "significant others" in forming perceptions of self.

As the child grows and explores himself, he discovers he is male or female, tall or short, fat or thin, blond or brunette. Some of these perceptions he arrives at through his own explorations of self. Other concepts, particularly those which have to do with values, he acquires from his interactions with people about him. He discovers not only what he is, but also what he is not and attaches values to these discriminations. He perceives himself as "good" or "bad," adequate or inadequate, handsome or ugly, acceptable or unacceptable, depending upon the ways he is treated by those who surround him in the growing-up years. He learns about himself not just from his own explorations, but through the mirror of himself represented by the actions of those about him.

The self is essentially a social product arising out of experience with people. Although some of the individual's experience of self may be achieved in isolation from other people, by far the greater portion arises out of his relationships with others. Human personality is primarily a product of social interaction. We learn the most significant and fundamental facts

²⁹William W. Purkey, Self-Concept and School Achievement (Englewood Cliffs: Prentice-Hall, 1970), p. 29.

³⁰George H. Mead, Mind, Self and Society (Chicago: University of Chicago Press, 1934).

about ourselves from what Sullivan called "reflected appraisals," inferences about ourselves made as a consequence of the ways we perceive others behaving toward us. We learn who we are and what we are from the way we are treated by those who surround us; in our earliest years by our families, and in later years by all those people with whom we come in contact.³¹

Anderson (1952) defines significant others as "those persons who are important or who have significance to the child by reason of his sensing their ability to allay insecurity or to intensify it--to increase or decrease his sense of helplessness, to promote or to diminish his sense of well-being."³² Parents, teachers, and peers are the significant others identified in research.

Parents and Self-Concept. Parents play an important role in shaping their child's perception of self. Manis (1958) reported from his research that a child's level of self-regard is closely associated with the parents' attitudes about their children and have a tremendous influence on the scholastic performance of their offspring.³³

³¹D. Snygg and A. W. Combs, Individual Behavior (New York: Harper and Row, 1949), pp. 126-27.

³²Camilla M. Anderson, "The Self-Image: A Theory of the Dynamics of Behavior," in The Self in Growth, Teaching, and Learning, ed. Don E. Hamachek (Englewood Cliffs, New Jersey, 1965), p. 6.

³³M. Manis, "Personal Adjustment, Assumed Similarity to Parents, and Inferred Parental Evaluation of the Self," Journal of Consulting Psychology 22:481-85.

A study by Brookover et al. (1965) examined three treatments designed to enhance the self-concept and thus to increase the scholastic achievement levels of forty-nine junior high students. The strategy was to enhance the self-evaluations and expectations of the students by:

- (1) enhancing the academic expectation and evaluations parents hold of their children's ability; (2) introducing an "expert" who communicated directly to students enhancing information about their academic ability; and (3) creating a new significant other in the form of a counselor whose high academic expectations and evaluations might be internalized by the students.³⁴

Only the first treatment, which involved modifying parents' perceptions of their children, resulted in changing the self-concept of low achieving students and thereby increasing their academic achievement. The results of this study contradicted literature which stated that the adolescent was influenced more by his peer group than by his parents (Coleman, 1961). Thus, it is important to note that parents play a vital part in forming self-perceptions, which can result in the academic success or failure of their children.

Teachers and Self-Concept. The teacher's attitude also plays a significant role in modifying the student's self-concept and his academic achievement. "In other

³⁴ Brookover et al., Self-Concept of Ability and School Achievement, p. 7.

words, when the teacher believes that his students can achieve, the students appear to be more successful; when the teacher believes that the students cannot achieve, then it influences their (the students) performance negatively."³⁵

Rosenthal and Jacobson (1968) found that teachers' favorable expectations influenced their pupils' achievement gains. In their study, Flanagan's Test of General Ability (1960) was administered to the students. The experimental group consisted of students arbitrarily and randomly selected as academic "spurters." Each teacher was given a list of the students in the class that were designated as having the top 20 percent scores on the IQ test. After one year the experimental group gained over twelve IQ points.

To summarize our (Rosenthal and Jacobson) speculations, we may say that not by what she (teacher) said, by how and when she said it, but her facial expressions, posture, and perhaps by her touch, the teacher may have communicated to the children of the experimental group that she expected improved intellectual performances. Such communications together with possible changes in teaching techniques may have helped the child learn by changing his self-concept, his expectations of his own behavior, and his motivation, as well as his cognitive style and skills.³⁶

Other research evidence supported the relationship between teacher attitude and student academic success.

³⁵Purkey, Self-Concept and School Achievement, p. 47.

³⁶R. Rosenthal and L. Jacobson, Pygmalion in the Classroom: Teacher Expectations and Pupils' Intellectual Development (New York: Rinehart and Winston, Inc., 1968), p. 180.

Davidson and Lang (1960) found a positive correlation between the student's perception of the teacher's feelings toward him and his perceptions about himself. Also, the more positive the children's perceptions, of their teacher's feelings, the better their academic success; and the more desirable classroom behavior, as rated by the teacher.³⁷ Gill (1969) posits that teacher attitudes toward students are equally important in shaping the self-concept of their students.³⁸

Some researchers pointed out the importance of the teacher being considered as significant by the child in order for interaction to take place between the teacher's expectations and the student's performance in school. According to Johnson (1970),

. . . the teacher's expectation toward the child as a learner will not always effect the self-attitudes of the child . . . one must take into account the exact conditions under which relationships will hold. Under some conditions a teacher's expectations of student's ability will have a significant influence upon the student's self-attitudes regarding his ability. But this situation will probably hold only when either the child has a need for social approval from

³⁷H. H. Davidson and G. Lang, "Children's Perceptions of Their Teacher's Feeling Toward Them Related to Self-Perception, School Achievement and Behavior," Journal of Experimental Education 29:107-18.

³⁸M. R. Gill, "Pattern of Achievement as Related to the Perceived Self," paper read at the Annual Meeting of the American Educational Research Association Convention, Los Angeles, February 1969.

adults or when the teacher has a warm, trusting relationship with the child. In addition, there is some evidence that it is only when the teacher really believes that the child is capable of achievement that his expectations affect the child's self-attitudes.³⁹

Moustakas (1966) states that a teacher must earn the right to be considered as a "significant other." He declared that every teacher wants to meet the student on a significant level, every teacher wants to feel that what he does makes a difference. Yet in order to influence students it is necessary to become a significant other in their lives. We are seldom changed by people whom we see as insignificant or unimportant. The way the teacher becomes significant seems to rest on two forces: (1) what he believes, and (2) what he does.⁴⁰

Teacher attitude seems to have the greater influence on younger children and exerts the most influence on children from low socioeconomic status (SES). Rosenthal and Jacobson (1968) found that children in the first and second grades made the most dramatic gains of all the grades through sixth.⁴¹ Kerckhoff (1972) concluded that the teacher's influence upon the children from the lowest

³⁹ David Johnson, The Social Psychology of Education (New York: Holt, Rinehart, and Winston, Inc., 1970), pp. 95-96, 99.

⁴⁰ C. Moustakas, The Authentic Teacher: Sensitivity and Awareness in the Classroom (Cambridge, Massachusetts: Howard A. Doyle Publishing Co., 1966).

⁴¹ Rosenthal and Jacobson, Pygmalion in the Classroom.

SES was potentially greater than the influence of the teacher upon children within the middle class.⁴² The research reviewed reveals that teacher expectations or attitudes affect the self-concept of students which in turn influence academic achievement.

Although the researcher was aware of the body of research that deals with the influence of peers on academic achievement, especially for adolescents (Coleman, 1961), it was not discussed in this study because it was not significant to the purpose of this study.⁴³

Race, Sex, and Achievement as Related to Self-Concept. The interaction effect among race, sex, achievement level with self-concept will be discussed because these three factors were experimental variables considered in this study.

Much controversy has surrounded the self-concept of Black children. Before the results of the Soares and Soares study (1969) was published, it was unanimously concluded that Blacks had a significantly lower self-concept than Whites. This assumption was based on: (1) studies where the Black child showed a preference for light-skinned

⁴²Alan C. Kerckhoff, Socialization and Social Class (New Jersey: Prentice-Hall, Inc., 1972).

⁴³James S. Coleman et al., Equality of Educational Opportunity (Washington, D.C.: U.S. Government Printing Office, U.S. Department of Health, Education, and Welfare, 1966).

dolls (Clark and Clark, 1946);⁴⁴ (2) the fact that the academic achievement of Black children was significantly lower than that of White children (Coleman et al., 1966);⁴⁵ and (3) the fact that Blacks as a whole have been relegated to an inferior position in society (Deutsch, 1960).⁴⁶

The Soares and Soares (1969) study compared the self-perceptions of advantaged and disadvantaged students in grades four through eight. Two-thirds of the disadvantaged youths were Black and Puerto Ricans. The results of this study indicated that the disadvantaged students had higher self-perceptions than the advantaged students. The reason given for the unexpected results was that the disadvantaged students were attending a neighborhood school.⁴⁷ Coleman (1966) reported that the self-concepts of the Black students diminished when they attended an integrated school system. Another reason that could

⁴⁴D. Clark and Mamie Clark, "Racial Identification Preference in Negro Children," in Readings in School Psychology, eds. T. M. Newcomb and E. L. Hartley (New York: Holt, Rinehart, and Winston, 1946).

⁴⁵Coleman et al., Equality of Educational Opportunity, 1966.

⁴⁶Martin Deutsch, Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement, Monograph No. 2, Society for Applied Anthropology, 1960.

⁴⁷A. T. Soares and L. M. Soares, "Self-Perceptions of Culturally Disadvantaged Children," American Educational Research Journal 6 (1964).

account for the results was that advantaged students are more likely to be pressured for better achievement by significant others. Research by Kerensky, 1967;⁴⁸ De Blassie and Healy, 1970;⁴⁹ McCarty and Yancy, 1971;⁵⁰ Baughman, 1971;⁵¹ and others also confirmed that minorities or the disadvantaged do not necessarily have lower self-concepts.

Another interesting result in the Soares and Soares study was that no significant differences existed between the sexes but significant differences did exist for the interaction between the sexes and their socioeconomic level. Advantaged girls had higher self-perceptions than advantaged boys. The converse existed for the disadvantaged students. The disadvantaged boys had higher self-perceptions than their counterparts. The interaction

⁴⁸V. M. Kerensky, "Reported Self-Concepts in Relation to Academic Achievement in an Inner-City Setting," Dissertation Abstracts 27, 2325.

⁴⁹R. R. De Blassie and G. W. Healy, Self-Concept: A Comparison of Spanish-American, Negro, and Anglo Adolescents Across Ethnic, Sex and Socio-Economic Variables, ERIC Document ED 037 287, University Par, New Mexico, New Mexico State University, March 1970.

⁵⁰John McCarthy and William Yancey, "Uncle Tom and Mr. Charlie: Metaphysical Pathos in the Study of Racism and Personal Disorganization," American Journal of Sociology 76 (January 1971):648-72.

⁵¹Earl Baughman, Black Americans: A Psychological Analysis (New York: Academic Press, 1971).

effect between sex and socioeconomic status appeared to result from societal influences.

The conclusion that girls have a greater self-esteem than boys was supported in a study by Bledsoe.⁵² Also, findings from Baum et al. indicated that both high and low achieving girls have a higher self-concept than high and low achieving boys.⁵³

Studies by Farls (1967)⁵⁴ and Davidson and Greenberg (1967)⁵⁵ concluded that there was a positive relationship between self-concept and achievement. Farls' experimental population was middle school students in which the self-concept of high achieving students was found to be significantly higher than the self-concept of low achieving students. Davidson's and Greenberg's sample of lower-class children rated themselves according to personal competence,

⁵²J. Bledsoe, "Self-Concept of Children and Their Intelligence, Achievement, Interests, and Anxiety," Childhood Education 43 (1967):436-38.

⁵³M. Baum et al. "Unified Effort of a Junior High School Faculty (NDEA Pilot Guidance Program) to Encourage Success for Seventh-Graders," Reporting Research, 1968.

⁵⁴R. J. Farls, "High and Low Achievement of Intellectually Average Intermediate Grade Students Related to the Self-Concept and Social Approval," Dissertation Abstracts 28 (1967):1205.

⁵⁵H. H. Davidson and J. W. Greenberg, School Achievers from a Deprived Background, USOE Project No. 2895, Contract No. OE-5-10-132 (New York: The City College of the City University of New York, 1960).

academic competence, and social competence. Farquhar (1968) studied over- and underachievers in the eleventh grade. Students who were academically successful tended to have higher self-concepts.⁵⁶ Research related to sex and achievement was conclusive in its findings, but more research is needed in the area of Blacks and/or lower socioeconomic children because even though their self-concepts are not necessarily low, their academic achievement is much lower than their middle-class counterparts.

The research results related to self-concept reviewed in this study have been conclusive in confirming the relationship between self-concept and academic achievement. The learner with a positive self-concept will usually achieve well in school while the one with a negative self-concept performs poorly on academic tasks. These findings emphasize the need for modifying a negative self-concept in order to improve the academic achievement of the learner. The personality types (need-achievement) discussed in Atkinson's theory of achievement motivation and the attributional theory were products of their self-concepts. Therefore, it is crucial that techniques and strategies for increasing achievement motivation are based on the principle of enhancing self-concept. It appears

⁵⁶W. W. Farquhar, "A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh-Grade High School Students," U.S. Office of Education, Cooperative Research Reports No. 846 (East Lansing: Office of Research and Publications, MSU).

that the two most significant conditions that must exist, in order to influence a change in self-concept, are:

(1) the learner's perception of learning; and (2) the learner's interaction with significant others.

If the child sees the educative process as meaningful and self-enhancing, and if the degree of threat provided by the school experience is not overpowering, then he is likely to grow in self-esteem and in academic achievement. Very few students want to be failures at learning, just as few teachers want to be failures at teaching.⁵⁷

Verbal Reinforcement

Techniques and strategies to improve academic achievement include such things as tangible rewards, social approval, grades, instructional aids, to positive verbal reinforcement. From their research, Zigler and Kanzer (1962) had conjectured the,

. . . existence of a developmental sequence in the relative potency of different reinforcers. With young children, tangible rewards are postulated to be most effective; with older youths, social rewards (expressions of affection or praise by an adult) and self-reinforcement (through internalizing achievement values and acquiring a capacity to adjust one's behavior to factual feedback on performance) become successively, effective methods for motivating academic achievement.⁵⁸

Since the purpose of this study was to test the effectiveness of a specific type of verbal cuing, the

⁵⁷Purkey, Self-Concept and School Achievement, p. 12.

⁵⁸Seymour Spilerman, "Raising Academic Motivation in Lower Class Adolescents: A Convergence of Two Research Traditions," Sociology of Education 46 (1971):103-18.

review of the literature was limited to verbal reinforcement. Two types of verbal reinforcements were measured in a study by Zigler and Kanzer (1962). The verbal reinforcement involved saying "right" when the student made a correct response or saying "good" or "fine" when the student made a correct response. The subjects were both lower- and middle-class second graders. Each subject was engaged in a game of Marble in the Hole. There was a choice of two holes in which to drop a marble. The subjects were reinforced for dropping a marble in a specific hole. Praise proved to be a more effective reinforcer for lower-class children, while correctness feedback was more effective for middle-class students.⁵⁹

A replication of Zigler's and Kanzer's study was done by Rosenhan and Greenwald (1965). Their study included both White and Black lower-class students and only White middle-class students. Their findings did not support the findings of the Zigler and Kanzer study. There was no interaction between praise versus correctness reinforcement and socioeconomic status. However, there was an interaction between sex and SES. Middle-class girls and lower-class boys were more responsive to both kinds of

⁵⁹ Edward Zigler and Paul Kanzer, "The Effectiveness of Two Classes of Verbal Reinforcers on the Performance of Middle- and Lower-class Children," Journal of Personality 30:157-65.

verbal reinforcers than were middle-class boys and lower-class girls.⁶⁰

A study by Van De Riet (1964) compared the effectiveness of praise and reproof on educationally retarded children. One hypothesis of the Van De Riet study was that educationally retarded children have a "need to fail," therefore they view praise as threat. The subjects, fourth, fifth, and sixth grade boys, had to associate a (CVC) trigram with a color. After the criterion level was reached on the first task, the subjects in the praise group were told:

Boy! You really did well. You know, you learned them faster than nearly any of the other kids that took this test. I'll bet you are one of the best students in your class. Now just to be sure, let's try another list like this first one to see if you can do as well on it. Here are the new names for these colors.

The reproof group was told:

. . . you know, you took a lot longer to learn those names than I expected, and I'm kind of disappointed. Do you think . . . maybe if we try another list you could do better on it? I tell you what we'll forget these scores and try a new list.⁶¹

⁶⁰D. L. Rosenhan and Jean A. Greenwald, "The Effects of Age, Sex, and Socioeconomic Class on Responsiveness to Two Classes of Verbal Reinforcement," Journal of Personality 31 (1965):108-21.

⁶¹Hani Van De Riet, "Effects of Praise and Reproof on Paired-Associate Learning in Educationally Retarded Children," in Remedial Teaching: Research and Comment, eds. Wayne Otto and Karl Koenke (Boston: Houghton Mifflin Co., 1969), p. 128.

Reproof resulted in slower learning than did saying nothing (control) or praising the subject.

A study by Cradler and Goodwin (1971) compared the effectiveness of material reward (M & M candy) versus praise (good) versus symbolic reinforcement (tallies on a sheet of paper). The sample included second and sixth grade students from lower- and middle-class environments. The subjects had to form sentences from four personal pronouns and one hundred verbs.

The lower class second graders were significantly more responsive to material than to social and symbolic reinforcement, but the difference between the effects of social and symbolic reinforcement was not significant. Contrary to expectations, the middle-class second grade subjects evidenced no significant differences in responsiveness to any of the three types of reinforcement. At the sixth grade level, lower-class subjects showed no significant differences in their responsiveness to the three types of reinforcement. The middle-class sixth grade subjects showed no significant difference between the effectiveness of praise and symbolic reinforcement; yet, as expected praise and symbolic reinforcement each produced a significantly greater increase in response than did material reinforcement.⁶²

The findings of a study by Anderson (1976) contradicted the study discussed above and others that indicated that material rewards are more effective for lower-class children of all ages than other forms of reinforcement. In Anderson's study, the effectiveness of positive verbal

⁶² John D. Cradler and Dwight L. Goodwin, "Conditioning of Verbal Behavior as a Function of Age, Social Class, and Type of Reinforcement," Journal of Educational Psychology 62 (1971):279-84.

reinforcement, a monetary reward, or a good player reward was measured and positive verbal reinforcement was the most effective technique for increasing intrinsic motivation. The effectiveness of the treatments was measured by how many pictures were drawn by four and five year old preschoolers from a lower socioeconomic environment.⁶³

Research in the area of verbal reinforcement is sparse and the few studies in this area are contradictory. It is difficult to come to any definite conclusions about verbal reinforcement until far more investigation is done. The investigations should involve a variety of verbal reinforcements and a comparison of these verbal reinforcements to each other and with other types of techniques and/or strategies designed to increase achievement.

The purpose of this study was to test the effectiveness of the "Psychological Attender." This achievement motivational strategy, for which there is no data available, is a strategy that was developed by Duffy and Sherman (1972). Duffy and Sherman feel that the role of the teacher is to control and direct the learning situation in order for the learner to learn the desired skill.

To adequately direct the learner to the task to be learned, we must be certain that the learner

⁶³Rosemarie Anderson; Manoogian Anderson; Sam Thomas; and J. Steven Reznick, "The Undermining and Enhancing of Intrinsic Motivation on Preschool Children," Journal of Personality and Social Psychology 34 (1976): 915-22.

possesses an appropriate psychological set for learning the task . . .⁶⁴

Sometimes the learner attends to the task because of interest; however, some tasks that should be learned are not interesting. Therefore, it is crucial for the teacher to command attention whether the task is interesting or not. There are techniques that achieve this condition but the concern today about poor test scores alludes to the fact that these techniques are not adequate. Techniques and strategies have failed to improve academic achievement because many students choose to ignore them.

Usually . . . learners who have experienced a long history of failure and confusion in learning what adults want to teach . . . have found that teachers invariably put them in positions where they can't perform, where they can't find the answer or make the correct response. Therefore, in self defense, they refuse to play the teacher's games, which they always lose. Such a learner views himself as "dumb," because he is made to feel dumb every time he joins a learning activity, and as a defense mechanism, he will not be proven dumb again by a teacher whose instructional skills do not allow him to learn. For such learners, you must pay special attention to the psychological conditions of learning.⁶⁵

⁶⁴Gerald G. Duffy and George B. Sherman, Systematic Reading Instruction (New York: Harper and Row Publishers, 1972), p. 20.

⁶⁵Ibid., p. 21.

. . . the sensitive acknowledgment of the difficulty of the learning task, is an important aspect of efficient instruction; it assists in establishing an appropriate psychological set for the learner. A wise teacher recognizes that learning, whether it be pie baking or a reading skill, is seldom a one-shot deal, that failure will probably occur more often than success, and that recognition of the difficulty of the task to be learned is essential if the learner is not to feel personal failure.⁶⁶

The "Psychological Attender" operates on an important premise. This premise is that the acknowledgement of the difficulty of the task by a "significant other" protects and enhances the self-concept of the learner by removing the psychological threat that learning may have for some children.

Summary

The studies reviewed in this chapter which are most pertinent to the present investigation were concerned with the theory of achievement motivation and manipulating the learner and his environment in order to increase academic performance. Atkinson's theory of achievement motivation hypothesized that achievement-oriented subjects preferred tasks of intermediate difficulty while failure-threatened subjects preferred easy or very difficult tasks. The research studies (Karabenick and Youssef, 1974; Moulton, 1965; de Charms and Carpenter, 1969) that tested Atkinson's hypothesis did prove that achievement-oriented

⁶⁶Ibid., pp. 21-22.

subjects preferred tasks of moderate difficulty. However, results were not conclusive in proving that failure-threatened subjects preferred easy or very hard tasks.

The attributional theory concerned itself with the attribution of success and failure. Bar-tal et al. (1974) stated that individuals high in achievement need attribute success to internal factors and their failures to external factors. The individuals low in achievement need ascribe their failure to internal factors and their success to external factors. Studies by Weiner and Kukla (1970) and Kukla (1972) supported the attributional theory.

Prior to discussing techniques and strategies, the self-concept of the learner was discussed. There proved to be a correlation between self-concept and academic performance (Lamy, 1965; Wattenburg and Clifford, 1964; Campbell, 1967). Manis (1958), Brookover et al. (1965), Rosenthal and Jacobson (1968), and Moustakas (1966) established the importance of the role of the "significant other" in developing and modifying the self-concept of the child. The self-concept of girls and high achievers was higher than the self-concept of boys and low achievers. However, the self-concept of Black and lower socioeconomic children did not prove to be significantly lower than the self-concept of the White and middle-class students. The relationship between self-concept and academic achievement pointed out the importance of

selecting techniques and strategies that would enhance and protect the self-concept of children.

Since this study was designed to test the effectiveness of a verbal reinforcement-type strategy, only literature concerned with this type of strategy was reviewed. Studies compared praise and correctness; praise and reproof; material reward versus praise versus symbolic reinforcement; and monetary reward versus a good player reward versus positive verbal reinforcement. Although research in this area was scarce, some conclusions were reached about verbal reinforcement. In spite of other studies to the contrary, Blacks and lower-socioeconomic children were found to be as responsive to verbal reinforcement as White and middle-class children.

In Chapter II a review of the literature pertinent to the present study was presented. The design of the study will be discussed in Chapter III.

CHAPTER III

THE RESEARCH METHODOLOGY

This chapter will contain a presentation of the following: the design of the study; the population and sample; the data collection procedures; the major research questions and hypotheses; and the treatment of the data. This study was designed to test the effect of cuing to the difficulty of a (paired-associate) learning task on the performance of first graders.

Design of the Study

In order to test the effect of cuing to the difficulty of a paired-associate learning task on the performance of first graders, three treatment groups and a control group were formed. All four groups were presented with the identical program sequence and verbal directions. The only variation between groups was the use of the Psychological Attender. Group 1 (PAH) was told prior to beginning the program sequence and prior to the third and sixth trials that the task was hard. Group 2 (PAE) was told prior to beginning the program sequence and prior to the third and sixth trials that the task was easy. After Group 3 (DPAH) had attempted the learning task (fourth

trial), they were told that it was hard. The control group (NPA) was given no psychological attender.

The two hundred and five first grade subjects were rated as low, average, or high achievers by their classroom teachers. Following this, the subjects were randomly assigned to the four groups.

Each subject's performance on the pre-tests and post-tests was recorded.

Population and Sample

The Community

The community in which this research was conducted is Detroit, Michigan. With a population of approximately 1,350,000¹ this community has all the problems of a large urban setting: (1) a high crime rate, (2) high rate of unemployment, (3) white flight to the suburbs, (4) cut-back of city employees such as police and firemen, (5) a deficit city budget; and (6) slums. According to 1975 population estimates, this community is about 55 percent black. In 1973, this city elected its first black mayor, who was re-elected to office in 1977.

The median income in this urban center is \$10,044 per year. Thirty-seven percent of the population of this city is employed by manufacturers, such as the automobile

¹"Population Estimates for Detroit," City of Detroit, Planning Department, Data Coordination Division, Report #406, September 15, 1976.

industry. White collar workers (professional, managerial, sales, and clerical) make up about 48 percent of the total population. Those involved in wholesale and retail trading compose 20 percent, government 12 percent, construction 4 percent, services (including educational) 13 percent, and craftsmen about 12 percent.² In spite of much adverse publicity this community, through various projects, is striving to revitalize itself.

The School District

The public school system is made up of eight rather autonomous units called regions. In November 1976, a millage proposal was defeated for the second time that year. This resulted in the reduction of schools' services and the formation of a committee to investigate the possibility of revising the perhaps costly decentralized system.

The Research Sample

The research sample was drawn from the population of first grade students in one region of the school system described above. The two elementary schools used in this study, designated as schools A and B, are located in the same general area (approximately five miles apart). Both schools have a predominantly black population with

²County and City Data Book 1972: A Statistical Abstract Supplement, U.S. Department of Commerce, Bureau of the Census, Robert L. Hagan, Acting Director, 1973.

school A being made up of 98 percent minority students and school B having a minority student population of 78 percent. Both schools receive Title I and Chapter 3, federal and state funds.

School A, pre-school through fifth grade, has an enrollment of around 890. The community surrounding the school has a somewhat stable residency with a high percent of the population consisting of second, third, and fourth generation residents.

School B, kindergarten through fifth grade, has a student enrollment of approximately 800. Unlike the national trend, the enrollment of this school is increasing rapidly. Presently, the neighborhood surrounding the school is highly transient. About four years ago, this school was predominantly white.

Subjects

The subjects were 205 first grade children; 119 from school A and 86 from school B. These subjects were randomly assigned to one of three treatment groups and a control group. Those children retained in the first grade for a second or third time were disqualified. In addition, those children who were absent, or transferred to another school during the time that the experimenter pre-tested the subjects, were eliminated from the study.

Subjects in the study ranged in age from 6 years 0 months to 6 years 11 months, with the average age being

6.4. The racial composition was 115 blacks and 4 whites at school A and 74 blacks and 12 whites at school B. The 92 percent of black subjects and 8 percent white subjects in this study reflects fairly accurately the racial composition of this city's public school enrollment, which is 81 percent black and 19 percent white.

Data Collection Procedures

The three instruments utilized in this study were a checklist and two tests (used both as pre- and post-tests).

Checklist

A twenty-one item checklist was used by the classroom teachers to evaluate the subject's academic achievement. The twenty-one items dealt with such concepts as auditory and visual discrimination, fine motor skills, ability to comprehend and verbalize, and number concepts (Appendix A). This checklist was designed from areas included on the Metropolitan Readiness Tests; The Harrison-Stroud Reading Readiness Profiles; and the Detroit Reading Test.

Test Forms

The two tests used both as pre- and posttests were constructed to measure the subject's ability to Match to Form and Match from Memory (Appendix D). These tests were developed and used in a study by Allington designed to test

the effectiveness of color cues in assisting children in discriminating between similar-looking figures. The tests were constructed according to Smith's suggestion that:

Foils are selected so that recognition of the unit must be based upon unique characteristics. Thus, other members of the unit's class are used. They have some characteristics in common (class features), thus maximally confusable and they differ from the unit in other characteristics (unique features).³

Each form contained the correct figure, its transformation, an incomplete and/or a figure with an added feature and/or a transformation of the figure other than one used in the program sequence. Position of the correct answer was randomly determined.⁴ The ability to discriminate a particular figure from a similar-looking figure and the ability to memorize the distinguishing feature of a figure in order to identify it again were skills that a subject needed to possess not only to complete the Match to Form and the Match from Memory tests but to complete the program sequence (paired-associate learning task) as well.

The teachers at schools A and B were asked to use the checklist and evaluate their students (with the exception of those repeating the grade), high, average, or low for each of the twenty-one items.

³Donald Smith, A Technology for Reading and Writing, Vol. I, Learning to Read and Write, Task Analysis (New York: Academic Press, 1976).

⁴Allington, "Use of Color Cues in Discrimination and Paired Associate Learning."

Some researchers question the validity of teachers academically evaluating their students. However, some research indicates that teachers' evaluations are as accurate as formal tests. Wang devised a study to measure the accuracy of teacher predictions in order to eliminate the comprehensive testing that is considered essential to an individualized program. The results of this study reflected:

. . . a wide range of variability in the accuracy of the teachers' informal observation for evaluating and diagnosing student learning needs. The variability occurred both within and between teachers. The variability we found in teacher's prediction accuracy lends its support to our assumption about the critical role that formal diagnostic testing plays in the individual instructional model. However, the fact that the teachers were able to predict with some accuracy (68 percent for teacher A, and 76 percent for teacher B, as opposed to an expected chance accuracy of 50 percent), suggests that some formal testing may be replaced by teacher observation.⁵

At school A, the teachers took on the average of fifty minutes to complete checklists for approximately thirty-two students. While each teacher left the room to complete the checklist, the researcher supervised the classroom. At school B, where the experimenter was employed, teachers were given the checklist to complete at their leisure.

⁵ Margaret C. Wang, "The Accuracy of Teacher's Predictions on Children's Learning Performance," The Journal of Educational Research 66 (July-August 1973): 462-65.

In order to divide the subjects into high or low achieving groups, an achievement score was computed for each student. A score of three, two, or one was given to a high, average, or low rating, respectively. The number of checks were then multiplied by their appropriate rating and added together to get an "achievement score" for each subject. For example, if a subject was rated high in ten areas, average in five areas, and low in six areas: ten, five, and six would be multiplied by three, two, and one, respectively. The resulting scores (30, 10, and 6) would be added together to get an achievement score of 46. All achievement scores were ranked from the lowest possible score of 21, to the highest possible score of 63. The median score of 40 was the point at which the subjects were separated into high and low achieving groups. The thirteen median scores were randomly assigned to the two groups. The subjects were assigned to the two achievement groups; and then assigned to one of the four groups: the Psychological Attender Hard treatment (PAH), the Psychological Attender Easy treatment (PAE), the Delayed Psychological Attender Hard treatment (DPAH), or the Control group (NPA) was given no psychological attender.

Administering the Pretests

Two pre-tests measuring the subjects' ability to Match to Form and Match from Memory were administered by the researcher to each student individually. On the Match

to Form test, the subject was asked to circle from among four similar-looking figures, a figure that looked exactly like the first one. There were eight figures to match. For the Match from Memory test, a tachistoscopic device was used to show the subject eight different figures at approximately five second intervals. After the subject viewed a figure for approximately one second, he/she was asked to select that figure from among four similar-looking figures, by circling it. Each subject took about seven minutes to complete both pre-tests. The pre-test scores were used as covariates in an attempt to eliminate the possibility of differences between the treatment groups prior to their exposure to the program sequence. If significant differences occurred, it was concluded that the differences were due to the treatment and not to the composition of the treatment groups and the control group.

Visual Stimulus Figures

Four pairs of visual stimulus figures used in this study were selected from a group of figures developed for a study done by Gibson et al. These figures were constructed using the same structure as actual letters, such as curves and lines, thus eliciting the same response as English orthography, at the same time eliminating the influence of past experience with the figure. The letters of the alphabet could not be used in this study because it would be impossible to control each subject's exposure to or

knowledge of the alphabet. However, by using figures that are similar to the letters of the alphabet, the results of the study could be generalized to a situation in which the subject would encounter English orthography. Letter-like figures such as τ and κ are similar to the letters t and k. Gibson discusses the guidelines used in constructing the letter-like figures.

Construction of Standard Forms. An analysis was made of actual letters (printed capitals, uppercase, of the simple type customarily used in primary texts) in terms of number of strokes, straight vs. curved lines, angles, open vs. closed forms, symmetry, etc. This procedure provided a set of "rules" which describe generally the construction of letters. New forms were generated which follow the same constraints.⁶

The four figures selected for this study were paired with either a left-to-right or an up-to-down transformation (see Figure 3.1).

Gibson used letter-like forms and their transformations to investigate the development of the ability of four through eight year olds to visually differentiate discriminating features. This experiment was then replicated by using the same transformations of real letters, but with five year olds. "The correlation between confusions of the same transformations for real letters and for the letter-like forms was very high ($r = +.87$), . . ."⁷

⁶Gibson et al., "A Development Study of the Discrimination of Letter-Like Forms," Journal of Comparative and Physiological Psychology 4 (1962):897-906.

⁷E. J. Gibson, "Learning to Read," Science 148 (1965):1066-72.

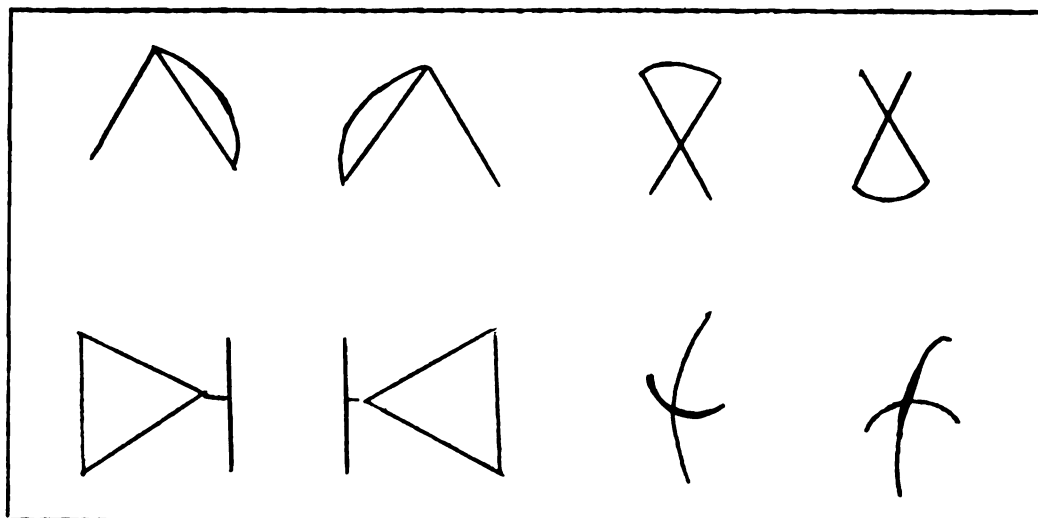


Figure 3.1. The Four Letter-Like Figures and Their Transformations.

A transparency was made of the figures printed in Allington's study. The figures were enlarged on an opaque projector to $1\frac{1}{2} \times 2\frac{1}{2}$, traced and then Xeroxed figures were made of the traced figures. The Xeroxed figures were traced with a black felt pen, highlighted with an orange water base magic marker, cut to $3" \times 3"$, and then glued to the audio-flashcards.

A consonant-vowel-consonant (CVC) oral trigram was paired for presentation with each stimulus figure (see Figure 3.2). Eight trigrams with an association value of 20 percent or less were selected from a group of trigrams developed by Archer. Trigrams with a low association value were selected to eliminate the possibility of subjects remembering a trigram only because it could be

connected to some common occurring experience. Each selected trigram was randomly assigned to a figure.

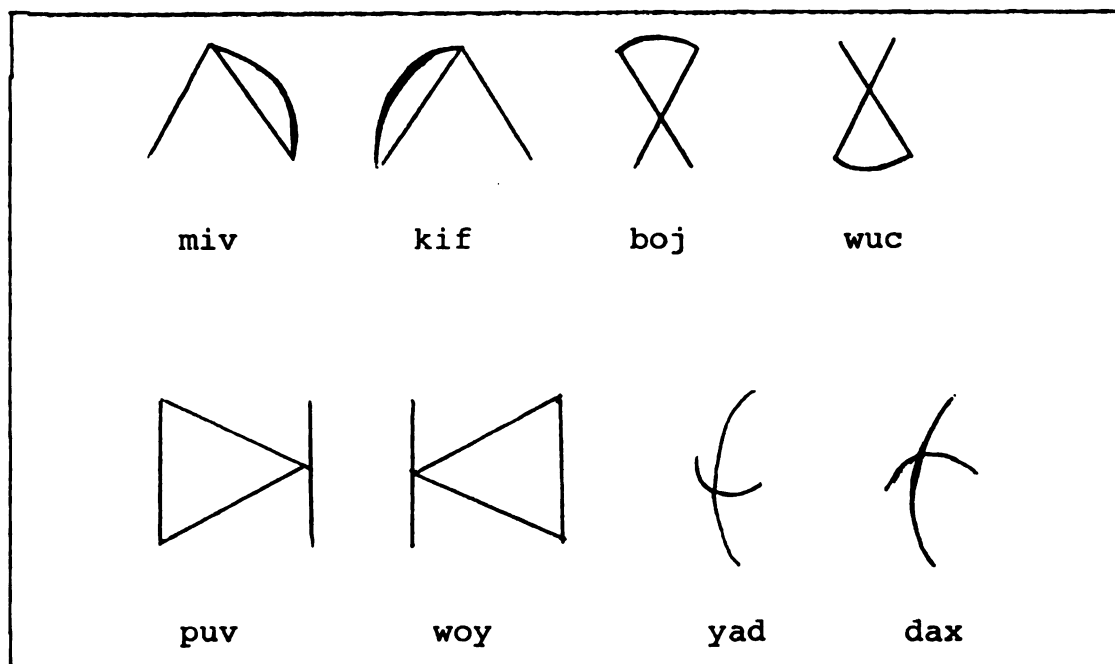


Figure 3.2. The Letter-Like Visual Stimulus Figures and Their Paired CVC Trigram.

Highlighting

Vanished highlighting was employed in this study to assist the subjects in focusing on the distinguishing features for identification purposes. This technique proved to be the most successful in facilitating learning. Results from a study by Allington demonstrates that:

. . . a single hue color which is vanished seems to facilitate attention to the distinctive features of letter-like figures without producing interference on a transfer task. These color cues were useful

⁸E. J. Archer, "A Re-evaluation of the Meaningfulness of All Possible CVC Trigrams," Psychological Monographs 74 (1960).

because they directed the learner's attention to salient information. A single hue eliminates the tendency to respond on the basis of the color cue alone. By employing a bright transparent color, attention can be focused on the distinctive feature of the letter-like figure while allowing the printed form of that figure to remain visible.

Gradually vanishing the color cue in subsequent presentations increase the effectiveness of the cue by forcing the subject to attend more to the distinctive feature of the stimulus and less to the color cue. The vanished color cues have the ability, when combined with verbal directions, to increase stimulus differentiation by directing attention to the salient features of the stimulus rather than to the color itself.⁹

An example of the highlighting technique employed in this study is shown in Figure 3.3. The distinctive features of the figures were highlighted and diminished gradually over eight trials. Highlighting was not used in the introductory trial. The introductory trial was not a part of the actual program sequence but it was necessary in order to correct any mispronunciations of the eight trigrams.

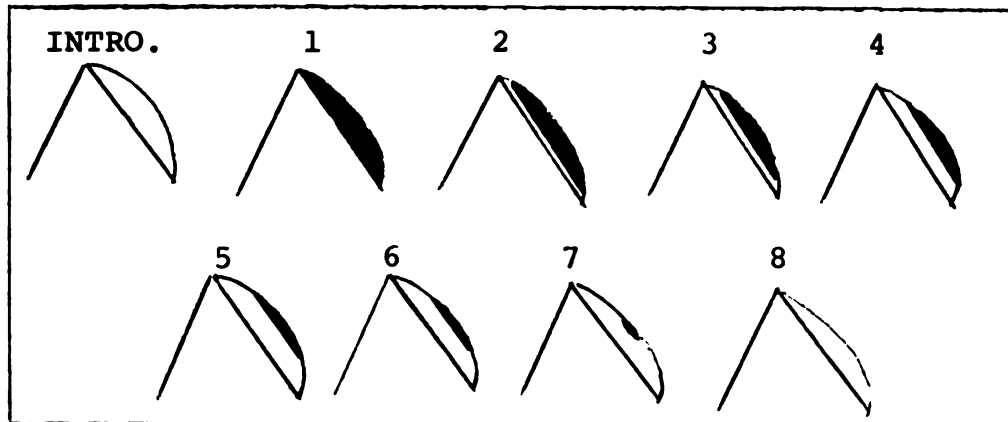


Figure 3.3. The Vanished Highlighting Technique Used in This Study.

⁹Allington, "Use of Color Cues in Discrimination and Paired Associate Learning," p. 86.

In order for each subject to receive the same presentation, an Audio-Flashcard Reader was used to present the program sequence.¹⁰ The audio-flashcards were 11 x 5 1/2 with a strip of recording tape affixed to the back of the card. These particular audio-flashcards had more than one recording track.¹¹ The flashcards were to be inserted in the top of the machine by the subject and then a button was to be pushed to receive verbal directions. Seventy-two flashcards were used to present the program sequence.

The Program Sequence

The program sequence for this study was also developed by Allington whose study was discussed earlier. The program consisted of an introductory trial and then eight trials of the actual program (Appendix C). The subjects had difficulty pronouncing the trigrams (one syllable nonsense words that have a consonant-vowel-consonant pattern) correctly. Four factors that could possibly have caused this were: (1) the audio capabilities of the machine; (2) the lack of visual clues that children received from the position of the speaker's mouth; (3) the speech patterns characteristic of children of that age;

¹⁰This machine, model 101 was manufactured by Electronics Futures Incorporated (Appendix C).

¹¹The audio-flashcards developed for the audio-flashcards reader were manufactured by Educational Development Corporation.

and (4) the meaninglessness of the trigrams which resulted in many children attempting to pronounce them as meaningful words. Two other possible factors, the dialect of the subjects and the dialect of the person that recorded the program sequence, were ruled out as reasons for the subjects having difficulty pronouncing the trigrams. After the researcher analyzed the errors of the subjects, it was concluded that the errors were not a result of the subjects' black dialect. For example, the most frequent error was "kif" which was pronounced as "kis." Speakers of black dialect do not have difficulty with the sound of the letter /f/. The experimenter concluded that the reason that "kif" was pronounced as "kis" so frequently was because the children associate the unknown with the known word "kiss." The program sequence was recorded by the researcher who was born and raised in the urban setting where the study took place. The researcher also had taught at both of the schools involved in the study. Although the researcher's speech patterns approximate standard English, her speech patterns were not foreign to the subjects.

The incorrect enunciation on the part of the subjects made it necessary to have an introductory trial at which time mispronunciation could be corrected by the experimenter. During the introductory trial, the subject was presented an unhighlighted stimulus figure, its

trigram, and then asked to repeat the name of the figure (trigram). For example,

"This is a miv. Say miv."

"This is a kif. Say kif."

"This is a . . .

Following the introductory trial, pairs of figures were randomly presented to each subject eight times. The first trial after the introductory trial was a Teaching Trial. Throughout this trial the subject was presented the figures, their trigram, and directed to focus on a feature of each figure that would be helpful in distinguishing it from its paired figure. For example,

"This is a yad. Look at the top of the yad.

Say yad."

"This is a dax. Look at the bottom of the dax.

Say dax."

The second trial following the introductory trial was a Test Trial. In the test trial the subject was asked to name the figures and then to push button three on the machine (Audio-Flashcard Reader) to see if the figure had been correctly identified. If the subject did not know the answer, he/she was directed to push button three to find out the name of the figure. Subsequent trials alternated between teaching and testing trials. The final trial was the Post-Achievement Measure for naming the stimulus figures.

Experimental Procedures

In school A the experimenter took over the classes involved in the study for about fifty minutes while the

teacher filled out the checklists. The experimenter played games, read stories, taught action poems, and/or helped children complete assignments that the teacher had left. The experimenter used this time with each class to establish rapport with the subjects in hopes that the subjects would respond: (1) to the experimenter as a non-stranger; and (2) to the experimental situation in much the same way that they would respond to any learning situation in the classroom. The next day the experimenter began testing. Directions were given to the child on how to complete the pretest (Appendix D).

After all of the children were pre-tested, the program sequence component of the experiment began. The subject was placed in front of the flashcard reader; the experimenter sat to the subject's right; and the audio-flashcards were placed to the left of the machine. Each subject received the same verbal directions on how to use the audio-flashcard reader (Appendix F). After the initial directions, treatment began. Each subject had been assigned to one of three treatment groups or a control group. The treatment involved the use of the Psychological Attender. Treatment group one (T_1) was the "Psychological Attender Hard" group. The subjects in the Psychological Attender Hard (PAH) group were given the following statement after the initial directions and prior to the third and sixth trials:

This is really hard, so don't feel bad if you can't remember all the names of the figures.

The Psychological Attender Easy group (PAE) was told, after the initial directions and prior to the third and sixth trials:

This is really easy, so you should remember all the names of the figures.

The Delayed Psychological Attender Hard (DPAH) group was told after the fourth trial:

This is really hard so don't feel bad if you can't remember all the names of the figures.

The control group (NPA) was given no Psychological Attender.

After the treatment, each subject went through the program sequence which took on the average twenty minutes. During the eighth (final) trial, the experimenter recorded each time the subject correctly identified a stimulus figure. Following the completion of the program sequence, the same two tests administered as pre-tests were also administered as post tests.

Major Research Questions and Hypotheses

Four major research questions evolved from the purpose of this study. These questions led to the formulation of the following research hypotheses and their accompanying null hypotheses:

- I. Will one treatment group achieve significantly higher than the other treatment groups?

H_R : There is a significant difference between the four treatment groups as measured by the three dependent variables.

H_O : There will be no difference between the four treatment groups as measured by the three dependent variables.

II. Will low and high achievers perform the same across all treatment groups?

H_R : There is an interaction effect between achievement levels and treatment as measured by the three dependent variables.

H_O : There will be no interaction effect between achievement levels and treatment as measured by the three dependent variables.

III. Will girls and boys perform the same across all treatment groups?

H_R : There is an interaction effect between sex and treatment as measured by the three dependent variables.

H_O : There will be no interaction effect between sex and treatment as measured by the three dependent measures.

IV. Will high achievers perform better than the low achievers on the three dependent variables?

H_R : There is a significant difference between the two achievement levels as measured by the three dependent variables.

H_O : There will be no difference between the two achievement levels as measured by the three dependent variables.

Treatment of the Data

The multivariate analysis of variance (MANOVA) was used in order to treat the multiple independent variables simultaneously while considering the correlations among them.

The 2 x 2 x 4 factorial design, shown in Table 3.1, included the three independent variables: (1) the Psychological Attender treatments (PAH, PAE, DPAH, and NPA), (2) the achievement levels (low and high), and (3) the sexes. Table 3.1 shows sixteen cells and the number of subjects in each cell. The number of subjects in the eight cells (the two achievement levels x the four treatment groups) is reported in Table 3.2. Table 3.3 shows the number of subjects in the eight cells (girls and boys x the four treatment groups).

For the treatment main effect and the achievement main effect and for the interaction effect between achievement and treatment and the interaction effect between sex and treatment, the multivariate analysis of variance provided an over-all test based on all three dependent variables. If MANOVA found a source of variation to be significant, then a univariate F test was applied to the data to identify which dependent variable(s) measured the effect of the treatment.

For the treatment main effect, three multivariate contrasts were constructed to identify which treatment was statistically significant. In order to identify which dependent variable produced the significance, a series of univariate F-tests was employed.

Table 3.1.--The 2 x 2 x 4 Experimental Design.

		T ¹ (PAH)	T ² (PAE)	T ³ (DPAH)	C (NPA)	Total
Boys	Low	17	18	9	16	60
	High	13	10	11	11	45
Girls	Low	11	11	6	13	41
	High	18	11	15	15	59
Total		59	50	41	55	205

Table 3.2.--Number of Subjects per Cell for the Achievement X Treatment Interaction Effect.

	T ¹	T ²	T ³	T ⁴	Total
Low Achievers	28	29	15	29	101
High Achievers	31	21	26	26	104
Total	59	50	41	55	205

Table 3.3.--Number of Subjects per Cell for the Sex X Treatment Interaction Effect.

	T ¹	T ²	T ³	T ⁴	Total
Boys	30	28	20	27	105
Girls	29	22	21	28	100
Total	59	50	41	55	205

Summary

The design of this study, the population and sample, the procedures for collecting data, the major questions and hypotheses of the study, and the treatment of the data have been discussed in Chapter III. The results of the study will be presented in Chapter IV.

CHAPTER IV

RESEARCH FINDINGS

Introduction

This research study was designed to test whether cuing first graders about task difficulty would affect their performance on a task. Achievement was measured by the subject's performance on a paired-associate learning task. The four cuing treatments applied to the learning task were: (1) to inform the subjects prior to instruction and prior to the third and the sixth trials that the task was hard (PAH); (2) to inform the subjects prior to instruction and prior to the third and the sixth trials that the task was easy (PAE); (3) to inform the subjects that the task was hard only after they had attempted it (DPAH); and (4) the control group (NPA)--to give the subjects no information about the difficulty of the task at all.

The 205 subjects were all the first graders from two elementary schools in Michigan, excluding those students who were repeating the first grade and those students who moved or were absent during the course of the research. After the subjects were rated as low or high

achievers by their classroom teachers, they were randomly assigned to one of the four treatment groups.

Prior to receiving the program sequence, two pre-tests, Match to Form (pre-test 1) and Match from Memory (pre-test 2) were administered to the subjects. In the initial planning, these pre-tests were to be used as covariates in order to detect any small differences that might exist between the levels of the independent variables. This procedure was designed to control for the initial differences (resulting from extraneous variables) that might have existed between the groups and would have increased the precision of MANOVA. However, because of the low correlation between each pre-test and its corresponding post-test, the pre-tests were not used as covariates. When the correlation between the dependent variables and the covariates are low, the covariate would not improve the precision of MANOVA. See Table 4.1 for the correlations. Analysis of covariance was not really necessary since the subjects were randomly assigned to the various treatment groups. Randomization was recommended as one of the best ways to equate groups.

The correlation coefficient between Pre-test 1 and Post-test 1, Match to Form, was .23. Pre-test 2 and Post-test 2, Match from Memory, had a correlation coefficient of .17. The two correlation coefficients indicated a very slight positive relationship between the scores received on the pre-tests and the scores received on the post-tests.

Table 4.1.--Pearson Correlation Coefficient Matrix Among Five Tests.

	Pre 1	Pre 2	Post 1	Post 2	Naming
Pre 1	1.00				
Pre 2	.23	1.00			
Post 1	.19	.07	1.00		
Post 2	.28	.17	.24	1.00	
Naming	.09	.11	.07	.14	1.00

Treatment began after the verbal directions were given. The dependent variables were the Match to Form post-test, the Match from Memory post-test, and the Naming task. These tests were administered after the program sequence. Each measure had a maximum score of eight, with each correct response receiving a score of one.

Major Research Questions and Hypotheses

The four major research questions and their accompanying null hypotheses that evolved from this study were:

- I. Will one treatment group achieve significantly higher than the other treatment groups?
 H_0 : There is no difference between the four treatment groups as measured by the three dependent variables.
- II. Will low and high achievers perform the same across all treatment groups?
 H_0 : There is no interaction effect between achievement levels and treatment groups as measured by the three dependent variables.

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III. Will girls and boys perform the same across all treatment groups?

H_0 : There is no interaction effect between sex and treatment as measured by the three dependent variables.

IV. Will high achievers perform better than the low achievers on the three dependent variables?

H_0 : There is no difference between the two achievement levels as measured by the three dependent variables.

Overview

The data were analyzed by using the multivariate analysis of variance (MANOVA) model. The MANOVA model was used since this study was concerned with testing differences between three independent variables (treatment, sex, and achievement) on three dependent variables (Match to Form, Match from Memory, and the Naming task) which have some degree of intercorrelation.¹ Table 4.2 contains the correlations among the three dependent variables.

Table 4.2.--Correlation Matrix for the Three Dependent Variables: Match to Form, Match from Memory, and the Naming Task.

	Match to Form	Match from Memory	the Naming Task
Match to Form	1.00		
Match from Memory	.24	1.00	
the Naming task	.07	.14	1.00

¹Jeremy D. Finn, A General Model for Multivariate Analysis (New York: Holt, Rinehart, and Winston, Inc., 1974).

The correlation between Match to Form and Match from Memory was .24, Match to Form and the Naming task was .07, and Match from Memory and the Naming task was .14. Although these correlations are low, they are at least positive, which indicates some slight relationship among the dependent variables. Thus, using MANOVA to analyze the three dependent variables simultaneously was appropriate.

The results of MANOVA identified a significant main effect for the treatment and the achievement variables but not for the interaction effect between achievement and treatment and between sex and treatment. However, this analysis did not identify the particular dependent variable(s) (Match to Form, Match from Memory, and the Naming task) on which the significance had occurred, for the treatment main effect and the achievement main effect. To determine on which of the three dependent variables the significance occurred, a series of univariate F tests were applied to each dependent variable.

After the variables on which treatment main effect had occurred were identified, it was necessary to then identify which treatment group was statistically different from the others. In order to do this three multivariate contrasts were constructed and were tested by the multivariate F tests. A series of univariate F tests were then employed to find which dependent variable(s) produced the significance. The Match to Form, Match from Memory,

and Naming were the three variables that were measured to determine the effects of the experimental treatment.

The results of the multivariate analysis of variance, the multivariate F test and the univariate F test will be reported in the following sections.

This research design had three independent variables: treatment, sex, and achievement. The achievement variable had two levels: high and low. The sex variable also had two levels: girls and boys. The cuing variable had four levels: (1) Psychological Attender Hard (PAH), (2) Psychological Attender Easy (PAE), (3) Delayed Psychological Attender Hard (DPAH), and no Psychological Attender (NPA). The three dependent variables were:

(1) Match to Form, (2) Match from Memory, (3) the Naming task. In Table 4.3 the means and standard deviations are reported for the three independent variables and the three dependent variables. The data in this table does not indicate whether one mean score differed significantly from another mean score. Whether or not significant differences really existed between the various treatment groups, the sexes, and the achievement levels, as measured by the three dependent variables, will be discussed later. Therefore, the following discussion and summarization of the data recorded in Table 4.3 will not be conclusive.

For purposes of simplicity and clarity, the discussion of the data in Table 4.3 is focused on the comparison of the mean scores for the three dependent

Table 4.3.--Observed Cell Means and Standard Deviations of the Three Independent Variables and the Three Dependent Variables.

		Treatment				
		PAH	PAE	DPAH	NPA	
Low Achievers	Boys	Match to Form	$\bar{X}$ 6.00 sd 1.41	6.07 1.43	5.33 2.00	5.69 1.08
		Match from Memory	$\bar{X}$ 5.12 sd 1.10	4.11 1.75	4.11 1.54	4.68 1.54
		the Naming task	$\bar{X}$.65 sd 1.27	.50 .62	1.11 1.05	.75 .78
	Girls	Match to Form	$\bar{X}$ 6.89 sd 1.40	5.64 1.21	5.00 1.27	5.69 1.55
		Match from Memory	$\bar{X}$ 4.91 sd 1.22	4.27 2.00	4.00 1.41	4.23 1.64
		the Naming task	$\bar{X}$.09 sd .30	.27 .65	.67 1.03	.46 .88
High Achievers	Boys	Match to Form	$\bar{X}$ 6.76 sd 1.17	6.40 .97	7.00 1.34	6.36 1.21
		Match from Memory	$\bar{X}$ 4.77 sd 1.24	4.20 1.87	5.27 1.49	5.00 1.48
		the Naming task	$\bar{X}$.62 sd 1.19	.80 .92	.90 1.00	.27 .47
	Girls	Match to Form	$\bar{X}$ 6.83 sd 1.04	6.91 1.30	6.27 1.28	6.67 1.11
		Match from Memory	$\bar{X}$ 5.56 sd 1.38	5.64 1.75	5.20 1.78	5.27 1.39
		the Naming task	$\bar{X}$.72 sd .90	.82 .92	1.47 1.25	.87 1.06

variables of (1) the treatment groups in relationship to the sexes within the two achievement levels, (2) the sexes in relationship to their designated achievement level, and (3) the two achievement levels. In reference to treatment, the mean score of the low achieving boys in the PAE group was greater than the mean scores of the other treatment groups on the Match to Form. On the Match from Memory, the mean score of the low achieving boys in the PAH group was highest. However, on the Naming task, the mean score of the low achieving boys in the DPAH group was greater than the mean scores of the low achieving boys in the other treatment groups.

The low achieving boys were not consistent in their response to the Psychological Attender. As measured by the Match from Memory test, it appeared that being told that the task was easy before attempting it was more motivating. However, the performance on the Match to Form test seemed to indicate that being told that the task was hard prior to attempting it, boosted the achievement of the low achieving boys.

For the high achieving boys, the mean score of the DPAH group on all the dependent variables (Match to Form, Match from Memory, and the Naming task) was greater than the high achieving boys in the other treatment groups.

For the high achieving boys, all three dependent variables seemed to indicate that being told that a task was hard after it was attempted increased achievement.

The low achieving girls in the PAH group had the greater mean score on the Match to Form and on the Match from Memory tasks. However, on the Naming task the mean score of the low achieving girls in the DPAH group was the highest.

The high achieving girls in the PAE group had the greatest mean score on the Match to Form and Match from Memory tasks. However, on the Naming task, the mean score was the highest for the DPAH group.

It seemed that being told that a task was hard prior to attempting it proved to be motivating for the low achieving girls as measured by both the Match to Form and Match from Memory tests. However, as measured by both the Match to Form and Match from Memory, the high achieving girls might have been more motivated by being told that the task was easy before they attempted it.

Although only tentative conclusions were drawn, one significant factor might be that both low and high achieving girls and boys in the Delayed Psychological Attender group scored highest on the Naming task only. Telling a student that the task was difficult after he had attempted it, appeared to be most successful regardless of sex or achievement.

Observation of the mean scores in terms of sex and achievement levels revealed that low achieving boys had higher mean scores than low achieving girls on the Naming task. However, the opposite existed for the high achievers.

The mean score of the high achieving girls was greater than the mean score of the high achieving boys on the Naming task.

On the Match to Form test, both the low and high achieving girls had higher mean scores than their counterparts. On the Match from Memory test, the low achieving boys scored higher than the low achieving girls while the high achieving girls performed better than the high achieving boys.

It was interesting to note that girls were not superior performers on all of the dependent variables. It seemed that there were some academic tasks on which primary grade boys performed better than girls. One factor which was puzzling and difficult to account for was that for the most part low achieving boys performed better than the low achieving girls while the high achieving girls performed better than the high achieving boys.

In terms of the achievement levels, with one exception, the mean scores of the high achievers were higher than the mean scores of the low achievers. The exception was the NPA group as measured by the Naming task. It seemed that the academic achievement of the subjects as a whole was accurately assessed for their designation and assignments as either a low achiever or a high achiever.

In order to determine whether the differences between the mean scores of the four treatment groups, the sexes and the two achievement levels discussed above, were

statistically significant, a 2 x 2 x 4 multivariate analysis of variance was applied.

Results of Hypotheses Testing

The following discussions will be in response to each of the four research questions and the hypothesis generated by each of them. These discussions will be prefaced by tables reflecting related statistical analyses.

The four hypotheses were tested simultaneously by (MANOVA) in response to their corresponding research questions. The four multivariate testings were performed for the treatment main effect, the interaction between achievement and treatment, the interaction between sex and treatment, and the achievement main effect. The results of the multivariate analysis of variance as applied to the three dependent variables Match to Form, Match from Memory, and the Naming task are reported in Table 4.4.

Table 4.4 contains data for which research questions and hypotheses were not formulated. The by product data for the sex and achievement and treatment will be discussed briefly. The sex main effect and the three-way interaction effect among sex, achievement, and treatment will be discussed at this point; while the

Table 4.4.--Result of Multivariate Analysis of Variance.

Source of Variance	df1/df2	Multivariate F-ratio	p	Decision
Sex	3/187	.77	.51	N.S.
Achievement	3/187	7.97	.0001*	S.
Treatment	9/455	2.06	.03*	S.
Sex x Achievement	3/187	2.75	.04*	S.
Sex x Treatment	9/455	.71	.70	N.S.
Achievement x Treatment	9/455	.77	.64	N.S.
Sex x Achievement x Treatment	9/455	.57	.82	N.S.

*This test is significant at the .05 level.

df¹ = degrees of freedom for the between terms.

df² = degrees of freedom for the error terms.

interaction effect between sex and achievement will be discussed when most appropriate within the section concerned with the achievement main effect.

For the sex main effect, a multivariate F-ratio of .77, with 3 and 187 degrees, had an obtained probability of .51, more than the specified p value of .05. Therefore, significant differences did not exist between the performance of the sexes. The mean scores of the girls and boys were not significantly different from each other as measured by the three dependent variables.

For the interaction effect between sex, achievement, and treatment, a multivariate F-ratio of .57, with 9 and 455 degrees had an obtained probability of .82 more than the specified p value of .05. Therefore, an interaction effect did not exist between sex, achievement, and treatment. The performance of all sixteen groups (2 x 2 x 4) were equal when compared to each other. Thus the mean scores of the girls and boys, the low and high achievers, and the PAH, PAE, DPAH, and the NPA groups, when compared to each other were not significantly different from each other.

Research Question I

One major concern of this study as expressed by the first research question and its corresponding null hypothesis was the effectiveness of a particular cuing strategy. Three treatment groups and a control group were

formed to compare the Psychological Attender Hard, the Psychological Attender Easy, the Delayed Psychological Attender Hard, and no Psychological Attender.

Will one treatment group achieve significantly higher than the other treatment groups?

Null Hypothesis I

There is no difference between the four treatment groups as measured by the three dependent variables.

The statistical analysis used for the examination of the research question stated above is presented in Table 4.4. For the treatment main effect, an F-ratio of 2.05, with 9 and 455 degrees had a probability of .03, less than the specified p value of .05. This suggested that significant differences existed between the groups as a result of the treatment, and implied that one of the treatment groups did perform differently from the other treatment groups.

To determine which treatment group was statistically different from all other groups, three multivariate contrasts were constructed and were tested by the multivariate F-test. The three contrasts are stated in the null hypothesis form as:

1. There is no difference between the population mean of group one (Psychological Attender Hard) and the control or group four (no Psychological Attender) on v_1 (Match to Form), v_2 (Match from Memory), and v_3 (the Naming task). ($H_0: \mu_1 - \mu_4 = 0$)

2. There is no difference between the population mean of group one (Psychological Attender Hard) and group two (Psychological Attender Easy) on v_1 , v_2 , and v_3 . ($H_0: \mu_1 - \mu_2 = 0$)
3. There is no difference between the population mean of group three (Delayed Psychological Attender Hard) and the average of the population mean of group one, two, and three on v_1 , v_2 , and v_3 . ($H_0: \mu_3 - \frac{\mu_1 + \mu_2 + \mu_4}{3} = 0$)

The results of the hypothesis testing is shown in Table 4.5.

Table 4.5.--Results of MANOVA for the Three Multivariate Contrasts on the Three Dependent Variables.

Source of Variance	df	Multivariate F-ratio	p	Decision
$\mu_1 - \mu_4$	3/195	.49	.69	N.S.
$\mu_1 - \mu_2$	3/195	1.72	.16	N.S.
$\mu_3 - \frac{\mu_1 + \mu_2 + \mu_4}{3}$	3/195	4.02	.008*	S.

*This test is significant at the .05 level.

Table 4.5 reveals that there was a significant difference at the .05 level for only the third contrast (DPAH) on the dependent variables. The third contrast was the comparison between the population means of the Delayed Psychological Attender Hard group and with the average of the population means of the other three groups, Psychological Attender Hard, Psychological Attender Easy, and the control group. Informing the subject that the task was hard after it has been attempted, significantly

motivated the subject to remember more of the paired-associations than the subjects that were told that the task was hard or easy prior to beginning the program sequence; or the subjects that were not told anything about the difficulty of the task.

To determine the particular source of the observed significant difference, a series of univariate F-tests were performed. Since the three dependent variables were tested separately, in order to control for the overall (Type 1 error), each test was judged at $\alpha = .01$, which is more conservative. The results are reported in Table 4.6. Three variables were measured to determine the effects of the experimental treatment. The purpose of the univariate F-tests was to pinpoint the functioning variable(s) that was influenced by the treatment.

The decision to reject the null hypothesis was made if the obtained p value was equal to or less than .01. The p value for Match to Form was .12, for Match from Memory was .70, and for Naming was .003. Therefore, the function of one dependent variable (Naming) resulted in the rejection of the null hypothesis indicating that the Delayed Psychological Attender group exhibited influence only on the Naming task. Significance existed on the Naming task even when the step-down method was applied. This method examines each variable while holding the other remaining variables constant. The Naming task was the criterion measure for the paired-associate learning task.

Table 4.6.--Univariate F test of the Difference between the Population Means of Group Three and the Average Population Means of Group One, Two, and Four on the Three Dependent Variables.

Variable	df	Hypothesis Mean Sq.	Univariate F-test	p	Step-down F-test	p	Decision
Match to Form	1	4.07	2.42	.12	2.42	.12	N.S.
Match from Memory	1	.40	.16	.70	.0002	.99	N.S.
The Naming task	1	8.15	8.99	.003	9.54	.002*	S.

Degrees of freedom for error is 197.

*The test is significant at the .01 level.

This experiment was designed to test the effects of the Psychological Attender upon the ability to memorize paired-associations. The Naming post-test was to measure the subject's performance in memorizing the paired-associations, while the experimental treatment involved the use of the three Psychological Attenders and no Psychological Attender. Therefore, the treatment would affect only the Naming as part of the paired-associate learning task and not the other dependent variables, Match to Form and Match from Memory.

Research Question II

Data, in response to research question two and the null hypothesis it generated, was secured to determine whether low and high achievers would respond in the same manner to the treatment groups. Research reviewed in this study indicated that low and high achievers would respond differently to the different cuing strategies.

Will low and high achievers perform the same across all treatment groups?

Null Hypothesis II

There is no interaction effect between the achievement levels and the treatment groups as measured by the three dependent variables.

The statistical analysis related to the second research question and null hypothesis is contained in Table 4.4. The interaction between achievement and

treatment had a multivariate F-ratio of .77, with 9 and 455 degrees of freedom.

The decision to reject the null hypothesis was made if the obtained $p = .64$ was less than the $p = .05$. Therefore, the null hypothesis was accepted indicating there was no significant interaction effect between the achievement levels and the treatment groups on any of the three dependent variables. Both low and high achievers responded in a similar manner to all four treatments. The mean scores of the low achievers on the three dependent variables were not significantly different from the mean scores of the high achievers in each one of the four treatment groups.

Research Question III

One concern of educators was the academic differences between boys and girls in the primary grades. Girls, up until about the fourth grade, were higher achievers than their male counterparts. Various motivational strategies to date had not bridged this achievement gap. Studies in the field of reading had rejected the theory that sex differences in reading achievement were due to physical or maturational differences but rather that they were sociological expectations.² As a result of the sex differences

²Dale D. Johnson, "Sex Differences in Reading Across Culture," Reading Research Quarterly 9 (1973-74): 67-86.

controversy as it relates to academic achievement, whether cultural or physiological, boys and girls may respond differently to cuing strategies. The following research question and its accompanying null hypothesis were formulated in response to the sex difference dilemma as it relates to academic achievement.

Will girls and boys perform the same across all treatment groups?

Null Hypothesis III

There is no interaction effect between the sex and the treatment groups as measured by the three dependent variables.

The statistical analysis related to research question three and null hypothesis III was reported in Table 4.4. A multivariate F-ratio of .71 was attained which, with 9 and 455 degrees of freedom, had a significance level of .70.

The decision to reject the null hypothesis was made if the p value was equal to or less than .05. Therefore, the obtained p value of .70 was not significant. The null hypothesis was accepted indicating that girls and boys did perform in a similar manner across all treatment groups. Sex was not a significant factor in terms of the effect of the treatments. Therefore, boys as well as girls in the Delayed Psychological Attender Hard group performed significantly higher on the Naming task than girls and boys in the other treatment groups.

Research Question IV

Each subject was assigned to a high or low achieving group as discussed on page 65. Each treatment group contained about equal numbers of both achievement levels. Since each subject was designated as either a low achiever or a high achiever, the fourth and final research question concerned itself with whether or not the teachers assessed the subjects correctly and whether or not high achievers proved to be superior performers to the low achievers on a paired-associate learning task.

Will high achievers perform better than low achievers on the three dependent variables?

Null Hypothesis IV

There will be no significant difference between the two achievement levels as measured by the three dependent variables.

The statistical analysis related to the above research question and its corresponding null hypothesis, which deals with achievement main effect, is reported in Table 4.4. A multivariate F-ratio of 7.97 attained which, with 3 and 187 degrees of freedom, had a significance level of p less than .0001. These results indicated that significant differences did exist between the high and low achievers on at least one of the three dependent variables. The mean scores of the high achievers were

significantly higher than the scores of the low achievers as recorded in Table 4.3. These results were expected since the sample was assigned to the two achievement levels on the basis of their academic achievement. The high achievers did perform better than the low achievers on at least one of the three dependent variables. However, the variable(s) which produced the significance was not identified.

To determine the specific variable(s) which produced the significance, a series of univariate F-tests were employed. Since the three dependent variables were tested separately, in order to control for the overall (Type I error), each test was judged at $\alpha = .01$, which is more conservative. Results of the univariate F-test on each of the three dependent variables are presented in Table 4.7.

Table 4.7.--Univariate F-test for Each Dependent Variable Measuring the Achievement Main Effect.

Variable	df	Hypothesis Mean Sq.	Univariate F-test	p	Decision
Match to Form	1	31.74	18.73	.0001*	S.
Match from Memory	1	19.10	7.63	.006*	S.
The Naming task	1	4.21	4.21	.04	N.S.

Degree of freedom for the error is 189.

*The test is significant at the .01 level.

The decision to reject the null hypothesis was made if the obtained p value was equal to or less than .01. The p value obtained for Match to Form was .0001, for Match from Memory was .006, and for Naming was .04. Thus the function of two dependent variables (Match to Form and Match from Memory) resulted in the rejection of the null hypothesis that there was a significant difference between the two achievement levels. The mean scores of the high achievers were significantly higher than the mean scores of the low achievers on these two post-tests. However, the mean scores of the low and high achievers were not significantly different from each other on the Naming task. Thus, treatment may have had an effect on low achievers since they performed almost equally as well as the high achievers on the Naming task. It was discussed under Research Question I that the Naming task was the only dependent variable that measured the effect of the treatment. While the other two dependent variables discriminated between the low and high achievers, the Naming task was not a discriminator between the achievement levels. These results implied that the mean scores of the low achievers and high achievers did not differ significantly in relationship to the treatment.

The test of interaction between sex and achievement revealed sex to be a factor that affected achievement.

For the interaction effect between sex and achievement, a multivariate F-ratio of 2.75, with 3 and 187 degrees has a probability of .04, less than the specified p value of .05. This suggested that the significant differences that existed between the two achievement levels was not the same for both boys and girls. In fact, they had a reverse effect as shown in Figure 4.1.

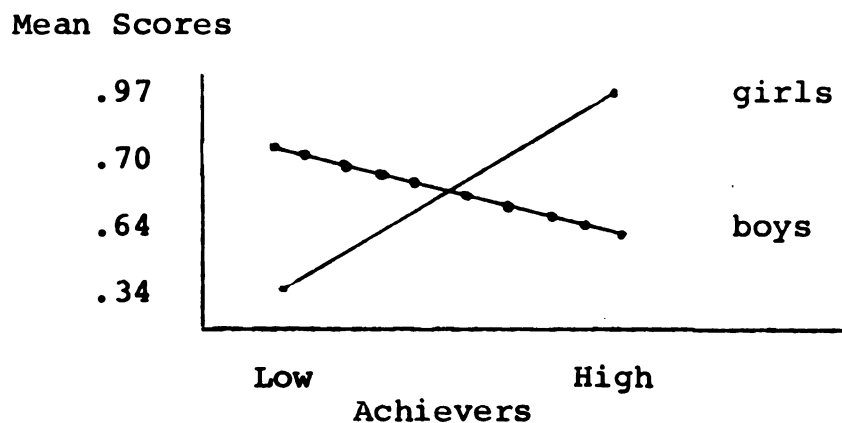


Figure 4.1. The Mean Scores of the Interaction Between Sex and Achievement for the Naming Task.

To further analyze which dependent variable measured the interaction, a series of univariate F-tests were used. The results of the univariate F-test on each of the three dependent variables are presented in Table 4.8.

The data in Table 4.8 imply that only the Naming task identified the differences in performance between

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Table 4.8.--Univariate F-test for Each Dependent Variable
Measuring the Interaction Between Sex and
Achievement.

Variable	df	Hypothesis Mean Sq.	Univariate F-test	p	Decision
Match to Form	1	.019	.011	.92	N.S.
Match from Memory	1	6.738	2.569	.11	N.S.
the Naming task	1	5.700	6.397	.01*	S.

Degree of freedom for the error is 189.

*The test is significant at the .01 level.

girls and boys across achievement levels. The obtained p value for the Naming task was .01. For the Match to Form and the Match from Memory the obtained p value was .92 and .11, respectively. The specified p value was .01.

A graph of the interaction pattern between sex and achievement on the Naming task is shown in Figure 4.1. The mean score of the low achieving boys was significantly higher than the mean score of the low achieving girls while the mean score of the high achieving boys was significantly lower than the mean score of the high achieving girl.

Table 4.9 provides a summary of the results concerning the average performance of the students among the four treatment groups. Since the three-way interaction between treatment and sex and achievement was not

Table 4.9.--Observed Combined Means for the Treatment.

Variable	1 (PAH)	2 (PAE)	3 (DPAH)	4 (NPA)
Match to Form	$\bar{X}$ 6.58	6.22	6.07	6.09
Match from Memory	$\bar{X}$ 5.14	4.50	4.81	4.80
the Naming task	$\bar{X}$.56	.58	1.12	.62

significant and neither were the two two-way interactions between treatment and sex and between treatment and achievement, the combined mean scores are reported.

As discussed earlier in this chapter, the subjects (both low and high achievers and girls and boys) in the Delayed Psychological Attender Hard group performed significantly better than their counterparts in the other two treatment groups and the control group. The combined mean scores for the Naming task were approximately two times greater for the Delayed Psychological Attender Hard group (DPAH; $\bar{X}$ = 1.12) than for the Psychological Attender Hard (PAH; $\bar{X}$ = .56), the Psychological Attender Easy (PAE; $\bar{X}$ = .58), and the control group (NPA; $\bar{X}$ = .69). These results were interpreted to mean that the DPAH group identified about two more figures correctly than the other groups. Therefore, it is assumed that the Delayed Psychological Attender Hard was more effective in motivating students to memorize the paired associations. Telling a child, regardless of sex or achievement level, after the task had been attempted that it was hard proved to be the

most effective of the other cuing strategies used in this study.

Summary

The multivariate analysis of variance indicated that the treatment main effect and the achievement main effect were significant at the .05 level. However, the interaction between treatment and sex and the interaction between treatment and achievement was not significant. Both girls and boys and low and high achievers responded in a similar manner to the treatment.

A series of univariate F-tests were used to determine on which specific dependent variable(s) the treatment main effect and the achievement main effect were found to be significant. Three multivariate contrasts were constructed to determine where the significant differences existed among the four treatment groups. The three contrasts were the difference between the population mean of the Psychological Attender Hard group (PAH) and no Psychological Attender (NPA); the difference between the population mean of the Psychological Attender Hard (PAH) group and the Psychological Attender Easy (PAE) group; and the comparison between the population mean of the Delayed Psychological Attender Hard (DPAH) group and the average of the population means of the Psychological Attender Hard (PAH) group, the Psychological Attender Easy

(PAE) group and the no Psychological Attender (NPA) group. The results of the multivariate analysis of variance (MANOVA) to test the three contrasts on the dependent variable(s) at the .05 level, indicated that the comparison between the population mean of the DPAH group and the average of the population means of the PAH groups, the PAE group and the NPA group to be significant. The subsequent univariate F-test revealed the comparison between the population mean of the DPAH group and the average of the population means of the PAH group, the PAE group, and the NPA group to be significant at the .01 level on the Naming task only.

For the achievement main effect, only the Naming task did not discriminate between the low and high achievers. On the Match to Form and Match from Memory, the achievement levels performed according to their designations (low and high). On the two post-tests, the mean scores of the high achievers were significantly higher than the mean scores of the low achievers. Sex was a factor that seemed to influence achievement. The mean score of the low achieving boys was significantly higher than the mean score of the low achieving girls; while the mean score of the high achieving girls was significantly higher than the mean score of the high achieving boys.

In conclusion, it appears that the Delayed Psychological Attender Hard was the most effective of the treatments, in producing a higher level of performance for

both high and low achievers and for both boys and girls. Informing the subjects that the task was difficult after they had attempted it motivated the subjects to remember the paired associations. The performance of the subjects in the DPAH group was significantly greater than the subjects who were told prior to entry into the program sequence that the task was hard or easy, or were not given any Psychological Attender. The DPAH cuing strategy proved to be effective for both achievement levels (low and high) and for boys as well as for girls.

Chapter V, the next and final chapter, contains a summary of the results of this study along with the conclusions and implications; and recommendations for further research.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The effectiveness of cuing first graders to the difficulty of a paired-associate learning task was the major focus of this study. The discussion and summary of the results, the conclusions, the implications, and the recommendations are presented in this final chapter.

Summary

Literature Review

A review of the literature revealed no other studies dealing specifically with the Psychological Attender theory. This theory, advanced by Duffy and Sherman (1972) is a strategy which informs the child that the task to be learned is difficult, thus protecting the child's self-esteem if he fails.

Research that closely relates to the psychological attender theory is in the areas of achievement motivation and attributional theory. While these two areas are somewhat related to the psychological attender theory, they

differ from it in that they are concerned with the perception of the task once it has been completed, either with success or failure.

From the results of research done by Bar-tal (1974), Davis (1972), Weiner & Sierad (1975), high achievement motivation students attribute their success to internal factors and their failures to external factors, while low achievement motivation students attribute their success to external factors and their failure to internal factors. On the basis of these results, it was concluded that the high and low achievers in this study would respond differently to the psychological attender.

Related research was concerned primarily with college or adult students. While some of the studies were undertaken with younger subjects, none were found to involve primary students.

The Study

To measure the influence of cuing first graders to the difficulty of the task, a program sequence was developed. The program was a paired-associate learning task which involved four letter-like figures and their transformations. It involved the use of an audio-flashcard reader in order that each treatment group would receive standard directions and information. Each letter-like figure was randomly assigned a CVC trigram that had a low association value.

The four treatment groups were each assigned a different Psychological Attender. The PAH group was told that the program sequence was hard; the PAE group was told that it was easy; the DPAH group was told that it was hard after the fourth trial; and the control group (NPA) was told nothing about the difficulty of the task.

This study included 205 first grade students from two public schools in an urban setting. Each subject was designated as either a low or high achiever on the basis of the classroom teachers' ratings on a checklist. This checklist included items dealing with various readiness skills. (See Appendix A.) The subjects were then randomly assigned to one of the four treatment groups. Each subject was pre-tested on his/her ability to match letter-like figures from among similar figures and on his/her ability to match the letter-like figure from memory. Each subject was administered the program sequence individually which was then followed immediately by a post-test. The post-test was the same as the pre-test.

The multivariate analysis of variance was used to determine: (1) the treatment main effect; (2) the interaction between sex and treatment; (3) the interaction between achievement and treatment; and (4) the achievement main effect. The null hypotheses were tested at the .05 level. A series of univariate F-tests were used to test for the specific dependent variable(s) that measured the

significance. The level of significance for the univariate F-test was at the .01 level.

Three multivariate contrasts were constructed to determine which treatment group performed statistically different at the .05 level. Another series of univariate F-tests were performed to determine on which variable(s) significant differences existed at the .01 level.

The Results

The results of the multivariate analysis of variance indicated that no significant interaction effect existed for achievement by treatment ($p = .641$) and sex by treatment ($p = .700$). The level of significance was tested at the .05 level. Nonsignificance for the interaction effect between achievement by treatment implies that low and high achievers responded in a similar manner in all treatment groups as well as the control group. Nonsignificance for the interaction effect between sex and treatment indicated that both boys and girls responded in a similar manner to the different treatments. Therefore, treatment did not influence one achievement level differently from the other achievement level. The Delayed Psychological Attender Hard proved to be the most effective treatment for both low achievers and high achievers as well as boys and girls.

Although MANOVA did not reveal significance for the interaction effect between achievement by treatment and sex by treatment, it did reveal significant differences for the treatment main effect ($p = .03$) and for the achievement main effect ($p = .0001$). The level of significance was tested at the .05 level. For the achievement main effect, the data corroborate that there were differences between the two achievement levels. The subjects in the study were assigned to their respective groups on the basis of their achievement in school.

A series of univariate F-tests for the achievement main effect revealed that only two of the dependent variables, the Match to Form ($p = .0001$) and the Match from Memory ($p = .006$), measured the significant difference between the mean scores of the low achievers and the high achievers. On the Naming task ($p = .042$), the mean scores of the high achievers were not significantly different from the mean scores of the low achievers. Since the three dependent variables were tested separately, in order to control for the overall (Type I), each test was judged at $\alpha = .01$, which is more conservative. Although the high achievers performed significantly better than the low achievers, on the Match to Form and the Match from Memory post-tests, the high and low achievers performed about the same on the Naming task. Since the Naming task was the dependent variable that measured the effect of the

treatment, these results indicated that low and high achievers were influenced in a similar manner by the treatment.

For the treatment main effect, the multivariate analysis of variance did reveal that significant differences did exist between the treatment groups. Therefore, three multivariate contrasts were constructed and tested by the multivariate F-tests in order to find out which treatment group was statistically different from the others. The contrast groups were: (1) the difference between the population mean of the Psychological Attender Hard (PAH) group and the Psychological Attender Easy (PAE) group, (2) the difference between the population mean of the Psychological Attender group (PAH) and no Psychological Attender (NPA), and (3) the comparison between the population mean of the Delayed Psychological Attender Hard (DPAH) group and the average of the population means of the Psychological Attender Hard (PAH) group, the Psychological Attender Easy (PAE) and the no Psychological Attender (NPA) group. The third contrast, the comparison between the population mean of the DPAH group and the average of the population means of the PAH group, the PAE group, and the NPA group, with ($p = .008$) was found to be statistically significant at the .05 level. The univariate F-tests revealed the comparison between the population mean of the Delayed Psychological Attender (DPAH) group and the average of the population means of the PAH group, the PAE group, and the

NPA group, to be significant at the .01 level at the Naming task only, at $p = .002$. The Naming task was the only dependent variable that measured the effect of the treatment.

The results indicate that the Delayed Psychological Attender was superior to the Psychological Attender Hard, the Psychological Attender Easy, and no Psychological Attender on the Naming task (the criterion measure for the paired-associate learning task). The Delayed Psychological Attender Hard group had a mean score approximately two times greater than the mean scores of the other treatment groups.

Data for the sex main effect, the interaction effect between sex and achievement, and the interaction effect between sex by achievement by treatment were available. Significant differences did not exist for the sex main effect ($p = .512$) and the interaction effect between sex by achievement by treatment ($p = .820$). The performance of girls and boys on the three tasks did not differ significantly. For the interaction effect among sex, achievement, and treatment, the mean scores of the sixteen cells on the three tasks were not significantly different.

MANOVA did reveal significant differences for the interaction effect between sex and achievement ($p = .044$), which indicated that the differences that existed between the low and high achievers were not the same for both sexes. In order to determine which dependent variable measured the interaction between sex and achievement, a series of univariate F-tests were used. The Naming task ($p = .0123$) was the only dependent variable of the three (Match to Form, $p = .951$ and Match from Memory, $p = .110$) that measured the differences of the means for the sexes within the achievement levels. The low achieving boys performed better than the low achieving girls while the high achieving girls performed better than the high achieving boys.

In summary, the Delayed Psychological Attender Hard treatment proved to be the most effective motivator regardless of the subjects' sex and or achievement level.

Conclusions

The major conclusion obtained from the analysis of the data of this study is that children who are told that a task is hard after they have attempted it, achieve at a significantly higher level (mean scores were approximately two times greater) on a paired-associate learning task than children who were told initially that the task was hard or easy or those children who were not cued as to the difficulty of the task at all.

Research findings in the area of achievement motivation had indicated achievement oriented individuals preferred a challenge, while on the other hand, failure-threatened individuals preferred easy tasks or very difficult ones. As a result of the achievement motivation findings, the following assumptions were made at the outset of the present study: (1) low and high achievers would respond differently to the psychological attender; and (2) low achievers would be motivated by the psychological attender easy while the high achievers would be motivated by the psychological attender hard. However, the results of this study were contrary to these assumptions.

Both low and high achievers responded in a similar manner in the three treatment groups and in the control group. The most significant finding of all was that the Delayed Psychological Attender proved to be the most effective for motivating both the low achievers and the high achievers.

The Delayed Psychological Attender appeared to provide the child with an opportunity to discover for himself whether the task was easy or hard. Once the child discovered that he/she was going to have difficulty mastering the task, the experimenter confirmed this by saying that the task was hard. The removal of the possible threat of being proven "dumb" may then have allowed the child to concentrate on learning.

Implications

One of the most perplexing issues in education today is the challenge of motivating students to learn. This problem has resulted in the creation of numerous "gimmicks," many of which are time-consuming, expensive, and yet are not always effective because perhaps they operate on the basis of faulty assumptions.

The purpose of this study was to test the Psychological Attender theory to determine whether it could be used as an effective motivator. The findings indicated that it would be an effective motivator for learning if two important factors were involved: (1) the emotional aspect of learning as it relates to self-concept; and (2) timing.

In the classroom, every teacher knows the importance of "attention getting devices" when beginning instruction. Perhaps even more important than the physical prop(s) used to get the student's attention, is the "psychological prop." This "psychological prop" must do more than command and hold the child's attention throughout instruction. It must, like a prop, boost or be non-threatening to a child's self-concept so that the child can concentrate on achieving. This is the theory behind, and the function of, the psychological attender.

The other crucial factor involving the Psychological Attender is timing. One controversy surrounding the psychological attender had to do with the notion that if a child was told a task was difficult before it was

attempted, the child might not attempt it at all. In effect, the child would view the task as an obstacle that he was not equipped to handle. However, the Delayed Psychological Attender proved to be the solution for this dilemma. Once the child has discovered that a task is difficult, it is important for this to be acknowledged to the child by a "significant other." For the high achiever, the Psychological Attender challenges and for the low achiever it not only "saves face," but provides a challenge as well.

The Delayed Psychological Attender approach is probably most crucial for pre-schoolers, kindergarteners, and first graders who enter school thinking that they will learn to read, write, and compute math operations automatically with little or no effort at all. For many of these children who thought learning was going to be easy, learning will be difficult. Many of these children begin to assume that if these tasks were supposed to be easy and they cannot perform them successfully, then they must be "dumb." Such students may become discouraged, frustrated, and lose interest in academic learning. Sometimes their interest in school is never regained. The child concludes that if I'm "dumb," I cannot learn, so why make the effort. Therefore, it is crucial for the "significant other" to step in when the child discovers that learning is going to be difficult and reassure the child that the difficulty is

due to the nature of the task and not because of the child's ability.

Recommendations

The following statements are recommendations offered both to parents and teachers and for further research.

Recommendations for Parents and Teachers

1. It is suggested that teachers and parents should empathize with the child, once the child has discovered the difficulty of the task. When the difficulty of the task has been acknowledged by a significant other (such as parent or teacher), the child is able to focus on the task and achieve because he/she is no longer blocked by the potential feelings of inadequacy.

2. Caution is recommended in the use of the word "easy" as a motivator. Many tasks that children attempt are not easy, at least for them. To be told that a task is "easy" when in actuality it is "hard," frustrates a child and causes negative feelings about one's self, which impedes achievement.

3. Perhaps teachers and parents should use the Delayed Psychological Attender Hard in preference to tangible rewards. The Delayed Psychological Attender Hard may prove to be even more effective than tangible rewards because it produces a more intrinsically motivated child.

4. The Delayed Psychological Attender Hard may be useful with lower-socioeconomic Black children regardless of sex or achievement level since it appears that lower-socioeconomic Black children do respond to verbal reinforcement.

5. When a child successfully completes a "difficult" task, it appears to be important for the teacher or parent to indicate to the child that the success was due to the child's ability and effort. This strategy may well enhance the self-concept of the child.

6. When a child experiences failure, the teacher or the parent ought to indicate to the child that the failure was due to the difficulty of the task and not to the child's lack of ability which may protect the self-concept of the child.

7. Results of this study make it clear that timing is an important factor in the use of the Psychological Attender. It seems to operate best when the child is allowed to discover that the task is difficult. Some children become discouraged if they are told that a task is hard before they attempt it.

Recommendations for Further Research

1. This study was carried out with individual children outside of the classroom and with the use of a machine that was a novelty to the children. This study

should be replicated in a group or classroom setting and with the use of different instructional aids.

2. The pre-test measures used in this study were perceived as being easy by the subjects and therefore they expected the program sequence to be easy. This study should be replicated without using pre-tests or with pre-tests of equal difficulty to the program sequence.

3. The program sequence in this study provided the subjects with continuous feedback as to whether they made correct or incorrect responses. It would be interesting to discover if the results would be the same if the child was not being constantly made aware of how he/she was performing.

4. This study used a paired-associated learning task to test the effectiveness of the treatment. Studies using other types of learning tasks are crucial in terms of the impact of the findings of this study.

5. The review of the literature for this study discussed the influence of the psychological attender on self-concept. However, a self-concept measure was not included in the design of this study. In order to measure the influence of the treatment on self-concept, in a replication of this study some measure of self-concept should be undertaken for all subjects before and after the treatment.

6. The researcher noted that subjects in the Psychological Attender Easy group exhibited more obviously

frustrated behavior. For example, one child cried and another child complained of a stomachache only after attempting the task. Thus, the systematic recording and subsequent analysis of information should add another interesting and revealing dimension to a study such as this one.

7. This study could be replicated using a sample of children that would include various socioeconomic levels and racial groups. Some research indicates that verbal reinforcement is more effective with White and middle-class children than with Black and lower-class children.

8. Many pre-schoolers and kindergarteners come to school with the notion that they will instantly know how to read, write, and do mathematical operations. They have no idea of how laborious these and other tasks are going to be for them. However, the longer children are in school the more realistic they become about the difficulty of various tasks. This study should be replicated at all grade levels in order to determine whether one grade level would differ significantly from the others.

9. A study in which a rewording of the psychological attender(s) is utilized might be conducted to test the effect of various verbal cues. (Example: I know you can do it, even though it is hard.) Some research indicates that children are sensitive to various kinds of verbal reinforcement.

10. A longitudinal study to measure the effect of the treatment on achievement and/or self-concept could provide educators with data on the impact of teacher's motivational techniques and strategies over a long period of time.

11. In order to control for the influence of timing, the Delayed Psychological Attender Hard and the Delayed Psychological Attender Easy should be compared.

12. Changing the timing of the Psychological Attender may change its effectiveness. For example, the Delayed Psychological Attender was given after the fourth trial. The point at which the child is told that the task is hard may be a significant factor.

In conclusion, the results of this study have contributed to the field of motivation and learning an effective technique for raising performance among first graders. It was demonstrated that the Delayed Psychological Attender Hard was successful with low achievers as well as high achievers of both sexes and that it was a superior motivating technique over the Psychological Attender Hard, Psychological Attender Easy, and no Psychological Attender.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Allington, Richard L. "An Evaluation of the Use of Color Cues to Focus Attention in Discrimination and Paired-Associate Learning." Ph.D. dissertation, Michigan State University, 1973.
- Anderson, Camilla M. "The Self-image: a Theory of the Dynamics of Behavior." In the Self in Growth, Teaching and Learning. Edited by Don E. Hamachek. Englewood Cliffs, New Jersey: Prentice-Hall, 1965.
- Anderson, Rosemarie; Anderson, Manoogian; Thomas, Sam; and Reznick, J. Steven. "The Undermining and Enhancing of Intrinsic Motivation on Preschool Children." Journal of Personality and Social Psychology 34 (1976):915-22.
- Atkinson, J. A., and Litwin, G. H. "Achievement Motive and Test Anxiety Conceived as Motive to Approach Success and Motive to Avoid Failure." Journal of Abnormal and Social Psychology 60 (1960):52-63.
- Atkinson, John W. An Introduction to Motivation. Princeton: Van Nostrand, 1964.
- _____. "Toward Experimental Analysis of Human Motivation in Terms of Motives, Expectancies, Incentives." In Motives in Fantasy, Action, and Society. Edited by J. W. Atkinson. Princeton: Van Nostrand, 1958c.
- Atkinson, John W., and Feather, Norma T., eds. A Theory of Achievement Motivation. New York: John Wiley and Sons, 1966.
- Avila, Donald L., and Purkey, William Watson. "Intrinsic and Extrinsic Motivation--A Regrettable Distinction." Psychology in the Schools 3 (1966):206-8.
- Bar-tal, Daniel; Frieze, Irene; and Greenberg, Martin S. "Attributional Analysis of Achievement Motivation: Some Applications to Education." Paper presented at the American Educational Research Association Annual Meeting, Chicago, April 1974.

- Bartel, Nettie R. "Locus of Control and Achievement in Middle- and Lower-Class Children." Child Development 42 (October 1971):1099-1107.
- Baughman, Earl. Black Americans: A Psychological Analysis. New York: Academic Press, 1971.
- Baum, M. et al. "Unified Effort of a Junior High School Faculty (NDEA Pilot Guidance Program) to Encourage Success for Seventh-graders." Reporting Research (Oregon Board of Education), October 1968.
- Bledsoe, J. "Self-concept of Children and Their Intelligence, Achievement, Interests, and Anxiety." Childhood Education 43 (1967):436-38.
- Berretta, Shirley. "Self-concept Development in the Reading Program." The Reading Teacher 24 (December 1970):232-38.
- Bower, W. Scott; Boyer, Joe L.; and Scheirer, Elinor A. "Research Related to Academic Achievement Motivation: An Illustrative Review." Theory Into Practice 9 (February 1970):33-46.
- Brookover, Wilbur B.; LePere, Jean M.; Hamachek, Don E.; Thomas, Shailer; Erickson, Edsel L. Self-concept of Ability and School Achievement. II, Report of Cooperative Research Project No. 1636, U.S. of Education, entitled, "Improving Academic Achievement through Self-Concept Enhancement," College of Education, Michigan State University, October 1965.
- Clark, D., and Clark, Mamie. "Racial Identification Preference in Negro Children." In Readings in Social-Psychology. Edited by T. M. Newcomb and E. L. Hartley. New York: Holt, Rinehart and Winston, 1946.
- Clark, Philip M. "Psychology, Education and the Concept of Motivation." Theory into Practice 9 (February 1970):16-22.
- Clifford, Margaret. "Motivational Effects of Competition and Goal Setting in Reward and Non-Reward Conditions." The Journal of Experimental Education 39 (Spring 1971):11-15.
- Cofer, C. N., and Appley, M. H. Motivation: Theory and Research. New York: John Wiley and Sons., Inc., 1964.

- Coleman, James S. et al. Equality of Educational Opportunity. U.S. Department of Health, Education, and Welfare, Washington, D.C., U.S. Government Printing Office, 1966.
- Combs, A. W. Perceiving, Behaving, Becoming. Yearbook of the Association for Supervision and Curriculum Development. Washington, D.C.: Education Association, 1962.
- _____. "Some Basic Concepts in Perceptual Psychology." Paper read at American Personnel and Guidance Association Convention, Minneapolis, April 1965.
- Cotler, Sheldon, and Palmer, Richard J. "The Relationships Among Sex, Sociometric, Self, and Text Anxiety Factors and the Academic Achievement of Elementary School Children." Psychology in the Schools 7 (1970):211-16.
- Cradler, John D., and Goodwin, Dwight L. "Conditioning of Verbal Behavior as a Function of Age, Social Class, and Type of Reinforcement." Journal of Educational Psychology 62 (1971):279-84.
- Davidson, H. H., and Greenberg, J. W. "School Achievers from a Deprived Background." USOE Project No. 2895, Contract No. OE-5-10-132. New York: The City College of the City University of New York, 1960.
- Davidson, H. H., and Lang, G. "Children's Perceptions of Their Teacher's Feelings toward Them Related to Self-perception, School Achievement and Behavior." Journal of Experimental Education 29 (1960):107-18.
- Davis, William L., and Davis, Elaine D. "Internal-External Control and Attribution of Responsibility for Success and Failure." Journal of Personality 40 (March 1972):123-36.
- De Blassie, R. R., and Healy, G. W. Self-Concept: A Comparison of Spanish-American, Negro, and Anglo Adolescents Across Ethnic, Sex, and Socio-Economic Variables. ERIC Documents ED 037 287, University Park, New Mexico: New Mexico State University, March 1970.

- de Charm, R., and Carpenter, V. "Measuring Motivation in Culturally Disadvantaged School Children." In Research and Development Toward the Improvement of Education. Edited by H. J. Klausmeir and G. T. O'Herarn. Madison, Wisconsin: Dembar Educational Services, 1969.
- Deutsch, Martin. Minority Group and Class Status as Related to Social and Personality Factors in Scholastic Achievement. Monograph No. 2, Society for Applied Anthropology, 1960.
- Drew, Walter F.; Olds, Anita R.; Olds, Henry F., Jr. Motivating Today's Students. California: Learning Handbooks, 1974.
- Duffy, Gerald G., and Sherman, George B. Systematic Reading Instruction. New York: Harper and Row Publishers, 1972.
- Farley, Frank, and Sewell, Trevor. "Attribution and Achievement Motivation Differences Between Delinquent and Non-Delinquent Black Adolescents." Adolescence 10 (Fall 1975):391-97
- Farls, R. J. "High and Low Achievement of Intellectually Average Intermediate Grade Students Related to the Self Concept and Social Approval." Dissertation Abstracts 28 (1967):1205.
- Farquhar, W. W. "A Comprehensive Study of the Motivational Factors Underlying Achievement of Eleventh-grade High-school Students. U.S. Office of Education, Cooperative Research Report No. 846. East Lansing: Office of Research and Publication, Michigan State University, 1968.
- Farr, Roger. Reading: What Can Be Measured? Newark, Delaware: International Reading Association Research Fund, 1969.
- Gibson, Eleanor J. "Learning to Read." Science 148 (May 1965):1066-72.
- Gill, M. R. "Pattern of Achievement as Related to the Perceived Self." Paper read at the Annual Meeting of the American Educational Research Association Convention, Los Angeles, February 1969.
- Goyen, Judith, and Lyle, J. G. "Effect of Incentives upon Retarded and Normal Readers on a Visual-Associate Learning Task." Journal of Experimental Child Psychology 2 (1971):274-80.

- Heckhausen, Heinz. "Achievement Motive Research: Current Problems and Some Contributions toward a General Theory of Motivation." Nebraska Symposium on Motivation 16 (1968):103-74.
- Henderson, Grace. "An Analysis of Self-Concept of Academic Ability (S.C.A.A.) as Related to Social-Psychological Variables, Comprising School Climate, in White and Black Elementary Children within Differential School Settings." Ph.D. dissertation, Michigan State University, 1973.
- Hogan, Ermon O., and Green, Robert L. "Can Teachers Modify Children's Self-Concepts?" Teachers College Record 72 (February 1971):423-26.
- Hood, Elizabeth F. "Motivating Urban Minority Group Youth." Education 93:363-66.
- Hunt, J. "Intrinsic Motivation and Its Role in Psychological Development." Nebraska Symposium on Motivation 13 (1965):189-282.
- Johnson, David. The Social Psychology of Education. New York: Holt, Rinehart, and Winston, Inc., 1970.
- Karabenick, Stuart A., and Youssef, Zakour I. "Performance as a Function of Achievement Motive Level and Perceived Difficulty." In Motivation and Achievement. Edited by J. W. Atkinson and Joel O. Raynor. Washington: Winston, 1974, pp. 83-90.
- Kerckhoff, Alan C. Socialization and Social Class. New Jersey: Prentice-Hall, Inc., 1972.
- Kerensky, V. M. "Reported Self-Concepts in Relation to Academic Achievement in an Inner-City Setting." Dissertation Abstracts 27 (1967):2325.
- Kukla, Andy. "Attributional Determinants of Achievement Related Behavior." Journal of Personality and Social Psychology 21 (1972):166-74.
- _____. "Foundations of an Attributional Theory of Performance." Psychological Review 79 (1972): 454-70.
- _____. "The Cognitive Determinants of Achieving Behavior." Journal of Personality and Social Psychology 21 (1972):166-79.

- Lamy, M. W. "Relationship of Self-perception of Early Primary Children to Achievement in Reading." In Human Development: Readings in Research. Edited by I. J. Gordon. Chicago: Scott Foresman, 1965.
- Lefcourt, Herbert M. "Internal Versus External Control of Reinforcement." Psychological Bulletin 65 (1966): 206-20.
- McCarthy, John, and Yancey, William. "Uncle Tom and Mr. Charlie: Metaphysical Pathos in the Study of Racism and Personal Disorganization." American Journal of Sociology 76 (1971):648-72.
- McClelland, David C.; Atkinson, John W.; Clark, Russell A.; Lowell, Edgar L. The Achievement Motive. New York: Appleton-Century-Crofts, Inc., 1953.
- Maehr, Martin L., and Sjogren, Douglas D. "Atkinson's Theory of Achievement Motivation: First Step Toward a Theory of Academic Motivation?" Review of Educational Research 41 (April 1971):143-61.
- Manis, M. "Personal Adjustment, Assumed Similarity to Parents, and Inferred Parental Evaluation of the Self." Journal of Consulting Psychology 22 (1958):481-85.
- Marlow, E. Stewart III. "Need for Achievement, Fear of Failure and Attribution Processes in Goal Setting." Ph.D. dissertation, Pennsylvania State University, December 1971.
- Maslow, Abraham. Motivation and Personality. New York: Harper and Row Publishers, 1970.
- Mead, George H. Mind, Self, and Society. Chicago: University of Chicago Press, 1934.
- Moulton, Robert W. "Effects of Success and Failure on Level of Aspiration as Related to Achievement Motives." Journal of Personality and Social Psychology 1 (1965):399-406.
- Moustakas, C. The Authentic Teacher: Sensitivity and Awareness in the Classroom. Cambridge, Mass.: Howard A. Doule Publishing Co., 1966.
- Purkey, William Watson. Self-Concept and School Achievement. New Jersey: Prentice-Hall, Inc., 1970.

- Rosenhan, D. L., and Greenwald, Jean A. "The Effects of Age, Sex, and Socioeconomic Class on Responsiveness to Two Classes of Verbal Reinforcement." Journal of Personality 31 (1965):108-21.
- Rosenthal, R., and Jackbson, L. Pygmalion in the Classroom: Teacher Expectations and Pupils' Intellectual Development. New York: Holt, Rinehart, and Winston, Inc., 1968.
- Roth, Robert M. "The Role of Self-Concept in Achievement." Journal of Experimental Education 27 (June 1959): 278-81.
- Spilerman, Seymour. "Raising Academic Motivation in Lower Class Adolescents: A Convergence of Two Research Traditions." Sociology of Education 44 (Winter 1971):103-18.
- Soares, Anthony T., and Soares, Louise M. "Expectancy, Achievement, and Self-Concept Correlates in Disadvantaged and Advantaged Youths." Reprinted from the Proceedings, 79th Annual Convention, APA, 1971, pp. 561-62.
- Soares, Anthony T., and Soares, Louise M. "Self-perceptions of Culturally Disadvantaged Children." American Educational Research Journal 6 (1964): 31-45.
- Sloane, Howard W., Jr., and Jackson, Donald A. A Guide to Motivating Learners. New Jersey: Educational Technology Publications, 1974.
- Snygg, D., and Combs, A. W. Individual Behavior. New York: Harper and Row, 1949.
- Stainback, W. C.; Payne, J. S.; Stainback, S. B.; and Payne, R. A. Establishing a Token Economy in the Classroom. Ohio: Charles E. Merrill Publishing Co., 1973.
- Van De Riet, Hani. "Effects of Praise and Reproof on Paired-Associate Learning in Educationally Retarded Children." In Remedial Teaching: Research and Comment. Edited by Wayne Otto and Karl Koenke. Boston: Houghton Mifflin Co., 1969, pp. 125-30.
- Waetjen, Walter B. "The Teacher and Motivation." Theory into Practice 9 (February 1970):10-15.

- Wang, Margaret. "The Accuracy of Teacher's Predictions on Children's Learning Performance." The Journal of Educational Research 66 (July-August 1973):462-65.
- Wattenberg, William W., and Clare, Clifford. "Relation of Self-Concepts to Beginning Achievement in Reading." Child Development 35 (June 1964):461-67.
- Weiner, B.; Heckhausen, H.; Meyer, W. U.; and Cook, R. "Causal Ascriptions and Achievement Motivation: A Conceptual Analysis of Effort and Reanalysis of Locus of Control." Journal of Personality and Social Psychology 21 (1972):239-48.
- Weiner, B., and Kukla, A. "An Attributional Analysis of Achievement Motivation." Journal of Personality and Social Psychology 15 (1970):1-20.
- Weiner, B., and Petepan, P. A. "Personality Analysis and Effective Reactions toward Exams of Succeeding and Failing College Students." Journal of Educational Psychology 61 (1970):144-51.
- Williams, Robert L. "Self-Concept and School Adjustment." The Personnel and Guidance Journal 46 (December 1967):478-81.
- Wyer, Robert S. "Effects of Task Reinforcement, Social Reinforcement, and Task Difficulty on Perseverance in Achievement-Related Activity." Journal of Personality and Social Psychology 8:269-76.
- Wylie, Ruth. The Self-Concept: A Critical Survey of Pertinent Research Literature. Lincoln: University of Nebraska Press, 1961.
- Zigler, Edward, and Kanzer, Paul. "The Effectiveness of Two Classes of Verbal Reinforcers on the Performance of Middle- and Lower-class Children." Journal of Personality 30 (1962):157-65.

APPENDICES

APPENDIX A

**TEACHER CHECKLIST TO IDENTIFY HIGH
AND LOW ACHIEVERS**

APPENDIX A

TEACHER CHECKLIST TO IDENTIFY HIGH
AND LOW ACHIEVERS

	High	Average	Low
1. Verbal and Comprehensive Ability			
Knows the meaning of words			
Expresses self well verbally			
Understands the relationship of opposites			
Classifies objects			
Understands the meaning of prepositions and that they signal relationships			
Able to comprehend sentence and paragraphs (note details or ideas and retain in mind for brief periods)			
Relate both literal and inferred details of a story			
2. Listening Skills			
Adequate attentiveness			
Follows directions well			
3. Visual and Auditory Discrimination			
Able to match alike shapes, letters, and words			
Auditorially discriminates between alike and different sounds			

4. Motor

Hand

Can

Can

5. Und

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6. Id

7. I

8. D

	High	Average	Low
4. Motor Coordination			
Handles crayon and pencils well			
Can trace straight lines			
Can copy figures correctly			
5. Understands number concepts			
Counts up to ten objects			
Able to manipulate quantitative relationships			
Identifies and reproduces number symbols			
Understands the concept of money			
6. Identifies the lower case letters of the alphabet			
7. Identifies the eight basic colors			
8. Do you think this child is performing up to his potential?			

APPENDIX B

DIRECTIONS FOR THE PRE-TESTS AND POST-TESTS

APPENDIX B

DIRECTIONS FOR THE PRE-TESTS AND POST-TESTS

Directions for the Match to Form Pre-Test

Instructions to Subjects:

(Subject's name), I'm trying to find out how boys and girls learn, so I want you to help me by marking some sheets. Look carefully at this first figure, on the first sheet (the experimenter points to the appropriate figure). Now, look carefully at each of the other four figures in the row (the experimenter points to each one of the other figures). Only one of these figures is just exactly the same as the first one. Find the one that looks exactly like the first figure and put a circle around it.

There is a figure in this row that looks exactly like the first figure (the experimenter points to the second row). Put a circle around it.

Do the same thing in each row. Good (is said of the subject follows the directions correctly).

Directions for the Match from Memory Pre-Test

Instructions to Subjects:

This sheet is different from the other one. This time you will see a figure in this window (the experimenter points to the window in a tachistoscope). You will see the figure for only a few seconds so you must look at it carefully and try to remember what it looks like.

After you have seen the figure, slide the cover down and look carefully at each figure, then circle the figure that you saw in the window.

Look carefully at the figure in the window because I will show it to you only once. Do you have any questions? Are you ready?

Here is the first figure. Look at it carefully. Now, slide the cover down and look at all the figures, then circle the one that looks just like the one that you saw in the window. Remember only one is just like the one in the window. Good.

Now, here's the next one.

Directions for the Match to Form Post-Test

Instructions to Subjects:

Remember how we did this paper before? Look carefully at the first figure and then at each of the other four figures in this row. Circle the figure that is just exactly like the first one. Remember that in each row only one figure looks just exactly like the first one.

Directions for the Match from Memory Post-Test

Instructions to Subjects:

Do you remember how we did this paper? I'll show you a figure in this window, look at it carefully and try to remember it. Slide the cover down and circle the one that looked exactly like the figure you saw in the window. O.K., now look carefully at this figure in the window, slide the cover down and circle the figure just like the one in the window. Good. Now look at the next figure.

APPENDIX C

INTRODUCTION TO THE PROGRAM SEQUENCE AND VERBAL
DIRECTIONS FOR THE PROGRAM SEQUENCE

APPENDIX C

INTRODUCTION TO THE PROGRAM SEQUENCE

Instructions to Subjects:

I'm trying to find out how children learn. I have put some figures on these cards. I want to see if you can learn the names of these figures (the experimenter points to the cards with figures on them). In order to learn the name of these figures, you must look at the figure and remember what it looks like. Then you must remember its name.

Let me show how this (the Audio Flashcard Reader) machine works. I'll put the card in and then push button (the experimenter demonstrates). When you push the button one a voice will tell you the name of the figure.

Later the voice will ask if you remember the figure's name. If you do, say it, then push button three to see if you were right. If you don't remember the name push button three and the machine will tell you the name.

This is really hard, so don't feel bad if you can't remember all the names of the figures (this statement was made to those subjects in the Psychological Attender Hard group--PAH).

This is really easy, so I'm sure you will remember all the names of the figures (this statement was made to those subjects in the Psychological Attender Easy group--PAE).

For the Delayed Psychological Attender Hard group (DPAH) the introduction was followed immediately by the verbal directions for the program sequence. The statement "This is really hard, so don't feel bad if you can't remember all the names of the figures," was made after the fourth trial.

For the control group (NPA) the introduction was followed immediately by the verbal directions for the program sequence.

<u>Verbal Directions</u>		<u>Trial</u>	<u>Figure</u>	<u>Card Sequence Number</u>	<u>Audio Track</u>
"This is a miv.	Say miv."	1	miv	1	1.
"This is a kif.	Say kif."	1	kif	2	1.
"This is a yad.	Say yad."	1	yad	3	1.
"This is a dax.	Say dax."	1	dax	4	1.
"This is a boj.	Say boj."	1	boj	5	1.
"This is a wuc.	Say wuc."	1	wuc	6	1.
"This is a puv.	Say puv."	1	puv	7	1.
"This is a woy.	Say woy."	1	woy	8	1.
"This is a yad.	Look at the top of the yad.				
Say yad."		1	yad	9	1.
"This is a dax.	Look at the bottom of the				
dax.	Say dax."	1	dax	10	1.
"This is a puv.	See which way it's pointing?				
Say puv."		1	puv	11	1.
"This is a woy.	See which way it's pointing?				
Say woy."		1	woy	12	1.
"This is a miv.	Which side is the hump on?				
Say miv."		1	miv	13	1.
"This is a kif.	See which side its hump is				
on? Say kif."		1	kif	14	1.
"This is a boj.	See how the lines point				
down? Say boj."		1	boj	15	1.
"This is a wuc.	See how the lines point up?				
Say wuc."		1	wuc	16	1.
"Say the name of this figure and then push					
button three to see if you were right.					
That is a boj. Did you say boj?"		2	boj	17	1.
"Say the name of this figure and then push					
button three to see if you were right."					
"This is a wuc. Did you say wuc?"		2	wuc	18	2.

<u>Verbal Directions</u>		<u>Trial</u>	<u>Figure</u>	<u>Card Sequence Number</u>	<u>Audio Track</u>
"Say the name of this figure and push button three to see if you're right."		2	miv	19	1. 2.
"This is a miv."					
"Say the name of this figure and push button three to see if you're right."		2	kif	20	1. 2.
"Kif. This is a kif. Did you remember that?"					
"Say the name of this figure and then push button three to see if you're right."		2	puv	21	1. 2.
"Did you say puv. That's right."					
"Say the name of this figure and then push button three to see if you're right."		2	woy	22	1. 2.
"Did you say woy?"					
"Say the name of this figure and then push button three to see if you're right."		2	yad	23	1. 2.
"This is a yad. Did you get it right?"					
"Try this one. Say the name of this one and then push button three to see if you're right."		2	dax	24	1. 2.
"Did you say dax? If you did you are right."					
"This is a miv. See which side the hump is on? Say miv."		3	miv	25	1.
"This is a kif. See which side the hump is on now? Say kif."		3	kif	26	1.
"This is a puv. See which way it's pointing? Say puv."		3	puv	27	1.
"This is a woy. See which way it's pointing? Say woy."		3	woy	28	1.
"This is a boj. See which way the arms are pointing? Say boj."		3	boj	29	1.
"This is a wuc. See which way its arms are pointing? Say wuc."		3	wuc	30	1.

"Say the name of this figure and push button three to see if you're right."
 "This is a miv."
 "Say the name of this figure and push button three to see if you're right."
 "Kif. This is a kif. Did you remember that?"
 "Say the name of this figure and then push button three to see if you're right."
 "Did you say puv. That's right."
 "Say the name of this figure and then push button three to see if you're right."
 "Did you say woy?"
 "Say the name of this figure and then push button three to see if you're right."
 "This is a yad. Did you get it right?"
 "Try this one. Say the name of this one and then push button three to see if you're right."
 "Did you say dax? If you did you are right."
 "This is a miv. See which side the hump is on? Say miv."
 "This is a kif. See which side the hump is on now? Say kif."
 "This is a puv. See which way it's pointing? Say puv."
 "This is a woy. See which way it's pointing? Say woy."
 "This is a boj. See which way the arms are pointing? Say boj."
 "This is a wuc. See which way its arms are pointing? Say wuc."

Verbal Directions

"This is a yad. See the top of the yad?
Say yad."
"This is a dax. See the bottom of the dax?
Say dax."
"Say the name of this one. Then push button
three to see if you're right."
"Did you say miv? If you did you are right."
"Say the name of this figure, then push button
three."
"Kif. That's a kif. Did you get it right?
I hope so."
"How about this one. Say it, then push button
three."
"If you said boj, you're absolutely right."
"Say the name of this one and then push button
three."
"Wuc. Did you wuc? That's the right answer."
"Say the name of this figure and then push
button three."
"Yad. If you said yad, you're absolutely
right."
"Say the name of this one, then push button
three."
"That is the dax. Did you get it?"
"If you remember its name, say it. Then push
button three."
"Did you say puv?"
"Say the name of this figure, then push
button three."
"Did you say woy? If you did, you're
absolutely right."

<u>Trial</u>	<u>Figure</u>	<u>Card Sequence Number</u>	<u>Audio Track</u>
3	yad	31	1.
3	dax	32	1.
4	miv	33	1. 2.
4	kif	34	1.
			2.
4	boj	35	1. 2.
4	wuc	36	1. 2.
4	yad	37	1.
			2.
4	dax	38	1. 2.
4	puv	39	1. 2.
4	woy	40	1. 2.

<u>Verbal Directions</u>		<u>Trial</u>	<u>Figure</u>	<u>Card Sequence Number</u>	<u>Audio Track</u>
"This is a puv. See which side the bar is on? Say puv."		5	puv	41	1.
"This is a woy. See which way it is pointing? Say woy."		5	woy	42	1.
"This is a miv. See which side the hump is on? Say miv."		5	miv	43	1.
"Kif. This is a kif. The hump is on the other side. Say kif."		5	kif	44	1.
"This is a boj. See which way the arms are pointing? Say boj."		5	boj	45	1.
"This is a wuc. See how the arms point up? Say wuc."		5	wuc	46	1.
"This is a yad. See how the top of the yad has a line across it? Say yad."		5	yad	47	1.
"This is a dax. See the line across the bottom of the dax? Say dax."		5	dax	48	1.
"What's the name of this figure? Say it and then push button three."		6	boj	49	1. 2.
"Did you say boj? If you did, you're right." "Say the name of this figure, then push button three."		6	wuc	50	1. 2.
"Wuc. Did you say wuc?" "Name this figure, then push button three." "That's a miv. Did you say miv?"		6	miv	51	1. 2.
"What do we call this one? Say it and then push button three." "Kif. Did you say kif?"		6	kif	52	1. 2.
"Say the name of this one, then push button three." "That is a yad. If you said yad, you're right."		6	yad	53	1. 2.

Verbal Directions

"Say the name of this one, then push button three."
 "Did you remember we call this one dax?"
 "Say the name of this figure and then push button three."
 "That is a puv. Did you say puv?"
 "Name this one and then push button three."
 "Woy. That's a woy. Did you get it right?"
 "Puv. That is puv. See which side the bar is on? Say puv."
 "That's a woy. See which way it's pointing? Say woy."
 "Boj. That's a boj. See which way the arms are pointing? Say boj."
 "This is a wuc. See which way the arms are pointing? Say wuc."
 "Miv. This is a miv. Point to the hump. Say miv."
 "This is a kif. Point to the hump. Say kif."
 "Yad. This is a yad. Point to the top of the yad. Say yad."
 "This is a dax. Point to the bottom of the dax. Say dax."
 "Name this one, then push button three."
 "Did you say puv? That's right."
 "Say the name of this one and then push button three."
 "This figure is woy."
 "Say the name of this figure. Then push button three."
 "Did you say miv? That's right."

<u>Trial</u>	<u>Figure</u>	<u>Card Sequence Number</u>	<u>Audio Track</u>
6	dax	54	1. 2.
6	puv	55	1. 2.
6	woy	56	1. 2.
7	puv	57	1.
7	woy	58	1.
7	boj	59	1.
7	wuc	60	1.
7	miv	61	1.
7	kif	62	1.
7	yad	63	1.
7	dax	64	1.
8	puv	65	1. 2.
8	woy	66	1. 2.
8	miv	67	1. 2.

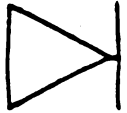
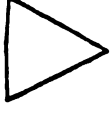
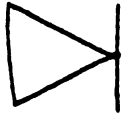
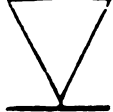
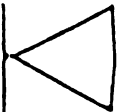
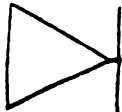
<u>Verbal Directions</u>		<u>Trial</u>	<u>Figure</u>	<u>Card Sequence Number</u>	<u>Audio Track</u>
"Name this one, then push button three."		8	kif	68	1.
"That's a kif. If you said kif, you're absolutely right."					2.
"Do you remember this one? Say its name, then push button three."		8	yad	69	1.
"Yad. Did you say yad?"					2.
"Say the name of this one, then push button three."		8	dax	70	1.
"Dax. Did you get it right?"					2.
"Say the name of this figure. Then push button three."		8	boj	71	1.
"This one is boj. Did you say boj?"					2.
"Say the name of this figure. Then push button three."		8	wuc	72	1.
"Wuc. If you said wuc, you're absolutely right."					2.

APPENDIX D

PRE-TEST AND POST-TEST SHEETS

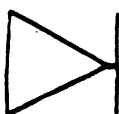
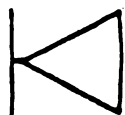
MATCH TO FORM

NAME

MATCH FROM MEMORY

NAME _____



APPENDIX E

RAW SCORES OF SUBJECTS

Test Data of Subjects
Psychological Attender Hard

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
002	1	2	1	1	5	6	1	2	2	0	0
003	1	2	1	1	5	6	1	6	6	0	0
004	1	1	1	1	5	8	3	5	2	-3	1
009	1	2	1	1	8	8	0	5	6	1	0
014	1	1	1	2	7	4	-3	5	4	-1	0
022	1	2	1	1	6	8	2	4	5	1	0
023	1	2	1	2	7	5	-2	7	5	-2	0
024	1	2	1	1	5	8	3	3	6	3	0
026	1	2	1	2	8	8	0	3	6	3	0
030	1	2	1	2	3	5	2	3	3	0	0
034	1	1	1	1	5	1	-4	5	3	-2	0
045	1	1	1	1	5	4	-1	6	6	0	1
052	1	2	1	2	6	5	-1	7	5	-2	1
054	1	2	1	2	5	7	2	3	6	3	2
060	1	1	1	1	5	3	-2	6	7	1	0
062	1	1	1	1	6	5	-1	6	6	0	0
066	1	1	1	1	3	7	4	2	6	4	0
070	1	1	1	1	6	3	-3	5	2	-3	2
071	1	2	1	2	7	7	0	5	7	2	1
072	1	2	1	2	7	2	-4	6	3	-3	0
080	1	1	1	1	6	8	2	3	7	4	1

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
089	1	2	1	1	5	6	1	3	4	1	1
092	1	1	1	2	6	8	2	5	5	0	1
096	1	1	1	2	6	8	2	5	5	0	1
097	1	1	1	1	7	8	1	7	8	1	5
092	1	2	1	2	7	6	-1	3	7	4	3
105	1	1	1	1	4	4	0	3	4	1	0
106	1	1	1	2	4	5	1	5	3	-2	0
109	1	3	1	1	4	8	4	4	6	2	4
116	1	2	1	2	8	8	0	5	8	3	1
118	1	1	1	1	3	5	2	3	3	0	1
122	1	2	2	1	6	6	0	6	5	-1	1
123	1	1	2	2	5	4	-1	8	6	-2	0
124	1	1	2	1	3	7	4	3	7	4	0
125	1	1	2	2	6	8	2	3	6	3	0
137	1	2	2	2	8	8	0	5	7	2	1
139	1	1	2	2	7	6	-1	2	3	1	0
140	1	2	2	2	6	7	1	5	5	0	0
146	1	2	2	1	6	7	1	6	4	-2	0
148	1	1	2	2	4	6	2	3	4	1	0
149	1	1	2	2	7	7	0	3	5	2	0
150	1	1	2	1	4	7	3	4	3	-1	0
155	1	1	2	1	1	7	6	4	4	0	0

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
157	1	2	2	1	5	7	2	5	3	-2	2
162	1	2	2	2	8	7	-1	5	6	1	1
163	1	1	2	1	3	4	1	1	7	6	0
166	1	2	2	2	7	8	1	2	5	3	0
169	1	1	2	2	5	8	3	2	6	4	0
173	1	2	2	2	7	4	-3	3	7	4	0
177	1	1	2	1	2	6	4	4	7	3	0
178	1	1	2	2	7	7	0	7	6	-1	0
179	1	2	2	1	4	5	1	4	5	1	0
181	1	2	2	2	6	7	1	5	5	0	0
190	1	2	2	2	8	7	-1	6	5	-1	0
193	1	1	2	2	8	8	0	2	6	4	0
195	1	2	2	1	5	5	0	4	5	1	0
196	1	2	2	2	6	7	1	4	6	2	0
203	1	2	2	1	8	8	0	6	5	-1	0

Test Data of Subjects
Psychological Attender Easy

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
005	2	2	1	2	5	8	3	5	8	3	0
011	2	2	1	1	4	6	2	2	2	0	0
015	2	1	1	1	4	6	2	5	4	-1	1
116	2	1	1	1	5	7	2	3	5	2	0
020	2	2	1	2	6	8	2	4	4	0	2
028	2	2	1	1	4	6	2	4	2	-1	3
030	1	2	1	2	3	5	2	3	3	0	1
039	2	1	1	2	4	6	2	3	2	-1	0
042	2	2	1	2	8	8	0	7	7	0	0
046	2	1	1	2	5	4	-1	4	6	2	0
047	2	2	1	1	4	6	2	3	2	-1	0
049	2	2	1	1	7	8	1	3	4	1	1
055	2	2	1	2	7	6	-1	4	6	2	0
056	2	1	1	2	4	5	1	5	3	-2	2
061	2	1	1	1	4	8	4	1	4	3	1
067	2	1	1	2	6	5	-1	3	7	4	0
073	2	1	1	1	5	3	-2	3	1	-2	1
074	2	2	1	1	8	7	-1	4	6	2	1
077	2	2	1	2	6	6	0	6	6	0	1
079	2	2	1	2	7	8	1	5	3	-2	0
081	2	1	1	1	4	8	2	6	5	-1	0

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 1	Post 2	Gain 2	Naming
086	2	1	1	1	5	5	0	4	4	0	1
087	2	2	1	1	6	8	2	7	7	0	1
088	2	2	1	1	8	8	-2	2	7	5	1
095	2	1	1	1	6	5	-1	2	5	3	1
098	2	1	1	1	4	6	2	4	1	-3	0
104	2	1	1	2	4	5	1	1	6	5	0
114	2	1	1	1	6	4	2	4	4	0	0
115	2	2	1	2	6	7	1	4	5	1	1
119	2	2	1	2	4	7	3	4	6	2	1
126	2	1	2	2	6	7	1	2	7	4	1
127	2	2	2	1	5	6	1	3	3	0	0
128	2	1	2	1	7	8	1	4	6	2	1
135	2	1	2	1	5	6	1	2	5	2	0
136	2	1	2	1	7	7	0	5	6	1	1
141	2	1	2	2	4	5	1	6	3	-3	0
144	2	1	2	2	3	8	5	3	4	1	0
145	2	1	2	1	5	5	0	4	4	0	0
151	2	1	2	2	3	5	2	6	4	-2	0
152	2	1	2	1	3	4	1	2	2	0	0
159	2	2	2	2	7	4	-3	4	8	4	3
161	2	1	2	1	6	5	-1	2	6	4	2
171	2	2	2	2	7	8	1	4	6	2	1

Student
Number

174

175

187

188

194

20

20

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
174	2	1	2	1	3	6	3	2	1	-1	0
175	2	1	2	2	4	7	3	4	1	-3	0
187	2	1	2	2	6	5	-1	2	4	2	0
188	2	2	2	2	8	6	-2	5	3	-2	0
194	2	2	2	1	6	5	-1	7	4	-3	0
202	2	2	2	1	8	6	-2	4	4	0	1
205	2	1	2	1	6	6	0	2	5	3	0

Test Data of Subjects
Delayed Psychological Attender Hard

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
001	3	2	1	1	5	8	3	2	3	1	0
007	3	1	1	1	4	7	3	5	5	0	1
018	3	1	1	2	4	6	2	4	4	0	0
019	3	2	1	1	7	8	1	6	5	-1	2
025	3	2	1	1	8	5	-3	4	5	1	0
027	3	2	1	2	5	4	-1	2	3	1	0
031	3	2	1	1	7	7	0	4	3	-1	0
032	3	2	1	1	7	8	1	2	6	4	1
035	3	1	1	1	4	6	2	4	2	-2	0
040	3	2	1	2	8	7	-1	3	7	4	2
043	3	1	1	2	5	4	-1	3	2	-1	2
050	3	2	1	2	6	7	1	3	6	3	3
057	3	1	1	2	3	4	1	4	5	1	0
063	3	1	1	2	6	4	-2	5	6	1	0
064	3	2	1	1	6	8	2	5	7	2	1
076	3	1	1	1	3	3	0	3	4	1	1
078	3	1	1	1	3	4	1	2	3	1	2
082	3	1	1	2	5	5	0	4	3	1	0
083	3	2	1	1	4	8	4	3	5	2	2
091	3	2	1	2	8	8	0	5	6	1	1
093	3	2	1	2	6	8	2	3	3	0	2

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
094	3	2	1	2	5	5	0	4	7	3	4
099	3	2	1	2	6	8	2	3	3	0	2
107	3	1	1	1	3	2	-1	4	2	-2	3
108	3	2	1	2	6	6	0	2	1	1	1
110	3	2	1	2	6	6	0	6	7	1	2
111	3	1	1	1	4	6	2	3	4	1	2
113	3	2	1	2	7	6	-1	3	4	1	0
129	3	2	2	1	7	5	-2	6	7	1	3
132	3	2	2	1	2	7	5	4	7	3	0
143	3	1	2	1	4	8	4	4	5	1	0
153	3	1	2	1	7	7	0	1	6	5	0
160	3	2	2	1	5	5	0	3	4	1	0
165	3	2	2	2	6	5	-1	5	6	1	1
172	3	2	2	2	7	5	-2	5	5	0	1
180	3	2	2	2	6	7	1	5	7	2	2
185	3	2	2	2	6	8	2	4	6	2	3
186	3	1	2	2	6	7	1	4	4	0	2
192	3	2	2	2	5	5	0	6	5	-1	0
200	3	2	2	2	4	7	3	3	5	2	0

Test Data of Subjects
No Psychological Attender

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
006	4	2	1	2	6	7	1	6	6	0	0
008	4	2	1	2	5	6	1	2	4	2	1
010	4	1	1	2	6	5	-1	5	5	0	1
012	4	1	1	2	3	5	2	3	4	1	0
013	4	1	1	2	6	8	2	4	4	0	1
017	4	2	1	1	4	4	0	6	5	-1	0
021	4	2	1	1	8	7	-1	6	7	1	1
033	4	1	1	1	3	3	2	2	7	5	0
036	4	2	1	1	6	7	1	3	6	3	0
037	4	1	1	1	7	7	0	5	6	1	1
038	4	2	1	1	8	5	-3	6	3	-3	0
041	4	1	1	1	8	5	-3	4	3	-1	2
044	4	1	1	1	3	6	3	4	4	0	0
048	4	1	1	2	8	5	-3	5	5	0	0
051	4	2	1	2	6	6	0	6	6	0	3
053	4	1	1	1	4	5	1	4	5	1	1
058	4	1	1	1	3	5	2	3	6	3	1
059	4	1	1	1	4	5	1	4	3	-1	2
065	4	1	1	2	5	7	2	3	2	-1	1
068	4	1	1	1	5	5	0	5	3	02	1
069	4	1	1	2	4	4	0	2	2	0	0

Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
075	4	2	1	2	6	6	0	5	8	3	0
084	4	1	1	2	6	7	1	5	7	2	3
085	4	2	1	1	4	7	3	3	6	3	1
090	4	1	1	1	4	6	2	3	6	3	0
100	4	2	1	2	5	8	3	4	5	1	1
101	4	1	1	1	8	8	0	4	7	3	1
103	4	2	1	2	4	7	3	3	7	4	0
112	4	2	1	2	7	7	0	7	5	-1	3
117	4	2	1	1	7	7	0	3	4	1	0
120	4	1	2	2	6	5	-1	2	6	4	0
121	4	1	2	1	6	6	0	3	3	0	0
130	4	2	2	1	7	6	-1	0	6	6	0
131	4	2	2	2	3	4	1	1	3	2	1
133	4	2	2	2	4	5	1	1	3	2	1
134	4	1	2	1	5	5	0	5	5	0	0
138	4	1	2	1	5	4	-1	3	3	0	0
142	4	1	2	2	7	7	0	3	3	0	0
154	4	1	2	1	3	7	4	2	3	1	0
156	4	1	2	2	8	7	-1	5	4	-1	0
158	4	2	2	1	7	7	0	3	7	4	0
164	4	2	2	2	5	7	2	6	5	-1	0
167	4	1	2	1	8	7	-1	3	5	2	2

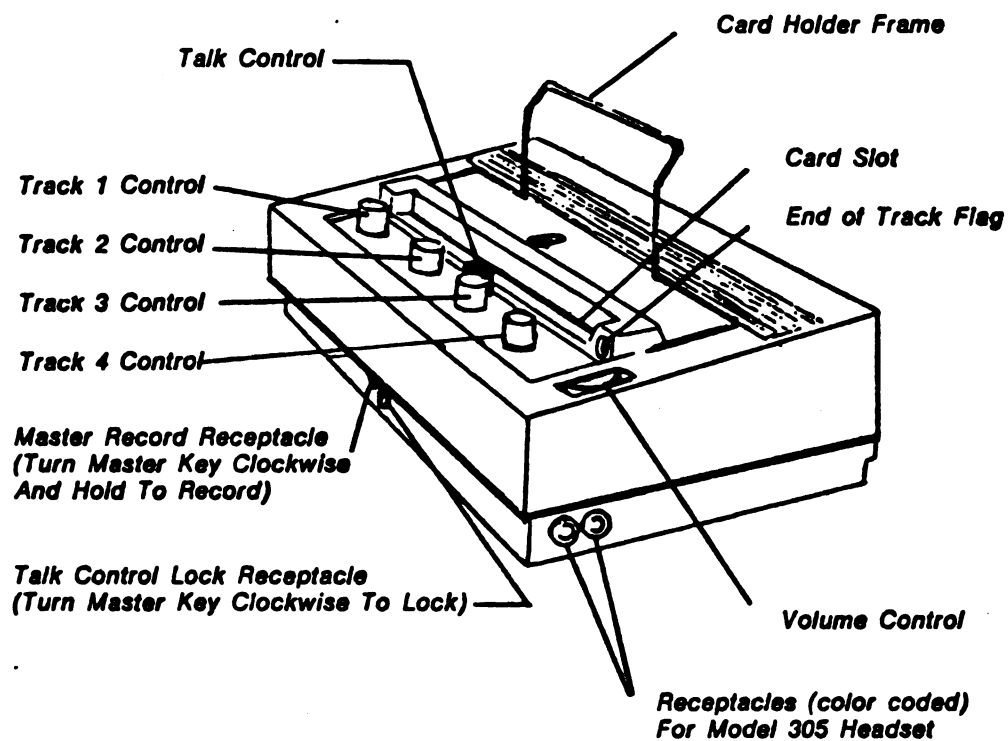
Student's Number	Treatment	Achieve- ment Level	Location	Sex	Pre 1	Post 1	Gain 1	Pre 2	Post 2	Gain 2	Naming
168	4	2	2	2	8	7	-1	6	5	-1	0
170	4	1	2	2	8	4	4	4	5	1	0
176	4	2	2	2	8	6	-2	7	5	-2	0
182	4	2	2	2	4	7	3	5	5	0	2
183	4	2	2	1	4	7	3	5	4	-1	0
184	4	1	2	2	7	7	0	3	6	3	0
189	4	1	2	1	7	5	-2	4	6	2	1
191	4	2	2	2	4	8	4	5	5	0	0
197	4	1	2	2	8	3	5	5	2	3	0
198	4	2	2	1	3	5	2	4	3	-1	0
199	4	2	2	2	8	8	0	2	7	5	1
205	4	2	2	1	6	8	2	4	4	0	1

APPENDIX F

ILLUSTRATION OF AN AUDIO FLASHCARD READER

APPENDIX F

ILLUSTRATION OF AUDIO FLASHCARD READER



Model 101M Audio Flashcard Reader