INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeeb Road
Ann Arbor, Michigan 48106

76-3790

HENDRIX, Dennis Herschel, 1948-
SELF-REINFORCEMENT IN CHILDREN AS A FUNCTION OF MONITORING, ACADEMIC ACHIEVEMENT, AND DEFINITION OF TASK.

The University of Arizona, Ph.D., 1975
Psychology, social

Xerox University Microfilms, Ann Arbor, Michigan 48106

THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED.

SELF-REINFORCEMENT IN CHILDREN AS A FUNCTION OF MONITORING, ACADEMIC ACHIEVEMENT, AND DEFINITION OF TASK

by

Dennis Herschel Hendrix

A Dissertation Submitted to the Faculty of the

DEPARTMENT OF PSYCHOLOGY

In Partial Fulfillment of the Requirements
For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

1 9 7 5

THE UNIVERSITY OF ARIZONA

GRADUATE COLLEGE

I hereby recommend that this dissertation prepared under my direction by Dennis Herschel Hendrix

entitled SELF-REINFORCEMENT IN CHILDREN AS A FUNCTION OF MONITORING, ACADEMIC ACHIEVEMENT, AND DEFINITION OF TASK

be accepted as fulfilling the dissertation requirement of the degree of DOCTOR OF PHILOSOPHY

Ralph J. Wetzel — Dissertation Director — 6/16/75 — Date

After inspection of the final copy of the dissertation, the following members of the Final Examination Committee concur in its approval and recommend its acceptance:*

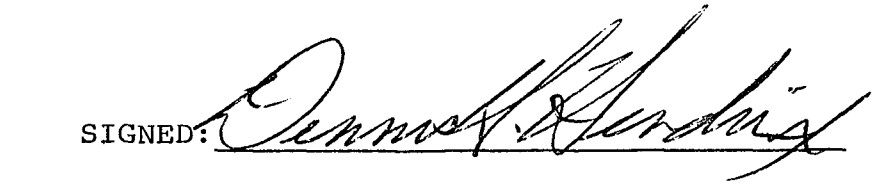
Ralph J. Wetzel	6/16/75
James E. King	6/9/75
Wayne R. Carroll	6/9/75
James C Chalfant	6/9/75

*This approval and acceptance is contingent on the candidate's adequate performance and defense of this dissertation at the final oral examination. The inclusion of this sheet bound into the library copy of the dissertation is evidence of satisfactory performance at the final examination.

STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: 

ACKNOWLEDGMENTS

I would like to thank Dr. Ralph J. Wetzel, my dissertation chairman, for his continuing interest in this research and for his comments and suggestions on the manuscript. Thanks also go to Dr. Wayne R. Carroll and Dr. James E. King for their comments and suggestions.

I also thank Dr. James C. Chalfant and Dr. Corrine E. Kass, my minor committee members, who were responsible for an important phase of my graduate training.

Special thanks go to the research department, principals, and teachers of Tucson School District 1 whose cooperation was invaluable in completing this research.

Finally, I thank my wife, Nancy, whose support smoothed many rough spots during my graduate career.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

ABSTRACT

In the self-reinforcement literature little attention has been focused on the consequences of self-reinforcement. The purpose of the present study was to determine how varying information about consequences of self-reinforcement would affect the self-reinforcement of subjects with varying learning histories. Ninety-six third grade students (48 boys and 48 girls), selected from the highest and lowest thirds of their respective classes, served as subjects. An equal number of high and low achievers were assigned to each of eight experimental treatments with the stipulation that each cell contain an equal number of boys and girls. The experimental task consisted of nine simple pencil mazes. For half the subjects the task was defined as a test and for half it was defined as a game. Subjects completed nine mazes, awarding themselves from zero to ten tokens for each maze, depending on the number they believed they had earned. The monitoring conditions consisted of the experimenter's telling the subjects either that their teacher, their classmates, the experimenter, or no one would know how many tokens they had taken.

None of the main effects was significant. The significant interactions indicated that, when the task was defined as a test, high achievers took significantly more

tokens than low achievers when told the teacher would count the tokens. Low achieving boys took significantly fewer tokens when the task was defined as a test than when it was defined as a game. Finally, when the task was defined as a game, subjects took more tokens when told that the experimenter would know how many tokens had been taken than when told that no one would know how many tokens had been taken. The results appear to reflect subjects' learning histories. High achievers, being accustomed to high scores on tests, rewarded themselves generously for test performance when the teacher was to know the scores. Under the same conditions, low achievers were extremely inhibited. Under the Game condition low achieving boys lost that inhibition, possibly indicating more past rewards for game performance. Another factor which seems to be reflected in the results is incentive value of potential acknowledgment from the experimenter for good scores. The results appear to indicate that children experience success and failure early in their school careers and that their perceptions of their own abilities are determined by those early experiences.

INTRODUCTION

The maintenance of human behavior not subject to external reinforcement is sometimes attributed to self-reinforcement. Bandura and Walters (1963) stress the importance of self-reinforcement in stating that, as the child spends less time with his parents, "self-generated stimuli may outweigh the influence of external stimuli in governing behavior" (p. 162). According to Skinner (1953), self-reinforcement "presupposes that the individual has it in his power to obtain reinforcement but does not do so until a particular response has been emitted" (p. 237). A considerable amount of research has focused on the factors which influence the timing and amount of reinforcement which a subject will self-administer. Some of those factors were explored in the present research.

Many relevant studies have emphasized events occurring prior to the opportunity to administer self-reinforcement. Most commonly investigated have been the effects of prior observation of a model. Often, subjects have observed a model who required himself to achieve a self-imposed standard of performance before taking a reinforcer. Subjects adhered to the modeled standard (Bandura and Kupers, 1964), and modeling was equal in effectiveness to direct training in producing adherence to the given

standard (Liebert and Allen, 1967; Liebert and Ora, 1968). Subjects violated a modeled standard if the model was obviously superior in ability or if the standard was too difficult to achieve (Bandura and Whalen, 1966). If the model adhered to one standard and imposed a different standard on the subjects, the subjects adopted the lower of the two standards (Mischel and Liebert, 1966; Rosenhan, Frederick, and Burrowes, 1968).

In some studies the subjects and model have been given an externally imposed criterion which they were to achieve before taking a reinforcer. If the model violated the criterion, reinforcing lower quality performance, the subjects also violated the criterion (Allen and Liebert, 1969). Subjects who saw two models, one who adhered to and one who deviated from the criterion, usually violated the criterion, particularly if the deviant model was the second of the two models to perform (McMains and Liebert, 1968; Heldebrandt, Feldman and Ditrichs, 1973).

In a second body of literature involving events prior to self-reinforcement, subjects have undergone experimentally produced success or failure experiences. The usual result has been that subjects who experienced success rewarded themselves more on a later task than did subjects who experienced failure (Mischel, Coates, and Raskoff, 1968; Masters, 1972; Masters and Peskay, 1972).

A third experimental event occurring prior to the opportunity to self-administer reinforcement has been an inequity experience in which a subject has received more or fewer tokens than a peer. A consistent result has been that subjects who received fewer tokens than the peer later rewarded themselves more generously than did subjects who received an equal number or more tokens than a partner (Masters, 1968, 1969, 1971).

Other variables might be expected to operate at the time of the self-administration of reinforcement rather than prior to it. One such variable which has been investigated by several authors is the contingency of reinforcement (Kanfer and Duerfeldt, 1968; Peskay and Masters, 1971; Masters and Peskay, 1972). As the terms are used in the self-reinforcement literature, "contingent reinforcement" is that which the subject takes when he thinks he has earned it; "noncontingent reinforcement" is that which the subject takes when he wants it regardless of whether or not it is earned. Results of studies involving "contingency" of reinforcement are somewhat complex, but a few findings seem noteworthy. Subjects who had experienced failure rewarded themselves less when the reinforcement was contingent than when it was noncontingent. Self-reinforcement of successful subjects did not differ under the two conditions (Masters, 1972; Masters and Peskay, 1972). When no success or failure experience preceded self-reinforcement, Peskay and Masters

(1971) found subjects more generous with contingent than with non-contingent self-reinforcement.

Relatively little attention has been focused on the events following the opportunity to self-administer reinforcement, but in the natural environment, these consequences are important. The child who moderates his self-reinforcement might later be rewarded for his modesty while the child who overindulges himself might suffer negative sanctions from his peers or superiors. In reality the consequences of a particular act cannot control that act because consequences do not occur until the act is completed. However, a subject might be led to anticipate the consequences of a given act if he is given information indicating that the consequences will be similar to those of previous acts in similar situations. Anticipation is seen as a covert response which is based on the individual's learning history and which will vary depending on the information the individual has concerning events in the future.

There is empirical support for the assumption that anticipated consequences will affect self-reinforcement. In separate experiments Mischel et al. (1968) found greater indulgence in noncontingent self-reinforcement by girls who were told no one would know how many tokens had been taken than by those who knew the experimenter would count the tokens. The authors attributed the difference to the presence or absence of privacy, but another explanation is possible. The effect of lack of privacy may vary depending

upon the characteristics of the person who is to know the results. In the Mischel et al. (1968) study the experimenter was an adult stranger who may have had an effect on subjects not produced by a familiar adult or a peer. Having no indication of the experimenter's power or influence, the reactions of subjects toward the experimenter's knowledge of their performances might have varied from apprehension to indifference. Had the adult been familiar to the subjects so that they knew what to expect from him, the results might have been different. The results might also have been different had subjects been told that a peer would count the tokens. Bandura and Kupers (1964) found that subjects adhered more strictly to a standard modeled by an adult than to one modeled by a peer. Although the evidence is indirect, it is possible that adults, in general, have an inhibiting effect on self-reinforcement which peers do not exert. The present study explored the possibility that familiar adults, strange adults, and peers differentially affect self-reinforcement.

In the present study the actual consequences of self-reinforcement were not manipulated. No consequences actually occurred, but subjects were told that one of four events would follow the self-reinforcement task. Subjects were informed that their teacher, their peers, the experimenter, or no one would know how many tokens they had taken. Thus through instructions given to the subjects, different

groups of subjects were led to expect different events following their self-reinforcement. Furthermore, it was assumed that subjects would have different learning histories associated with taking a test or playing a game, with being a high or low academic achiever, or with being a boy or a girl. The primary aim of this study was to determine whether subjects' varying learning histories coupled with varying information received about future events would affect self-reinforcement.

One variable included in the present study was the Monitoring variable, an operation designed to manipulate subjects' anticipation of consequences for self-reinforcement. Actual monitoring did not occur, but subjects were instructed that their scores would be revealed to different individuals in their environments. It was expected that subjects would alter their self-reinforcement depending upon who they were told would count their tokens. The Monitoring variable consisted of instructing subjects that their teacher, the experimenter, their peers, or no one would know how many tokens they had taken.

In addition to the Monitoring variable a Task Definition variable was included in the present study. Tasks in self-reinforcement research are nearly always defined for the subjects as games. Masters and Christy (1974) did use a task which was very much like a test and involved arithmetic, but no effort was made to compare test performance

with game performance. In the present study the task was defined as a game for half the subjects and as a test for the other half. The task was one in which all subjects succeeded easily, and the Task Definition manipulation was expected to change the value of success and, therefore, the amount of self-reinforcement.

A Task Definition variable such as that in the present study might be expected to interact with other variables, such as academic achievement. It is hypothesized that for some children, particularly high academic achievers, success on a test will be more important than success on a game. Other children, such as low academic achievers, might have learned to devalue academic achievement but still try to succeed in games. Academic achievement and the related variable of success-failure have been investigated in previous studies, but the results are conflicting. Haynes and Kanfer (1971) found high achievers more critical of their own performances and, therefore, more inhibited in their acceptance of self-reward. Furthermore, Kanfer and Duerfeldt (1968) found that high achievers accepted less undeserved self-reward than did low achievers. If high and low academic achievement may be regarded as academic success and failure, the opposite result seems to be indicated by several studies (Mischel et al., 1968; Masters, 1972; Masters and Peskay, 1972). These investigators found that subjects who had succeeded on a prior task self-administered

more reinforcement on a later task than did subjects who had experienced prior failure. In the present study it was not assumed that high and low academic achievement were equivalent to experimentally manipulated success or failure, but only that some relationship does exist. The difference in self-reinforcement corresponding to high and low achievement was expected to yield some information regarding the nature of that relationship.

The final variable included in the present research was the Sex variable. The relationship between sex of subjects and self-reinforcement is unclear from the results of published research. Mischel et al. (1968) found that subjects' knowledge that the experimenter would count the tokens affected girls more than boys. Other studies have also found girls to be more sensitive to experimental manipulations (e.g., Masters, 1968) while still others have reported no sex effect (e.g., Masters, 1971) or an interaction between sex and another variable (e.g., Bandura, Grusec, and Menlove, 1967). In an attempt to shed more light on this issue, the performance of boys was compared to that of girls.

The purpose of the present study, as stated earlier, was to determine whether subjects' varying learning histories coupled with varying information concerning future events would affect their self-reinforcement.

METHOD

Subjects

Subjects were 96 third-grade students (48 boys and 48 girls) from local schools in middle-class neighborhoods. Teachers were asked to identify the highest and lowest thirds of their classes with respect to academic achievement. An equal number (six) of high and low achievers were randomly assigned to each of eight experimental treatments with the stipulation that each cell contain an equal number of males and females.

Experimental Task

The experimental task consisted of a series of simple pencil mazes. The mazes used in the experimental task are reproduced in the Appendix. Each subject completed nine different mazes. The maze task was chosen for several reasons. First mazes could be made easy enough so that any child, regardless of academic ability, was able to complete them with little difficulty. Second, mazes could be introduced as either a test or a game. Finally, mazes had been used successfully in earlier studies (Mishel et al., 1968; Masters, 1972; Masters and Peskay, 1972). In the Game condition described below, the cover sheet on the mazes was headed "Maze Game," and in the

Test condition the cover sheet was headed "Writing Ability Test."

Procedure

Prior to calling subjects, the experimenter went into the classroom and announced that he would be asking some of the students to come with him to another room to draw some mazes.

Each subject was escorted to the experimental room and seated at a table on which were a booklet of mazes, pencils with erasers, a bowl of approximately 150 plastic tokens, and an empty bowl. A paper bag, a stapler, and a box containing other bags ostensibly placed there by previous subjects were also available. Each subject's bag had his name prominently printed on it in all but the Anonymous condition.

After the subject was seated, the experimenter delivered the following instructions in the Test condition:

> This is a test to measure how well children your age do some of the things you have to do when you write. In this test you take a maze and trace the path from the START to the FINISH. When you finish a maze, put from zero to ten tokens in this bowl, depending on how many you think you have earned. The more tokens you have, the better your score will be. Now, let me see you do the practice maze.

In the Game condition the underlined sentence was replaced with "I'm working on a new game and I want to see

how well children your age do on it," and any further reference to a test was replaced with the word "game."

After hearing the instructions, the subject was required to complete the first maze and take some tokens. The first maze was labeled "Practice Maze" and was not counted as one of the nine in the experimental task. Any subject who did not perform satisfactorily was given further assistance. When the subject had completed the practice maze successfully, the experimenter delivered the following instructions: "I'm going to leave for a few minutes. Do all the mazes and take the tokens you think you have earned. When you have finished your mazes, put your tokens in the bag, staple it closed, and put it in the box."

The Monitoring manipulation was carried out by following the above instructions with one of those given below:

Teacher-Knowledge: "I will ask your teacher to count your tokens to see what your score is."

Peer-Knowledge: "You and your classmates will count one another's tokens to see what your scores are."

Experimenter-Knowledge: "I will count your tokens to see what your score is."

Anonymous: "Don't put your name on the bag. The tokens will be counted but no one will know which ones are yours."

After delivering the instructions, the experimenter required the subject to tell him how many tokens he could take for each maze and who would know how many tokens had been taken. When necessary, portions of the instructions were repeated. The experimenter then replaced the tokens taken for the first maze explaining that those were just for practice. The experimenter reminded the subject to do all the mazes and left the room announcing that he would be waiting outside. After the subject had deposited his tokens, he was escorted back to class.

After all subjects from a school had participated, the experimenter returned to the classroom and told the subjects they had participated in a special kind of experiment. All of the Monitoring and Definition conditions were revealed, and subjects' questions were answered.

Experimental Design

The experimental design was a 4 x 2 x 2 x 2 (Monitoring x Task Definition x Academic Achievement x Sex) randomized groups design and is diagrammed in Figure 1. The Monitoring variable consisted of Teacher Knowledge, Peer Knowledge, Experimenter Knowledge, and Anonymous conditions. The Task Definition variable consisted of Test and Game conditions. Levels of the Academic Achievement variable were High and Low Achievers and Levels of the Sex variable were Boys and Girls.

	Test				Game			
	High Achievers		Low Achievers		High Achievers		Low Achievers	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Teacher Knowledge								
Peer Knowledge								
Experimenter Knowledge								
Anonymous								

Figure 1. Experimental Design

The dependent variable was the number of tokens taken by each subject on the maze-drawing task and was analyzed by means of an Analysis of Variance. Post hoc analyses by means of Tukey tests (Winer, 1962) were performed where appropriate.

RESULTS

The dependent variable was the number of tokens taken by each subject on the maze-drawing task. A 4 x 2 x 2 x 2 (Monitoring x Task Definition x Academic Achievement x Sex) Analysis of Variance was performed on the results. None of the main effects reached significance at the .05 level. Subjects administered similar amounts of self-reinforcement regardless of sex, academic achievement, definition of the task, or who they believed would know their scores.

The Monitoring x Task Definition x Academic Achievement interaction was significant ($F = 2.86$, $df = 3/64$, $p < .05$). That interaction is presented in Figure 2. Tukey analyses (Winer, 1962) at the .05 level revealed that, under the combination of Teacher-Knowledge and Test conditions, low achievers took significantly fewer tokens than did high achievers. There were no other significant differences under the Test condition nor were there any significant differences among the means in the Game condition.

The Task Definition x Academic Achievement x Sex interaction was also significant ($F = 6.82$, $df = 1/64$, $p < .025$) and is presented graphically in Figure 3. Tukey analyses at the .05 level revealed that, among boys, low

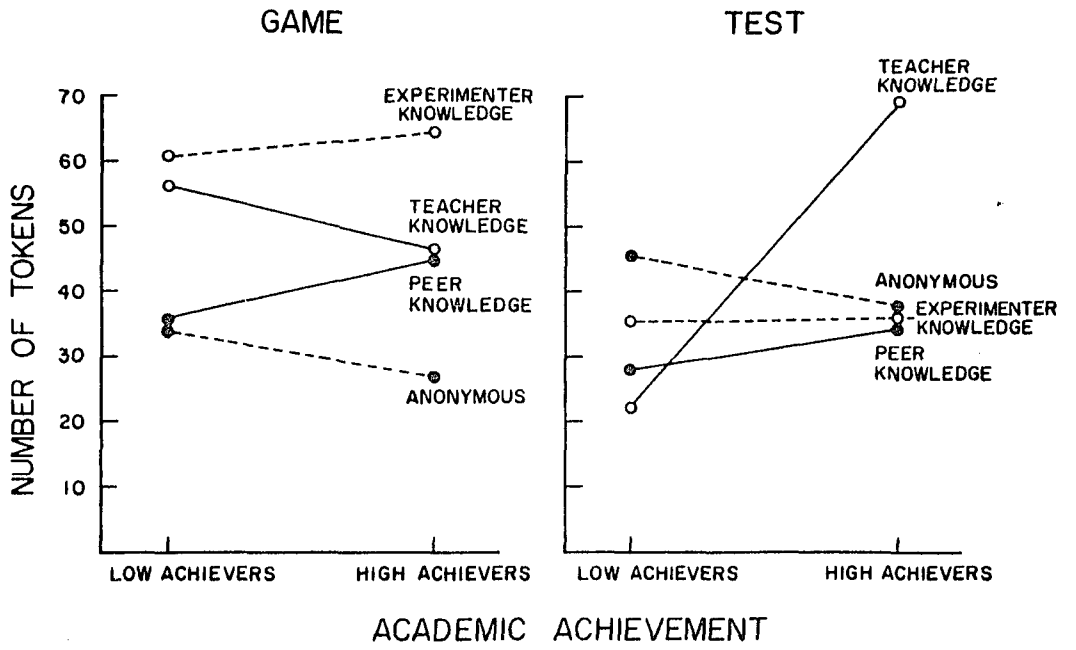


Figure 2. Monitoring x Task Definition x Academic Achievement Interaction

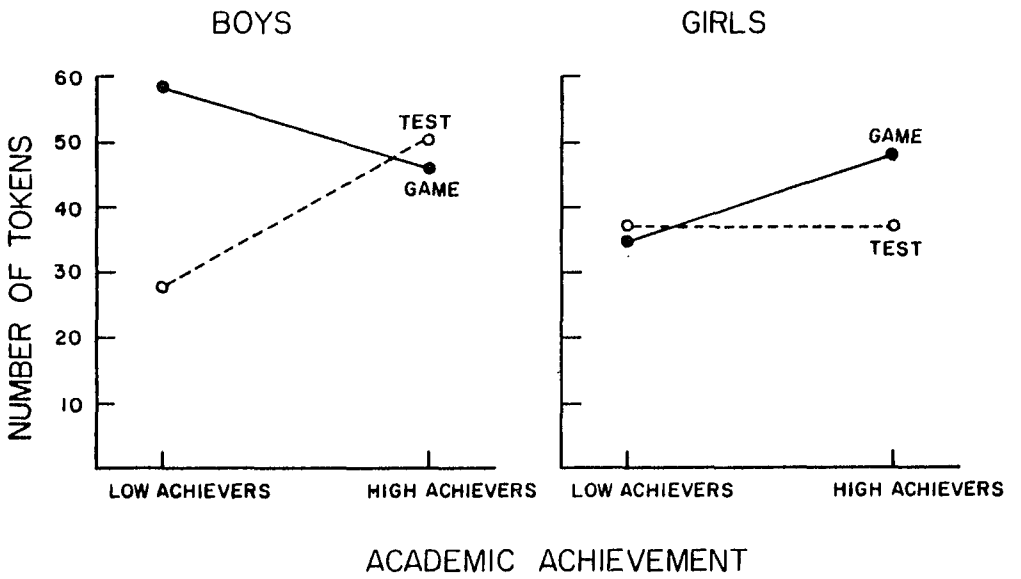


Figure 3. Task Definition x Academic Achievement x Sex Interaction

achievers took significantly fewer tokens in the Test condition than in the Game condition. Neither the high achieving boys nor any of the groups of girls exhibited any significant differences in the number of tokens taken.

The third interaction to reach significance was the Task Definition x Monitoring interaction ($F = 2.79$, $df = 3/64$, $p < .05$). The interaction is presented graphically in Figure 4. Tukey tests at the .05 level revealed a significant difference between the Experimenter-Knowledge and Anonymous conditions when the task was introduced as a game. Subjects who were told the experimenter would count the tokens took significantly more tokens than those who were told no one would know how many tokens had been taken. There were no significant differences in the Test condition.

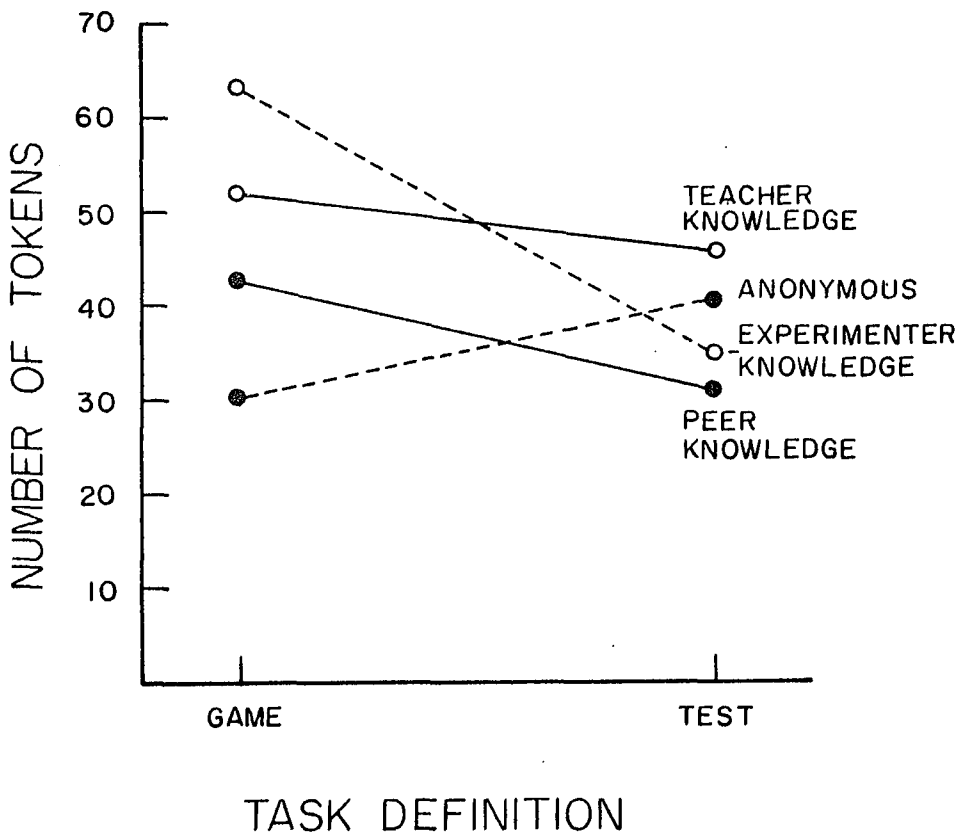


Figure 4. Monitoring x Task Definition Interaction

DISCUSSION

Although none of the main effects was significant, all four independent variables entered into significant interactions.

One of the significant interactions was the Monitoring x Task Definition x Academic Achievement interaction. In the Test condition high achievers took significantly more tokens than did low achievers when told that the teacher would count the tokens. High achievers took an average of nearly eight tokens per maze while low achievers averaged only 2.5 tokens per maze although the simplicity of the task was such that extremely superior and extremely inferior performances were not possible. These results are consistent with those obtained when success and failure are experimentally manipulated (Mischel et al., 1968; Masters, 1972; Masters and Peskay, 1972).

It seems that subjects' reinforcement histories did influence their self-reinforcement. In academic tasks it is the teacher who has almost complete control over dispensing and witholding reinforcement. Although reinforcement may come from other sources, it is probably the teacher who determines when and where it will be dispensed. High achievers, having received substantial amounts of reinforcement from the teacher, expect it in the future, while low

achievers do not expect much teacher reinforcement. Some might even fear a negative reaction from the teacher if they award themselves scores inconsistent with past performance.

Aside from liberal standards of the high achievers, self-reinforcement in the Test condition was relatively conservative, and the scores of the various groups were markedly similar. The average scores of the high and low achievers in the Experimenter-Knowledge condition differed by less than one point. Since neither group had any reinforcement history associated with the experimenter, both groups might be expected to have similar, uncertain expectations of the events following their self-reinforcement. The Peer-Knowledge scores were as conservative and nearly as similar as the Experimenter-Knowledge scores possibly indicating that neither high nor low achievers receive much peer reinforcement for academic achievement. In the Anonymous condition a lack of incentive to self-administer reinforcement would be expected.

Another interaction to reach significance was the Task Definition x Academic Achievement x Sex interaction. Low achieving boys were relatively inhibited in taking tokens in the Test condition but reinforced themselves freely in the Game condition. High achieving boys were not affected by the manipulation, nor were high or low achieving girls. The performance of low achieving boys is, again,

consistent with the results obtained when success and failure are experimentally manipulated (Mischel et al., 1968; Masters, 1972; Masters and Peskay, 1972). It appears to support the assumption, expressed earlier, that low academic achievement is related to experimentally induced failure. Performance of low achieving boys is also consistent with Feather's (1966) finding that subjects who had experienced failure on one task did not expect to succeed on a subsequent task. Low achieving children, even as early as the third grade, have probably experienced failure on tests. They might expect their performances to be inferior on any test, especially without objective evidence to the contrary. On the other hand, while success on a game is not guaranteed, it is probably more likely for low achievers than is academic success. Consequently, low achievers indulged more freely in reinforcement for game performance. The same reasoning applies to high achieving boys except that they have probably experienced less disparity between test and game success. This similarity is reflected in the similarity in test and game scores of high achieving boys.

The behavior of the girls was quite different from that of boys. Self-reinforcement of high and low achieving girls was essentially the same, and both were relatively unaffected by the Task Definition manipulation. One possible interpretation is that low achieving girls, those rated in the lower third of their classes by their teachers,

experience fewer academic failures than do low achieving boys. Hallahan and Cruickshank (1973) support this supposition in stating that more boys than girls experience reading problems. They also state that boys more frequently exhibit problems of a visual nature and are overrepresented in the learning disability population.

The Monitoring x Task Definition interaction indicates that subjects took significantly more tokens in the Experimenter-Knowledge condition than in the Anonymous condition when the task was defined as a game. No significant differences appeared when the task was defined as a test. It seems likely that incentive conditions (i.e., anticipated consequences) might have played an important role in these results. The game was introduced as one on which the experimenter, himself, was working. He was the one who wanted to see how well the subjects would do on it. Subjects might have wanted to show the experimenter that they could do well on his game for whatever acknowledgment might have resulted. This interpretation is consistent with the observation by Mischel et al. (1968) that successful subjects wanted to help the experimenter. The Anonymous condition, in contrast, held no possibility of any kind of personal acknowledgment, and subjects appeared to take just enough tokens to fulfill the requirements of the task.

While there were no other significant differences among the Game scores and no significant differences among

the Test scores in the Monitoring x Task Definition interaction, the difference in the ranges of scores is suggestive. The range of group means in the Game condition was 32 tokens awarded. In the Test condition the difference between the highest and lowest group means was only 15 tokens. More clear-cut standards for test performance might be indicated. Another possible interpretation is that serious negative sanctions for inflating one's test score exist.

Several features of the present study were designed to relate the experimental situation to conditions in the child's natural school environment. First, the introduction of the task as a "writing ability test" was expected to cause subjects to associate the task with an academic skill and, thereby, increase the importance of doing well. Second, no "prizes" were offered or said to be exchangeable for the tokens. In the natural environment, particularly the classroom, material rewards are seldom offered. Symbolic rewards, such as good grades or gold stars, may or may not lead to praise from teachers and peers. Inadequate performance may lead to negative sanctions. Finally, it was assumed that high and low academic achievement are real-life instances of success and failure and should have some of the same effects as experimentally manipulated success and failure.

It was hoped that relating the experimental procedures as closely as possible to the natural environment

would produce results which were immediately applicable. In this respect several of the findings are of particular interest. First, the large difference between the scores of high and low achievers under the combination of Teacher-Knowledge and Test conditions suggests a distorted perception by subjects of their own ability. The mazes were purposely designed to be easy and to prevent any objective evaluation by the subjects of their work. Although the subjects themselves did not know it, there were no perceivable differences in performance on the mazes by high and low achievers. Yet, the difference in the average number of tokens by these two groups was nearly 50, or about 5.5 tokens per maze.

Another indication of distorted self-perception is the difference in scores of low achieving boys who were told the task was a test compared to those who were told the task was a game. Again, there were no differences in actual task performance, but the Game scores surpassed the Test scores by 30 points or about 3.3 points per maze.

There is an apparent contradiction between the present results and those of Bridgeman, Strang, and Buttram (1974) with respect to the Test-Game manipulation. The latter authors found that WISC scaled scores of sixth grade students were higher when told that the task was a test than when told it was a game. The scores of third grade students did not differ. The difference exhibited by the sixth grade

students was attributed to greater motivation in the Test condition. The authors concluded that third grade students had not had sufficient experience with formal testing to produce a motivational difference. The results of the present study, in contrast, indicate that third grade children did differentiate between the Test and Game labels and that their self-reinforcement was affected by those labels.

Apparently, very early in the child's school career, success or failure begins to be expected and accepted as a way of life. For high achievers this attitude is ideal since it means that they will continue striving for success. The low achievers, however, seem to have given up almost before they have begun. The present study does not suggest any ways to transform low achievers into high achievers, but it does suggest that one of the causes of low achievement is low achievement, itself. Likewise, one of the causes of high achievement is probably a history of high achievement which has been reinforcing to the child. By breaking academic tasks into small steps and providing substantial reinforcement for any success, a history of reinforcement for achievement can be established in low achievers. If low achievers can be made to feel that success and, more specifically, teacher reinforcement are within reach, the impact of past failures might be reduced.

Low achievement is a complex problem involving factors such as parental attitudes toward achievement, overall home environment and peer influences. Increasing the availability of teacher reinforcement to low achievers will probably not, by itself, transform them into high achievers, but it should help to increase motivation to achieve. Further research might indicate whether increased availability of reinforcement is reflected in a child's self-reinforcement and whether higher academic achievement will follow.

Another possible target for future research is suggested by the Monitoring x Task Definition interaction. The results under the Game condition appear to be the reverse of those obtained by Mischel et al. (1968) who found girls to take more tokens in the Anonymous condition than in the Experimenter-Knowledge condition. Although the present study was, to some extent, an outgrowth of the Mischel et al. study, there were a number of procedural differences which could easily account for the differences in results. First, in the earlier study two experiments were compared to show that girls in the Anonymous condition were less inhibited. No test of significance was possible so the observed difference, although suggestive, might have been due to chance. If it is assumed that the observed difference was due to the privacy manipulation, there are other explanations for the difference between the two studies. In the earlier study

prizes were promised as a reward for high scores, the higher the score, the better the prize. In the present study no prizes were offered; the only reward was whatever acknowledgment might come from the person who counted the tokens. Moreover, the Anonymous condition in the earlier study was anonymous only to the extent that the experimenter supposedly would not know the scores. Subjects were told that "another lady" would count the tokens and award the prizes. By implication she would know each subject's score. Subjects in the Anonymous condition of the present study were specifically told that, although the tokens would be counted, no one would be able to match the subjects with their scores. A final consideration concerns the contingency of the reinforcement. Subjects in the present study were instructed to take the tokens they believed they had earned; reinforcement was to have been contingent on performance. Mischel et al. (1968) define their reinforcement as noncontingent, but in reality, it appears to have been contingent on subjects' enjoyment of the task.

Earlier, the explanation offered was that possible acknowledgment from the experimenter provided an incentive to achieve while no such incentive was present in the Anonymous condition. While this explanation seems to be satisfactory in the present study, further research might continue to focus on true anonymity and true noncontingent

self-reinforcement, neither of which was present in the Mischel et al. (1968) study.

Part of the theoretical basis for the present study is that subjects' expectations of the consequences of self-reinforcement influence their behavior. It is proposed that the nature of these expectations depends upon subjects' reinforcement histories. This position is essentially the one espoused by Rotter (1966). While the present study was not conducted with Rotter's position in mind, there are some relationships between the Rotter paper and the results of the present study.

Rotter (1966) states that an individual's reinforcement history determines whether he will be "internally" or "externally" controlled. One is internally controlled when he sees reinforcement as being contingent upon, and thus a function of, his own behavior. The externally controlled individual sees reinforcement as being controlled by luck, fate, or some powerful person. Rotter relates the concepts of internal and external control to levels of achievement. Internally controlled individuals would be expected to strive for achievement since they would hold themselves responsible for their own well-being. Externally controlled individuals, believing that they have little control over their own welfare, should be less likely to strive for achievement.

With respect to the present study, it was proposed earlier that low achievers do not expect much reinforcement from their teachers. It is possible that they have repeatedly tried and failed and now regard reinforcement to be totally under the control of the teacher (i.e., a powerful person). High achievers, in contrast, have probably experienced a much more consistent relationship between their striving for success and receiving teacher reinforcement.

Self-reinforcement is internally controlled; the subject completely determines the amount he obtains. It might be expected that low achievers, having finally received an opportunity to determine the amount of reinforcement they obtain, would reward themselves generously. Their failure to take a large number of tokens under the combination of Teacher-Knowledge and Test conditions might indicate that they did not believe high test scores would lead to teacher reinforcement. High achievers, however, seem to have been assured that a large number of tokens, not particularly reinforcing in themselves, would lead to some recognition for good test performance from the teacher.

One can infer from Rotter's (1966) position that he does not believe that simply building in reinforcing experiences will necessarily produce better performance in low achievers. He states that reinforcers will strengthen

a behavior only if the individual sees the reinforcing event as a result of his own actions. In other words, the child must receive the reinforcement and he must perceive it as a product of something he has actually done. If he sees the reinforcer as a contrived event which the teacher has designed to make him "feel better," the benefit will be negligible.

Several times this discussion has implied that self-reinforcement is an index of self-perception and attitudes toward achievement. These are actually personality constructs and cannot be directly observed. In his book, Personality and Assessment, Mischel (1968) states that one of the problems associated with personality constructs is the selection of behavioral referents for each construct.

The present study provides preliminary evidence that self-reinforcement might be one behavioral referent for the construct of self-perception or self-concept. In selecting behavioral referents for a construct, Mischel warns that extensive validity research is necessary to establish the relationship between the construct and an observable behavior. Construct validity research involves generating and testing hypotheses about how the construct (self-concept) as manifested by the test behavior (self-reinforcement) relates to other behaviors thought to reflect the construct (Mischel, 1968).

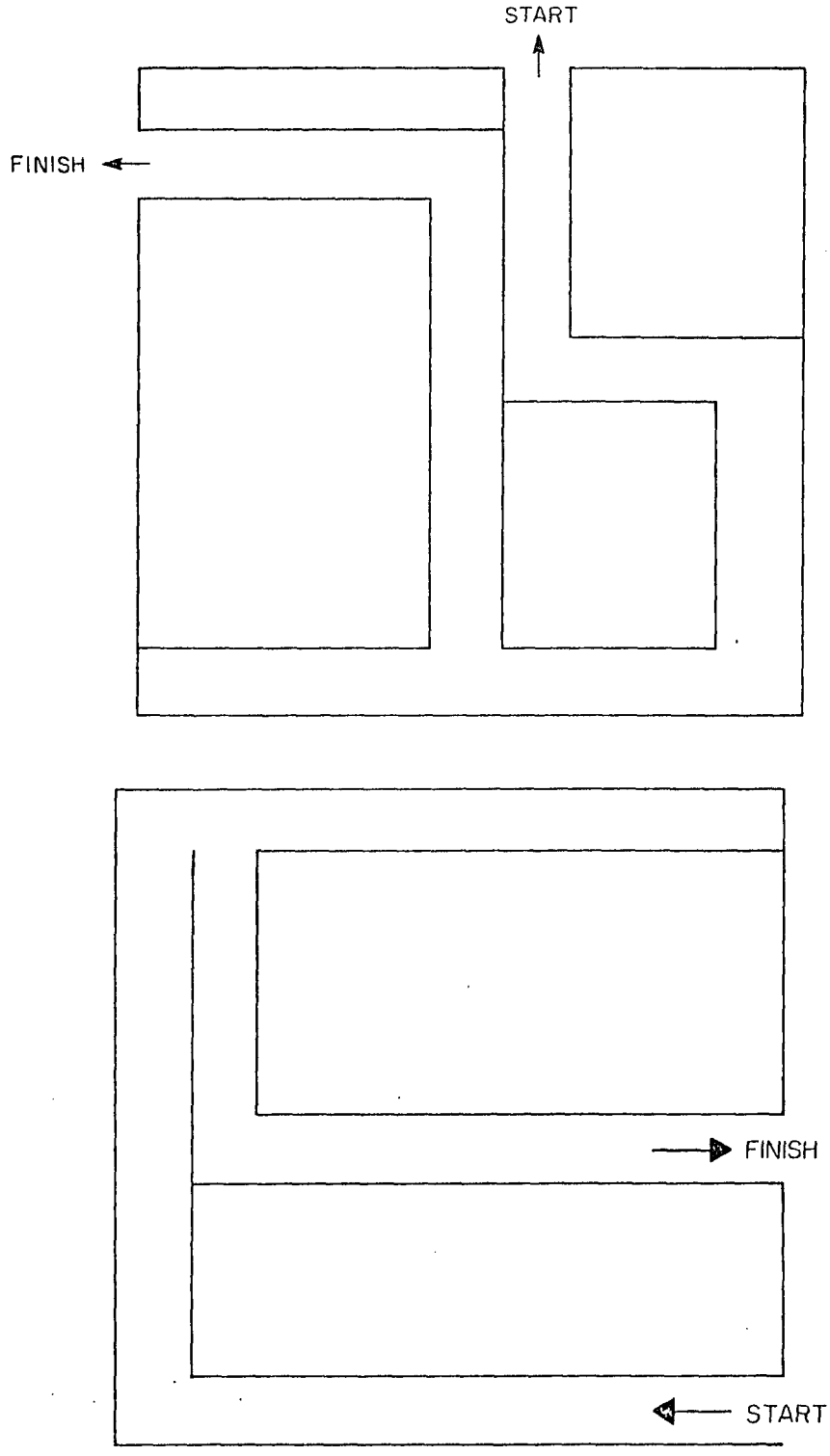
After construct validity has been established, the next research need is to attribute a causal role to the construct (Mischel, 1968). Self-reinforcement is sensitive to several manipulations as noted in the Introduction to the present research. The question which remains concerns the causal effect of various levels of self-reinforcement on subsequent behavior. Especially interesting as an extension of the present study would be an indication of the effect on academic achievement of improving a subject's self-concept. In other words, will building a history of success experiences cause a subject to exhibit more liberal self-reinforcement and higher academic achievement?

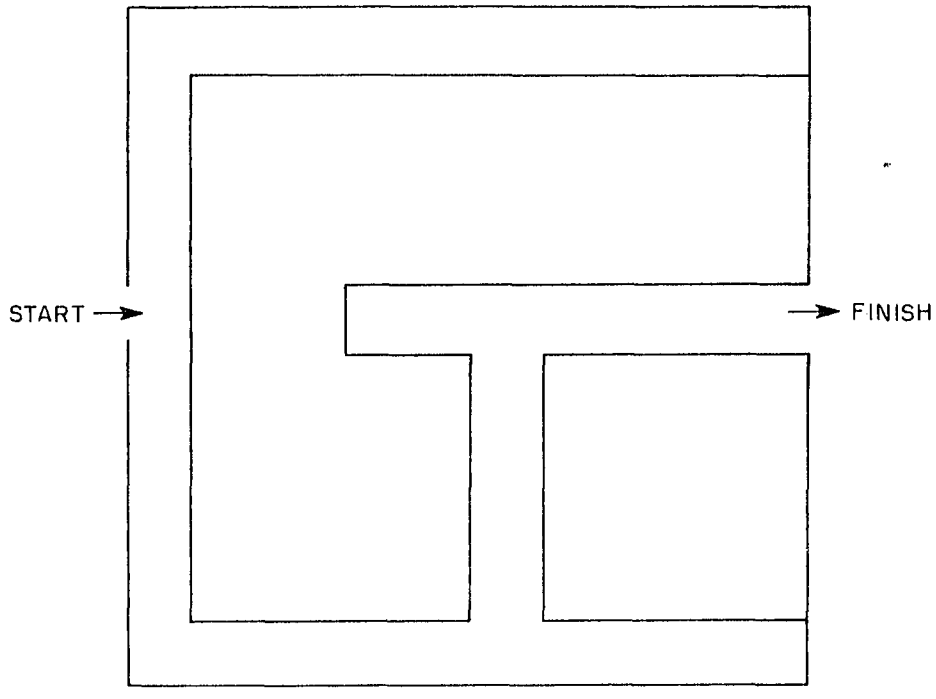
APPENDIX

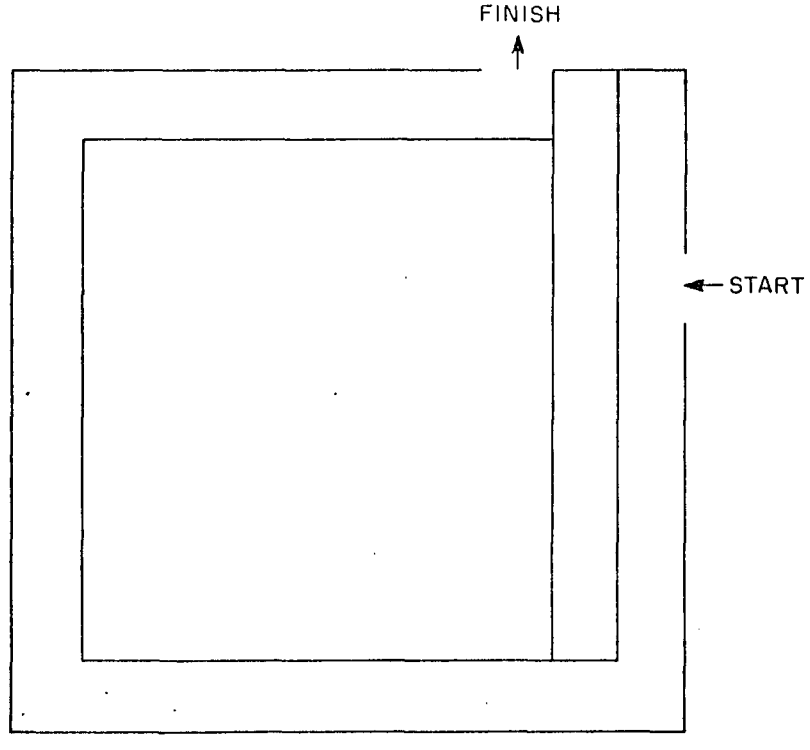
THE EXPERIMENTAL TASK

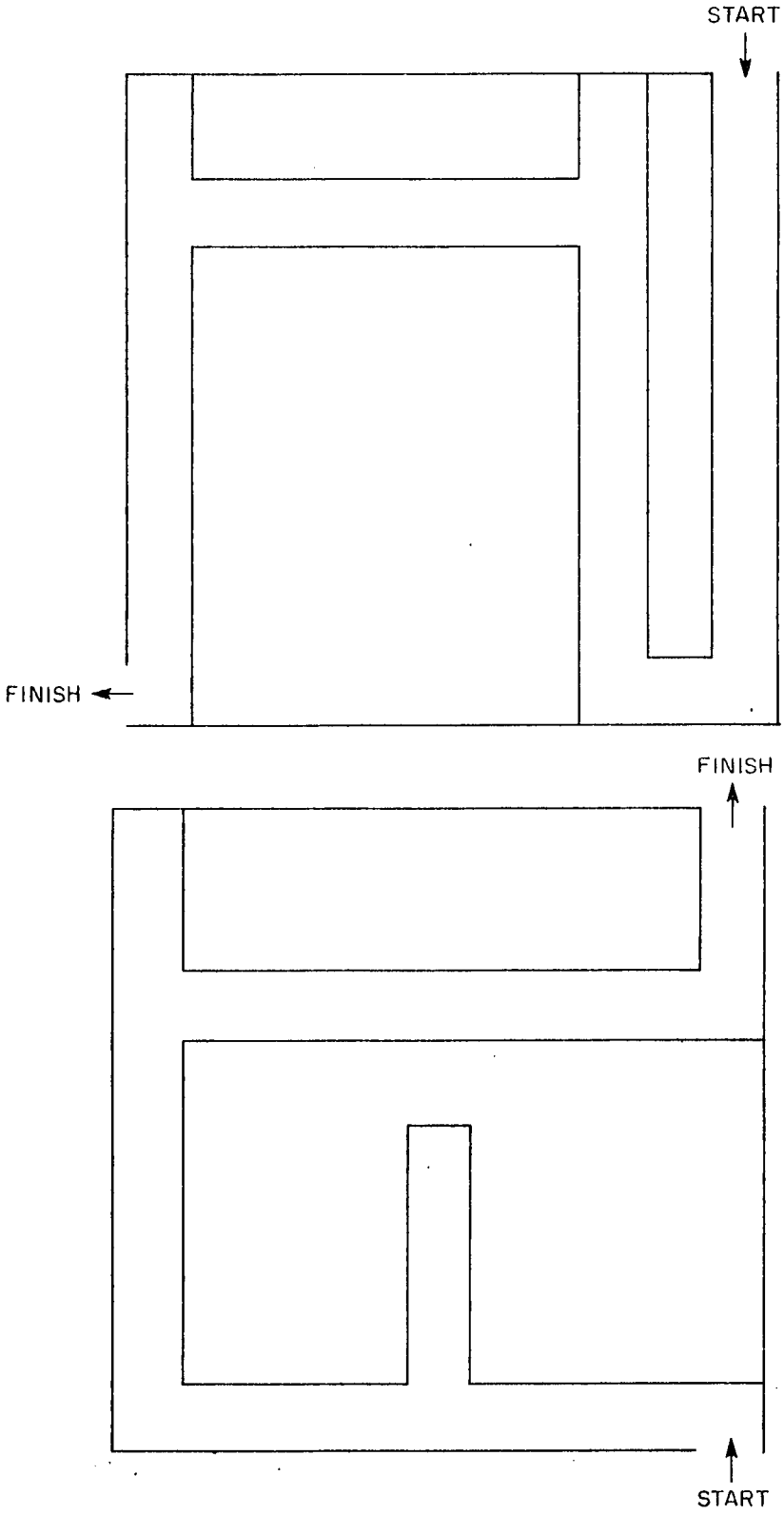
The mazes were presented, one per page, on 8-1/2" x 11" white paper. The actual size of each maze was 5" x 5".

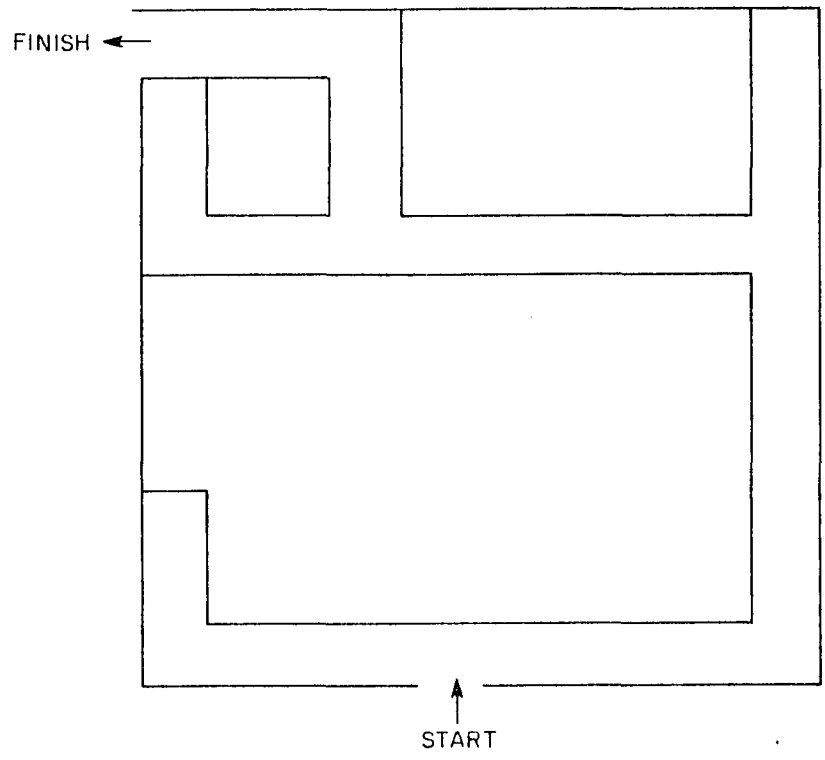
Practice Maze

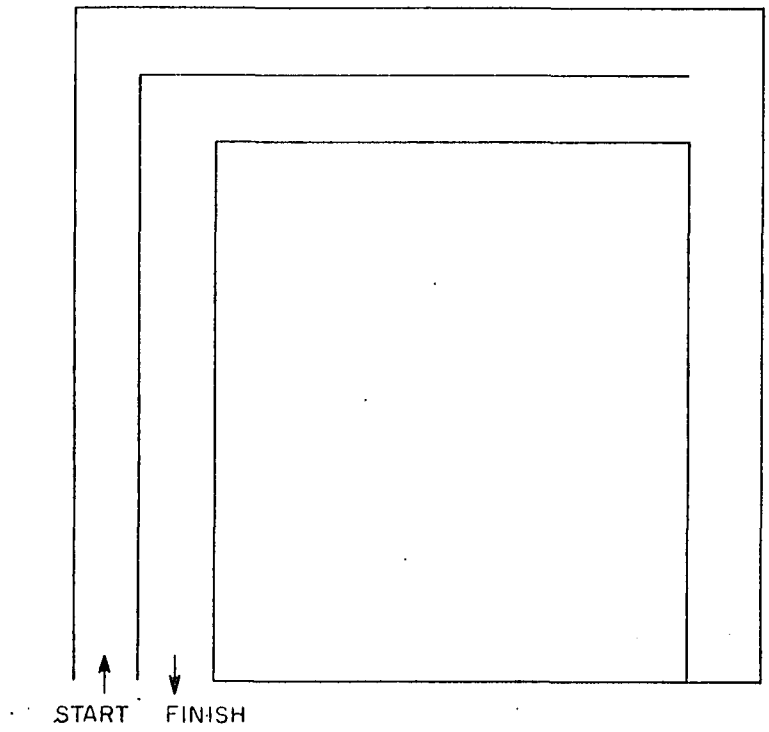


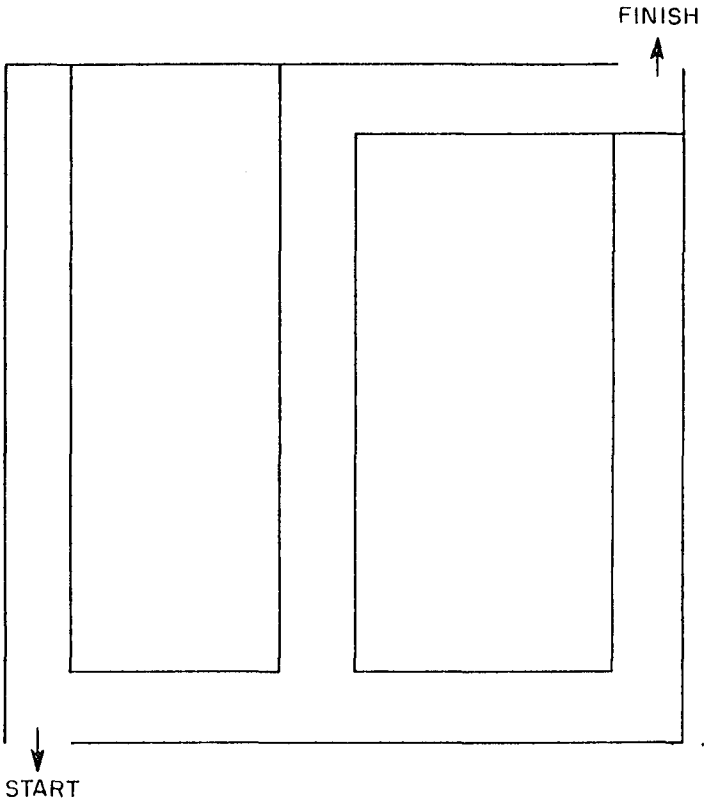

START
FINISH

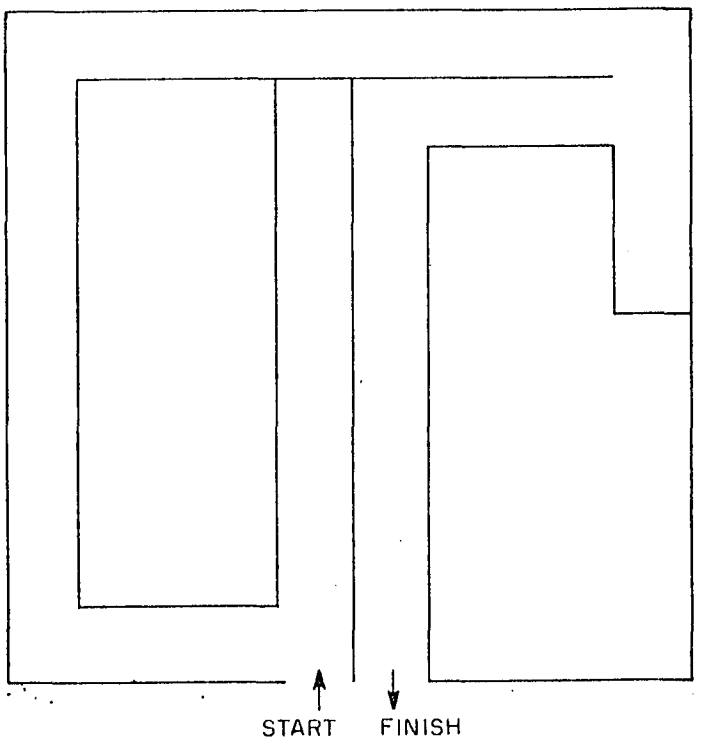

FINISH
START


START
FINISH
FINISH
START


FINISH
START


START
FINISH


FINISH
START


START
FINISH

REFERENCES

Allen, M. K., and Liebert, R. M. Effects of live and symbolic deviant modeling cues on the adoption of a previously learned standard. Journal of Personality and Social Psychology, 1969, 11, 253-260.

Bandura, A., Grusec, J. E., and Menlove, F. L. Some social determinants of self-monitoring reinforcement systems. Journal of Personality and Social Psychology, 1967, 5, 449-455.

Bandura, A., and Kupers, C. J. Transmission of patterns of self-reinforcement through modeling. Journal of Abnormal and Social Psychology, 1964, 69, 1-9.

Bandura, A., and Walters, R. Social learning and personality development. New York: Holt, Rinehart and Winston, 1963.

Bandura, A., and Whalen, C. K. The influence of antecedant reinforcement cues and divergent modeling cues on patterns of self-reward. Journal of Personality and Social Psychology, 1966, 3, 373-382.

Bridgeman, B., Strang, H. R., and Buttram, J. "Game" versus "test" instructions for the WISC. Journal of Educational Measurement, 1974, 11, 285-288.

Feather, N. T. Effects of prior success and failure on expectations of success and subsequent performance. Journal of Personality and Social Psychology, 1966, 3, 287-298.

Hallahan, D. P., and Cruickshank, W. M. Psychoeducational foundations of learning disabilities. Englewood Cliffs, N. J.: Prentice-Hall, 1973.

Haynes, L. E., and Kanfer, F. H. Academic rank, task feedback, and self-reinforcement in children. Psychological Reports, 1971, 28, 967-974.

Heldebrandt, D. E., Feldman, S. E., and Ditrichs, R. A. Rules, models, and self-reinforcement in children. Journal of Personality and Social Psychology, 1973, 25, 1-5.

Kanfer, F. H., and Duerfeldt, P. Age, class standing, and commitment as determinants of cheating in children. Child Development, 1968, 39, 545-557.

Liebert, R. M., and Allen, M. K. Effects of rule structure and reward magnitude on the acquisition and adoption of self-reward criteria. Psychological Reports, 1967, 21, 445-452.

Liebert, R. M., and Ora, J., Jr. Children's adoption of self-reward patterns: Incentive level and method of transmission. Child Development, 1968, 39, 537-544.

Masters, J. C. Effects of social comparison upon subsequent self-reinforcement behavior in children. Journal of Personality and Social Psychology, 1968, 10, 391-401.

Masters, J. C. Social comparison, self-reinforcement and the value of a reinforcer. Child Development, 1969, 40, 1027-1038.

Masters, J. C. Effects of social comparison upon children's self-reinforcement and altruism toward competitors and friends. Developmental Psychology, 1971, 5, 64-72.

Masters, J. C. Effects of success, failure, and reward outcome upon contingent and non-contingent self-reward. Developmental Psychology, 1972, 7, 110-118.

Masters, J. C., and Christy, M. D. Achievement standards for contingent self-reinforcement: Effects of task length and task difficulty. Child Development, 1974, 45, 6-13.

Masters, J. C., and Peskay, J. Effects of race, socio-economic status and success or failure upon contingent and noncontingent self-reinforcement in children. Developmental Psychology, 1972, 7, 139-145.

McMains, M. J., and Liebert, R. M. Influence of discrepancies between successively modeled self-reward criteria on the adoption of a self-imposed standard. Journal of Personality and Social Psychology, 1968, 8, 166-171.

Mischel, W. Personality and assessment. New York: John Wiley and Sons, 1968.

Mischel, W., Coates, D. B., and Raskoff, A. Effects of success and failure on self-gratification. Journal of Personality and Social Psychology, 1968, 10, 381-390.

Mischel, W., and Liebert, R. M. Effects of discrepancies between observed and imposed reward criteria on their acquisition and transmission. Journal of Personality and Social Psychology, 1966, 3, 45-53.

Peskay, J., and Masters, J. C. Effects of socioeconomic status and value of reinforcer upon self-reinforcement by children. Child Development, 1971, 42, 2120-2123.

Rosenhan, D., Frederick, F., and Burrowes, A. Preaching and practicing: Effects of channel discrepancy on norm internalization. Child Development, 1968, 39, 291-301.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs, 1966, 80, Whole No. 609.

Skinner, B. F. Science and human behavior. New York: The Free Press, 1953.

Winer, B. J. Statistical principles in experimental design. New York: McGraw-Hill, 1962.