

INCREASED DELAY OF  
GRATIFICATION IN  
YOUNG PRISON...

J. Stumphauzer, 1969

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INCREASED DELAY OF GRATIFICATION IN YOUNG PRISON INMATES  
THROUGH IMITATION OF HIGH-DELAY PEER-MODELS

JEROME STEPHEN STUMPHAUZER

A Dissertation submitted to the  
Department of Psychology  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

Approved:

*Richard A. Kimmel*  
Professor Directing Dissertation

*S. J. May*  
*Carol Egan*  
*A. Cooper Bulie*  
*T. J. Hendel*

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And I wonder, how long can I delay?

--Simon and Garfunkel

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## I. INTRODUCTION

Few would question that crime among young people is a major concern for both the general public and the treatment-research community. Tunley (1964) reports that apart from peace and national survival, Americans are more interested in delinquency than in any other problem. The figures in the Federal Bureau of Investigation's annual Uniform Crime Report's are often quoted as suggestive of the extent of the problem. In 1967, for example, there were more than two million arrests of persons under 21 years of age. Arbuckle and Litwack (1960) estimate recidivism rates for juvenile parolees at from 43 to 73 percent, whereas Attorney General Kennedy (1964) found the rate to be 50 percent. Kennedy estimated the cost of keeping a youthful offender in an institution at as much as \$3,500 a year.

The reported treatment of delinquents and youthful offenders gives little promise of success in lessening this national problem. The well-publicized Cambridge-Somerville project found no significant differences between treatment and control groups (McCord, McCord, & Zola, 1959; Powers & Witmer, 1951). Psychiatric treatment of delinquents is reported to have had no effect on number of subsequent court

appearances (Teuber & Powers, 1951). Gordon (1962) found the addition of individual therapy to a group treatment program resulted in less success than group treatment alone. One investigator (Meece, 1961) even reported that treatment did more harm than good in terms of anxiety, academic achievement, and reading skill. Results such as these suggest that new approaches to the treatment of youthful criminal offenders are needed.

Behavior modification and behavior therapy are receiving increased coverage in the literature. For example, Behavior Research and Therapy has increased to a circulation of over 1000 in six years (H. J. Eysenck, personal communication). A new journal, the Journal of Applied Behavior Analysis, has just made its appearance. Several reviews of behavior modification and therapy are currently available: Bandura (1961, 1967, & in press), Gelfand and Hartman (1968), Grossberg (1964), Krasner and Ullmann (1965), Wolpe (1958), and Wolpe, Salter, and Reyna (1964). The emphasis in the conditioning therapy of children and adolescents has been either on the treatment of behavioral deficits or on the treatment of phobias (Werry & Wollersheim, 1967). A number of studies are reported which utilize behavior modification and therapy

with juvenile delinquents. This circumscribed area has been reviewed in detail elsewhere (Stumphauzer, 1969). One particularly promising behavior modification approach is the use of imitative learning, and that area needs more extensive review here.

#### Psychotherapeutic Application of Imitative Learning

There is little doubt that observational learning takes place in individual and certainly in group therapy. Rosenthal (1955), for example, found that in treatment cases termed successful, patients changed moral values in the direction of those of the therapist. Alexander (1967) provides a case-study in support of the idea that the therapist is a model. Mowrer (1956) offers an extensive discussion of the importance of modeling in therapy. He feels that typically therapists all but display the kinds of behaviors they want from their patients:

What in conventional therapy does the therapist do which, if imitated by the patient, would be particularly therapeutic? The therapist is silent a good deal of the time, and the patient is expected to talk. And when the therapist does speak, it is usually, in psychoanalysis, to make interpretation or, in Rogerian counseling, to reflect and hopefully clarify what the client has said (p. 451).

Setting out specifically to implement imitative learning as a treatment regime is not a new approach,

but it only recently has received extensive attention in the literature. In a now classical study in the field of imitation and behavior therapy, Jones (1924) used modeling techniques for the elimination of children's fears. A subject who feared rabbits observed peers showing no fear in the dreaded situation and subsequently the subject's own fear subsided. Some forty years elapsed between this report of the therapeutic use of imitation and the next.

By far, most of the recent interest in this area has been centered around the treatment of severe behavioral deficits, e.g., childhood autism and retardation. This may be due to the fact that one of the symptoms of these children is often a failure to imitate (Ritvo & Provence, 1953). Baer and Sherman (1964), Hewett (1965), Lovaas, Berberich, Perloff, and Schaeffer (1966), Lovaas, Freitas, Nelson, and Whalen (1967), and Baer, Peterson, and Sherman (1967) all report the use of operant learning techniques in the establishment of imitative repertoires in retarded, autistic, and schizophrenic children. Since the operant rates of imitation were either low or non-existent, imitative behaviors typically had to be shaped by successive approximation. Reinforcers, usually food

and social reinforcement, were used freely and gradually faded out as behaviors became established. Some of the investigators (Lovaas, et al., 1967, p. 180) were so confident in their procedures that they concluded: "By the use of imitation, we have been able to teach the children a number of behavior patterns which seem virtually impossible to train otherwise. The procedure outlined above has the advantage that it works." All of these studies report the generalization of imitation learning, i.e., the development of imitative behaviors other than those specifically rewarded. Data on the extinction of imitation and, in two cases the reinstatement of the imitation (Baer et. al., 1964, & 1967), are also provided

Vicarious extinction of phobic behavior, first reported by Jones (1924), received more systematic study by Bandura, Grusec, and Menlove (1967). Children who showed avoidant behavior toward dogs indicated substantial improvement after observing peers in the phobic situation. Control groups, without model exposure, did not show the extinction effect. In an extension of the previous study, Bandura and Menlove (1968) examined effects of one or multiple models in the observational extinction of fears. They found that exposure to a variety of fearless models

in the fear arousing situation resulted in greater fear reduction than exposure to only one model.

Kennedy (1965) reported the use of symbolic modeling as part of a successful treatment program directed at the elimination of school phobias. A number of stories, such as one about how important it is to get right back on the horse after a fall were told to children experiencing fear of returning to school.

Modeling techniques have been used in the counseling of high school students (Thoresen, 1966a; Thoresen, Krumboltz, & Varenhorst, 1967; Thoresen & Krumboltz, in press) and college students (Thoresen, 1967). Groups of students were exposed to video-tapes of students successfully working out academic and career choice problems in groups. They then began their own group sessions, often with the same counselor as in the tape. They were found to benefit greatly from what they had observed. Such a simple and straight-forward approach, one would think, could easily be implemented in group psychotherapy as well as in family therapy. Typical problems and their successful group or family solution could be viewed by beginning groups or families and a head-start effect might well be found. Thoresen (1966b) found these procedures also useful

in the counseling of college professors regarding their classroom discussion periods. Inappropriate and appropriate classroom discussion techniques were first viewed on video-tape and then discussed.

Some support for the use of modeling techniques with delinquents is available. In two behaviorally oriented studies which stressed manipulation of reinforcement variables (Slack, 1960; Filipczak, Bis & Cohen, 1966), it was found unexpectedly that delinquent subjects began to imitate the experimenters. In the Cohen et al. study, subjects went so far as to "spend" some of their reinforcements to acquire clothing similar to that of the staff! Unfortunately, the acquisition of these imitative behaviors was simply noted, and the topic received no systematic investigation.

Truax, Warge, Carkhuff, Kodman, and Moles (1966) and Truax, Shapiro, and Wargo (1968) have made use of imitative learning in group therapy with juvenile offenders. By exposing groups about to begin therapy to tape recordings of on-going group therapy, it was hoped that patients could vicariously learn what is expected of them in the group and that they would benefit from such a group experience. Results, in the form of changes in



self-concept and MMPI profiles, suggest that the vicarious experience of group therapy did have positive effects. These measures were, however, indirect measures of whatever imitative learning did take place and no mention is made of behaviors vicariously observed in the tapes and subsequently performed by the patients.

Sarason (1968) demonstrates the use of modeling experiences in a delinquent treatment setting. Sarason's premise was that a good deal of juvenile delinquency is a reflection of inadequate learning experiences. His interest in test anxiety led him to question what effect anxiety level might have on responsiveness to observational learning in delinquents. He focused on the vocational and educational plans, interests, and attitudes of delinquents. In two preliminary studies, he examined the effect of modeling experiences and traditional role-playing on subsequent behaviors as reflected in (1) subjects' self reports, (2) staff ratings, (3) the Semantic Differential, and (4) Wahler's Self Description Inventory. The sessions took the form of demonstration, role-playing, and group discussion. Each session had a particular theme, such as "applying for a job". Results tend to show that High Test Anxiety subjects made more positive change than Low

Test Anxiety subjects. Experimental subjects showed less discrepancy between self and ideal-self than did controls. Boys in modeling groups became increasingly dissatisfied with themselves the longer they stayed at the institution while controls became more self-satisfied. Modeling experiences showed more positive results than traditional role-playing. Sarason is currently conducting a similar but more extensive study.

It should be noted that while Sarason investigated the effect of modeling experiences, he did not study the acquisition of imitated behaviors per se, i.e., the increase of a behavior due to exposure to models displaying that particular behavior. His dependent measures were only indirectly related to modeling experience. There was no freedom to imitate or not imitate. Subjects were, in fact, required to role-play: "We want you to watch us and then take turns in pairs, playing the same roles yourselves." Sarason's data also provide no information on the process of imitation learning in delinquents. What is still lacking, and what is the topic of the present research, is the controlled modeling and subsequent measured acquisition of a socially relevant behavior in young criminal offenders.

In applying the principles of imitative learning in such programs, it is of particular importance to examine current knowledge of the acquisition of imitative learning; i.e., what variables are important in learning through observation?

The Acquisition of Behavior Through Imitation

Although social learning, in the form of observation and imitation, had received attention earlier (Miller & Dollard, 1951; Mowrer, 1960), it remained for Bandura in his Nebraska Symposium on Motivation (1962) paper, to offer the theory and systematic research that set the current enthusiastic trend in the imitation literature. Bandura and Walters (1963) added further discussion and research review. At least three main classes of variables are of importance in observational learning and the subsequent performance of imitative responses: (1) model characteristics, (2) subject characteristics, and (3) reinforcement. Bandura (1962) summarized important model and subject characteristics found in the literature. Models who are attractive, rewarding, prestigious, competent, high status, and powerful are likely to receive more attention and therefore to elicit more imitative behavior.

Likewise, subjects who are dependant, lacking in self-esteem, incompetent, and who have been frequently rewarded for displaying matching responses are likely to be very attentive to the behavioral cues of others. In subjects with very limited behavioral repertoires or extremely low base-rates of imitation (e.g., autistic children), investigators have found it necessary to stress manipulation of reinforcement variables (Baer et al., 1967; Lovaas et al., 1967). In these cases, imitation was shaped by reinforcing successive approximations and finally imitative behaviors.

A particular relevant question here, and in light of the above information, is who would make a particularly good (efficient) model for delinquents or youthful prisoners to imitate? He should be attractive, rewarding, prestigious, competent, high status, and powerful seems an obvious answer. Whenever possible, these model characteristics should be considered. Suggestions come from two other sources. Schwitzgebel (1964, p. 134) suggests using nondelinquents who are only somewhat older than subjects and who are employed in some trade feasible for the delinquent to enter. "In this way, the non-delinquent serves as a role model which the delinquent

may imitate while learning for himself new patterns of behavior." Bandura (personal communication) further suggests that delinquents themselves might be used as models. Delinquents who have nearly completed the program in an institution, and who are relatively near the time of release, may be effective models for more newly admitted inmates. "Successful" inmates may well appear competent, prestigious, and to have high status. A new inmate, on the other hand, would tend to be relatively more dependent and seem incompetent. These variables were all considered in selecting the models for the present study.

What remains is a discussion of a socially relevant behavior which has met with controlled study and modification.

#### Delay of Gratification

The ability to work and wait for larger rewards, later in time, is stressed in virtually all discussions of normal personality development (e.g., Freud, 1946; Singer, 1955; Bijou & Baer, 1961; Mischel, 1966). To learn to delay immediate gratification in favor of later, more valuable reward is an important part of the

socialization process. The psychopathic personality may best represent a failure to so develop. Shapiro (1965, p. 157) suggests "the psychopath is the very model of the impulsive style ... his aim is the quick, concrete gain." Coleman (1964, p. 363) adds to the description an "inability to forego immediate pleasure for future gains and long range goals."

Often, juvenile delinquents are also characterized by this inability to delay gratification. McCord and McCord (1964, p.9) suggest the psychopathic delinquent is "like an infant, absorbed in his own needs, vehemently demanding satiation. The average child ... learns to postpone his pleasure ... the psychopath never learns this lesson." This trait of delinquents is evident even in playing games. Kessler (1966) finds "he is unable to accept the rules, the competition, and even the elementary problem of waiting his turn. He is so impatient that he excels at little, whether it is mental, mechanical, or physical. (page 308)."

Empirical support for the above view that delinquents are immediate gratifiers is offered by Mischel (1961a). Very simply, he offered children a series of real choices between something they could have immediately

or something more valuable for which they would have to wait. He found that delinquents showed a preference for immediate, smaller rewards. Quick-gain orientations were also related to father absence in the home. Delay of gratification, measured by series of choices, has received a good deal of research attention from Mischel and his colleagues (Mischel, 1958; Mischel, 1961a, & 1961c; Mischel & Metzner, 1962; Mischel & Gilligan, 1964; Bandura & Mischel, 1965; Mischel & Staub, 1965; Mischel, 1966; Mischel & Grusec, 1966). The Bandura and Mischel (1965) paper is directly relevant to the present study.

Using the series of choices measure, Bandura and Mischel selected two groups of fourth and fifth grade children, one showing a tendency to choose immediate rewards and the other a tendency to choose delayed rewards. Subjects from each group were exposed to live models, symbolic models, or no models (control group). The adult models, also in a series of choices, displayed delay orientations opposite to those of the subject. For example, subjects originally showing preference for immediate rewards observed a model who preferred delayed, more valuable rewards. The model also gave a summary of

the rationale for his orientation. Immediately after observing models, the delay behavior of subjects was again measured to determine any immediate modeling effect. Delay orientations were measured four weeks later as well, so that temporal generalization could be examined. Results clearly indicate a modification of self-imposed delay of reward using modeling techniques. The behavior of subjects, both preferring immediate rewards and preferring delayed rewards, was changed to the direction of the opposite orientation. Modeling effects were maintained to a somewhat lesser extent one month later.

Rosenquist and Megargee (in press) also developed an index of short-range hedonism and delay of self reward. As part of an extensive study of delinquency in three cultures (Anglo, Latin, and Mexican), they simply asked delinquents and nondelinquents what they would do with various sums of money (25 cents, 2 dollars, 20 dollars and 200 dollars). As expected, nondelinquents were more likely to say they would save their money while delinquents in all three cultures were more likely to say they would spend it immediately on pleasurable items. This was true especially for the smaller amounts of money. For the large amounts, 20 dollars and 200 dollars, the



difference between the two groups were less clear. Rosenquist and Megargee suggest that the spending of the larger amounts was less realistic for these subjects and so their responses tended to be stereotyped into giving gifts, buying cars, etc.

The Bandura and Mischel study shows the modification of delay orientations using modeling techniques. Since delinquents and youthful offenders tend to show immediate gratification orientations, as demonstrated by both Mischel (1961a) and Rosenquist and Megargee (in press), it was decided to systematically replicate and extend the Bandura-Mischel findings with a young prison population. Live models were used with young prison inmates indicating an immediate gratification orientation. Thus, the present study sought to demonstrate the controlled acquisition of a socially relevant behavior, delay of gratification, in youthful offenders through imitation. If this modeling procedure does effectively modify delay behavior, measured here by percentage of delay choices, will other measures of delay behavior indicate this change as well? An additional measure of delay orientation was needed to examine this response generalization. A measure similar to that of Rosenquist and Megargee was

developed for use as the additional measure. Thus, examinations of both temporal generalization and response generalization were made. Follow-up measures, later in time, indicated the presence of temporal generalization. An additional measure of delay behavior, other than that displayed by the models and subsequently performed by the subjects provided an index of response generalization.

## II METHOD

### Subjects

The 40 subjects in this study were inmates of the Federal Correctional Institution for Youthful Offenders in Tallahassee, Florida. This is a medium security institution with a total of approximately 500 inmates who reside in four dormitories and range in age from 17 to 26. The subjects were (1) newly admitted inmates, (2) from 18 to 20 years of age, (3) Caucasian males, and (4) they had a sentence of at least three months duration. With the use of the Choice Lists, the 40 subjects were selected from groups of newly admitted inmates as preferring immediate gratification (more than 70 percent immediate reward choices). Of the 40 subjects, 20 were assigned to an experimental group, who were exposed to a model, and 20 were assigned to a control group with no exposure to a model.

### Models

In the light of the model characteristics and suggestion discussed earlier, two older, somewhat prestigious inmates were selected as models for this study. They were confederates and told what behavior to display

for subjects to observe. In each case, relative to the subject, the model was older (ages 21 and 23), had been at the institution longer (several months) and had a prestigious work assignment (institutional photographer or X-ray technician). New inmates are assigned initially to a low-prestige detail such as dorm-orderly or food-service worker. Each model had one "professional" contact with each subject, either taking his identification photograph or chest X-ray on admission to the institution. To guard against contamination of the experiment by extensive contact of models and subjects, no model was paired with a subject who resided in the same dormitory as the model. Also, subjects were exposed to each model at a rate of no more than one subject per week. Since there were two models, each served as model for 10 of the 20 subjects.

#### Choice Lists

The four Choice Lists (A, B, C, and M) were developed for this particular population. Money is available to these inmates only in their institutional accounts. Inmates are permitted to spend this money in the commissary on certain hours during the week. Examples of items available are: cigarettes, cigars, various candy

and food-snacks, magazines, and personal grooming needs. Since most of these items are sought after by inmates, they represent a ready list of realistic rewards for this population. Money may be used as a reward by adding it to the inmates' account. A pool of choices between immediate or delayed but more valuable rewards was developed. As in previous research, half of the choices were monetary (e.g., 35 cents now or 50 cents in one week) and half were between small articles (e.g. small candy bar now or large one in one week). The item lists used by Mischel (personal communication) were used as a model as far as the ratio of quantity of reward for given delay periods and the length of delay periods. For each of four lists, seven monetary and seven small-article choices were selected randomly from the pool of 100 choices. The resulting four Choice Lists, consisting of 14 choice items each, were administered in a random order to 30 newly admitted inmates as a preliminary study of the scales themselves. Cross correlations of percent delay choices on the four Choice Lists are given in Table 1. All correlations, ranging from .87 to .94 were found to be highly statistically significant ( $p < .001$ ). It was decided that the list with the lowest cross correlations

TABLE 1  
CROSS CORRELATIONS OF PERCENTAGE OF DELAY  
CHOICES ON THE FOUR CHOICE LISTS FOR 30 INMATES

	LIST A	LIST B	LIST C	LIST M
A	1.00			
B	.94***	1.00		
C	.88***	.91***	1.00	
M	.89***	.87***	.87***	1.00

\*\*\*  $P < .001$

would serve as the Choice List for the model to respond to. That list, Choice List M, along with Lists A, B, and C are found in the Appendix. For each subject, List A, B, or C served as the initial measure of delay orientation or base-rate. List M was used for the model's choices which 20 of the subjects observed. Lists A, B, or C were used to measure the subject's delay orientation immediately after exposure to the model. Finally, List A, B, or C was used as the follow-up or temporal generalization measure one month later. Approximately one sixth of the subjects in each group received Lists A, B, and C in following orders across the three phases of the study: ABC, ACB, BCA, CAB, and CBA.

#### Money Saving Measures

The Rosenquist and Megargee (in press) measure of delay orientation, simply asking subjects what they would do with certain amounts of money, was developed into a forced-choice measure rather than an open-ended measure. By providing subjects with five choices -- (1) spend all of it, (2) spend most (75 percent) of it, (3) spend half and save half of it, (4) save most (75 percent) of it, and (5) save all of it -- a numerical index of

delay orientation could quickly be determined and be available for later statistical analysis. Since inmates can spend no more than 20 dollars a month, the 200 dollar item used by Rosenquist & Megargee seemed unrealistic for this population. Therefore, three questions made up the Money Saving Measure for this study: (1) If 25 cents were added to your account, what would you do with it? (2) If 2 dollars were added to your account, what would you do with it? and (3) If 20 dollars were added to your account, what would you do with it? The Money Saving Measure, as it was used, may be found in the Appendix. Thus, a Choice List and the Money Saving Measure were given at each of the three phases of the study to all 40 subjects.

#### Reinforcement

To make choices on the Choice Lists realistic, subjects were actually given one of their 14 choices each time a list was administered to them (after Bandura & Mischel, 1965). Since they received either an immediate or a delayed reward, this can be considered a differential reinforcement of that particular response class. To determine any effect of this reinforcement, half (ten) of



the experimental and half (ten) of the control group received only delayed rewards. The other half of each group received only immediate rewards. Each time, of course, subjects did receive one of the items that they had actually chosen. Since each subject responded to three Choice Lists, each received a total of three rewards.

#### Procedure

The procedure closely followed that of Bandura and Mischel with the notable exceptions that (1) only live models were used, (2) only with inmate subjects who had immediate gratification orientations, and (3) another measure of delay orientation was added to examine response generalization. A diagram of the experimental paradigm is presented in Figure 1.

The first phase of the experiment (Pre-Measure) consisted of selection of subjects. One of the Choice Lists was administered to newly admitted, 18- to 20-year-old Caucasian inmates. These inmates were called in individually and the experimenter read the following instructions (taken in part from Mischel, personal communication):

I am interested in finding out how people choose when they are offered different kinds of choices. I will

EXPERIMENTAL  
GROUP  
(20 SUBJECTS)

CONTROL  
GROUP  
(20 SUBJECTS)

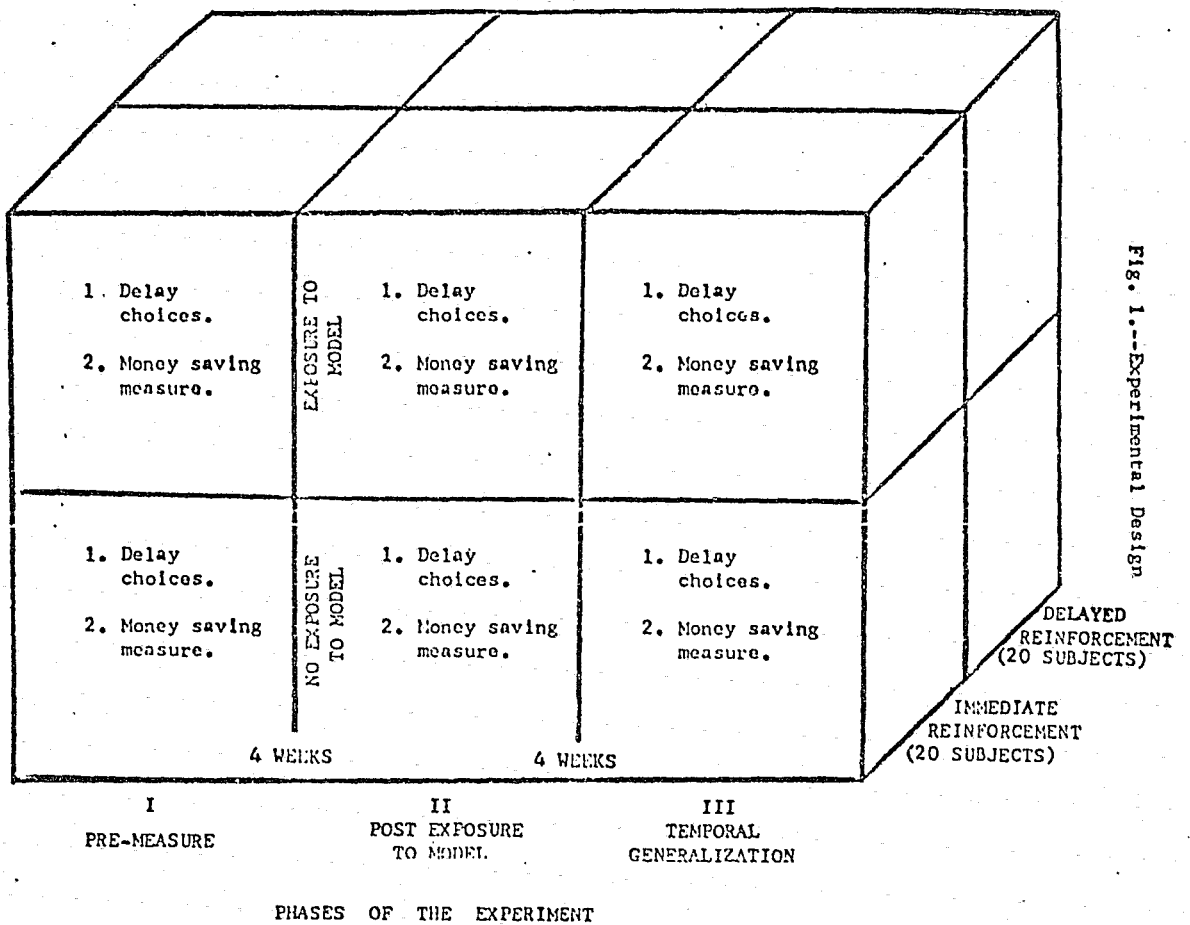


Fig. 1.--Experimental Design

be asking you to make some choices: the choices will be between two things both of which you want, but if you choose one you can't have the other. Answer each question to show what you would really take. This is not a test, there are no right or wrong answers. For example, the choice might be 50 cents now or 75 cents next week. If you took the 50 cents now you could not have the 75 cents next week and if you wait for the 75 cents next week you could not have the 50 cents now. I will offer you 14 such choices. Choose very carefully and realistically because in one of the choices you will really get what you choose. You won't know which one of your 14 choices you'll actually get until the very end, so choose very carefully each time.

The 14 items of a Choice List were then displayed on a desk for the subject and his choices were recorded. Next, the Money Saving Measure was given. If the subject was indeed to receive an immediate reward, he was given one of his immediate choices at that time. If he was to receive a delayed reward, he was given one of his delay choices after the specified time period. All subjects received a reward within four weeks, four weeks being the longest delay-period. Number of delayed reward choices for each subject was tabulated and only subjects choosing less than 30 percent delay choices, four choices or less, continued as subjects in the study. Forty subjects were selected in this manner, 20 were assigned to the experimental and 20 to the control group. Subjects in the two groups were matched with regard to number of delay choices on this first measure. As an example, for every subject

in the experimental group who chose three delayed rewards there was a subject in the control group who chose three delayed rewards.

Approximately four weeks after Pre-Measure, control subjects were administered another Choice List and Money Saving Measure, and again they received one of their choices within the next four weeks. Experimental subjects individually observed a model who showed the opposite delay orientation; i.e., the model consistently made delay of self-reward choices to Choice List M. The subject was led to believe that the model was also a subject. Both model and subject were called in at the same time. In order to make the difference between model and subject explicit to the subject, a short joint-interview was conducted by asking such questions as "How old are you? How long have you been at F.C.I., how many months? What is your work detail here?" Next, the experimenter read the instructions and turned to the model saying, "Let's start with you." The choices of Choice List M were displayed for the model (while the subject was observing) and the model's responses recorded. Rather than summarize his delayed orientation rationale, as in the Bandura-Mischel study, the models were instructed to make two side comments

while they were making their choices. For one money item they said, "That's pretty good interest, I'll take the \_\_\_ in \_\_\_ weeks." For one of the small article choices, the model said, "I can wait for that." Next, the model was given the Money Saving Measure on a clipboard and in such a way that the subject could not observe the model's responses to this measure. The model was then excused with the pretext, "You can go now, you probably have things to do." The items of another Choice List were then displayed for the subject and his choices recorded. Again, he responded to the Money Saving Measure and he received one of his choices, depending on whether he was in the immediate or delayed reinforcement half of his group, within four weeks. The results of this Choice List provided the Post-Exposure to Model measure of delay orientation and indicated any immediate modeling effect. The responses to this second Money Saving Measure indicated any immediate response generalization effect.

Four weeks later, for the final (Temporal Generalization) phase of the study, each of the 40 subjects was administered a third Choice List and the Money Saving Measure. For the 20 experimental subjects, the results of this Choice List determined the stability of any modeling

effect, over this period of time. If there was a modeling effect, the Money Saving Measure provided an index of response generalization to a second measure of delay behavior not observed directly in the model. For the control group, results of the three Choice Lists and the three Money Saving Measures indicated any change in delay measures just as a function of differential reinforcement and not as a function of exposure to high-delay peer-models.

### III. RESULTS

#### Delay Choices

The major dependent variable in this study was the percentage of delay choices on the Choice Lists across the three phases of the experiment. The two independent variables were exposure versus no exposure to a high-delay peer-model and immediate versus delayed reinforcement. The mean percentage of delayed reward choices are graphically presented in Figure 2. A repeated measures analysis of variance was computed and the results of that analysis are given in Table 2. With 1 df an  $F$  value of 108.29, the modeling effect was found to be highly statistically significant ( $p < .001$ ). No other source of variance reached a statistically significant level. The within-group error term was found to be particularly large in this analysis. This may well be explained by a high degree of individual variability. Examination of data for individual subjects revealed, for instance, that all subjects who were exposed to a model did increase their percent delay choices on subsequent measures, but for some it was an increase of only a few percentage points while

MEAN PERCENTAGE OF DELAYED REWARD CHOICES

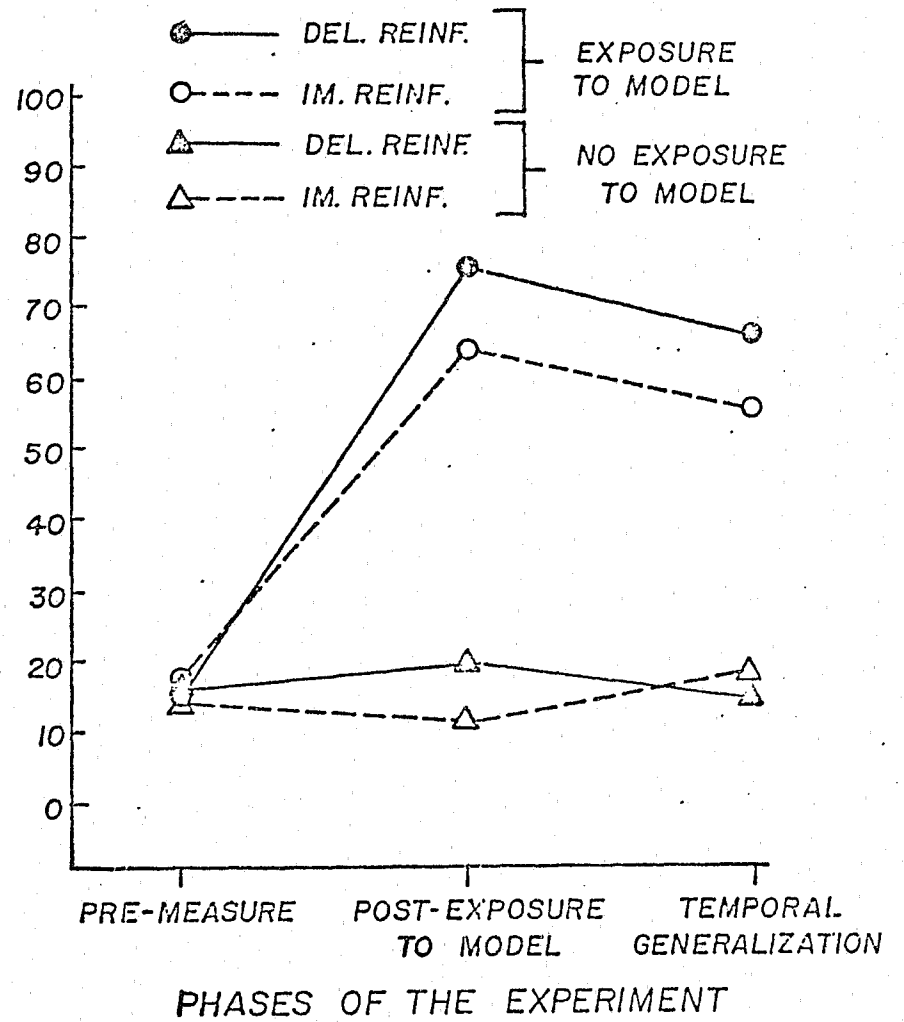


Fig. 2.--Mean percentage of delayed reward choices as a function of modeling condition, reinforcement condition, and phases of the experiment.



TABLE 2  
 REPEATED MEASURES ANALYSIS OF VARIANCE  
 OF PERCENTAGE OF DELAYED REWARD CHOICES

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Modeling (M)	1	30752.01	108.29***
Reinforcement (R)	1	795.68	2.80
M X R	1	216.01	<1
Error (b)	36	283.98	
Phases (P)	2	339.91	<1
P X M	2	203.76	<1
P X R	2	399.23	<1
P X M X R	2	77.41	<1
Error (w)	72	704.56	

\*\*\*p < .001

for others a gain of as much as 92 percent was found.

Further comparisons by the t test of pairs of means across experimental phases (Table 3) show that both groups which were exposed to the model significantly increased their delay of gratification behavior regardless of whether they actually received delayed or immediate reward choices. Furthermore, this modeling effect was maintained to a significant degree four weeks after exposure to the high-delay peer-model (Temporal Generalization).

#### Money Saving Measures

As a measure of response generalization, i.e. generalization to a second measure of delay of gratification which was not directly observed in the model, a series of three hypothetical Money Saving Measures was administered to all subjects at all three phases of the study. Three amounts of money were used: 25 cents, 2 dollars, and 20 dollars. Percentage subjects would save was tabulated at 0, 25, 50, 75, or 100 percent due to the forced-choice nature of the measures.

Figure 3 shows the mean percentage the subjects would save of 25 cents as a function of experimental phases. A repeated measures analysis of variance was

TABLE 3  
 COMPARISON OF PAIRS OF MEANS ACROSS EXPERIMENTAL PHASES  
 FOR DELAYED REWARD CHOICES

Treatment Conditions	Pre-Measure versus Post-Exposure to model	Pre-Measure Versus Temporal Generalization	Post-Exposure to model versus Temporal Gen.
	t	t	t
Delayed reinforcement with model	8.21***	6.72***	2.11
Immediate reinforcement with model	5.13***	3.46**	1.68
Delayed reinforcement with no model	0.48	0.51	1.38
Immediate reinforcement with no model	1.59	0.02	2.25

\*\*  $p < .01$   
 \*\*\*  $p < .001$

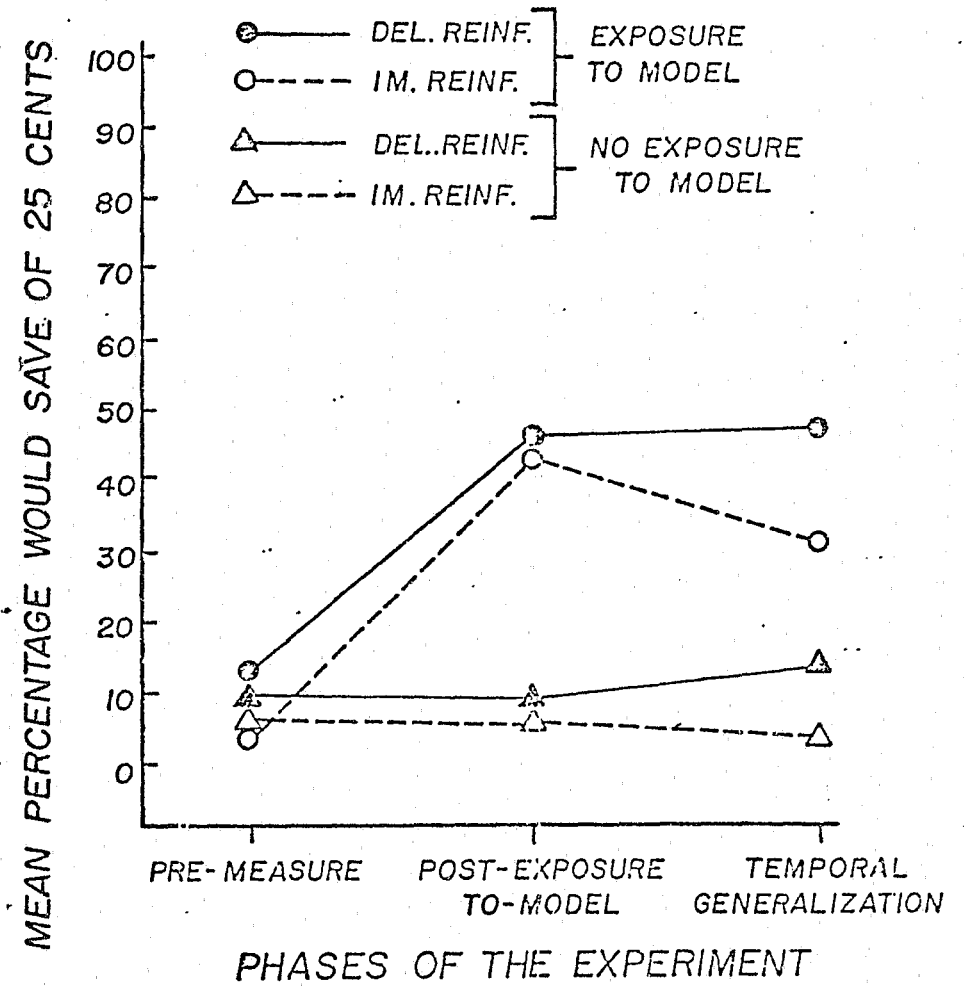


Fig. 3.--Mean percentage subjects would save of 25 cents as a function of modeling condition, reinforcement condition, and phases of the experiment.

computed and, as in the Delay Choices measure, the modeling effect was found to be highly significant with an  $F$  value of 31.71,  $p < .001$  (Table 4). Again, no other source of variance was found to reach the .05 level of significance. Further comparisons by the  $t$  test of pairs of means across phases revealed that both groups exposed to models increased the percentage they would save and that the effect was maintained 4 weeks later (Table 5).

Mean percentage subjects would save of 2 dollars as a function of experimental phases is presented in Figure 4. What appeared to be substantial differences between groups at the Pre-Measure phase were noted. However, a simple analysis of variance was computed on these values and the  $F$  ratio did not reach a statistically significant level (Table 6). A repeated measures analysis of variance was computed and revealed a significant modeling by phases interaction effect ( $p < .05$ , Table 7). No other  $F$  value reached the .05 level of significance in this analysis. To further identify the sources of variance, two sets of  $t$  tests between means were computed: between pairs of means across phases (Table 8) and between the groups at each of the three phases (Table 9). Results reveal that no  $t$  value reached the .05 level of significance. Thus,

TABLE 4  
 REPEATED MEASURES ANALYSIS OF VARIANCE  
 OF PERCENTAGE WOULD SAVE OF 25 CENTS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Modeling (M)	1	16333.33	31.71***
Reinforcement (R)	1	1687.50	3.28
M X R	1	187.50	<1
Error (b)	36	515.05	
Phases (P)	2	1348.96	1.74
P X M	2	880.21	1.14
P X R	2	765.63	<1
P X M X R	2	1234.38	1.60
Error (w)	72	773.73	

\*\*\* $P < .001$

TABLE 5  
 COMPARISON OF PAIRS OF MEANS ACROSS EXPERIMENTAL PHASES  
 FOR PERCENTAGE WOULD SAVE OF 25 CENTS

Treatment Conditions	Pre-Measure versus Post-Exposure to model t	Pre-Measure versus Temporal Generalization t	Post-Exposure to model versus Temporal Gen. t
Delayed reinforcement with model	2.90*	2.94*	0.36
Immediate reinforcement with model	3.75**	2.28*	1.86
Delayed reinforcement with no model	0.00	1.00	1.50
Immediate reinforcement with no model	0.00	1.00	0.43

\*  $p < .05$

\*\*  $p < .01$

TABLE 6  
ANALYSIS OF VARIANCE OF PRE-MEASURE VALUES  
FOR PERCENTAGE WOULD SAVE OF 2 DOLLARS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Between Groups	3	3038.33	1.82
Within Groups	36	1670.14	
Total	39		



**CONTINUED**

**1 OF 2**

MEAN PERCENTAGE WOULD SAVE OF 2 DOLLARS

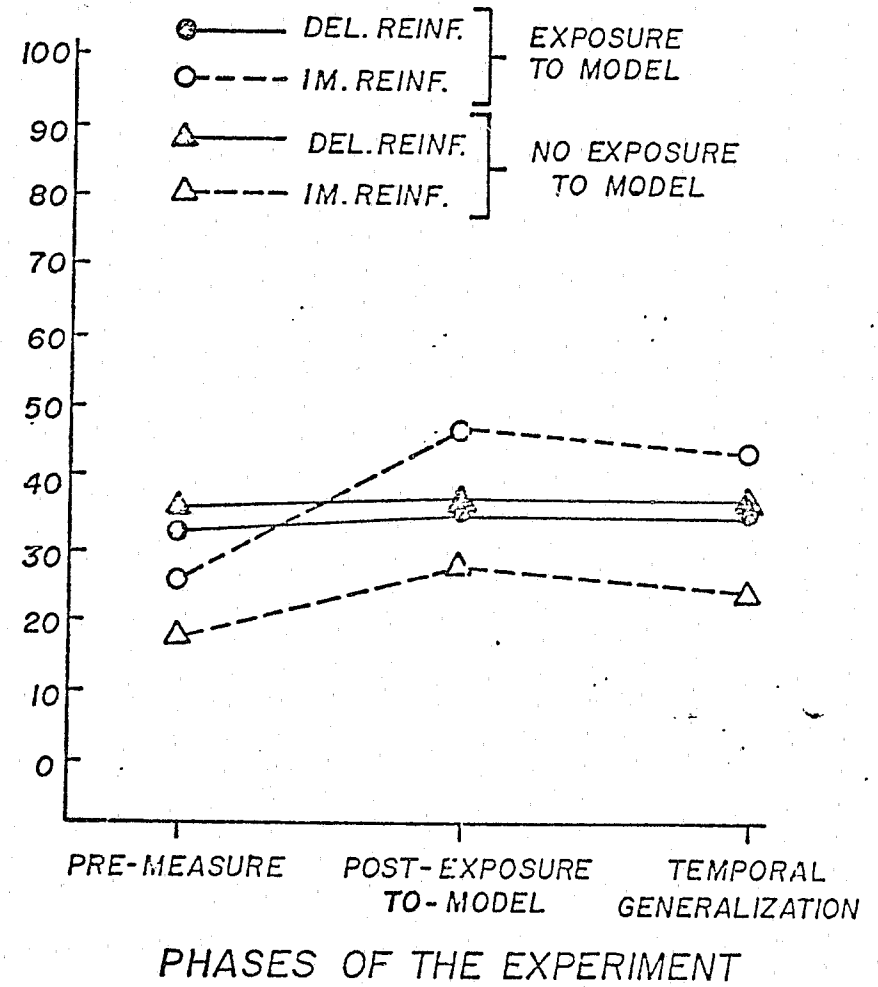


Fig. 4.--Mean percentage subjects would save of 2 dollars as a function of modeling condition, reinforcement condition, and phases of the experiment.

TABLE 7  
 REPEATED MEASURES ANALYSIS OF VARIANCE  
 OF PERCENTAGE WOULD SAVE OF 2 DOLLARS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Modeling (M)	1	1880.21	1.98
Reinforcement (R)	1	421.88	< 1
M X R	1	1880.21	1.98
Error (b)	36	950.81	
Phases (P)	2	583.33	< 1
P X M	2	3083.33	3.91*
P X R	2	1187.50	1.50
P X M X R	2	895.83	1.13
Error (w)	72	789.35	

\* $p < .05$

TABLE 8  
 COMPARISON OF PAIRS OF MEANS ACROSS EXPERIMENTAL PHASES  
 FOR PERCENTAGE WOULD SAVE OF 2 DOLLARS

Treatment Conditions	Pre-Measure versus Post-Exposure to model t	Pre-Measure versus Temporal Generalization t	Post-Exposure to model versus Temporal Gen. t
Delayed reinforcement with model	0.36	0.36	0.00
Immediate reinforcement with model	2.20	1.86	1.00
Delayed reinforcement with no model	0.43	0.00	0.43
Immediate reinforcement with no model	1.31	0.61	1.00

TABLE 9  
 COMPARISONS OF PAIRS OF MEANS BETWEEN TREATMENT CONDITIONS  
 FOR PERCENTAGE WOULD SAVE OF 2 DOLLARS

Comparisons	Pre-Measure t	Post Exposure to model t	Temporal Generalization t
Del. Reinf. with model vs. Im. Reinf. with model	0.61	0.85	0.49
Del. Reinf. with model vs. Del. Reinf. alone	0.20	0.18	0.00
Del. Reinf. with model vs. Im. Reinf. alone	1.21	0.49	0.82
Im. Reinf. with model vs. Del. Reinf. alone	0.94	1.10	0.55
Im. Reinf. with model vs. Im. Reinf. alone	0.79	1.35	1.28
Del. Reinf. alone vs. Im. Reinf. alone	1.64	0.35	0.94

modeling, reinforcement, and phases were found to have no statistically significant effect by themselves; modeling and phases did have a significant interaction effect on this 2 dollar measure.

Finally, Figure 5 shows the mean percentage subjects would save of 20 dollars as a function of experimental phases. Table 9 gives the results of a repeated measures analysis of variance on this measure. In no cases did an  $F$  value reach the .05 level of statistical significance. Thus, no modeling, reinforcement, phases, or interaction effect was found for this 20 dollar measure of response generalization.

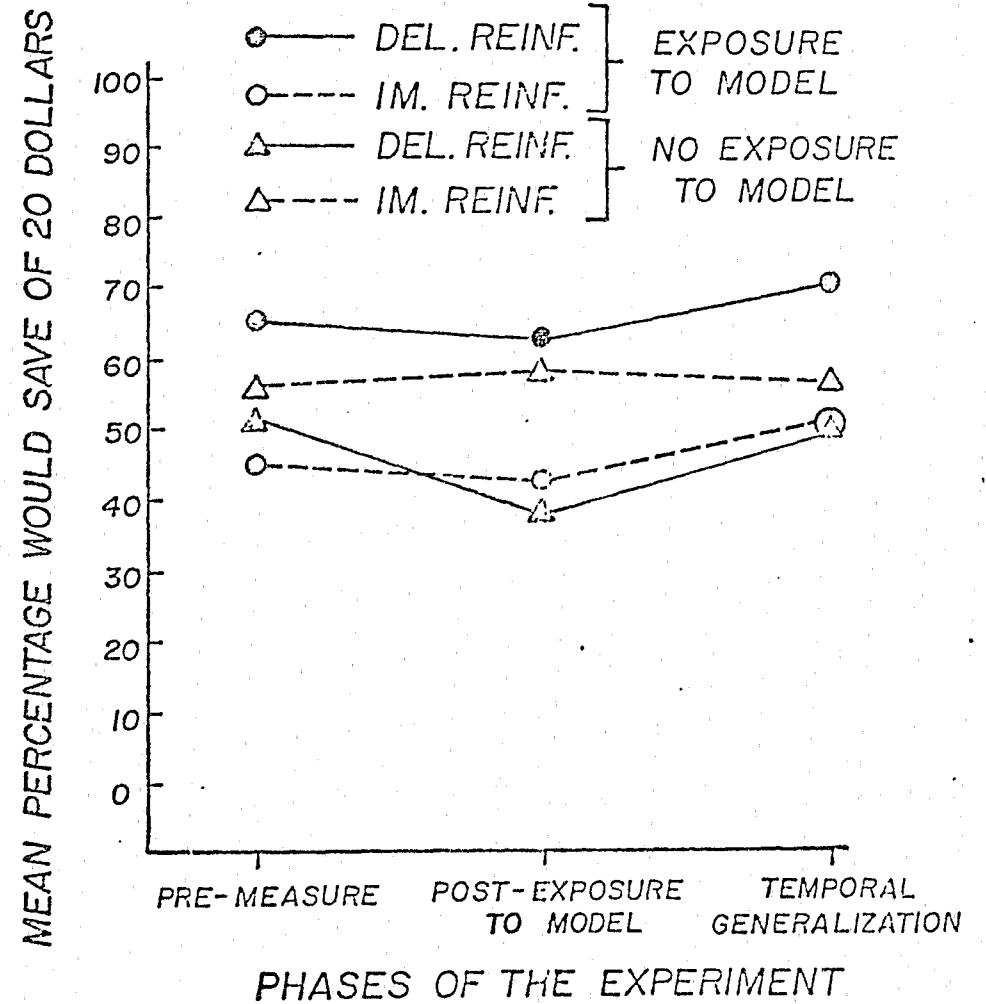


Fig. 5.--Mean percentage subjects would save of 20 dollars as a function of modeling condition, reinforcement condition, and phases of the experiment.

TABLE 10  
 REPEATED MEASURES ANALYSIS OF VARIANCE  
 OF PERCENTAGE WOULD SAVE OF 20 DOLLARS

Source	<u>df</u>	<u>MS</u>	<u>F</u>
Modeling (M)	1	630.21	<1
Reinforcement (R)	1	880.21	1.23
M X R	1	1380.21	1.93
Error (b)	36	717.01	
Phases (P)	2	67.71	<1
P X M	2	880.21	1.90
P X R	2	884.95	1.91
P X M X R	2	1098.95	2.37
Error (w)	72	463.54	



#### IV. DISCUSSION

In this study it was found that not only did exposure to high-delay peer-models immediately increase percentage of delay choices, but that this effect was maintained one month later as well. Further, this change in delay of gratification through imitation did generalize to two hypothetical Money Saving Measures (25 cents and 2 dollars). No effect on the 20 dollar measure was found. The 20 dollar measure may have been unrealistic in this population since, as noted earlier, inmates can spend a maximum of only 20 dollars each month. Actually, very few have this large an amount in their accounts. Rosenquist and Megargee (in press) also found the larger amounts of money unrealistic in their three delinquent populations. Since models displayed delay responses only to choices between items ranging in values less than a dollar, there would be reason to expect less generalization to a measure so different in value.

The two models used in this study possessed at least three important characteristics: they were older, had been at the institution longer, and had prestigious work

details. Which characteristic(s) were important in affecting the behavior change? As they were used only in combination here, no more can be said than these models with all three characteristics were very effective in changing this behavior in younger, newly admitted inmates. It remains for other studies to focus on specific model and subject characteristics in this kind of population. Indeed, such study is probably required before an imitation-behavior modification program can be carried out with institutionalized delinquents or youthful offenders.

One ethical point needs discussion through wisdom gained in retrospect. As in most of the imitation literature, this study made use of social deception. Models were instructed as to what behavior to display for subjects. At a time when civil rights, credibility gaps, and human experimentation are all important social concerns, the "lying" to young prison inmates further endangers their already untrusting view of established society and of psychologists in particular. This could and should have been avoided through the use of older inmates who were indeed "delayed gratifiers". There were a few individuals who chose a high percentage of delay choices; they were excluded from the study as subjects, but could well have

served as models. The potential loss of close experimental control may have been made up with a gain in credibility. While there is no evidence of disbelief in subjects that the models were responding as they normally would, such could have been the case and could have been completely avoided.

It is the psychoanalytic view (e.g. Freud, 1946; Singer, 1955) that the beginnings of the delaying mechanism signal the emergence of the reality principle, and further that determinants of the "mechanism" are sought in hypothetical internal events -- ego organizations and energy systems. In contrast, both the Bandura-Mischel findings and the present study support the social-learning view that self-controlling behavior is determined by external, social-stimulus events. Another alternative theory of the development of self-control is offered by Bijou and Baer (1961). Their view is that self-control is learned as are all other operant responses, through reinforcement. The findings of the present study do not support such a view since differential reinforcement was found to have no affect on delay behavior. If a reinforcement effect was present, it was more likely to have been a vicarious reinforcement effect (Bandura & Walters,

1963, p.4) with subjects observing reinforcement of the model. Models, like subjects, were instructed that they would indeed receive one of their choices. Since they made all delay choices, they were excused at the end of the session with the implication that a delayed reward would follow. Model-exposed subjects did vicariously experience this sequence of events. However, the present study made no provisions for an examination of vicarious reinforcement effect versus just a modeling effect and a further study would be needed to differentiate the two or combined effects. Also, extrinsic reinforcement was found to have no effect as it was used here. Indeed, even when effect of modeling and effect of reinforcement were at odds with each other (e.g., when these initially low-delay subjects were on the one hand reinforced for immediate reward choices but on the other hand were exposed to a high-delay model), only an increase in delay behavior was found. This is not to imply that delay behavior cannot be controlled by manipulation of reinforcement variables. The point is that in this study extrinsic reinforcement was not a necessary condition to achieve the change in delay orientation. This tends to support Bandura's (1962) discussion of imitative learning, that a behavior may be acquired through observation

and without practice. Reinforcement variables may then play a role in subsequent performance of the learned responses.

Gewirtz and Stingle (1968) have made a strong case for the learning of generalized imitation as the basis for identification. Baer and Sherman (1964) see the key to understanding imitative learning in the closer examination of generalized imitation. The present study did find generalization to a second series of responses within the larger response class, delay of gratification. Low-delay inmates who were exposed to high-delay models not only increased their percentage of delay choices, but also their hypothetical money saving activity on a measure not directly observed in the model. This generalization of imitation effect, especially when considered in its extreme (identification), is very important when looking forward to the use of imitation in behavioral psychotherapy programs. If the imitation were only of the specific response displayed by the model, and there was no hope of generalization to other, somewhat similar responses, then imitative learning would probably have little future use as a behavior modification regime. The present study did find the generalization and the effect was maintained one

month later. However, before these findings may be applied directly in a treatment program it would be helpful to examine more closely generalization to real money saving, to less impulsivity, to planning for the future, etc. It is suggested, within the social-learning view supported here, that generalized delay of gratification is achieved in normal personality development through repeated modeling of delaying behavior by several models (parents and peers) and in many different situations. Further, it is likely that imitation of delay behavior then meets with both social approval and extrinsic reinforcement. In certain delinquents and adult criminal offenders these particular socialization agents may not have been present or, indeed, the opposite may have been the case -- modeling and reinforcing of impulsive, hedonistic, and anti-social behavior. Witness Mischel's (1961a) finding that immediate gratification orientations in delinquents were related to father absence in the home. In keeping with the above discussion, it is suspected that a behavior modification program aimed at an increased delay of gratification in delinquents and youthful offenders would require repeated modeling of high-delay behavior by several models in diverse situations. Furthermore, reinforcement variables

could be manipulated to help achieve the generalized delay of gratification. This line of research, whether of an experimental-personality nature or ultimately as behavior modification, warrants further judicious study because of its potential social significance.

## V. SUMMARY

The ability to work and wait for larger rewards, later in time, is stressed in virtually all discussion of normal child development. Many discussions of juvenile and adult criminal behavior center on an inability to delay gratification. Bandura and Mischel (1965) were able to change delay orientations of children by exposing them to adult models who displayed delay orientations opposite to those of the subjects. In the present study the Bandura-Mischel findings were extended to a young prison inmate population.

Forty newly admitted, 18-20-year-old inmates served as subjects. In a pre-measure condition, they all demonstrated an immediate gratification orientation with about 15 percent delay choices in a series of 14 choices between something they could have immediately or something they would have to wait a few weeks for. The 40 subjects were then divided into an experimental and a control group of 20 subjects each. Two older inmates, with prestigious work details, served as models. One month later experimental subjects observed another "subject". actually



one of the models, make a series of choices. The model made all delay choices. Immediately afterward, the subject was given another choice list to determine any change due to exposure to the high-delay peer-model. The 20 subjects did show a statistically significant increase from 17 percent delay to 70 percent delay. One month later they were administered a third list and the change in behavior did hold up over that period of time. The subjects in the control group were simply administered the three lists, a month apart, each time, and their percent delay choices remained at about 15 percent. This increased delay of gratification in the experimental group did generalize to two other measures of delay behavior: What would you do with it if 25 cents were added to your account? If 2 dollars were added to your account? The generalization effect was not found with a third measure, what would you do if 20 dollars were added to your account. Results are discussed in terms of the development of self-controlling behavior and with regard to the behavior modification treatment of youthful criminal offenders.

APPENDIX

## CHOICE LIST A

Name \_\_\_\_\_

1. \_\_\_\_\_ 1 can of mixed nuts today  
 \_\_\_\_\_ 2 cans of mixed nuts in three weeks
2. \_\_\_\_\_ 70¢ today  
 \_\_\_\_\_ 95¢ in two weeks
3. \_\_\_\_\_ a large bag of potato chips in 2 weeks  
 \_\_\_\_\_ a small bag of potato chips today
4. \_\_\_\_\_ 50¢ in 3 weeks  
 \_\_\_\_\_ 25¢ today
5. \_\_\_\_\_ 2 packs of Kool Ade in 1 week  
 \_\_\_\_\_ 1 pack of Kool Ade today
6. \_\_\_\_\_ 30¢ today  
 \_\_\_\_\_ 65¢ in three weeks
7. \_\_\_\_\_ 1 mechanics magazine today  
 \_\_\_\_\_ 2 mechanics magazines in 2 weeks
8. \_\_\_\_\_ 70¢ in one week  
 \_\_\_\_\_ 55¢ today
9. \_\_\_\_\_ 3 packs of cigarettes in 2 weeks  
 \_\_\_\_\_ 2 packs of cigarettes today
10. \_\_\_\_\_ 80¢ today  
 \_\_\_\_\_ 75¢ in 1 week
11. \_\_\_\_\_ 2 issues of Time magazine in 2 weeks  
 \_\_\_\_\_ 1 issue of Time today
12. \_\_\_\_\_ 20¢ today  
 \_\_\_\_\_ 30¢ in one week
13. \_\_\_\_\_ 2 Snickers candy bars today  
 \_\_\_\_\_ 4 Snickers candy bars in 3 weeks
14. \_\_\_\_\_ 95¢ in one week  
 \_\_\_\_\_ 70¢ today

## CHOICE LIST B

Name \_\_\_\_\_

- 1 \_\_\_\_\_ 40¢ in 4 weeks  
\_\_\_\_\_ 15¢ today
- 2 \_\_\_\_\_ small jar of instant coffee today  
\_\_\_\_\_ larger jar of instant coffee in 2 weeks
- 3 \_\_\_\_\_ 65¢ today  
\_\_\_\_\_ 80¢ in 1 week
- 4 \_\_\_\_\_ 3 packs of cigarettes today  
\_\_\_\_\_ 5 packs of cigarettes in 3 weeks
- 5 \_\_\_\_\_ 30¢ today  
\_\_\_\_\_ 45¢ in 1 week
- 6 \_\_\_\_\_ 3 Milky Way candy bars in 3 weeks  
\_\_\_\_\_ 1 Milky Way candy bar today
- 7 \_\_\_\_\_ 30¢ today  
\_\_\_\_\_ 60¢ in three weeks
- 8 \_\_\_\_\_ 2 sports magazines in 3 weeks  
\_\_\_\_\_ 1 sports magazine today
- 9 \_\_\_\_\_ 25¢ today  
\_\_\_\_\_ 55¢ in four weeks
- 10 \_\_\_\_\_ 2 cigars today  
\_\_\_\_\_ 4 cigars in 2 weeks
- 11 \_\_\_\_\_ 55¢ in 2 weeks  
\_\_\_\_\_ 30¢ today
- 12 \_\_\_\_\_ large jar of instant tea in 3 weeks  
\_\_\_\_\_ small jar of instant tea today
- 13 \_\_\_\_\_ 90¢ in two weeks  
\_\_\_\_\_ 50¢ today
- 14 \_\_\_\_\_ 1 bag of pretzels today  
\_\_\_\_\_ 2 bags of pretzels in 2 weeks

## CHOICE LIST C

Name \_\_\_\_\_

- 1 \_\_\_\_\_ 2 cigars today  
\_\_\_\_\_ 5 cigars in 3 weeks
- 2 \_\_\_\_\_ 50¢ today  
\_\_\_\_\_ 90¢ in 2 weeks
- 3 \_\_\_\_\_ 1 car magazine today  
\_\_\_\_\_ 2 car magazines in 3 weeks
- 4 \_\_\_\_\_ 35¢ today  
\_\_\_\_\_ 45¢ in 1 week
- 5 \_\_\_\_\_ a can of peanuts in 4 weeks  
\_\_\_\_\_ a bag of peanuts today
- 6 \_\_\_\_\_ 70¢ in 2 weeks  
\_\_\_\_\_ 45¢ today
- 7 \_\_\_\_\_ 3 packs of cigarettes in 4 weeks  
\_\_\_\_\_ 1 pack of cigarettes today
- 8 \_\_\_\_\_ 45¢ today  
\_\_\_\_\_ 90¢ in 3 weeks
- 9 \_\_\_\_\_ 1 Mad magazine today  
\_\_\_\_\_ 2 Mad magazines in 3 weeks
- 10 \_\_\_\_\_ 60¢ today  
\_\_\_\_\_ 75¢ in 2 weeks
- 11 \_\_\_\_\_ a large package of cocoa in 3 weeks  
\_\_\_\_\_ a small package of cocoa today
- 12 \_\_\_\_\_ 80¢ in 4 weeks  
\_\_\_\_\_ 40¢ today
- 13 \_\_\_\_\_ a large package of cookies in 2 weeks  
\_\_\_\_\_ a small package of cookies today
- 14 \_\_\_\_\_ 35¢ today  
\_\_\_\_\_ 75¢ in 4 weeks

## CHOICE LIST M

Name \_\_\_\_\_

- 1 \_\_\_\_\_ 25¢ today  
 \_\_\_\_\_ 40¢ in 2 weeks
- 2 \_\_\_\_\_ small Hershey bar today  
 \_\_\_\_\_ large Hershey bar in 1 week
- 3 \_\_\_\_\_ 80¢ in 2 weeks  
 \_\_\_\_\_ 55¢ today
- 4 \_\_\_\_\_ 2 packs of cigarettes in 2 weeks  
 \_\_\_\_\_ 1 pack of cigarettes today
- 5 \_\_\_\_\_ 35¢ in 3 weeks  
 \_\_\_\_\_ 15¢ today
- 6 \_\_\_\_\_ small box of cheese crackers today  
 \_\_\_\_\_ large box of cheese crackers in 1 week
- 7 \_\_\_\_\_ 70¢ in 3 weeks  
 \_\_\_\_\_ 35¢ today
- 8 \_\_\_\_\_ 1 James Bond paperback today  
 \_\_\_\_\_ 2 James Bond paperbacks in 4 weeks
- 9 \_\_\_\_\_ 60¢ today  
 \_\_\_\_\_ 90¢ in 2 weeks
- 10 \_\_\_\_\_ 3 packs of cigarettes in 1 week  
 \_\_\_\_\_ 2 packs of cigarettes today
- 11 \_\_\_\_\_ 50¢ in one week  
 \_\_\_\_\_ 30¢ today
- 12 \_\_\_\_\_ 1 motorcycle magazine today  
 \_\_\_\_\_ 2 motorcycle magazines in 3 weeks
- 13 \_\_\_\_\_ 85¢ in 2 weeks  
 \_\_\_\_\_ 65¢ today
- 14 \_\_\_\_\_ 3 packs of Kool Ade in 4 weeks  
 \_\_\_\_\_ 1 pack of Kool Ade today

## MONEY SAVING MEASURE

Name \_\_\_\_\_

INSTRUCTIONS: For each amount of money, circle what you would do.

---

(1) If 25¢ were added to your account, what would you do with it?

1. spend all of it.
2. spend most (75 percent) of it.
3. spend half and save half of it.
4. save most (75 percent) of it.
5. save all of it.

(2) If \$2.00 were added to your account, what would you do with it?

1. spend all of it.
2. spend most (75 percent) of it.
3. spend half and save half of it.
4. save most (75 percent) of it.
5. save all of it.

(3) If \$20.00 were added to your account, what would you do with it?

1. spend all of it.
2. spend most (75 percent) of it.
3. spend half and save half of it.
4. save most (75 percent) of it.
5. save all of it.

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## VITA

## BIOGRAPHY:

January, 1941	Born, Elyria, Ohio
Sept., 1946-June 1959	Public Schools, Avon, Ohio
Sept., 1959-Aug. 1963	Student, Ohio University
Sept., 1963-June 1965	Student, Department of Psychology Kent State University, Kent, Ohio
Sept., 1965-June 1967	Student, Department of Psychology Florida State University
July 1967-July 1968	University of Southern California Medical Center, Los Angeles
July 1968-1969	Student, Department of Psychology Florida State University, Tallahassee Staff, Federal Correctional Institution, Tallahassee, Florida

## EDUCATION:

Avon High School, Avon, Ohio  
High School Graduate, 1959

Ohio University, Athens, Ohio  
A.B. - Psychology Major, August 1963

Kent State University, Kent Ohio  
M.A. - Clinical Psychology, August, 1965

Florida State University, Tallahassee, Florida  
Ph.D. Candidate

## TRAINING:

Psychology Clinic, Kent State University, Kent, Ohio  
Extern-September 1963-August 1965

Veterans' Administration Hospitals  
Extern-January 1966-July 1967  
1500 hours supervised clinical training

University of Southern California School of Medicine  
Intern - July 1967-July 1968

## WORK EXPERIENCE:

Kent State University, Kent, Ohio  
Dean of Men's Staff, Residence Hall Counselor  
September 1963 - August 1965

Federal Correctional Institution for Youthful Offenders  
Tallahassee, Florida  
Staff Psychologist  
July 1968 - July 1969

## RESEARCH:

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