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EXPECTANCY FOR DELAYED REWARD,
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TO TEMPTATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the
Degree Doctor of Philosophy in the Graduate School of
The Ohio State University

By

Richard Ralph Lanese, B.A., M.A.

* * * * * * *

The Ohio State University
1966

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And to my wife, a very special debt is acknowledged.
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CHAPTER I
THEORETICAL BACKGROUND
AND RELATED RESEARCH

The ability to delay gratification for the sake of later, more gratifying outcomes has long been recognized as crucial from both the "common-sense" viewpoint and the vantage point of a number of theoretical writers.

This preference for immediate or delayed gratification was viewed critically by Freud with his theoretical exposition of the pleasure and reality principles.

We know that the pleasure principle is adjusted to a primary mode of operation on the part of the psychic apparatus, and that for the preservation of the organism, amid the difficulties of the external world it is 'ab initio' useless and extremely dangerous...It is replaced by the 'reality principle,' which without giving up the intention of ultimately attaining pleasure yet demands and enforces the postponement of satisfaction, the renunciation of manifold possibilities of it, and the temporary endurance of 'pain' on the long and circuitous road to pleasure. (Freud, 1922, p.5)

Freud (1935) viewed this transition from the pleasure principle to the reality principle as one of the most significant advances in the growth of culture and the development of the ego. This formulation paralleled his distinction between "primary" and "secondary" processes in mental functioning (Jones, 1953).
It was secondary process thinking that allowed for the deferment of gratification. Unfortunately, Freud did not systematically develop this transformation to secondary process.

Rapaport (1951) has taken this psychoanalytic conception of secondary process and delay of discharge, and has systematically formulated and elaborated it into a theory of thinking. Rapaport describes thinking as drive determined. The delay in discharge of a drive results in a cathexes of memory traces of the pleasurable or gratification experience. Still borrowing heavily from Freud but in part from Werner, Rapaport theorizes that in the course of increased experience with delay one associates many representations with the drives investing some cathexes with each. Eventually it occurs that where need-satisfying representations could formerly be raised to consciousness, and thus partly discharge the drive in terms of gratification through wish-fulfillment (primary process), the path of gratification is detoured through a meaningful connection of ideas, each of which is invested with some drive energy. This occurs as a function of the economics of cathexes, no single representation having enough of a concentration of energy to discharge the drive and bring pleasure. Rapaport concludes:

Thus the drive-organization of memories yeilded to a conceptual-organization...the new form of thought processes is usually conceptualized as ordered or goal-directed thinking, or the 'secondary process.' (p. 697).

and writing further on the subject:
Thinking explores the possible pathways of action to find the one of least persistence, least danger, and greater directness, while preserving almost intact the energy necessary for motor action. (Rapaport, 1950, p.169).

The psychoanalytic theory of thinking appears to play a pivotal role in ego development and the ability to delay gratification. Almost all psychoanalytic writers associate delay of gratification with the developmental process, mastery of impulses, maturity, and normal adjustment. Immediate gratification or discharge, they often relate to narcissism, immaturity, impulsiveness, and pathological behavior.

Investigators working more or less independently of Freudian theory have focused on somewhat different aspects of the delay of gratification construct. Mowrer and Ullman (1945), concerned primarily with the delay of punishment, view "time" or the delay interval as a crucial determinant in non-integrative (neurotic or delinquent) behavior. They argue that reinforcements belatedly administered are less effective than reinforcements more promptly administered except when the organism can bridge the time gap through the skilled use of symbols and compare the two or more consequences separated by time.

Rotter (1954) calls upon an expectancy concept to handle the problem of the apparent weaker effect of a delayed reinforcement. When a choice arises between an immediate reinforcement and a delayed reinforcement, differential expectancies for the occurrence of each determine the choice behavior. Behavior directed toward an immediate reinforcement rather than toward a delayed reinforce-
ment is a function of a specific or generalized expectancy that the occurrence of the future event is less likely to occur. The occurrence of the future reinforcement may be based on someone else's keeping a promise, or on some skill of the subject, or on chance factors. There are some instances, however, when delay of reinforcement does lower or even raise the value of a reinforcer. They may be explained as a result of different situations in which they occur.

Singer (1955), straddling Freud, Werner, and Rorschach, has suggested that human movement responses on the Rorschach test may be a possible measure of delay of gratification (inhibition of motor response). He also suggests that studies of subjects who differ sharply in Rorschach M may generate important theoretical implications for the theory linking delay and thought.

The above accounts of delay of gratification or delay of reinforcement are more or less concerned with this construct as a personality variable. Delay of reinforcement as it is usually studied in the animal laboratory has as its focus the acquisition of an instrumental response under various conditions of delay. In general, it appears that delayed reinforcement during acquisition weakens a response, as long as some learning criterion is used. If, however, resistance to extinction is used as the criterion measure the effects of delay more closely parallel the effects observed in partial reinforcement studies.
Most investigators in this area have studied the effects of delay of reward. There is very little data on the effects of delay of punishment. Renner, in the previously cited review, has pointed out how the relatively sparse data on human delay-of-reward learning appears to agree with the data from animal studies although the studies are only roughly comparable.

An investigation of the effects of delayed reward on choice behavior in children by Lipsett and Castaneda (1958) does, in fact, support the animal studies conclusion with respect to acquisition. Five-year-old children were asked to make choice's between a red light or blue reflector. These were followed by immediate or delayed reinforcement. Some trials were automatic, i.e., the reinforcement was paired with the colored light or reflector without the child making a choice. The reinforcement was a marble that could be used to fill a marble board and consequently win a toy. Over trials the investigators report an increase in frequency of choices for the immediate light. These results would seem to suggest that the delay, per se, effectively weakens the effect of a reinforcer.

Mischel appears to be the first investigator to systematically study preference for immediate or delayed reinforcements as a personality variable. In a series of experiments (Mischel, 1958, 1961a, 1961b, 1961c; Mischel & Metzner, 1962; Mischel & Gilligan, 1964) various correlates and antecedents relating to this variable have been specified.
The general procedure involves presenting a child with the choice between a small immediate reward or a larger, but delayed reward. The theoretical implications that gave rise to this series of studies appear to have been drawn from essentially that same theoretical background reviewed here. The ability to postpone is a sign of maturity, the socialization process and reality contact; whereas the preference for immediate reward is a sign of immaturity, impulsiveness, poor planning ability, and self-indulgence.

In an early study with Trinidadian children aged seven to nine years, Mischel (1958) applied the above procedure for eliciting choice preferences between a small and larger candy bar, the larger accompanied by a delay of one week. The significant finding was a relationship between father absence and preferences for immediate reinforcement. In a later study (Mischel, 1961a) with Trinidadian children aged 12 to 14, again using choice preferences for varying size candy, a number of significant relationships were reported. The preference for delayed reward predicted higher scores on a scale presumably tapping social responsibility. This ability to delay gratification also related to more accurate time perspective and ability to estimate time. The preference for immediate reinforcement differentiated a group of institutionalized delinquents from non-delinquents. Unfortunately there was no control group to partial out the effects of institutionalization as a variable.
Exploring further correlates of these choice preferences with another Trinidadian population, a positive relationship was found between ability to delay and achievement imagery (n'Achievement) as predicted. Also predicted was a negative relationship between delay and Couch and Keniston's acquiescence. Delay, once again, related positively to Harris' Social Responsibility Scale. The boys and girls in this research ranged in age from 11 to 14.

Three preference measures were utilized, the usual behavioral choice and two questionnaire items. The increase in effectiveness of this modified measure is not entirely clear. It is interesting to note that later modification of the delay of reinforcement measure dropped the hypothetical choice items in favor of behavioral choice items (Mischel & Gilligan, 1964). Other variables correlated with choice preference for delayed reinforcement have been intelligence (Melikian, 1959), and intelligence and age (Mischel & Metzner, 1962).

Recent work has explored the relationships among choice preferences of reinforcement, need for achievement and behavior in a resistance to temptation situation (Mischel & Gilligan, 1964). Sixth-grade boys were administered a 17-item behavioral choice measure of preferences for immediate and delayed rewards. A measure of n'Achievement was also obtained. Subjects were then placed in a temptation situation where they could ostensibly attain achievement awards. The situation consisted of playing a ray-gun game (to be described later), where only by engaging
in prohibited behaviors could badges be won. Unknown to the subject scores attained were prearranged electronically and were not a function of one's shooting skill. The subject played the game alone, recorded his own score and reported this to the experimenter. Both choice preferences and n'Achievement related to responses to temptation. Of 42 subjects on whom data was available, 34 cheated to obtain badges. This high proportion made it statistically unlikely that resisting or yielding to temptation could be predicted from preferences for immediate or delayed reinforcement. But among only those who cheated, choice preferences did predict amount of cheating and latency before cheating. For those children who preferred immediate reward choices the amount of cheating was greater ($r = .31$, $p < .05$) and the quicker they were to start cheating ($r = .38$, $p < .02$). This study suggests a link between choice preferences for delayed reinforcement as a personality variable and approach-avoidance responses in a double approach-avoidance situation.

Grinder's ray-gun game (1961) provides what appears to be a useful and interesting dependent variable for research in resistance to temptation situations. This "game," briefly described earlier, will be more fully described in a later section of this paper. Summarizing some of the virtues of this game --- if there can be virtue in deceit --- it is
interesting and challenging to subjects; it has high face validity; it can be administered across a broad age range (6 to 15); and it provides not only evidence of cheating or not, but measures of latency before the first deviant response and amount of cheating.

In a study of 11 and 12-year-old children which attempted to relate child-rearing antecedents to behavior in the temptation situation, Grinder (1962) reported only four of forty tests of significance at the .05 level or better. His antecedent data, obtained six years earlier by Sears et al., through interviews with mothers focused on psychoanalytically-inspired material such as sex training, toilet training, discipline and conscience development.

A similar study (Burton, Maccoby & Allin smith, 1961) investigating child-rearing practices of mothers and response to temptation behavior in four-year-old children also yielded inconsistent and unclear results. However, Grinder and McMichael (1963), using a story-completion technique as indices of "guilt," found differences between sixth and seventh grade Samoan and American children on both the guilt measures and resistance to temptation responses. The Samoan children showed significantly less guilt and significantly more yielding to temptation. The crucial prediction, however, that guilt would positively vary with resistance to temptation, was confirmed only for one of
the three guilt dimensions. Investigating fantasy confession through projective stories and its relationship to temptation behavior in 11-year-olds, Rebelsky, Allinsmith and Grinder (1963) found that non-cheaters used confession more than did cheaters; but this was only true for female subjects. In general, one might conclude from these investigations that the various indices of guilt are not strongly or systematically related to socially deviant or prohibited behavior.

Closely related to the delay of gratification construct is the construct of "trust." While few writers have given much formal attention to this sometimes vague and amorphous term, it occupies a central position in Erikson's theory of psychological development. Trust is the first of Erikson's ego values: Trust vs. Basic Mistrust, the first of his eight stages of man. The establishment of enduring patterns for resolving this early conflict is held to be the first task of the ego as well as the first task of the mother. When trust is established normal development (ego identity) is the outcome. The absence of trust or mistrust is viewed by Erikson as leading to various psycho-pathological conditions such as described by the terms schizoid, paranoid, and depressive.

Mothers, I think, create a sense of trust in their children by that kind of administration which in its quality combines sensitive care of the baby's individual needs and a firm sense of personal trustworthiness within the trusted framework of their culture's life style. (Erikson, 1950, p. 221)
While Rotter's Social Learning Theory does not formally deal with the construct of trust it is often implicit in his expectancy variable as it is used in certain contexts. For example, in a study by Mahrer (1956) investigating the role of expectancy in delayed reinforcement, a positive relationship was found between frequency of unkept promises and preferences for a subsequent immediate or delayed reinforcement in a choice situation where the delayed reinforcement was larger. Theoretically the subject's expectancy for the occurrence of the delayed outcome was reduced as a function of the specific situational experiences with the social reinforcing agent. Less formally, the subject's trust in the experimenter diminished as a result of broken promises.

Subjects in the above study were second-grade children. For performing a daily task each of a number of groups was promised a balloon the following day for five successive days. This promise was differentially kept for the various groups, establishing different levels of expectancy. Later when a choice was offered between two toys, one small but immediate, the other larger but delayed, the previously mentioned relationship between the variables was observed.

In a study of adult male subjects in a correctional institution where trust was studied in relation to immediate and delay choice behavior, Ladwig (1963) found just the opposite
relationship. Cigarettes, a pack immediately or two packs the following week, served as the choice items. Both authority and peer social reinforcing agents were utilized. Subjects who distrusted peers and authority figures tended toward delayed choices with either agent. The measure of trust used in this experiment was obtained through a Likert-type scale where authority and peer figures were rated on a number of trust-related adjectives. Intelligence, amount of criminality, and father-absence were also investigated with non-significant results.

As the investigation and hypotheses to be described in the next chapter will, in part, draw from Rotter's Social Learning Theory it will be necessary to define and elaborate a few of the relevant, basic concepts which characterize this theory.

**Expectancy**

This theoretical concept has been around for a number of years as an explanatory concept in both animal and human behavior. Relied upon heavily by Tolman (1955) as a behavioral determinant, it occupied a major but somewhat less important role in the complex theoretical model of Lewin (1944). More disciplined and systematic use of this construct is observable in the theoretical models of Atkinson (1957) and Rotter (1954). All of these theorists have viewed the expectancy construct in a
roughly similar manner, as a probability variable, internal, subjectivé, or actuarial (Brunswik, 1951), in part, determining human behavior.

Rotter defines expectancy as the contingency or probability held by a person that any specific or group of reinforcements will occur in any given situation. This probability held by the individual is internal and subjective and dependent upon the past history of reinforcement or generalizations from related behavior - reinforcement sequences. Expectancy is held to be independent of the value of the reinforcement to which it is associated. The formula for expectancy in a given situation has been described by Rotter in the following way:

\[
\text{Expectancy (E_{81}) is a function of probability of occurrence as based on past experience in situations perceived as the same (E'_{81}) and the generalization of the expectancies for the same or similar reinforcements to occur in other situations for the same or functionally related behaviors (GE). (1954, p. 166).}
\]

**Reinforcement value**

The value of a reinforcement (or value of a reward) is a function of the expectancies the given reinforcement will lead to other reinforcements. This value can be further defined as the mathematical preference on the part of the subject for a given reinforcement to occur. Reinforcements with which the given reinforcement has been historically paired determine its value. A crude method of measuring the value of a reinforcement
is by determining the degree of preference for any reinforcement of a group to occur if the possibilities for each to occur were equal.

Behavior potential

This concept is defined as the potential for a given behavior to occur in a given situation in relation to a specific reinforcement as a function of the expectancy of the occurrence of that reinforcement to follow the given behavior in the given situation, and the value of the specific reinforcement.

Three additional relationships that should be summarized at this time are (1) the occurrence of a reinforcement following a given behavior raises an expectancy, while the failure of a reinforcement to occur lowers an expectancy, (2) the stability of an expectancy is a function of the amount of experience in a specific situation and, (3) the effect of a reinforcement on expectancy diminishes with experience in the specific situation.
CHAPTER II
PURPOSE AND HYPOTHESES

The present research investigates the relationships concerning an individual's general preference for immediate rewards or larger delayed rewards, possible induced changes in this choice behavior as a function of imposed situational conditions of "trust" and "distrust," and the relationship of both choice behavior and these situational conditions to responses in a resistance to temptation situation. Stated somewhat differently, the focus of interest is the investigation of situational conditions affecting both choice behavior and responses to temptation.

Previous work has concerned itself mainly with investigating the antecedents and correlates of choice behavior or "delay of gratification." With the increased elaboration of the nomological net surrounding this variable over the past ten years, it appears that studies, such as the one to be proposed, manipulating the situational conditions affecting these choice preference patterns should be highly valuable, particularly in terms of explanatory utility and ultimately, theory building.
The previously cited research of Mahrer has suggested that choice preferences for immediate and delayed rewards may be manipulated by differential promise-breaking. At the end of the differential training subjects choose immediate or delayed reward objects, presumably to the extent that they believe or expect that the social agent will, in fact, deliver the larger, more valuable, but delayed reward. This experiment has not concerned itself with individual differences, nor has it tested the relationship between broken promises and choices behavior in such a way that the results could be generalizable to other more realistic or likely situations. When an individual makes choices between small rewards or immediate goals and larger but delayed rewards or goals he makes that choice in the face of, or while confronted with, the immediate goal. His real life experience, then, is a continuous sequence of choices between the two contingencies. He seldom experiences only one contingency and not the other, as in the Mahrer study, before having to make a sudden choice between the two. Put another way, the individual himself may be instrumental in establishing his preference for immediate or delayed gratification, and a laboratory situation that does not provide an immediate reward as an alternative choice to a delayed reward that occurs or fails to occur may not be most fruitful. One purpose of the present investigation is to establish a more realistic,
generalizable laboratory situation for observing not only the
effect of broken promises on choice behavior but effects of
kept promises as well.

The resistance to temptation situation may provide a useful
dependent variable for evaluating the effects of the experimental
conditions on both the choice preference variable and cheating
behavior. Interest here is on whether initial choice preferences
determine cheating or resisting behavior after the experimental
manipulations, or whether an increase or decrease in cheating
behavior is preceded by experimentally altered choice preferences.
As these are not mutually exclusive relationships, both may be
true.

The Mischel and Gilligan data has provided low order
evidence that a relationship exists between delay of gratification
and cheating behavior. The investigators have provided the follow­
ing rationale:

... a relatively consistent preference for
immediate gratification and an unwillingness to defer
or delay the immediate for the sake of larger but
later consequences should make it more difficult for
a person to observe social prohibitions and restrictions,
particularly if violating such prohibitions yields immed­
iate rewards. ... if the subject is to resist temptation
and to refrain from deviant behavior he must be able to
defer immediate gratification. (p. 412)

In the above study two female experimenters collected the
data so that the game situation was not associated with the
independendent variable. One purpose of the present study is to
modify that procedure so that the social reinforcing agent is associated with the game situation. The rationale for this alteration will be explained in the following theoretical speculation.

An individual's consistent preference for immediate or delayed rewards may be regarded as a measure of his generalized expectancy (GE) for the occurrence of delayed rewards. In a novel situation the subject will draw on this class of expectancies, i.e., in a situation with an unfamiliar social agent. It is fair to say that initially in the new situation a subject expectancy (E) for delayed reward is almost entirely a function of GE because theoretically E' contributes little without situational experience. With subsequent experience in the situation with the social reinforcing agent E becomes increasingly a function of E', and GE increases, but only by some small amount depending on the stability and amount of experience in similar or related situations the subject has had. If situations are established so that E' is allowed to increase in one case (keeping promises for delivering delayed reward) and decrease in the second case (breaking promises for delayed reward), then a change in subsequent expectancies should obtain and be measureable. In the trust situation this would be expected even in the context of immediately occurring rewards, because delay, per se, in theory has no way of lowering the reinforcement value of a reward.
In the game situation the presence of the experimenter-social reinforcing agent will provide situational cues for the subject so that expectancies from the trust and distrust conditions should generalize and influence game related expectancies and subsequent behavior. On the assumption that both high and low GE subjects change by the same amounts with the experimental manipulations the prediction would be advanced that both GE and changes in expectancy would relate to game behavior.

To achieve the purposes of this experiment a neutral condition or control group has been included to provide additional and necessary comparative data - especially in view of the altered neutral experiment.

In summary, the more specific purposes of this experiment are to (1) develop a measure of GE for delayed reward, (2) attempt to influence expectancies for delayed reward in the context of occurring immediate rewards, (3) obtain comparative measures of expectancy change over trials, and, (4) attempt to relate both GE, expectancy change, and the experimental conditions to dependent variable behaviors in the resistance to temptation situation.

The hypotheses to be tested were as follows:

1a. When subjects are given a number of choices between small immediate rewards that actually do occur, or larger but delayed rewards that also occur, their preferences will move toward delayed choices as some function of their experience with
the occurrence of those delayed rewards. The trust condition will provide a test of this hypothesis.

lb. When subjects are given a number of choices between small immediate rewards that actually do occur, or larger but delayed rewards that do not occur, their preferences will move toward immediate choices as some function of their experience with the non-occurring larger reward. The distrust condition will provide a test of this hypothesis.

lc. Subjects in the trust condition and subjects in the distrust condition will significantly differ in their choice preferences for immediate and delayed rewards as some function of their experience in these respective conditions. The direction of the difference has been specified in the previous hypotheses.

2a. Subjects with an initial preference for immediate rewards, i.e., subjects with a low generalized expectancy for delayed reward, will submit to temptation in a "resistance to temptation" situation more often than subjects with a preference for larger, but delayed, rewards, i.e., subjects with a high generalized expectancy for delayed reward.

2b. Among subjects who submit to temptation the group with an initial preference for immediate rewards and the group with an initial preference for delayed rewards will differ in the length of the delay before the first deviant response in the resistance to temptation situation. The latter group, or
those with the high generalized expectancy for delayed reward, will exhibit a greater tendency for postponing or delaying the deviant response that leads to reward.

2c. Among subjects who submit to temptation those with an initial preference for immediate rewards and those with an initial preference for delayed rewards will differ in the amount of cheating in which they engage. The former group will report higher deviant scores which lead to more highly valued goals.

3a, 3b, 3c. The three conditions employed in this study should relate to the three dependent variables in the resistance to temptation situation as follows: with increasing conditions of trust, i.e., moving from distrust, through neutral, to trust, it is predicted that (3a) resistance to cheating will increase; (3b) the latency or delay of the first deviant response will also increase; and (3c) the amount of cheating will decrease.

4a, 4b, 4c. Across conditions subjects with an initial preference for immediate rewards and subjects with an initial preference for delayed rewards will differ on the dependent variable measures in the resistance to temptation situation. The latter group of subjects (4a) will more often resist the temptation to cheat, (4b) will exhibit longer latency periods when they do cheat, and (4c) will report lower deviant scores.
5a, 5b, 5c. Changes in subjects' preferences or expectancies for delayed rewards should relate to the three dependent variables in the resistance to temptation situation as follows: with changes toward delayed preferences (5a) resistance to cheating will increase; (5b) latency before the first deviant response will increase; and (5c) the amount of cheating will decrease.
CHAPTER III

METHOD

Subjects

The data in this investigation was collected from an initial sample of 165 boys from the fourth, fifth and sixth grades of three small, comparable public schools in a school district bordering Columbus, Ohio. Attenuation over the five phases of the design reduced the number of usable subjects to 150. Each school provided from 44 to 55 subjects across the three grades, their entire population of boys at these levels. Subjects ranged in age from nine to twelve years old from relatively homogeneous socioeconomic backgrounds. Their parents engaged in occupations ranging from medium-skill workers to proprietors of small businesses. These occupations fall primarily into classes 4 and 5 of the Socioeconomic Classification of Occupation (Warner, Leeke, and Bells, 1949).

Immediate-Delay Measure

The Immediate-Delay Measure or choice-preference measure employed in the present study consists of eighteen pairs of choice items, each between a small reward immediately or a larger, more valuable reward of the same kind at some specified later time. The development of the choice items, to be described
at the end of this chapter, are, to some extent, based on previously described procedures (Mischel, 1958; Mischel & Gilligan, 1964; and Mischel, personal communication, 1965).

Each pair of objects was actually displayed to the groups before they recorded their individual choice preferences on the paper and pencil measure (Appendix 1). This realistic and concrete emphasis, and the "playing for keeps" directions accompanying the measure and read aloud by the experimenter were intended to elicit behavioral choices rather than hypothetical choices.

The importance of the above distinction between these two orders of choices, behavioral and hypothetical, cannot be overemphasized. Behavioral choices are presumed to be reflected in the subject's responses because he has been promised one of his eighteen selections, and having no prior knowledge as to which of these choices he will subsequently receive, each choice appears as real to him as any other. In this situation the subject's responses may be considered a reflection of his behavior potential and a direct correlate of his expectancies concerning the occurrence of future rewards since the reinforcement value of the paired items was previously controlled. The method of controlling reinforcement value will be described in the next section. If the choice preference measure had been developed and employed around purely hypothetical choices, e.g., where the individual chooses between items of a pair but is not expecting to receive either,
then this measure would have to be treated with much the same
cautions and inferential skill as one would treat any fantasy or
projective instrument.

Of the paired items constituting the choice-preference
measure finally developed ten choices were between monetary items.
Examples ranged from fifteen cents today or twenty cents in two or
three days to fifty cents today or eighty cents in three weeks.
Non-monetary examples included choices between a small notebook
today or a large notebook in two or three days, a small magnifying
glass today or a large magnifying glass in three weeks, and
two bags of M&Ms today or three bags in two or three days. The
preponderance of monetary choices appear to be justified on the
assumption that these items are generalized reinforcements and
more broadly relate to an individual's various need areas.

Each pair of choice items was printed on a separate page.
This was a necessary procedure employed to reduce the possibility
of any single choice being influenced by those that followed.
These orders of interference might take the form of distraction,
or "paralaying" choices, or any other idiosyncratic, decision-
making strategy. No attempt was made to eliminate the effect of
prior choices on any given choice.

At the top of each page of the Immediate-Delay Measure
the following directions were repeated:

Wait until both things are shown to you.
Then check the one you choose.
If you take one you cannot have the other.
The sequence of pairs were then arranged on the basis of two considerations. First, for the most part, monetary pairings were alternated with the remaining pairs. This was done to reduce, as much as possible, the sameness of the choices and, ultimately, to sharpen response discrimination. Second, the ordering of items within each pair with reference to value or magnitude was varied. This procedure was introduced to control for response (position) set and, again, to maximize choice discrimination.

**Resistance to temptation measure**

The resistance to temptation measure is based on a situation and "ray-gun-game" developed by Grinder (1961). The ray-gun consists of a toy gun, swivel mounted at one end of a seven-foot plank. At the other end of the plank sits a rectangular box 15"x15"x10". On the front of this box is a small eight-inch screen upon which two moving rockets appear. Above the screen are five lights which register a score from zero to four each time the trigger of the ray-gun is pulled. Scores are pre-arranged through a system of electric relays. The number of shots each subject takes registers on an electric impulse counter concealed at the back of the instrument. A push-button reset switch allows the counter and programmed arrangement of scores to be returned to zero and the beginning of the sequence.

Construction of the ray-gun game was undertaken by the experimenter, and, in the main, followed Grinder's specifications whenever possible. Changes were made in the gun itself when the
specified "pistol-type acetylene torch" that was to serve as the ray gun could not be found. Instead a Wen soldering gun was modified and employed as the shooting mechanism. The soldering tip was removed and a rather heavy metal tube was attached to the nose of the gun to serve as a ray-gun barrel. The trigger switch of the gun was rewired to return through the AC cord that normally supplies the electrical current to the soldering-gun transformer. The AC cord was fitted through a half-inch hole at one end of the plank and from underneath the plank carried each trigger impulse to the electric relays at the other end of the apparatus. This AC cord also served, in part, to anchor the gun to the base of the plank and yet provide some flexibility and movement so that the ray-gun could be aimed over the necessary radius of the moving targets. To provide limited movement at the barrel end of the gun encompassing the barrel was a one and one-half inch steel bearing attached to a steel rod which in turn was firmly fixed to the plank. This arrangement was worked out to provide just enough gun movement so that sighting would just cover the target area and no more. This was a rather important consideration designed to prevent intentional or even accidental shooting "off target" and consequently achieving a score (hit) with its obvious implications. An additional design feature serving this same end was to provide two moving rocket targets, 180 degrees apart on a six-inch diameter circle. This reduced
maximum miss distance from six inches to about three inches or from 180 degrees to 90 degrees relative to a single moving target. The internal mechanical and lighting arrangement provided an image of the pair of rockets on the translucent screen 64 times per minute.

Other departures from Grinder included reducing the number of shots allowed each subject from twenty to ten as per Mischel and Gilligan (1964). Accordingly, the electrical relay network was modified to provide a maximum 20 shots rather than 40. This provided an opportunity for a subject to take more than the ten shots prescribed by the rule of the game. At the end of the 20 shot sequence the electrical system was designed to terminate the sequence and simply buzz upon further trigger actuation. This modification was intended to avoid the possibility of repeating the scoring sequence and, therein, run the risk of a subject possibly discovering or suspecting the prearranged order of scoring.

The scoring sequence also departed from Grinder who followed high scores with low scores. This pattern would seem to favor the establishment of relatively low expectancies concerning one's skill in the specific situation, or expectancies that chance or external factors were determining one's score. Consequently, for present research purposes the patterned sequence was arranged to minimize either high or low expectancies concerning the development
of one's skill at the game while at the same time allowing for
expectancies that one could legitimately win a prize. This
modification hopefully would allow the subject the opportunity to
delay or avoid a cheating response. For others this pattern should
not significantly interfere with the prohibited response.

Prizes available to subjects yielding to temptation differed
slightly from those employed in the earlier-mentioned studies.
Instead of badges, the experimenter offered three ribbons at
different levels of reinforcement value. A reported score of
20 points achieved a "Marksman" ribbon (white); a score of 25
points received a "Sharpshooter" ribbon (red); and a score of
23 points received an "Expert" ribbon (blue). Both economics
and availability dictated the decision to use ribbons rather
than badges.

Procedure: initial expectancy
measurements and the experimen-
tal manipulations

Fifty subjects from the fourth, fifth and sixth grades at
each school comprised a group. One group was subjected to the
experimental "trust" manipulation. A second school was subjected

1The sequence of scores finally programmed was 1, 0, 2, 3, 2,
4, 2, 3, 0, 1, a total of 18 points, followed by a similar but
slightly higher sequence to round out the twenty shot program.
to a "neutral" condition while the third school received the "distrust" treatment. At each school the investigator was introduced to the subjects by the principal. The subjects were gathered together in a large classroom or auditorium. The principal was requested to limit the introduction to the investigator's name and his ostensible purpose in visiting the school: as a representative of a game manufacturer who was interested in finding out what kinds of prizes children preferred. The experimenter was then left alone with the subjects. The Immediate-Delay Measure was group administered after the directions, which accompanied the instrument, were read aloud by the experimenter:

Hil

We are going to play a game about choosing today. I'm going to hold up two things. One is a big thing. One is a small thing.

If you choose the small thing, fine, you can have it today. If you choose the bigger thing, fine, but you will have to wait for a while before you get it.

I can't give you all the things you choose, but I will give you one of them. It could be one of the things you want now. It could be one of the things you want later. You won't know which thing I am going to give you.

This is not a test. But choose very carefully because one of the things you choose you will get to keep.

Upon completion of this measure the subjects were requested to return to their classrooms. There they would resume their normal routine until the experimenter completed the scoring of the Immediate-Delay Measure and arranged choice items for distribution.
Approximately 90 to 120 minutes later, after the Immediate-Delay Measure had been scored and divided into two categories, based on the number of immediate or delayed choice preferences, all subjects were again summoned to the experimental site. Those subjects in all of the three groups who more often made immediate to delayed choice preferences were given one of their immediate choices, the smaller, less valuable item of the pair. Each subject receiving an immediate choice, was called front and center, one at a time, and given a preferred choice item preselected by the experimenter. Each choice item was held up before the entire group, named, and associated with the other member of the pair. This procedure was employed to constantly remind all subjects that the object received was the smaller, less valuable option. This was particularly necessary in the case of monetary pairings, where, because of the large number of monetary choices called for, it was not always obvious from which pair the item came. Presumably this procedure also served to point out the various complementary items subjects awaiting delayed choices would receive when the experimenter returned. Reinforcement contingencies were, in this way, hopefully made more apparent to all subjects.

After subjects preferring immediate rewards in each of the three conditions received one of their immediate choices the experimenter announced that he would return shortly with choice items for those subjects who had not yet received one of their
choices. Except for a few signs of frustration and mild disappointment most subjects accepted this announcement with heightened anticipation.

Three days later the experimenter returned, unannounced, to each of the three schools. For the groups in the trust and neutral conditions one delayed-choice item, preselected by the experimenter, the complement of earlier dispensed items, was given to each of the subjects who had previously chosen more delayed than immediate items. The procedure for distributing these items was essentially the same as that described earlier, again with all subjects assembled together. In the case of the subjects in the distrust condition the experimenter failed to keep the promise that upon his return he would bring the as yet unrewarded subjects one of their chosen items. Instead he delivers the first of three "excuses" (Appendix 2): "I don't have the things you chose last time with me today. But I will have them for you the next time I come here."

Procedure: intermediate expectancy measurements and experimental manipulations

Immediately following the unkept promise in the distrust condition and the distribution of delayed choices in the trust condition the Immediate-Delay Measure was readministered. As before, it was scored and subjects were placed in immediate or
delay categories according to the same earlier established criteria. Each subject in the new immediate grouping, based on this repeated measurement, was given one of his immediate choices, following the same procedure described previously. For those subjects not receiving anything the experimenter once more promised to return with an item for each of them. Subjects at the school in the neutral condition were not given the repeat choice-preference measure as were the two other groups. Instead the experimenter engaged the neutral condition subjects in an innocuous task for approximately 25 to 30 minutes, the equivalent period of time that was spent with groups in the trust and distrust conditions. For this innocuous activity the subjects were asked to draw a person.

Procedure: final expectancy measurements and experimental manipulations

Two days later the experimenter returned to repeat the previous procedures in the three conditions. Remaining subjects in the trust group received one of their delayed choices while remaining subjects in the distrust condition received nothing. The experimenter simply told them: "I'm sorry, but I still don't have the things you chose the other times I was here. I'll have them for you the next time I return." This second excuse was a slight variation on the previously employed excuse. An appearance was also made before the neutral condition subjects, this time only
to engage them in a neutral activity. On this occasion the time was spent rating photographs of men on various dimensions.

The general procedure of the previous session was, in part, repeated three days thereafter. In closing out this phase of the study the Immediate-Delay Measure was not repeated. The broken promise to the distrust group was dramatized with the announcement: "I'm very sorry to have to admit it, but I still don't have those things you chose. I'll have them for you when I come back." This third excuse completes the initial phase of the experiment which attempts to manipulate choice preferences between small, immediate rewards and larger but delayed rewards.

In theoretical terms an estimate of each subject's generalized expectancy for the occurrence of delayed reinforcement has been measured by the initial score on the Immediate-Delay Measure. The experimental conditions of trust and distrust which followed this initial measurement were, in effect, efforts to respectively raise and lower situational expectancies. Consequently, subsequent scores measuring changed expectancies ($E$) should no longer reflect only the subjects generalized expectancy ($GE$), but rather, his specific expectancy ($E^1$) in the specific situation, which is a function of previous trials, and generalized expectancy ($GE$). Since there should theoretically be little change in generalized expectancy in the course of the few trials employed, observed changes in scores over trials should reflect the effectiveness of the experimental manipulation.
Procedure: administration of the resistance to temptation situation

The resistance to temptation situation was introduced to the neutral group two and one-half days later. On the following two days the trust group and then the distrust group were also shown the game and instructed in how to play. On each day approximately four subjects per hour were able to take their turn at the game. For a two-week period the ray-gun game was alternated across schools or a systematic daily basis until all subjects in the three conditions received a turn. The alternating of schools was designed to control for any effects of differential intervening time periods between administration of the final treatment sessions and the dependent variable. After all subjects completed their turn in the game situation those subjects in the distrust condition who had items promised them received their overdue choice or choices. For having to wait this longer delay period these subjects were given additional compensatory rewards from the box of leftover choice items.

In demonstrating the ray-gun game at each school the subjects were assembled together in an available room that served as the experimental setting. The game was shown, described, and demonstrated to the group of boys, after which they were instructed in how to record their scores on the scoring sheet (Appendix 3) with a ball-point pen. The scoring sheet consisted of three
columns and ten rows. The first column of ten dashed lines was labeled "Shot Number." The second column was headed by "Score on Each Shot" and the third column by "Points So Far."

The experimenter addressed the group in the experimental room with the following directions:

I am interested in finding out how well boys at different schools can shoot a ray-gun at a high-speed rocket. Let's pretend that the rocket is the enemy's and must be destroyed. To those of you who are good shots I am going to give this white marksman ribbon, and to those of you better than marksman I'm going to give this red sharpshooter ribbon. And to those of you better than marksman and sharpshooter I'm going to give this blue expert ribbon. (The ribbons were displayed.)

Then the subjects were asked to gather around the ray-gun game where they were told:

See the rotating enemy rockets. They are moving pretty fast. Whenever you hit one of the rockets in dead center you score a bull's-eye and all four white lights above the rocket will light-up. If you hit the head or tail of the rocket you may get a score of 1, 2, 3, or 4 points depending how close you are to dead center. If you miss completely only the blue light will flash on and you get a score of 0 points. (Here the experimenter demonstrates.)

Now let me show you how we play the game. See this score sheet. You will take ten shots. Every shot you take is numbered in this column on the left. For each shot you write down the scores you get in this middle column. The last column is for adding up your score as you take your shots. Let me show you how it works.

1Also from Grinder with revisions by Mischel and Gilligan and this investigator.
The experimenter demonstrates again with five or six shots engaging the group to join in tallying the scores on the score sheet.

Now here's the important part: if your final score for all ten shots is at least 20 points you win a marksman ribbon. If your score is 25 points you win a sharpshooter ribbon; and if it is 28 points or more you win an expert ribbon. (Score criteria for the various ribbons was printed on the score sheet.) Now let's return to your classroom and you can come out one at a time and play the game.

As each subject returned to the experimental room to take his turn at the game the experimenter explained:

I'm very busy across the hall (indicating the room). Will you please play the game by yourself? Do you understand how to play? Take your ten shots, write down your scores and add them up after each shot as I showed you. If you shoot well I'll give you the ribbon that you've won. OK? Bring your score sheet to me when you've finished.

Scoring was prearranged in such a way that the total score the subject could obtain without responding deviantly was 18 points. All subjects therefore who reported legitimate scores reported 18 points. Subjects who reported a score greater than 18 points were presumed to be cheaters. As the subject recorded his performance after each shot with a ball-point pen, the first departure from the programmed sequence serves as the measure of latency. These scores range from zero to nine, i.e., cheating may occur on the first trial (0) or may be delayed up to the final trial (9). The amount of cheating may have a possible range of 23 points, the difference between a legitimate 18 points and a reported perfect score of 40 points.
After each subject completed his turn at the ray-gun game he delivered his score sheet to the experimenter in another room. In the case of the legitimate score the experimenter simply thanked the subject for his cooperation after checking his score sheet. To the subject who reported a deviant score the experimenter gave the appropriate ribbon accompanied by the typical comment: "Let's see... you've won a white, marksman ribbon." This subject, too, was thanked for his cooperation and allowed to return to his classroom.

The procedure agreed upon for selecting the sequence of subjects was worked out earlier in conferences with the various classroom teachers. It was decided that no more than three or four successive subjects from a given grade and classroom would participate before subjects from a higher or lower grade took a similar turn. This method was congenial to the teachers in that classroom interruptions were held to relatively short periods, enabling the teacher to schedule her daily lessons around them. Experimental design considerations, calling for a constant alternating of subjects by grades to minimize any possible effects of position, were also optimized by this procedure. The order of selection of subjects was, in the main, according to classroom seating whenever possible.
**Statistical methods**

It was proposed to test the hypotheses concerning expectancy change as a function of the experimental manipulations by comparisons of the initial and final scores on the Immediate-Delay Measure. To compare differences between the trust and distrust conditions over the experimental manipulations the amount of change for each subject will constitute the data. For each of the three comparisons the $t$ statistic may be used. However, for the two within group differences, which are based on repeated measures, a correction for correlation between the tests will be necessary.

The hypotheses predicting relationships between generalized expectancy for delayed reward and the dependent variables of cheating behaviors will be tested by a comparison of differences between two groups. Again $t$ tests will be used.

Each of the remaining hypotheses will be tested by means of analysis of variance except for those predictions concerning cheating-resisting behavior. As this is a dichotomous variable equality of variance cannot be assumed. While an arcsine transformation of the square root of the proportion cheating in each group will resolve the difficulty in the case of groups of equal size, groups in this study are not equal in size. In addition, the above method will not allow a test for interaction as each proportion would be treated as a single observation and there would be no estimate of within group variance. For these reasons
it was decided to use contingency tables and the $X^2$ statistic to test the cheat-resist hypotheses.

Development and preliminary testing of the Immediate-Delay Measure

An effort was made to develop a choice preference measure of some 14 to 20 pairs of items, each pair demanding a choice between a small reward which could be obtained immediately or a more valuable or larger reward of the same kind which required the subject to wait for a period of time. These pairs were selected from a larger pool of paired items on the basis of the following considerations. First, in a straight choice situation the seemingly larger or more valuable item of the pair should be overwhelmingly preferred. In the immediate-delay choice situation, however, approximately 50 per cent of the children had to choose the immediate reward and 50 per cent the delayed reward. These operations were necessary to both reliability and distribution requirements. The final consideration was economic. Since the number of rewards distributed among the subjects were in excess of 450 the average item cost had to be as low as practicable, somewhere between 25 cents and 35 cents.

The pool of choice pairs were based, in part, on 14 of the best pairs from the 17-item scale used by Mischel and Gilligan. These items were suitably modified before pretesting, primarily
because shorter delay periods were involved in the present study. Inasmuch as any change in the length of delay should presumably be accompanied by a corresponding change in the size or value of the reinforcement, considerable modification was foreseen and was necessary. Fortunately seven of the fourteen pairs involved choices between different amounts of money. The testing and selection of final monetary pairs was more straightforward than the selection of other non-monetary rewards.

Additional pairs of items were selected by the experimenter. The procedure called for fifth-grade teachers to individually submit lists of desirable items. Each teacher was asked to submit items that would be interesting to and highly preferred by most boys in her class. Finally a composite list of items were rank ordered by each teacher. The most promising ten items were retained and pairs were established by varying the amount of each item.

With this total pool of 24 paired-choice items pretesting began in a Columbus elementary school comparable to those schools that were later used in the experiment proper. Two fifth-grade classes were made available for this first phase of pretesting. The investigator entered the classroom with a large box of prizes. Instructions were similar to the instructions described earlier although somewhat more formal and probably at a readability level beyond many of these fifth graders, judging from the many perplexed and bewildered expressions.
After the introduction and general instructions the first group of 22 boys registered their preferences with eyes closed, by a show of hands. After testing all 24 pairs of choice items all subjects were given one of their immediate choices. Following this the data was analyzed and suitably modified for presentation to a second classroom of subjects later that day. Fortunately this class had been visiting the zoo during the morning and was not aware of the earlier proceedings. Had there been knowledge of the morning event it would have closely corresponded to what later was employed as the experimental trust manipulation.

Comparison of the results of pretesting the two groups strongly suggested that something other than the variables being manipulated and modified was at least partly responsible for the very divergent effects observed. There appeared to be little or no relationship between the experimental variation of relative amounts of reinforcement or delay periods and the direction and proportion of choices. It was subsequently concluded that the raising of hands was contributing to the apparent cues. All pretesting that followed, therefore, required that the subject record his response choices on a paper and pencil measure.

The subsequent modification and development of the Immediate-Delay Measure was accomplished through pretesting three groups of elementary school boys from a school in the same district as those later used in the final experiment. Each group was com-
prised of boys from the fourth, fifth and sixth grades. In all, nine different, entire classes of boys took part in this phase of pretesting.

Each group of subjects was assembled in the auditorium. Group I, consisting of 26 fourth, fifth and sixth graders, approximately equally represented, made their choices in the morning. Following this the investigator analyzed the data and modified those item-pairs that were farthest from the ideal 50-50 split with reference to the number of immediate and delayed choices. Then Group II subjects were tested on the modified measure immediately after each of the immediate choice subjects received one of their immediate-choice preferences. The Group II subjects (N=22) were called together immediately before the lunch hour that same morning and consequently knew nothing about what had taken place earlier. Analyses of the choice responses of this second group of boys reflected progress in the development of the measure. Yet it was clear that at least one additional pretest group would be required to respond to a second modification. Early the next morning Group III (N=42) comprised of all the remaining boys from the three grades were tested on the final modification.

It should be pointed out that this third group was not a completely adequate pretest group. The delay between running the first two groups and this third group allowed for some social interaction, communications and more than likely some prior
knowledge about the reinforcing agent. This knowledge, at most, would pertain only to the delivery of immediate rewards as none of the subjects from the previous two groups had received his delayed-choice preference as yet. The effect anticipated was one of possible inflation of immediate choice preferences. What might be predicted is a raising of expectancies for the occurrence of immediate rewards and to some lesser extent an expectancy increase for the occurrence of delayed choice items, the latter based on the possibility of generalization of expectancies or trust. With these above considerations in mind the decision was made to accept the results of Pretest Group III as essentially valid if the proportion of delayed choices was near or slightly below the 50-50 criterion.

The results of pretesting each of the three groups of boys is summarized below in Table 1.

| TABLE 1. Percentage of delayed choices of all possible choices (subjects X choices) |
|-------------------------------|-----|-----|-----|
|                              | N   | 4th Grade | 5th Grade | 6th Grade |
| Pretest Gr I                 | 26  | 66%        | 76%        | 94%        |
| Pretest Gr II                | 22  | 44%        | 87%        | 76%        |
| Pretest Gr III               | 42  | 33%        | 47%        | 67%        |
An examination of the above table will reflect the progressive improvement in the development of the Immediate-Delay Measure. The form administered to Group III was comprised of 19 paired choice-items. All pairs but one were retained and employed in the experiment itself. Of these 18 pairs each delayed-item choice was preferred by 40 per cent to 69 per cent of the subjects in Pretest Group III. (Percentages in Table 1 are based on subjects X choices.)

It is apparent that the results summarized in Table 1 point to a probable positive relationship between grade level and preference for delayed choices. This relationship will be further explored in the discussion chapter in the context of more complete data. It appears likely that a further attempt to reduce the percentage of delayed choices among sixth graders to closer to 50 per cent would correspondingly reduce the delayed choice percentage of fourth graders to a still lower figure than that achieved. Consequently, the 18 item measure was judged to be sufficiently acceptable as a research instrument under the difficult conditions of having to be appropriate to subjects at three different grade levels.

One further consideration pertaining to the adequacy of pairs of items should be mentioned at this point. As was pointed out earlier, in a straight choice situation the larger or more valuable item of a pair should be overwhelmingly preferred. It
should be apparent that this unanimous group preference should prevail for each of the larger items before one can reach any systematic conclusions concerning the role of delay in a choice situation. The straight choice preference was checked for Group III subjects (N=42). After completion of the Immediate-Delay Measure subjects were asked to choose between the items of each pair, this time as a straight choice. The experimenter instructed them as follows:

This time let's see which of two things you would choose if you could have either one of them today. Only this time you may just close your eyes and place your heads on your desks. After I tell you what the two things are you may raise your right hand if you want the first thing. If you want the second thing, raise your left hand. Close your eyes tightly and don't raise your hand until I tell you. You'll all raise them together.

The experimenter then called out each pair in exactly the same order that they appeared in the Immediate-Delay Measure. The only change was that each item was followed by the word "today."
The show of hands was counted for each pair with the larger or presumably more valuable item clearly preferred in all cases. The number of choices for the larger items ranged from 37 to 42, all above eighty-five per cent agreement.
CHAPTER IV

RESULTS

The purpose of this chapter is to present the findings of the study with regard to the major hypotheses and to make additional comparisons wherever these might help to clarify relationships in the data.

Before presenting the statistical tests on data related to the experimental hypotheses, enumerative data, the means and standard deviations of initial Immediate-Delay Measure scores for schools and grades, reliability, and equality of variance data will be presented.

The data to be analysed is based on a maximum of 150 subjects, 50 in each of the three conditions. Of these 150 subjects, 141 participated in the last phase of the study, the resistance to temptation situation. Of these 141 subjects the experimental manipulations of trust and distrust included a total of 91 subjects. The remaining 50 constituted the neutral or control group. In the game situation 73 of the 141 subjects, or 51.7 per cent were unable to resist temptation. One of the previously discussed goals of the experimental design was to attempt to limit
cheating behavior to near 50 per cent of the subjects to maximize the design potential for predicting resisting or cheating.

Table 2 presents the means and standard deviations of schools and grades for the initial administration of the Immediate-Delay Measure.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>School-Trust</td>
<td>50</td>
<td>6.40</td>
<td>5.33</td>
</tr>
<tr>
<td>School-Neutral</td>
<td>50</td>
<td>7.94</td>
<td>4.83</td>
</tr>
<tr>
<td>School-Distrust</td>
<td>50</td>
<td>8.52</td>
<td>5.56</td>
</tr>
<tr>
<td>Fourth Grade</td>
<td>51</td>
<td>6.78</td>
<td>5.15</td>
</tr>
<tr>
<td>Fifth Grade</td>
<td>55</td>
<td>8.78</td>
<td>5.89</td>
</tr>
<tr>
<td>Sixth Grade</td>
<td>44</td>
<td>7.14</td>
<td>4.45</td>
</tr>
<tr>
<td>Combined Groups</td>
<td>150</td>
<td>7.62</td>
<td>5.33</td>
</tr>
</tbody>
</table>

To complete the descriptive statistics of the newly constructed Immediate-Delay Measure a sample of 40 tests was drawn from the larger sample of 150 in order to compute a split-half reliability coefficient. The smaller sample was selected by a stratified random method, the number of subjects from each grade representative of that grade's proportion of the total sample. Final selection was based on a table of random numbers. From this sample the odd-even reliability correlation based on the Spearman-Brown Prophecy formula was found to be $r_{oe} = .82$ for
this 18-item, choice-preference scale. In summary, then, the present scale has a mean of 7.62, a standard deviation of 5.33 and a split-half reliability of .82 with reference to the subjects in this investigation.

As subsequent analyses will be based on these initial Immediate-Delay Measure scores it is desirable to compare the variances of the experimental groups to determine if each was drawn from a population with a common variance. The Hartley Test, applied to this data, was within the critical region and so the hypothesis of equality of variances is acceptable.

It is also important that the experimental groups not differ in initial levels of generalized expectancy for delayed rewards. Any initial differences of sufficient magnitude could confound any effects of the experimental conditions on expectancy changes and behavior in the game situation. Therefore, a two-way analysis of variance was computed of initial scores on the Immediate-Delay Measure for schools and grades. The F ratios for schools and grades, respectively, were 2.23 and 2.21, which were not significant. Table 3 summarizes this analysis of variance. It was concluded that these experimental groups did not differ in their initial levels of generalized expectancy for delayed reward.
TABLE 3. Summary of the analysis of variance of initial scores on the Immediate-Delay Measure for schools and grades

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Schools</td>
<td>119</td>
<td></td>
<td>59.5</td>
<td>2.21</td>
<td>N.S.</td>
</tr>
<tr>
<td>Between Grades</td>
<td>120</td>
<td>2</td>
<td>60.0</td>
<td>2.23</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interaction</td>
<td>223</td>
<td>4</td>
<td>55.7</td>
<td>2.07</td>
<td>N.S.</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3791</td>
<td>141</td>
<td>26.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>4253</td>
<td>149</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results of data concerning hypotheses of expectancy change under experimental manipulations

Directing attention to the three hypotheses, la, lb, and lc, concerned with changes in expectancies for delayed rewards as a function of the experimental conditions, data will be presented on each in accord with the order that they were presented earlier in this chapter. Hypothesis la, predicting changes in choice preferences toward delayed rewards as a function of experience in a situation wherein delayed rewards occur was tested by comparing the mean of the initial Immediate-Delay Measure and mean of the third or final administration. Table 4 summarizes the results of this analysis.
TABLE 4. Differences between means of initial and final Immediate-Delay Measures for trust manipulation

<table>
<thead>
<tr>
<th>Immediate-Delay Measure</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>r IF</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust Initial (E_1)</td>
<td>50</td>
<td>6.40</td>
<td>.33</td>
<td>.31</td>
<td>5.14</td>
<td>48</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Trust Final (E_3)</td>
<td>50</td>
<td>11.22</td>
<td>5.96</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It may be observed in this table that as the two means are from repeated measures on the same individuals the correlation between these scores has been accounted for in computing the significance test. The $t = 5.14$, df 98, is significant beyond the .001 level supporting the experimental hypothesis la. Subjects who experience the occurrence of promised, delayed rewards do, in fact, shift from choice preferences which are immediately available to choice preferences for larger rewards which are delayed. This result would seem to support the theoretical position that delay, per se, does not lower the value of a reward. The associated expectancy for its occurrence effectively seems to bridge the delay period and serves as a major determinant of choice behavior, at least within the limitations of this phase of the investigation.

Hypothesis lb, predicting changes in choice preferences toward immediate rewards as a function of experience in a situation wherein delayed rewards do not occur was tested in a similar manner.
as the previous, related hypothesis. The test between the means of initial and final scores on the Immediate-Delay Measure failed to support hypothesis 1b. Table 5, below, shows almost no change in mean score for the repeat measure. Within the limits of the experimental distrust manipulation in this study the initial group expectancy concerning the occurrence of delayed rewards was not lowered.

**TABLE 5. Differences between means of initial and final Immediate-Delay Measures for distrust manipulation**

<table>
<thead>
<tr>
<th>Immediate-Delay Measure</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>IF</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distrust Initial (E₁)</td>
<td>50</td>
<td>8.52</td>
<td>5.56</td>
<td>.40</td>
<td>0.13</td>
<td>48</td>
<td>N.S.</td>
</tr>
<tr>
<td>Distrust Final (E₃)</td>
<td>50</td>
<td>8.62</td>
<td>6.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A more complete picture of the distrust condition is possible by comparing the means on the initial and final Immediate-Delay Measure with the mean score after the first distrust manipulation. Previously the hypothesis was tested by comparing only initial and final scores. Table 6 shows the means and standard deviations for the distrust group and the trust group for all three administrations of this measure.
TABLE 6. Means and standard deviations of scores on the Immediate-Delay Measure for trust and distrust manipulations

<table>
<thead>
<tr>
<th>Group</th>
<th>Initial ($E_1$)</th>
<th>Repeat ($E_2$)</th>
<th>Final ($E_3$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Trust</td>
<td>50</td>
<td>6.40</td>
<td>5.33</td>
</tr>
<tr>
<td>Distrust</td>
<td>50</td>
<td>8.52</td>
<td>5.66</td>
</tr>
</tbody>
</table>

With respect to the trust group the data reflects the greatest change with the first replication ($E_2$). The final mean score ($E_3$) for this group continued to rise but only by a negligible amount. For the distrust group the first replication of the measure resulted in an upward shift of nearly three scale points, contrary to the experimental hypothesis. With the final measure there is then a shift downward, of again some three points, to about the basal level. To better evaluate the significance of the shifts with the distrust manipulation tests of the differences between scores were computed. The difference between the means of the initial measure and first replication was significant by a $t$ test beyond the .01 level. The difference between means of the first replication and the final score was also significant at the .01 level (Table 7). In summary, then, while the distrust manipulation did not result in a lowering of initial or generalized expectancies for delayed rewards, it did produce a marked effect. A discussion of this unexpected pattern of shifting will be reserved for the next chapter where it can be placed in broader perspective.
TABLE 7. Differences between means of Immediate-Delay Measures for distrust manipulation

<table>
<thead>
<tr>
<th>Immediate-Delay Measure</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>EE</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distrust Initial (E1)</td>
<td>50</td>
<td>8.52</td>
<td>5.56</td>
<td>.39</td>
<td>3.32</td>
<td>48</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Distrust Repeat (E2)</td>
<td>50</td>
<td>11.50</td>
<td>5.93</td>
<td>.51</td>
<td>3.33</td>
<td>48</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Distrust Repeat (E2)</td>
<td>50</td>
<td>11.50</td>
<td>5.93</td>
<td>.51</td>
<td>3.33</td>
<td>48</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Distrust Final (E3)</td>
<td>50</td>
<td>3.62</td>
<td>6.44</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third and final hypothesis of the set concerning expectancies for delayed rewards as the dependent variable was tested in a two by three analyses of variance design with conditions and grades as the classifications, and change scores between initial and final testing as the relevant data. Actually, this was the first hypothesis tested by the investigator, partly out of curiosity, and partly because differences, if any, between grades would be maximized and would thusly determine if grades might be combined in subsequent statistical analysis of the remaining hypotheses in this triad.

Hypothesis 1c predicts that subjects in the trust and distrust conditions will differ in their choice preferences for immediate and delayed rewards as a function of their respective conditions. Means and standard deviations for the various groups are shown in Table 8.
TABLE 8. Means and standard deviations of change scores on the Immediate-Delay Measure for trust and distrust manipulations and grades

<table>
<thead>
<tr>
<th>Grades</th>
<th>Trust Change</th>
<th>Distrust Change</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Fourth</td>
<td>17</td>
<td>4.71</td>
<td>6.36</td>
</tr>
<tr>
<td>Fifth</td>
<td>16</td>
<td>7.25</td>
<td>6.12</td>
</tr>
<tr>
<td>Sixth</td>
<td>17</td>
<td>2.71</td>
<td>6.70</td>
</tr>
<tr>
<td>Combined</td>
<td>50</td>
<td>4.89</td>
<td>6.66</td>
</tr>
</tbody>
</table>

For these change score subgroups the Hartley Test of equality of variances yielded an F ratio of 1.51 when $k = 6$, $df = 11.19$, well within the critical region. The data in Table 8 reflects very small mean differences between grades, and much larger mean differences between conditions. A summary of the analysis of variance of these change scores is presented in Table 9.

Hypothesis 1c, that subjects in the trust and distrust conditions will differ in choice preferences for immediate and delayed rewards, is supported at the .001 level of significance. While there are no main effects for grades the interaction mean sum of squares is sufficiently large that it will be regarded as significant.
TABLE 9. Summary of the analysis of variance of change scores on the Immediate-Delay Measure for grades and conditions

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Grades</td>
<td>1</td>
<td>2</td>
<td>0.5</td>
<td>.01</td>
<td>N.S.</td>
</tr>
<tr>
<td>Between Conditions</td>
<td>509</td>
<td>1</td>
<td>589.0</td>
<td>13.48</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Interaction</td>
<td>291</td>
<td>2</td>
<td>145.5</td>
<td>3.33</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Within Groups</td>
<td>4063</td>
<td>23</td>
<td>43.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>4944</td>
<td>98</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To determine which cells were contributing to the observed interaction summarized in Table 9, respective row and column means were subtracted from each of the six subgroup means after which the general mean was added. The larger deviations from the expected value of 0 were then assumed to be the likely sources of the interaction. Both fifth grade and both sixth grade subgroups were identified in this manner. Following this procedure differences between subgroups means were computed. These individual t tests are summarized in Table 10. In this table comparisons were made within conditions wherever differences appeared large. Of the three subgroup mean differences within each condition none proved significant. Of the remaining subgroup differences, that between fifth-grade trust and fifth-grade distrust showed the largest and most significant t value. As the difference between the means of the sixth-grade groups was the smallest, and clearly not significant, the conclusion that
may be drawn is that the sixth-grade groups were least affected by the experimental conditions of trust and distrust. The fifth-grade groups, on the other hand, were the most influenced by the experimental conditions and contribute most of the variance in the significant F ratios. A further discussion of the basis for this interaction will be taken up in the following chapter.

TABLE 10. Differences in change score means between trust and distrust conditions and grades

<table>
<thead>
<tr>
<th>Groups Compared</th>
<th>Means</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Within Trust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th vs. 5th</td>
<td>4.71 vs. 7.25</td>
<td>1.17</td>
<td>31</td>
<td>N.S.</td>
</tr>
<tr>
<td>5th vs. 6th</td>
<td>7.25 vs. 2.71</td>
<td>2.02</td>
<td>31</td>
<td>N.S.</td>
</tr>
<tr>
<td><strong>Within Distrust</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th vs. 6th</td>
<td>-2.00 vs. 2.03</td>
<td>-1.02</td>
<td>27</td>
<td>N.S.</td>
</tr>
<tr>
<td><strong>Grade x Condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th-T vs. 4th-D</td>
<td>4.71 vs. 0.35</td>
<td>1.96</td>
<td>35</td>
<td>N.S.</td>
</tr>
<tr>
<td>4th-T vs. 5th-D</td>
<td>4.71 vs. -2.00</td>
<td>3.23</td>
<td>32</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>5th-T vs. 4th-D</td>
<td>7.25 vs. 0.35</td>
<td>3.10</td>
<td>34</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>5th-T vs. 5th-D</td>
<td>7.25 vs. -2.00</td>
<td>4.48</td>
<td>31</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>5th-T vs. 6th-D</td>
<td>7.25 vs. 2.03</td>
<td>2.20</td>
<td>26</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>6th-T vs. 5th-D</td>
<td>2.71 vs. -2.00</td>
<td>2.13</td>
<td>32</td>
<td>&lt;.05</td>
</tr>
</tbody>
</table>

Results of data concerning hypotheses related to generalized expectancy for immediate and delayed reward and behavior in the resistance to temptation situation

This section will be concerned with the analyses of data reflecting upon hypotheses 2a, 2b, and 2c. The first of these hypotheses predicts that subjects with a low generalized expectancy
for delayed rewards will submit to temptation more often than subjects with a high generalized expectancy for delayed rewards. The observations constituting the relevant data for testing this hypothesis were made on the group in the neutral condition. These subjects did not receive the experimental manipulations and served primarily to provide an empirical link between preferences for immediate and delayed rewards and the three dependent variables in the game situation. Casting the cheat-resist observations in a two-by-two contingency table the resultant $X^2$ value does not reach the level of significance. Although there is a trend in the predicted direction the experimental hypothesis relating choice behavior for immediate and delayed rewards to cheating or resisting in a temptation situation cannot be supported.

**TABLE 11. Frequencies of cheating and resisting for subjects in the neutral condition with high and low generalized expectancy for delayed reward**

<table>
<thead>
<tr>
<th>Group</th>
<th>Cheat</th>
<th>Resist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High GE</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Low GE</td>
<td>21</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>TOTAL</td>
<td>31</td>
<td>19</td>
<td>50</td>
</tr>
</tbody>
</table>

$X^2 = 1.28$ df, 1 p N.S.

The second hypothesis in this set predicts differences in latency before submitting to temptation for subjects choosing
immediate rewards and subjects choosing delayed rewards. The differences in generalized expectancy should result in high GE subjects delaying longer before cheating compared with low GE subjects. This prediction was tested, again, from observations on the neutral group which was free of the experimental manipulations. Table 12 shows the means, standard deviations and $t$ value for this comparison. The difference between the groups is thus sufficient enough to support the above hypothesis beyond the $<.02$ level of significance.

**TABLE 12. Differences between latency of cheating means for subjects in neutral condition with high and low generalized expectancy for delayed reward**

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>$M$</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>High GE</td>
<td>10</td>
<td>5.10</td>
<td>3.83</td>
<td>2.65</td>
<td>29</td>
<td>&lt;.02</td>
</tr>
<tr>
<td>Low GE</td>
<td>21</td>
<td>2.10</td>
<td>2.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third and final hypothesis in this set predicts differences between groups in the amount of cheating. Amount has been defined as the magnitude of the deviant score. The larger deviant scores lead to more highly valued game prizes. Subjects with choice preferences for immediate rewards were expected to report higher scores than subjects with delayed reward preferences. The means, standard deviations, and $t$ values are
shown in Table 13. Because of the large difference in group variance, significant beyond the <.05 level using the Hartley Test, separate estimates of population variances were employed in computing t. The difference in the amount of cheating between the two groups of subjects is significant and in the direction predicted by hypothesis 2c.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t*</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>High GE</td>
<td>10</td>
<td>3.60</td>
<td>1.69</td>
<td>3.15</td>
<td>29</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Low GE</td>
<td>21</td>
<td>6.90</td>
<td></td>
<td>4.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Variances of the means were computed separately rather than with pooled estimate.

Summarizing the results of this phase of the study with respect to the three hypotheses 2a, 2b, and 2c, choice preference for delayed reward is positively related to latency of cheating, inversely related to the amount of cheating, and, slightly but not significantly related to cheating and resisting.
Results of data concerning hypotheses of the effects of generalized expectancy for delayed rewards and the experimental conditions upon behavior in the temptation situation

Viewing the experimental conditions as the independent variable the prediction was made that subjects would show increasingly greater resistance to cheating moving from distrust, through neutral, to trust. Generalized expectancy for delayed reward was also hypothesized to relate to this dependent variable. Table 14 and Table 15 summarize the outcome of these relationships between the variables. For conditions, the obtained $X^2$ value of $3.52, df = 2$ did not reach statistical significance. Differences between the trust and neutral condition were in the direction predicted by the experimental hypothesis, while the largest difference was between the groups in the neutral and distrust conditions. This difference occurred in the direction opposite to the prediction. There were only negligible differences between the trust and distrust groups where the largest differences were expected. The hypothesis that the conditions and generalized expectancy variable would predict cheating and resisting was not supported. However, there was an interaction effect in the neutral and distrust conditions for the low GE groups. In order to speculate about these differences in the discussion chapter a separate $X^2$ analysis was applied to these cells. Had this relationship been predicted the resultant $X^2$ value of $4.39, df = 1$, would have been significant with a $p < .05$ (Table 16).
TABLE 14. Frequencies of cheating-resisting behavior for conditions

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Trust</th>
<th>Neutral</th>
<th>Distrust</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheat</td>
<td>20</td>
<td>31</td>
<td>22</td>
<td>73</td>
</tr>
<tr>
<td>Resist</td>
<td>22</td>
<td>19</td>
<td>27</td>
<td>68</td>
</tr>
<tr>
<td>TOTAL</td>
<td>42</td>
<td>50</td>
<td>49</td>
<td>141</td>
</tr>
</tbody>
</table>

\[ X^2 = 3.52 \text{ df}, 2 \text{ p}<.20 \]

TABLE 15. Frequencies of cheating-resisting behavior for generalized expectancies for delayed reward

<table>
<thead>
<tr>
<th>Group</th>
<th>Low GE</th>
<th>High GE</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheat</td>
<td>47</td>
<td>26</td>
<td>73</td>
</tr>
<tr>
<td>Resist</td>
<td>44</td>
<td>24</td>
<td>68</td>
</tr>
<tr>
<td>TOTAL</td>
<td>91</td>
<td>50</td>
<td>141</td>
</tr>
</tbody>
</table>

\[ X^2 = <.02 \text{ df}, 1 \text{ p N.S.} \]

TABLE 16. Frequencies of cheating-resisting behavior for generalized expectancies for delayed reward and conditions

<table>
<thead>
<tr>
<th>Group</th>
<th>Trust</th>
<th>Neutral</th>
<th>Distrust</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low GE Cheat</td>
<td>15</td>
<td>21*</td>
<td>11*</td>
</tr>
<tr>
<td>Low GE Resist</td>
<td>17</td>
<td>9*</td>
<td>18*</td>
</tr>
<tr>
<td>High GE Cheat</td>
<td>5</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>High GE Resist</td>
<td>5</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

*\[ X^2 \text{ between these cells} = 4.89 \text{ df}, 1 \text{, p}<.05 \]
Turning to the latency data it was predicted that latency before the first deviant response in the game situation would be longest for the trust condition, and shortest for the distrust condition, in line with the previous, related hypothesis. It was also predicted that subjects with high and low generalized expectancies for delayed reward would differ in latency independent of conditions.

Before proceeding with the analysis of variance the Hartley Test for equality of variance was applied to the latency data. As a single analysis of variance was utilized to examine the effects of conditions and the individual differences variable on latency, the test for equal variances included the six subgroups in Table 17. The $F$ ratio obtained for the largest and smallest variance estimate was 2.93 with $k = 6, df = 4.20$. This value was small enough to assume homogeneity of variance for the six samples.

<table>
<thead>
<tr>
<th>Group</th>
<th>Trust</th>
<th>Neutral</th>
<th>Distrust</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N M SD</td>
<td>N M SD</td>
<td>N M SD</td>
<td>N M SD</td>
</tr>
<tr>
<td>High GE</td>
<td>5 2.20 2.93</td>
<td>10 5.10 3.83</td>
<td>11 4.10 3.71</td>
<td>26 4.15 3.77</td>
</tr>
<tr>
<td>Low GE</td>
<td>15 3.00 2.80</td>
<td>21 2.10 2.24</td>
<td>11 7.13 2.98</td>
<td>47 3.57 5.39</td>
</tr>
<tr>
<td>Combined</td>
<td>20 2.80 3.14</td>
<td>31 3.06 3.18</td>
<td>22 5.68 3.69</td>
<td>73 3.78</td>
</tr>
</tbody>
</table>
From the analysis of variance of the latency data (Table 18) a significant F ratio for conditions was obtained but was accompanied by significant interaction effects. An approximate subdivision of the sum of squares for the interaction located the source of the interaction in the neutral-high GE group and in the distrust-low GE group. Subsequently a decision was made to compute another analysis of variance dropping the groups in the neutral condition in order to explore the effects of trust-distrust and generalized expectancies independently. The subsequent F ratio for conditions was again significant and, as expected, the interaction estimate of the variance was not significantly different from the within group estimate, although there still remained a considerable amount of variability.

TABLE 18. Summary of analyses of variance of latency scores for generalized expectancy for delayed reward and conditions

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td>5.6</td>
<td>1</td>
<td>5.6</td>
<td>0.54</td>
<td>N.S.</td>
</tr>
<tr>
<td>Conditions</td>
<td>114.6</td>
<td>2</td>
<td>77.3</td>
<td>7.43</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Interaction</td>
<td>107.6</td>
<td>2</td>
<td>53.8</td>
<td>5.17</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Within Groups</td>
<td>696.7</td>
<td>67</td>
<td>10.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>924.5</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tests comparing the means of all pairs of subgroups confirmed the earlier conclusion that the low GE group in the distrust condition was responsible for much of the effects observed. Of the
four significant t test differences between subgroups in Table 19, the low GE-distrust group is involved in three. The results of the over-all analysis of this data point out that there were two distinct effects that took place. The difference within the neutral condition was expected and had been predicted in a previous hypothesis. This was one distinct effect. The second effect, largely attributable to the low GE and distrust interaction, resulted in significant differences between the conditions of trust and distrust, and neutral and distrust. Both differences were in the opposite direction to the experimental hypothesis 3b. There were no differences between trust and neutral conditions. High and low generalized expectancy did not show differences across conditions as predicted. Rather, it appears that the manipulations in the trust and particularly the distrust conditions tend to be associated with longer latencies for the low GE groups and shorter latencies for the high GE groups, opposite to the experimental hypothesis, and opposite to group latencies in the neutral condition.
The hypotheses predicting relationships between conditions, individual differences and amount of cheating will be considered together. Means and standard deviations for the six groups are presented in Table 20. The question of equality of variances should not be settled by the Hartley Test which gave ambiguous results. Consequently, the Bartley Test was applied and showed the variances to be equal ($B = 3.18$, $df = 5$).

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>H</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi GE - Trust</td>
<td>5</td>
<td>2.20</td>
<td>2.93</td>
<td>2.92</td>
<td>14</td>
<td>&lt;.02</td>
</tr>
<tr>
<td>Lo GE - Distrust</td>
<td>11</td>
<td>7.10</td>
<td>2.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hi GE - Neutral</td>
<td>10</td>
<td>5.10</td>
<td>3.83</td>
<td>2.65</td>
<td>29</td>
<td>&lt;.02</td>
</tr>
<tr>
<td>Lo GE - Neutral</td>
<td>21</td>
<td>2.10</td>
<td>2.24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lo GE - Trust</td>
<td>15</td>
<td>3.00</td>
<td>3.18</td>
<td>3.23</td>
<td>24</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Lo GE - Distrust</td>
<td>11</td>
<td>7.10</td>
<td>2.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lo GE - Neutral</td>
<td>21</td>
<td>2.10</td>
<td>2.24</td>
<td>5.24</td>
<td>30</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Trust</td>
<td>20</td>
<td>2.80</td>
<td>3.14</td>
<td>2.73</td>
<td>40</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Distrust</td>
<td>22</td>
<td>5.68</td>
<td>3.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral</td>
<td>31</td>
<td>3.06</td>
<td>3.18</td>
<td>2.71</td>
<td>51</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Distrust</td>
<td>22</td>
<td>5.68</td>
<td>3.69</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 20. Means and standard deviations of amount of cheating for high and low generalized expectancy for delayed reward and conditions

<table>
<thead>
<tr>
<th>Group</th>
<th>Trust</th>
<th>Neutral</th>
<th>Distrust</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N  M  SD</td>
<td>N  M  SD</td>
<td>N  M  SD</td>
<td>N  M  SD</td>
</tr>
<tr>
<td>High GE</td>
<td>5  5.00  3.03</td>
<td>10  3.60  1.69</td>
<td>11  5.45  3.11</td>
<td>26  4.65  2.77</td>
</tr>
<tr>
<td>Low GE</td>
<td>15 4.87 2.28</td>
<td>21 6.90 4.13</td>
<td>11 3.18 1.11</td>
<td>47 5.38 3.44</td>
</tr>
<tr>
<td>Combined</td>
<td>20 4.90 2.49</td>
<td>31 5.84 3.85</td>
<td>22 4.32 2.60</td>
<td>73 5.12</td>
</tr>
</tbody>
</table>

The two-by-three analysis of variance of the amount of cheating scores produced no significant main effects. The significant interaction (Table 21) was located in the neutral condition where the generalized expectancy for delayed reward variable had produced effects. This, of course, had been predicted in a previous hypothesis. The only other significant relationship among the six groups was between the low GE groups in the neutral and distrust conditions where a t value of 2.34 df, 30 was obtained, significant beyond the <.01 level. Once again, of the four groups, low GE for delayed reward subjects seem to be most responsive to the experimental manipulations. However, neither conditions alone, nor generalized expectancy, alone, predicts to the amount of cheating in the game situation. Moreover, the direction of the observed difference between the trust and distrust subgroups was opposite to the experimental hypothesis.
TABLE 21. Summary of analyses of variance of amount of cheating scores for generalized expectancy for delayed reward and conditions

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td>9.0</td>
<td>1</td>
<td>9.0</td>
<td>.96</td>
<td>N.S.</td>
</tr>
<tr>
<td>Conditions</td>
<td>31.2</td>
<td>2</td>
<td>15.6</td>
<td>1.66</td>
<td>N.S.</td>
</tr>
<tr>
<td>Interaction</td>
<td>93.6</td>
<td>2</td>
<td>46.8</td>
<td>4.93</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>Within Groups</td>
<td>630.2</td>
<td>67</td>
<td>9.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>764.0</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In order to better fix the relationships among the variables in these two sets of hypotheses, the graphic representation of Figure 1 has been prepared. Except to note that there are consistent effects upon each of the three dependent variables within each subgroup, further discussion of the results of this phase of the experiment will be reserved for the next chapter.

Results of data concerning hypotheses related to changes in expectancy for delayed reward and behavior in the temptation situation

Changes in expectancy from the initial expectancy to the final measured expectancy, presumably a function of both the experimental manipulation and subjective responses to that manipulation, were predicted to relate positively to resistance to cheating behavior on the three dependent variables.
Fig. 1.—Resistance to temptation behaviors observed in high GE for delayed reward and low GE for delayed reward subjects under various conditions of trust.
Table 22 shows the differences in cheating and resisting for all study subjects categorized by lowered expectancies and not lowered expectancies. While the $X^2$ value of 2.74, df, 1, $p<.10$ does not quite reach statistical significance, the direction of change is in accord with the experimental hypothesis.

TABLE 22. Frequencies of cheating resisting behavior for expectancy changes for all subjects

<table>
<thead>
<tr>
<th>Group</th>
<th>Expectancy Changes</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lowered</td>
<td>Not Lowered</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Cheat</td>
<td>22</td>
<td>20</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Resist</td>
<td>35</td>
<td>14</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>57</td>
<td>34</td>
<td>91</td>
<td></td>
</tr>
</tbody>
</table>

$X^2 = 2.74$ df, 1 $p<.10$

Expectancy changes were not related to either latency or amount of cheating. Tables 23 and 24 show the F ratios obtained for this data.
TABLE 23. Summary of analyses of variance of latency of cheating for changes in expectancy and conditions

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expectancy Change</td>
<td>9.0</td>
<td>1</td>
<td>9.0</td>
<td>0.72</td>
<td>N.S.</td>
</tr>
<tr>
<td>Conditions</td>
<td>37.0</td>
<td>1</td>
<td>87.0</td>
<td>6.96</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Interaction</td>
<td>12.7</td>
<td>1</td>
<td>12.7</td>
<td>1.02</td>
<td>N.S.</td>
</tr>
<tr>
<td>Within Groups</td>
<td>476.3</td>
<td>38</td>
<td>12.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>585</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The significant F for conditions in Table 22 is of a slightly lower value than the F ratio reported previously for the same change scores. This apparently is a result of slightly different within-group variance.

While a decision had been made to employ expectancy change scores as the independent variable in this set of hypotheses rather than final expectancy scores the latter was tested also for possible effects. No significant results were obtained from this analysis.
CHAPTER V
DISCUSSION

The discussion which follows will fall within three major areas in accord with the three phases of the experiment. These areas may be summarized as (1) the situational or experimental manipulation of expectancies for delayed rewards; (2) the relationship of generalized expectancy for delayed reward to cheating behavior; and (3) the effects of expectancies for delayed reward and the experimental conditions upon cheating behavior.

The experimental manipulation of expectancies

From a theoretical point of view it was proposed earlier that individuals differed in their ability to delay gratification, or more accurately in their choice preferences for immediate or delayed rewards or goals, as a function of their beliefs or expectations about the occurrence of the delayed event. It was also suggested that generalized beliefs or expectancies were based on previous experience with parents and other important social reinforcing agents. The focal point of this experience was whether or not the social agent actually delivered promised or implied delayed rewards, or was instrumental in their occurrence.
or non-occurrence. The present experiment attempted to provide data to support or refute the hypothesis that an individual would, in fact, choose a delayed reward in preference to an immediate reward if the former were at least a little more valuable and if there were a certain level of confidence in its occurrence. Our experimental results seem to support this hypothesis. Subjects were willing to give up immediately available prizes even though the majority of them made more immediate than delayed choices initially and received an immediate choice. This contingency would, on the surface, seem to encourage subsequent immediate choice behavior. Yet a single trial in a setting where the social agent delivered the promised larger reward was accompanied by significant changes in choice behavior. If the experiment had been concluded at this point it might have been presumed that the outcome was clear-cut and the hypothesis supported. But the inclusion of the distrust condition serving, in part, as a comparison situation, made it clear that the upward shift of expectancies for delayed reward in the trust group at this point in the procedure, could not necessarily be attributed to the occurrence of the delayed rewards. The distrust group, too, chose more delayed prizes at this same point, after having experienced the non-occurrence of the promised, delayed reward. Only after a repeated manipulation were differences between the two groups observed. Even then the distrust group had not shifted below their first-measured general-
ized expectancy. To explain these observations it is necessary to re-examine the methods employed in the two situations.

In order to split subjects into two groups on the basis of generalized expectancy for delayed reward it was necessary to have all subjects leave the room and return to their classes. After 90 to 120 minutes all subjects were resummoned by the experimenter, and these subjects who made nine or fewer delayed choices were then given one of their immediate choices. These subjects did not know why some of their group received choices while others did not. These subjects making ten or more delayed choices were promised one of their choice objects in a few days. When the entire group reassembled the experimenter gave the excuse to the distrust subjects and asked them to make choices again. The shift upward in expectancy for delayed reward is hardly evidence for distrust. Yet, repeating the procedure, exactly, resulted in a shift downward or a lowering of expectancies. This sequence of events suggests that the group, or some members of the group, interpreted the first non-occurrence of the promised reward differently from the second non-occurrence. It may be that the nearly two-hour delay followed by the actual chosen rewards served to change the expectations of the total group. Up to that point there must have been some doubt or pessimism about the whole situation, including the experimenter. The Immediate-Delay Measure may even reflect this doubt in a lowered initial score. A more credible or realistic experimental situation may have resulted in
higher initial scores. With the experimenter's return a few days later, as promised, the situation took on more credibility, with or without the delayed prizes. It is this aspect of the situation that may be reflected in the increase of choices for delayed, larger, rewards on retest, not only for the distrust group but even, perhaps, for the trust group. With the final administration of the Immediate-Delay Measure differences between the two situations begin to make themselves felt. The distrust subjects having already responded to the credibility of the situation, turned their attention to the delayed rewards promised to some of them but not delivered. The trust group, on the other hand, maintained its raised expectancies for delayed rewards.

The significant effect observed in the trust condition validates the role of expectancy as an explanatory construct in the area of delay of reinforcement or delay of gratification. It is true that the validation would have been stronger had the distrust condition turned out more in line with the experimental hypothesis. Yet the difference between the two conditions partially resolves this discrepancy.

From the trust condition data a very important inference of both theoretical and developmental interest may be drawn. As the design of the experimental situation was such that there was an equal probability for the occurrence of both the immediate and
delayed reward one would expect that subjects would not alter their choice behavior over trials. Entering the choice situation with a given generalized expectancy for immediate rewards and a given generalized expectancy for delayed rewards, the effect of equally probable events on the two generalized expectancies would be to change them both by an equal amount leaving them in their same relative positions. Consequently choice behavior in this situation would be predictable from generalized expectancy and would not change over trials. However, Social Learning Theory suggests that increments or decrements in expectancy are a function of the number of previous trials in the same or similar situations. As the number of trials increase the amount of change decreases.

As the subjects in the present study changed their choice preferences in the direction of delayed items one could conclude that they had fewer trials or less experience in delayed reward situations. While it may be true that their experience is such, the change in expectancies may very well be a function of the uniqueness of the situation. The individual may abruptly stop drawing on generalized expectancies which provided a basis for behavior in the unique situation and draw on the situational cues as the basis of a more appropriate expectancy.

Another implication of these expectancy change results is that the shaping of choice behaviors with respect to immediate and delayed reward may involve, in a more natural setting, little more
than promise-keeping and related efforts on the part of adults to assure the occurrence of delayed rewards or delayed goals.

One major disadvantage of this type of choice preference measure is that it is probably not useful among populations that even slightly differ as to age, sex, intelligence, and background, without considerable modification and pretesting. This necessity for developing a scale so that it is congenial with and meaningful to the population in which it will be used may be the basis that our three grades did not yield significant differences. The earlier-cited Mischel and Metzner study reported grade (age) differences. It would seem that age or grade differences would depend, significantly, upon the nature of each pair of items that goes into constructing the measure.

Generalized expectancy for delayed reward and cheating behavior

This phase of the study supported, in the main, the hypotheses and the experimental results obtained by Mischel and Gilligan (1964). The attempt in the present design to reduce the total proportion of subjects who cheated was relatively successful, near fifty per cent. However, in the neutral group, which should, alone, be compared to Mischel's Boston sample of boys, cheating occurred in over sixty per cent of the cases. Mischel reported eighty per cent. If one is willing to assume that the two samples were alike in their potential for cheating behavior then it is likely that the
program employed for hits in the ray-gun game made the difference. The scoring sequence pattern attempted to establish expectancies that the subject could win up to the final shot, therein hopefully reducing the tendency to cheat and increasing the variability of latency scores.

A reduction in frequency of cheating was desired in order to test the hypothesis that cheating and resisting were predictable from the subjects' generalized expectancy for delayed reward. The earlier study was unable relate these variables because it did not have a sufficiently large group of subjects who resisted. In a sense the sample size in this present study was not large enough, for it did seem that with a somewhat larger N some weak but significant relationship would obtain.

The relationships between subject scores on the independent variable measure and behavior in the game situation establishes some predictive or construct validity for the former. This instrument being a greatly modified version of the instrument used with the Boston sample, could not necessarily share the benefits of the results of the earlier study. The fact that the present study obtained significant results with modifications of the choice-preference scale, the game situation, and variations in the general paradigm, recommends this multi-item choice preference method of assessing delay of gratification or, as it has been termed frequently in this paper, generalized expectancy for delayed reward.
Viewing the results on all three dependent variable measures of cheating behavior, one is inclined to accept the hypothesis that subjects with low generalized expectancies for delayed reward will engage in cheating behaviors more than subjects who can delay gratification and demonstrate this with delayed reward choices. The theoretical basis for this was presented earlier before the results were in and was only moderately acceptable to the investigator. One primary reason for the choice of the resistance to temptation situation as a dependent variable in this experiment was because it was a choice behavior task where changes and differences could easily be measured and quantified. Another consideration determining the employment of the game situation was that it represented an important area of behavior, and if linked to the independent variable had broad implications for other related behaviors.

However, if one is skeptical of the possible relationship between cheating and resisting and the independent variable, then one is in a position to dismiss the experimental findings, en toto, on the basis that they have no relevance to cheating and are trivial. This could be argued since it appears that when only latency and amount of cheating variables are involved in the experimental link with choice preferences for reward, then one must inquire why these and not the third.
It is possible to respond to the above question by proposing that the behavior potential for cheating and the behavior potential for resisting are a function of a complex interaction of many expectancies, needs, and rewards, only one of which is preference for immediate or delayed reward. The effect of the independent variable might, then, be swamped by the effects of other, more powerful variables. However, once the decision to cheat is made, then, the independent variable, generalized expectancy for delayed reward, comes into play. In this more restricted, innocuous setting it produces effects that are observed as latency and amount of cheating.

Another explanation for the relationship of only latency and amount of cheating to the independent variable might seek to show that latency cannot truly be separated from, nor is it independent of, cheating. Latency would be viewed as a measure of the resistance to cheating and the fact that some individuals could not be measured by the investigator's instrument only attests to the inadequacy of the measurement technique. Those resisting temptation then would simply be one end of a continuous theoretical distribution that the investigator was unable to measure. Amount of cheating may be handled in much the same way.

A third view would hold that latency of cheating is the only meaningful finding, and that it is a variable, entirely independent of the decision to cheat, following that decision at some point in
time. Latency would be meaningful in terms of the reward or goal object in the specific situation and not to ethical behavior. In this theoretical setting the amount of cheating relationship might be held less meaningful in that it is partly dependent upon latency for its magnitude.

This investigator is inclined to favor the first explanation of the relationship between the independent and three independent variables. That explanation will be referred to again during the discussion of the results in the following pages.

The Effects of expectancy for delayed reward and the experimental conditions upon cheating behavior

The discussion which follows will not explore the results in accord with the presentation of the hypotheses. Instead, the discussion will go directly to the common denominator that clearly accounts for most of the significant effects observed. The distrust condition found its way into this investigation to provide a contrasting effect relative to the trust condition. The study could have been designed only around the neutral and trust conditions and, was originally conceived of in this way. To establish distrust, that is, to lower a subject's expectancy for delayed reinforcements, while repeatedly measuring the effect of the manipulation has always presented certain methodological problems. The present design, apparently, has not uncovered a solution to those
problems. While it does seem that experimental distrust has been achieved — there is evidence to support this that will be elaborated momentarily — it appears, now, not without having introduced a second, unanticipated effect. It is this variable that accounts for much of the variance in the outcomes of this phase of the experiment. An attempt will be made to support this contention in speculating about some of these outcomes, and in so doing, hopefully identify the bête noire.

Some evidence was offered earlier in this chapter as to the validity of the distrust condition with respect to lowering individual expectancies for delayed reward. This was not the case if the final expectancy $E_3$ was compared with the initial expectancy or $GE$. But when $E_2$ and $E_3$ form the basis of the comparison a significant drop occurred. As this downward shift, by definition, reflects a lowering of expectancy for delayed rewards, and was not observed in the trust condition between $E_2$ and $E_3$, an explanation was offered to account for this. Elaborating further on this point, there is very little to indicate that there was any difference in the manipulation for either group at point $E_2$. For each in effect, it was a trust trial. The manipulation prior to the measurement of $E_3$ effectively induces a lowering of expectancies for the distrust group. At this point in the experiment one group has received two trust trials, the other one trust trial followed by a distrust trial. The latter group seems
to be about back where it started with its expectancies about delayed reward. But this view may not be quite accurate. As the final reinforcement for subjects choosing delayed items on the third trial did not occur or fail to occur until after the measurement itself, the subjects were administered the game situation with expectancies that, theoretically, should have been still higher for one group and lower yet for the other.

Speculating further, the second variable that found its way into this condition may be a function of the reinforcing method employed. The delivery of reinforcing items to subjects making immediate choice preferences some two hours after the choices were made, raising expectancies at $E_2$, suggests that the subjects were interpreting this two-hour delayed reward as such sufficient evidence of trust that they were prepared to completely disregard the non-occurring reward some two or three days later and accept the experimenter's excuse. The two-hour delay may have served to temporarily allay the mixed expectancies toward the situation that the method of reinforcing some and not others in a group could elicit, especially in lieu of a satisfactory rationale for understanding this differential treatment. These additional expectancies, established on the following trial, are linked to an uncertainty, and a cautiousness, or wariness about the nature of the situation, and accompany the lowered expectancy for delayed reward. This uncertainty or wariness was probably concentrated
in the group of subjects with low GE for delayed reward. Of the seventy-five rewards distributed throughout the entire distrust manipulation, sixty-five went to the twenty-nine low GE subjects; the remaining ten rewards were dispensed among the twenty high GE subjects. This very preferential munificence, it is believed, particularly sensitizes the beneficiaries to this experimental situation and the subsequent resistance to temptation situation. It is in this context that the results of the third phase of the study may be best explained.

While the hypothesis that the trust condition would reduce cheating behavior was not supported, there are indications in the data that the condition serves to narrow the cheating differences between high and low GE subjects. If the neutral condition is viewed as reflecting the untampered-with relationship between GE for delayed reward and cheating behavior then the trust condition tends to have the greatest influence on individuals with initially low GE. Low GE subjects are, in fact, slightly higher in resistance to cheating on all three variables compared to high GE subjects. How this relates to changes in generalized expectancy may be partially determined by dividing the subjects in the trust condition as close to the median as possible. Of the ten subjects higher on GE who cheated, seven had shifted down at E3. Only one of the ten cheating subjects below the median lowered his final expectancy. If a $X^2$ test were applied to this data it would be significant beyond the <.05 level.
Additional support for the implications above comes from examining shifts among subjects who resisted cheating in the trust condition, dividing them again near the median. Only two of ten in the higher GE group shifted down and two of twelve in the lower GE end of the distribution shifted down. These observations then lend some basis to the contention that (1) if expectancies for delayed reward can be raised in subjects they will be less likely to cheat, and (2) raising expectancies in low GE subjects results in some attenuation of all three cheating behaviors compared to their cohorts in the neutral condition. The near-significant change results (Table 22) with reference to cheating and resisting also support (1) above, but this data is partially confounded by distrust group data. However, there was no support for predicted relationships between changes in expectancy and latency or amount of cheating behavior. Why this should be so when these variables were the more firmly related to other independent variables is not apparent.

The predicted relationships between conditions and frequencies of cheating-resisting behavior was not supported. These was an unpredicted trend that reflected less cheating among subjects in the two manipulated groups (Table 14). The distrust condition had been expected to induce greater cheating behavior than the other conditions. The theoretical basis for this was that lowered expectancies for the occurrence of delayed rewards would carry
over to the game situation with the experimenter serving as situational cue. If one accepts the results obtained, the trend suggests that experimentally lowering delayed reward choice preferences or, at minimum, keeping them at their initial level, whichever view is preferred, is as effective in reducing the incidence of cheating as raising expectancies, and superior to no manipulation whatsoever.

The above conclusion may, in fact, be a true one, but hardly one that lends itself to explanation without calling upon a second factor such as the wariness or high-risk hypothesis developed earlier. If low GE subjects do perceive the game-experimenter situation as one involving considerable risk, then a wariness expectancy would account for this result and the similar outcomes involving the two other dependent variables. The low GE subject, sensing the experimenter is "up to something," may be very reluctant to take the risk and even when submitting does not do so early in the game, nor does he set his achievement goals as high as others do.

Subjects with high initial expectancies for delayed reward in the distrust condition, on the other hand, do not reflect as much resistance to temptation as do the others in their group. Comparing them also to high GE subjects in the neutral and distrust conditions they show less resistance on five of the six pairings (Figure 1). The differences, however, are very small, and leave
one with the conclusion that high GE subjects are not readily influenced to resist or submit to temptation by the experimental induction of situational expectancy change toward immediate or delayed preferences.

Other methodological considerations

The ray-gun game as a research instrument presents certain problems when employed in a resistance to temptation situation. For one, it is exceedingly difficult to assess the effects of the complex interactions taking place among subjects. That these uncontrolled factors influence the subjects' behavior there is little doubt. All that is in doubt is the extent of that influence over the span of a study such as the present one. The more subjects taking part in the study from a given setting the greater the likelihood may be of obtaining spurious effects. The obtained relationships, though quite low, between choice preference for immediate and delayed rewards and behavior in the gun game are to some extent quite remarkable. The very complex set of needs and pressures, ethics and conflicts working on the subject make the search for effective independent variables that are both meaningful and effective a most difficult task for the investigator.
CHAPTER VI

SUMMARY

The ability to delay gratification for the sake of larger delayed rewards has long been considered of critical importance to personality development by students of human behavior. The preference for immediate or delayed gratification has been linked with the pleasure and reality principles, the growth of culture or civilization, the development of ego processes, psychopathology, and a theory of thinking. Research results, primarily with children, have associated this choice behavior to maturity, intelligence, social responsibility, the presence or absence of the father in the home, and prohibited behavior in the resistance to temptation situation.

The purposes of the present research were fourfold: (1) to develop a choice-preference instrument that would prove useful in measuring generalized expectancies for delayed reward, (2) to attempt to influence choice preferences for delayed reward in the context of occurring immediate rewards, (3) to obtain measures of expectancy change over trials, and (4) to relate generalized expectancy, changes in expectancy, and the experimental conditions to behaviors in the resistance to temptation situation.

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The following experimental hypotheses tested were formulated within the broad outlines of Rotter's Social Learning Theory (Rotter, 1954):

1a. When subjects are given a number of choices between small immediate rewards that actually do occur, or larger but delayed rewards that also occur, their preferences will move toward delayed choices as some function of their experience with the occurrence of those delayed rewards. The trust condition will provide a test of this hypothesis.

1b. When subjects are given a number of choices between small immediate rewards that actually do occur, or larger but delayed rewards that do not occur, their preferences will move toward immediate choices as some function of their experience with the non-occurring larger reward. The distrust condition will provide a test of this hypothesis.

1c. Subjects in the trust condition and subjects in the distrust condition will significantly differ in their choice preferences for immediate and delayed rewards as some function of their experience in these respective conditions. The direction of the differences has been specified in the previous hypotheses.

2a. Subjects with an initial preference for immediate rewards, i.e., subjects with a low generalized expectancy for delayed reward, will submit to temptation in a "resistance to temptation" situation more often than subjects with a preference for larger, but delayed, rewards, i.e., subjects with a high generalized expectancy for delayed reward.

2b. Among subjects who submit to temptation the group with an initial preference for immediate rewards and the group with an initial preference for delayed rewards will differ in the length of the delay before the first deviant response in the resistance to temptation situation. The latter group, or those with the high generalized expectancy for delayed reward will exhibit a greater tendency for postponing or delaying the deviant response that leads to reward.
2c. Among subjects who submit to temptation those with an initial preference for immediate rewards and those with an initial preference for delayed rewards will differ in the amount of cheating in which they engage. The former group will report higher deviant scores which lead to more highly valued goals.

3a, 3b, 3c. The three conditions employed in this study should relate to the three dependent variables in the resistance to temptation situation as follows: with increasing conditions of trust, i.e., moving from distrust, through neutral, to trust, it is predicted that (3a) resistance to cheating will increase; (3b) the latency or delay of the first deviant response will also increase; and (3c) the amount of cheating will decrease.

4a, 4b, 4c. Across conditions subjects with an initial preference for immediate rewards and subjects with an initial preference for delayed rewards will differ on the dependent variable measures in the resistance to temptation situation. The latter group of subjects (4a) will more often resist the temptation to cheat, (4b) will exhibit longer latency periods when they do cheat, and (4c) will report lower deviant scores.

5a, 5b, 5c. Changes in subjects' preferences or expectancies for delayed rewards should relate to the three dependent variables in the resistance to temptation situation as follows: with changes toward delayed preferences (5a) resistance to cheating will increase; (5b) latency before the first deviant response will increase; and (5c) the amount of cheating will decrease.

The design for testing these hypotheses employed three homogeneous groups of unequal size, all subjects classified according to scores on an individual difference measure, and exposed to one of three experimental conditions. Repeated measurements were obtained on the individual difference variables in the two conditions calling for repeated trials. The dependent
variables were behaviors in a resistance to temptation situation and situational changes in the individual difference measure. Analyses of variance, t tests, and $X^2$ statistics were utilized in assessing differences between the groups.

To obtain a measure of generalized expectancy for delayed reward, the individual-difference variable, an 16-item choice-preference instrument was developed appropriate to male subjects in the fourth, fifth and sixth grades. After obtaining generalized expectancy scores for all subjects the trust group experienced the occurrence of delayed, promised rewards in the context of immediate but smaller occurring rewards. The distrust group did not experience the delayed rewards. Though promised, they never occurred. For both groups immediate rewards were given to subjects with low generalized expectancies. With repeated trials new expectancy measures were obtained which provided the basis for distributing immediate rewards and delayed rewards. On each trial subjects with high expectancies for delayed reward in the distrust condition experienced the non-occurrence of the promised reward.

Neutral group subjects after the initial measurement and after having received their choice preferences, were not exposed to further trials in choice behavior. Instead they were engaged in neutral activities. After completing this phase of the experiment the neutral group and the two actively-manipulated groups were given a turn on a ray-gun-game in the resistance to temp-
The dependent variables employed from this situation were (1) cheating-resisting, (2) latency before the first deviant response, and (3) amount of cheating.

The results of the investigation show (1) that choice preferences or generalized expectancies, for delayed reward may be reliably measured, (2) that choice preferences or expectancies for delayed reward may be altered in the direction of increased preference or expectancy for delayed reward as a function of situational trust, (3) that choice preferences or generalized expectancies for delayed reward have a significant relationship to behavior in a resistance to temptation situation as predicted, (4) that the conditions of trust and "distrust" tend to have a greater effect upon subjects with low generalized expectancies than upon subjects with high generalized expectancies, and (5) that the direction of change of expectancies for delayed reward for all subjects in the experimentally manipulated conditions tends to relate to cheating and resisting behavior as predicted.

The results with respect to distrust suggest that the methodology employed for experimentally inducing lowered expectancies for delayed rewards in the context of occurring immediate rewards may have introduced a confounding variable. It was suggested that the procedure introduced a high-risk expectancy in the resistance to temptation situation among low generalized expectancy subjects. This was hypothesized to account for
significantly attenuated cheating behaviors among subjects in this subgroup, and consequently much of the variance in the observed significant differences in latency of cheating behaviors between conditions.

The hypotheses predicting differences in cheating behavior for high GE and low GE subjects across conditions was not confirmed.

The prediction that changes in expectancies for delayed reward would relate to the latency and amount of cheating received no support.

The study was most successful in providing evidence that one's choice preference for an immediate or delayed larger reward or one's ability to delay gratification is largely a function of the extent to which one believes the delayed reward will occur.
APPENDIX I
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_________25¢ now

_________30¢ in 2 or 3 days
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_______Two Hershey bars in 2 weeks

_______One Hershey bar today
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_______ Small eraser today

_______ Large eraser in 2 or 3 days
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_____ 75¢ in 2 weeks

_____ 50¢ today
Wait until both things are shown to you.
Then check the one you choose.
If you take one you cannot have the other.

_________ Small notebook today
_________ Large notebook in 2 or 3 days
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

________ 5 pencils today

________ 6 pencils in 2 or 3 days
Wait until both things are shown to you.

Then check the **one** you choose.

If you take one you cannot have the other.

- 40¢ in 2 weeks
- 25¢ today
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_____ Large bag of balloons today

_____ Large bag and small bag of balloons in 2 or 3 days
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

______ 50¢ in 2 or 3 days

______ 45¢ today
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

Two bags of H&M's now

Three bags of H&M's in 2 or 3 days
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

______ 15¢ today

______ 20¢ in 2 or 3 days
Wait until both things are shown to you.
Then check the one you choose.
If you take one you cannot have the other.

Bag of small marbles and bag of large marbles in 3 weeks

Bag of small marbles today
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

______25¢ today

______35¢ in 1 week
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

70¢ in 2 or 3 days

60¢ today
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_____ Small magnifying glass today

_____ Large magnifying glass in 3 weeks
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

80¢ today
95¢ in 2 weeks
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

_____ 65¢ in 3 weeks

_____ 35¢ today
Wait until both things are shown to you.

Then check the one you choose.

If you take one you cannot have the other.

____ 50¢ today

____ 80¢ in 3 weeks
APPENDIX II
The Excuses

(the first time) "I don't have the things you chose last time with me today. But I will have them for you the next time I come here."

(the second time) "I'm sorry but I still don't have the things you chose the other time I was here. I will have them for you the next time I return."

(the third time) "I'm very sorry to have to admit it but I still don't have those things you chose. I'll have them for you when I come back."
APPENDIX III
Score Sheet

Name__________________________________________

School________________________________________

20 Points = **Marksman** Wins White Ribbon
25 Points = **Sharpshooter** Wins Red Ribbon
28 Points = **Expert** Wins Blue Ribbon

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BIBLIOGRAPHY


