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The Relationship between Maternal Reinforcement Behavior for High and Low Achieving Children

Constance Anita Fullilove

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THE RELATIONSHIP BETWEEN MATERNAL
REINFORCEMENT BEHAVIOR FOR HIGH
AND LOW ACHIEVING CHILDREN

by
Constance A. Fullilove

A Dissertation Submitted to the Faculty of the
Graduate School of Loyola University of Chicago
in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy

February
1977
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VITA

The author, Constance Anita Fullilove, is the daughter of Otho Harrison Fullilove and Dorothy (Whitney) Fullilove. She was born June 7, 1950 in Chicago, Illinois.

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CHAPTER I

INTRODUCTION

Mothers' influence on the academic competence of children is a neglected but important area of research. Despite the long-standing recognition of the importance of parents in the socialization of children, achievement studies have focused on the child (specifically, his motivation or IQ) or on the teacher. These studies have given some insight into why certain children succeed and others fail, but have left many questions unanswered.

The parents, especially mothers, have sustained contact with children and from this contact expectations about behavior are developed. These expectations can be found in many areas including the academic one. Before the children are old enough to enter school, mothers have formed an impression, albeit general, regarding their intellectual capability. These impressions are modified and/or reinforced as the child progresses from grade to grade, and mothers receive feedback, such as report cards, teacher evaluations, and achievement test scores from the school. Mothers' expectations of their children's academic competence may be communicated quite directly to
the child or in ways as subtle as facial expression or voice inflection. If one considers this latter assumption that mothers form expectations and communicate them to their children to be a tenable one, then one might extrapolate from this that mothers may treat their children differently on the basis of their expectations. That is, once an expectation regarding intellectual competence has been established, it seems likely that mothers' perceptions of their children's performance will be colored by this expectation. More specifically, mothers probably tend to consider variables such as the difficulty level of the task and the perceived competence of children when making judgments regarding performance. However, this has never been demonstrated empirically with parents despite the abundance of research in the area of teacher expectation for pupil performance.

The factors that influence mothers' reinforcing behavior may be based on certain attitudes about childrearing. Specifically, the attitudes which reflect on mothers' ability to communicate and effectively interact with their children are viewed as important. Mothers' reinforcement behavior may also have a direct effect on the aggressiveness of children. It is speculated that mothers who are negatively reinforcing have children who act out aggressively. Although these aspects of maternal reinforcement behavior seem quite interesting, there has only been a nominal amount of research carried out in this area.
The present study investigated maternal expectations and reinforcing behavior in a contrived learning situation and their relationship to their children's achievement level (high or low), as estimated by teachers. In addition, mothers' reinforcing behavior was investigated with respect to task difficulty, performance, and maternal attitudes. Further, an attempt was made to investigate the relationship between maternal reinforcing behavior and reports of the perceived aggressiveness in the child.
CHAPTER II

REVIEW OF RELATED LITERATURE

Two areas of research seemed relevant to the present topic and are reviewed in this section. They are (a) the literature on expectation; and (b) attribution theory.

**Expectation and the Self-Fulfilling Prophecy**

Finn (1972) stated: "An expectancy or expectation set is a conscious or unconscious evaluation which one person forms of another or of himself, which leads the evaluator to treat the person evaluated in such a manner as though the assessment were correct. Further, he will anticipate that the person evaluated will act in a manner consistent with the assessment" (p. 390). Both parents and teachers hold expectations for the academic behavior of a child and react on the basis of these. Finn (1972) noted that the expectations of teachers begin to shape the child's view of self as either an achiever or a nonachiever, and have a bearing on his future expectations of achievement. The idea of children incorporating expectations and operating behaviorally on them was investigated by Rosenthal and Jacobson (1968a). These authors manipulated teachers' expectations for students in their classes. The experimenters in this
study informed teachers that further validation was needed for a test designed to predict academic "blooming" or intellectual gain in children. After the children were tested in the late spring of an academic year with the Test of General Ability, 20 per cent were designated as "spurters." Four months after the school reopened, the children were again retested. It was found that children from whom teachers expected greater intellectual gains, actually showed such gains on the Test of General Ability. In addition, teachers' evaluations of pupils in their classes indicated that the children designated as "spurters" were described as having a better chance of being successful in later life and being happier, more curious, and more interesting than the other children. On the other hand, the more the undesignated children gained in IQ points, the less they were liked.

Rosenthal and Jacobson (1968a) provided the following explanation for this occurrence. Teachers probably communicate their expectations to children through tone of voice, facial expression, touch, and posture as opposed to the amount of time or attention given to their pupils. The authors felt that tone of voice, etc. had an indirect influence on the child's self-concept, his ability to anticipate his own behavior, motivation, and/or cognitive skill.

Rosenthal and Jacobson (1968b) attempted to explain how expectations were transmitted in the classroom. The hypothesis of the authors stated that the quality of inter-
actions between a teacher and a pupil who is highly regarded differs from the quality of interactions that a less regarded pupil experiences which is partly responsible for the expectation effect and the communication of differential expectations. Firestone and Brody (1975) tested this latter hypothesis. In a well controlled study, 79 kindergarteners and their six teachers were observed over an extended period of time. These observations were carefully recorded using a standardized category system. The results of the study did indeed point out that the interactions that occur between teachers and pupils enables one to better predict academic performance. It was found that the children who experienced the highest percentage of negative interactions with their teachers performed more poorly than other children in their rooms on an intelligence measure after completing their first year. It was speculated that this interaction finding supports the self-fulfilling prophecy notion.

Although the Rosenthal and Jacobson (1968a) research opened the doors to increased exploration of the area, the study itself had methodological flaws. Grieger (1971) in discussing some of these flaws, noted that there was sample attrition, with 20 per cent of the original subjects missing at the time of the retest. Perhaps the most important fact, however, was that the majority of the teachers reported that they could not recall the names of the "bloomers"
with some even stating that they did not bother to look at the paper that listed the names of these pupils.

Beez (1968) corrected some of the flaws in methodology of the Rosenthal and Jacobson (1968a) study. He randomly assigned children to a "high" or "low" ability group. Graduate students in education were randomly assigned to teach these children as many symbols as they could within a 10-minute period. Prior to the start of this teaching session, they were given a psychological evaluation to read which interpreted the identical data either positively or negatively, depending on the child's group membership. These graduate education students were observed while they taught and were rated on a number of variables. The author found that teachers of the so-called "high" ability group, attempted to teach more symbols, and, in fact, the "high" ability group acquired more symbols than the "low" ability group. This study clearly demonstrated the teacher expectancy effect. Another study which supported this effect was carried out by Brophy and Good (1970). The three highest and three lowest pupils of each classroom were observed interacting with the teacher. However, the pretext was that the children's classroom behavior was being observed, not the teachers'. The authors found that the highest achieving students raised their hands more and initiated more procedural and work-related interactions with the teacher than did the low achieving group. Further, this top group received
less behavioral criticism, more praise for correct answers, less criticism for incorrect answers, and a greater percentage of repetitions and rephrasings than the low group. This seems to indicate that the highest achieving groups are provided with a far more conducive environment for continued achievement than are the low achieving pupils.

As indicated by the preceding review, the research on expectancy effects has typically involved teachers and their students, although there is a small body of literature concerned with reinforcement and expectancy effects of parents or children, as well. Hill and Dusek (1969) examined the influence of social reinforcement on the achievement expectations of a group of children. The subjects, depending on the experimental group, were exposed to a pre-training experience of success, failure or no pre-training, and to one of two reinforcement conditions, social or non-reinforcement. Following this initial period in one of the aforementioned groups, the subjects worked on an angle matching task. Expectations for success were checked prior to and following this angle matching task. Hill and Dusek (1969) found that social reinforcement did indeed increase achievement expectations but that following non-reinforcement, expectations remained stable. Adelman (1969) investigated both non-reaction or non-reinforcement as well as the positive and negative verbal reactions on the achievement expectations.
of successful and non-successful child subjects. As hypothesized, positive and negative verbal reactions were found to increase and decrease generalized academic expectancies. However, non-reaction caused the underachieving subjects to increase their expectations, but caused the achievers to lower their expectancies. The importance of parental reaction on the behavior of children was investigated in a study by Patterson, Littman, and Hinsey (1964). These researchers studied the effect of parental approval upon a child's performance on a simple task. The child had been instructed to drop marbles one at a time into either of two holes on a tray. Parents were told that following the child's performance, they should make a designated reinforcing remark at the sound of a signal. The authors found that parents had a significant effect in changing response preferences of their children.

Palardy (1969), in a well designed study that explored the teacher bias effect, devised a questionnaire to assess teachers' beliefs about the percentage of boys being successful in learning to read in comparison to girls. Then the same teachers administered the Stanford Achievement Test (reading section only) to children in their classes. It was found that boys whose teachers believed males would achieve at a lower rate than females, scored significantly lower than the girls in their classes and also lower than all other children whose teachers believed that boys would read
as well as girls.

A follow-up study to the Rosenthal and Jacobson (1968a) research was carried out by Rubovits and Maehr (1971). This study was designed to investigate the intervening teacher-student interactions that directly affect student behavior. Observers were trained to record the incidence of six teacher behaviors: (a) attention; (b) encouragement; (c) elaboration; (d) ignoring; (e) criticism; and (f) praise. The results of this study demonstrated that gifted students were called on more and praised more than nongifted students. The authors speculated that being given more opportunities to participate in the class could cause the high group to clarify their thoughts more through dialogue with the teacher and to demonstrate their proficiency more frequently. It was suggested that receiving more praise has far reaching implications for improving the students' motivation and learning.

As indicated by the preceding review, teachers not only hold different expectations for the performance of their pupils, they also behaviorally operate on these expectations as though they were factual. Since parents have more direct and continuing influence on their children's behavior, their expectations regarding their children's achievement are also likely to be important. If parents do indeed hold differential expectations for performance and thus reinforce according to this, then a partial explanation for a child's
academic success or failure might be found.

The present study investigated whether or not mothers, like teachers, form expectations about the competence of their children and operate behaviorally on these expectations. It seems logical to assume that this would be so. If a mother had had a history of interacting with her child and had found that the child learned quickly, she would assume that this behavior would continue. The converse of this would be true as well. Further, it might be assumed that the rapid learning ability of the child would be pleasing to the mother who, in turn, would reward the child. The hypothesis tested here was that mothers of high achievers hold higher expectations for the success of their children than mothers of low achievers. Another hypothesis of this study was that mothers of high achievers administer more rewards than mothers of low achievers.

The literature on attribution theory is reviewed in the next section.

The Observer's Perception of Performance: Attribution Theory

Attribution theory is concerned with the processes through which an individual assigns causes to various responses he makes or observes and the consequences of the resulting beliefs about causality (McArthur, 1971). There are a number of steps that an observer takes in assigning causative elements to an actor's behavior. Initially, he must
arrive at some decision as to whether or not the person intended the behavior to occur. Maselli and Altrochi (1967) noted that a person is more likely to infer intent as opposed to accident if the act (or acts): (a) required a great deal of physical or mental exertion or (b) demonstrated complexity or duration. He must also decide whether or not some more stable factors such as competence or motivation were the cause of the act or whether to attribute the behavior to unstable factors, such as luck or chance. Heider (1958) stated that attribution provides a way for an observer to comprehend what occurs in the environment. First, the observer must recognize that some specified change has occurred in the environment and that a particular person has caused this change. Secondly, the fact of a person causing change is given further meaning by linking this to certain dispositional properties (defined by Heider as the invariances that make possible a more or less stable, predictable, and controllable world) of the person and of the environment. Finally, the observer concludes that the person who caused the change was able to do so, wanted to do this, was trying to do this, or liked to bring about the change specified. These conclusions represent the facts of reality for that person and are no longer experienced as interpretations.
In attributing cause, observers tend to emphasize the stable dispositional properties of the actor (Jones, Kanouse, Kelley, Nisbett, Valens, & Weiner 1972). Actors, on the other hand, are inclined to attribute their behavior to situational causes (Jones & Nisbett, 1971). This attributional difference is carefully explained in the following quotation:

The major reason for the divergent perspectives is probably a simple perceptual one. The actor's attention at the moment of action is focused on the situational cues—the environmental attractions, repulsions, and constraints with which his behavior is coordinated. It therefore appears to the actor that his behavior is a response to these cues, that is, caused by them. For the observer, however, it is not the situational cues that are salient, but the behavior of the actor. In gestalt terms action is figural against the ground of the situation. The observer is therefore more likely to perceive the actor's behavior as a manifestation of the actor and to perceive the cause of behavior to be a trait or quality inherent in the actor (p. 82).

A second probable reason for the differential bias of actors and observers stems from a difference in the nature and extent of information they possess. "In general, the actor knows more about his past behavior and his present experiences than does the observer. The difference in informational level probably often serves to prevent the actor from interpreting his behavior in dispositional terms while allowing the observer to make such an interpretation" (Nisbett, Caputo, Legant, & Marecek 1973, pp. 154-155). A study by Jones and Harris (1967) investigated whether observers do indeed attribute cause to the stable dispositional properties
of the actor. In their study, college students were asked to read essays or listen to speeches, presumably written by fellow students. These subjects were then asked to give their estimate of the communicator's real opinions after having been told either that the communicator had been assigned to one side of the issue or that he had been completely free to choose a side. In spite of the fact that the subjects seemed to have clearly perceived the heavy constraints on the communicator in the no-choice condition, their estimates of the true opinion of the communicator were markedly affected by the position taken by the writer. When an essay or speech supporting Castro's Cuba was read, the subjects inferred that the communicator was pro-Castro. The results of this study demonstrated that the stand which was taken (pro vs. anti) was a significant determinant of attributed attitude in the no-choice condition. This study again illustrated that observers pay scant attention to situational factors and tend to attribute cause to the stable dispositional properties of the individual. Similarly, Nisbett, Caputo, Legant and Marecek (1973) consistently demonstrated that actors were more inclined to attribute the cause of their own behavior to some aspect of the situation, while observers related the cause to some predisposition of the actor. These findings again support the evidence presented thus far.
A study that gave further support to this was undertaken by McArthur (1971). Subjects of this study read a single-sentence description concerning an action, emotion, accomplishment, or opinion and were asked about the causative factors involved. For the experimental group, these statements were accompanied by distinctiveness information (whether or not the same response is produced by other people in the presence of the entity) and consistency information (whether or not the response occurs whenever the entity is presented and in whatever order it is presented). It was found that experimental subjects most frequently attributed cause to some aspect of the person or the interaction of person to stimulus rather than to the external environment. Consistency and distinctiveness information are used by many persons to ascertain that their subjective impressions accurately represent the inherent properties of the entity. However, once certain attributions are made, they become the basis for making further ones and they permit the individual to bypass the utilization of the informational units of consistency, consensus, and distinctiveness (Kelley, 1967).

Storms (1973) investigated the reasons for the differing perspectives of actors and observers. The aforementioned author speculates that if attribution were, in fact, influenced by one's focus of attention then it would, in fact, be possible to change the interpretation of behavior
by changing their visual orientation. Two actors participated in a conversation and were videotaped while being viewed by two observers. The videotaped conversation of the actors was then shown to actors and observers from either the same visual perspective as previously (actor sees other actor on tape and observer sees same actor he previously watched) or a different perspective (subject saw himself on tape or observer saw the actor not previously the focus of his attention). It was found that in the same orientation condition that subjects assigned the causes of their own conversational behavior to situational influences more than observers. This finding is similar to the results of the studies concerning the opposing perspectives of actors and observers which have been reviewed to this point. But, when the visual orientation was altered, subjects became more dispositional about their behavior, and observers became more sensitive to the situational constraints of the situation.

At an earlier point in this paper, consideration was given to the steps an individual takes as he attempts to ascertain the cause of an action. Intention and stable dispositions have been discussed thus far. Responsibility is the other area that belongs in this composite with intention and stable dispositions. Heider (1958) suggested that the less environmental factors (luck or chance) impinge on an act, the more one attributes responsibility to
the person for the act. In summing up these steps, a person makes a decision as to whether the other person intended the act to occur, that is, did he make an effort. Then, he assesses how difficult or easy the task was while forming a judgment about the competency of the individual. Finally, he assigns responsibility by evaluating whatever environmental circumstances might be present.

Attribution theory uses "common sense" terms and seems very straightforward. Nonetheless, the motivations of persons who perceive an act vary enormously within and across situations. Beckman (1970) explored the area of observer motivation. This researcher experimentally manipulated a situation to study the effects it would have on observer motivation. The subjects of this research either taught two fictitious students for four trials (participant condition) or received information in story form about a situation similar to the participating persons' condition (observer condition). Although one child consistently performed well, a second child's performance either remained poor (low-low), improved (low-high), or deteriorated (high-low). The subjects in the participant condition attributed the low-high child's success to themselves while observer-condition subjects attributed success to characteristics of the child. The subjects in both conditions tended to attribute the low-low and high-low children's failure to external factors such as situational demands or to characteristics
of the child. The fact that participants, but not observers, attributed the low-high child's success to themselves, suggested that ego relevant attributions were in operation. This indicates that the affective significance of the act for the "teacher" bears on whether the actor is held responsible or the teacher.

Hendrick and Giesen (1975) also carried out a study related to observer motivation. Subjects in this study were given case study material about an artist. This material varied for each of the four groups, with the artist either a drug user or not and who was successful or not. It was predicted and confirmed that the dimension of success-failure interacted with drugs no drugs in determining attributions of ability. Another interesting finding of the study was that success was attributed to ability more than was failure. That is to say, success was seen as a stable dispositional property of the actor, but failure was attributed externally.

In the present study, predetermined feedback about the children's performance was given to mothers, i.e., children performing at high or low levels of correctness. It is hypothesized that the high or success feedback, as it may also be termed, is reinforced more positively than the low or failure feedback.
Further, mothers of high achievers who receive success feedback are more positively reinforcing than mothers of low achievers who receive the same feedback. One final hypothesis will be mentioned at this point. Mothers of high achievers who receive low or failure feedback give more negative reinforcement than mothers of low achievers who receive such feedback because failure is an uncommon event for the high achievers.

Another study that investigated observer motivation was carried out by Johnson, Feigenbaum, and Weiby (1964). This study was based on Heiderian tenets. That is, if the characteristics of an actor are positive (origin) and his act is positive (effect), the cause will tend to be located in the actor (his characteristics) and the observer will perceive the situation as balanced. But, if the characteristics are negative, a state of imbalance exists since the person fails to fit the effect. On these occasions, the locus of causality will tend to be perceived as external to the actor. Thus, by locating the cause outside the actor, the observer creates a state of balance. In a simulated teaching situation, the subjects of Johnson et al.'s study taught arithmetical concepts to fictitious students who then performed high (student A) or low (student B) on a task. Stable dispositional properties, e.g., intellectual competence, were seen as causative for the behavior. The subjects then taught another set of concepts to these fictitious students.
Student A's performance remained at its identical high level, but student B's performance either remained low or changed to a higher level. In this latter condition, the subjects continued to attribute the performance of the student to intellectual competence if the performance remained the same. However, if the performance changed (low to high), the subjects attributed this to their teaching skills. This result is important since it suggested that in some instances an individual will not receive credit when his performance improves and consequently such behavior will not be reinforced by the teacher.

Lanzetta and Hannah (1969) investigated the issue of whether or not "naive" trainers were responsive to factors other than the actual level of performance by their subjects in their reinforcing behavior. The authors hypothesized that a trainer's perception of performance is colored by knowledge of the competence of the trainee and the difficulty level of the task. The trainers in their study were given the task of training a fellow student (a confederate of the experimenter whose performance was predetermined and identical throughout) on a concept task. These subject-trainers were led to expect a certain level of performance of their trainees since they had been given information pertaining to the difficulty of the task (easy vs. difficult) and the competence of their trainee (competent vs. noncompetent). The authors concluded...
that "trainees who are presumed to have low ability as compared to those with high ability receive less differentiated feedback, that is, fewer high rewards for correct responses and fewer high punishments for incorrect responses...such a schedule providing as it does fewer discriminable cues as to performance adequacy, leads to slower learning. Thus, a trainer's expectations of low ability may have the character of a 'self-fulfilling prophecy' (pp. 251-252)." Therefore, extraperformance variables, subject competence and task difficulty level did affect the reinforcing behavior of naive trainers in this study.

Two conclusions relevant to the present study can be drawn from this review of attribution literature: (a) observers attend more to the stable dispositional qualities of an actor when inferring intent than to any of the external or situational variables which may be involved; (b) observers attend to task difficulty level when attributing responsibility for success or failure. The author in the present study not only chose child subjects on the basis of high or low achievement but also varied task difficulty in order to determine whether mothers would indeed reinforce differentially on the basis of these variables. One of the hypotheses being tested in this study is that mothers give more rewards and fewer punishments on a hard task as compared with an easy one.
Maternal Reinforcement Behavior, Maternal Attitudes, and Children's Aggression

The reinforcement behavior of mothers is probably related to certain attitudes about childrearing. If there is such a relationship, mothers' reinforcement behavior in a learning situation can be predicted from certain of her attitudes about childrearing. It is speculated that mothers of high achievers effectively interact and communicate with their children and reinforce their learning behavior more appropriately than mothers of low achievers. Two subscales from Cohler's (1966) Maternal Attitude Scale, Reciprocity and Emotional Complexity, seemed useful for the assessment of attitudes about childrearing and the parent-child relationship. The specific hypotheses being tested are:

(a) there is a significant positive relationship between total rewards and an adaptive score on the Reciprocity and Emotional Complexity subscales of the Maternal Attitude Scale; and
(b) there is a significant negative relationship between total punishments and an adaptive score on Reciprocity and Emotional Complexity subscales.

Procyk (Note 3) demonstrated a significant relationship between low levels of reward and children's aggression. The present author, in attempting to corroborate this finding, investigated the relationship between maternal reinforcement behavior and aggression by administering to teachers and mothers a revised version of Walder, Eron, Walder, &
Laulicht's Aggression Index. The specific hypotheses being tested are: (a) there is a significant negative relationship between total rewards and aggression ratings by mothers and teachers; and (b) there is a significant positive relationship between total punishments and aggression ratings by mothers and teachers.

Research Design

The present study used a design which would permit the testing of hypotheses which have a relationship to maternal expectations, attribution, and reinforcement behavior. This research as well as two prior studies, permitted actual observation of mother-child dyads, rather than resorting to questionnaire or self-report methods. Yarrow (1963) spoke of one advantage of using observational methods:

The forte of observation is, obviously, the first hand nature of the data. Direct observations of behaving parents and children provide an opportunity for looking for uncommon socialization data not in the habitual focus of research. The investigator can try to see what is there, and thus to see other dimensions of parent-child interaction in addition to the salient ones of authority, aggression, and dependency dimensions (pp. 223-224).

Also, moment-by-moment reinforcement contingencies could be studied since mothers were allowed to reinforce after each task. Thus, mothers' behavior could vary on the dimension of reinforcement while the children's behavior was held constant through use of predetermined feedback.
The two studies which are relevant to the methodology and design of the present research represent successive attempts to achieve this control in as naturalistic a situation as possible while manipulating and assessing the relevant variables to adequately test the hypotheses. The first is an unpublished study by Procyk (Note 3). She developed a technique for investigating mothers' scheduling of rewards. Mothers and sons in the Procyk study were supposedly separated from one another by a wall and mothers were told that they could monitor their children's responses to their instruction on a task by viewing "right" and "wrong" lights on a large electronic board. After each trial mothers could reward their children by pressing a button that was supposed to flash a light on the children's board with the flashes earning credit toward a prize. In actuality, their children did not participate in the study at all and all mothers were given the same preprogrammed signals on their boards. Following the initial trials mothers were given the experimenter feedback that their child had performed either satisfactorily or unsatisfactorily. On subsequent trials Procyk found, as hypothesized, that significantly lower levels of reward were associated with the same level of performance described as unsatisfactory by the experimenter.

The second study relevant to this design is a study by Fullilove (Note 2), who had an interest in further investigating the area of mothers' reinforcement behavior. An attempt was made in that study to modify the experimental
setting to (a) make it less artificial, and (b) clarify certain aspects of Procyk's findings. Fullilove placed mother-child dyads face-to-face (there was a partition with a window to permit mothers a view of her children's face) in the same room. Mothers were told, following each trial, that the children's performance was either right or wrong and were allowed to give or take away tokens based on their feelings about the performance of their children. Thus the Fullilove study allowed mothers to both reward and punish their children which was unlike the Procyk research where mothers were only able to give rewards. In addition, the Fullilove study actually used high and low achieving subjects to determine whether mothers reinforced differently on this basis instead of only using manipulated experimenter feedback as in the Procyk research. Finally, the Fullilove study varied the level of task difficulty to determine whether mothers reinforced differently on this basis, as suggested by the Lanzetta and Hannah (1969) study. There were several interesting findings from the Fullilove study: (a) mothers accepted the experimental situation as presented to her; (b) mothers were sensitive to differences in task level as demonstrated by their giving the most rewards for a difficult task and the fewest for an easy task; and (c) contrary to the hypothesis, mothers of high achievers did not give more rewards than mothers of low achievers. However, it was speculated that giving the identical feedback (60 per cent correct) to all mothers regardless of the
achievement of the children meant that mothers of high achievers felt that their children had performed poorly, and mothers of low achievers felt their children had done well. Thus differences in reinforcing behavior between the achievement groups may have been masked by that procedure.

The present study was similar to the prior study in terms of using children who have high or low achievement in school and in the manipulation of task difficulty. However, it used two reward conditions, a tangible one in which tokens were given or taken away as in the initial study and a non-tangible reinforcement condition in which mothers could verbally reinforce their children. This author felt that mothers in the prior study may have felt somewhat uncomfortable using tangible reinforcements. Therefore, a nontangible or verbal reward condition was added which might be more naturalistic.

A second modification of the initial Fullilove study was the use of two experimenter feedback conditions indicating either high (80 per cent correct) or low (40 per cent correct) success for both high and low achievement groups. The influence of experimenter feedback on mothers' reinforcement behavior could be assessed in this way.

Hypotheses

The following is a summary of the hypotheses of the present investigation:

(1) Mothers of high achievers hold significantly higher expectations about their children's performance on the
experimental task than mothers of low achievers.

(2) Mothers of high achievers administer significantly more rewards than mothers of low achievers.

(3) Mothers administer significantly more rewards and fewer punishments on a hard task as compared with an easy one.

(4) Mothers receiving high performance feedback about their children are significantly more positively reinforcing than mothers receiving low performance feedback.

(5) Poor performance (low feedback group) on an easy task by a high achiever is significantly more likely to be negatively reinforced than a similar performance by a low achiever.

(6) Low achievers who fail on a difficult task receive significantly less punishments than high achievers.

(7) There is a significantly negative relationship between total rewards and aggression ratings by mothers and teachers.

(8) There is a significantly positive relationship between total punishments and aggression ratings by mothers and teachers.

(9) There is a significantly positive relationship between total rewards and an adaptive score on scales of Reciprocity and Emotional Complexity of the Maternal Attitude Scale.

(10) There is a negative relationship between total punishments and an adaptive score on scales of Reciprocity and Emotional Complexity of the Maternal Attitude Scale.
CHAPTER III

METHODOLOGY

Subjects

The subjects of this study were 80 mother-child dyads. The child subjects were boys in the third, fourth, and fifth grades in both parochial and public schools in the Chicago area. Letters that described the study (see Appendix A) and asked for participation were sent to mothers of children rated by their teachers as being in the upper or lower 25 per cent of their classes. Affirmative responders to the letter were then scheduled for an appointment at the school or at a facility nearby. There were 80 boys, 40 representing the upper 25 per cent of their classes, and 40 representing the lower 25 per cent.

Apparatus and Measures

Apparatus. A 30-inch x 37-inch rectangular shaped plywood structure with folding wings was the principal apparatus used in this study. The structure had a 5-inch x 10-inch window near the top which permitted the mother to view her child, but not his performance, and an inverted U-shaped opening at the bottom through which the tangible reinforcements were passed. The apparatus was placed on a table and participants in the study were seated on opposite sides.
**Puzzle.** The task for the child was a square wooden puzzle board that contained eight numbered square and rectangular shaped pieces of varying sizes. The mother read directions to the child on how to move the puzzle pieces. There were 30 trials, with 10 trials each representing moderate, easy, and difficult levels. For example, the child might be required to move pieces to the right or left, or to manipulate several numbered pieces in a specified manner, within a limited time period. A diagram of this puzzle and the instructions read by the mother are presented in Appendix B.

Poker chips were used as the reinforcements in the tangible reward condition. At the beginning of these trials, the mother had 40 poker chips that she could dispense (after any trial) in any quantity she chose. The child started with 20 poker chips. This arrangement of giving both mother and child poker chips prior to starting the trials allowed the mother more flexibility in both taking away and giving poker chips.

**Ratings.** Prior to the start of the moderate, easy, and difficult trials, mothers were given a form and asked to circle a number from 0 to 10, which represented how many correct she felt her child would get (pre-expectancy rating). After the child had completed each set of 10 trials, mothers were given two other forms to complete. One asked her to indicate on a scale from "1" (very easy) to "11" (very difficult) how difficult she perceived the trials to have been
(task difficulty ratings). The other form (performance rating) asked her to indicate on an 11-point scale ("11" = superior, "1" = poor) how well she felt her child had performed.

The purpose of these ratings was to ascertain whether (a) the mother's expectancies concerning her child's performance reflected the child's status (high or low achiever), (b) whether her perceptions of the task were consonant with what was described to her by the experimenter, and (c) to ascertain how she evaluated her child's performance. In the nontangible reward condition, responses of mothers following the performance of their child and the feedback from the experimenter, was written verbatim.

A rating system was also set up to categorize verbal or nontangible responses. Representative examples of these responses were drawn at random from the entire group to derive a scoring standard. They were then rated on a continuum from 5 (very positive) to 1 (very negative). An example of a very positive response was "very good" and an example of a very negative response was "you're not concentrating." Irrelevant responses received a score of 3 and included a response such as "did you finish?" or any failure to respond. The score for the positive verbal responses was the sum of all scores of 5 or 4 while the score for the negative responses was the sum of all scores of 1 or 2. The scoring standard was then used to rate the remaining verbal responses. Interrater reliability
was established to assure the reliability of the scoring system (the complete scoring standard may be found in Appendix D).

The final rating system of this study was the Coleman (Note 1) Index which was used to rank the occupations of parents on a socioeconomic scale. Occupations were given ratings from 1 (lower lower class) to 7 (upper class). The Coleman Index considers racketeers or peddlers as occupations which belong to the lower lower class while highly paid (in excess of $22,500) corporation officers and physicians are occupations which belong to the upper class.

Parental Attitudes. Mothers' childrearing practices were measured by using the Maternal Attitude Questionnaire (Cohler 1970). In this Likert type attitude survey, there were six choices (ranging from strongly agree to strongly disagree), for each of the questions concerning parental attitudes and the parent was required to choose the one with which she most agreed.

The 45 items in the survey belonged to one of the following five scales: (a) Aggression; (b) Reciprocity; (c) Closeness; (d) Emotional Complexity; and (e) Maternal Competence. Each scale is scored based on its adaptive or maladaptive relationship in terms of childrearing attitudes.

The Aggression Scale is concerned with the appropriate versus inappropriate control of the child's aggression. An adaptive attitude about aggression reflects a recognition of the aggressive impulse, but its actual expression is modulated
thru provision of alternate channels. In contrast, a mother holding maladaptive attitudes about aggression tends to be overly restrictive or, less commonly, overly permissive. A question that taps this scale is: "Good mothers keep tight hold on their child's expression of angry feelings."

Mothers' encouragement versus discouragement of Reciprocity is the second scale of the Maternal Attitude Survey. An adaptive attitude on this factor or scale implies a communication between mothers and their children and the encouragement of a relationship between mother and child. On the other hand, a maladaptive attitude on the Reciprocity Scale exists if mothers feel that babies do not communicate with their mothers and are unable to develop a reciprocal social relationship or to respond to appropriate cues from their mothers. A question from this scale is the following: "If a mother plays very much with her 7 month old baby he (she) will want her to be around all the time."

The third factor of the Maternal Attitude Scales is appropriate versus inappropriate Closeness with the child. The adaptive side of this factor refers to a mother enjoying and caring for her child without sacrificing herself, without becoming overly binding or protective and without yielding to the child's demand for an exclusive relationship. The maladaptive end of the continuum refers to many aspects of child-care being seen as burdensome, depleting and destructive of self. Feelings vacillate between, on the one hand, a perpetuation of mother-infant symbiosis and, on the other hand,
relegation of all aspects of child care to others. An example of an item pertaining to this factor is: "A typical 1 year old baby is likely to get upset when he (she) is left with a babysitter."

Acceptance versus denial of Emotional Complexity in child care is the fourth factor. An adaptive attitude for this scale means acceptance of ambivalent feelings about child care, of some feeling of inadequacy as a mother and of uncertainty regarding some aspects of child care without loss of self-esteem. On the other hand, a maladaptive attitude on this scale is defined as the denial of any concerns or doubts regarding child care and of inadequacy in the maternal role along with highly conventional or stereotyped beliefs. Additionally, this end of the continuum reflects the feeling that mothers require little child care assistance from others. A question from this scale is as follows: "Mothers never demand that their children will do as they are asked."

The final factor is a feeling of Competence versus lack of Competence in perceiving and meeting the baby's needs. The adaptive end of this scale is defined as mothers' ability to understand the infant's physical needs and meet them adequately. On the other hand, maladaptive attitude or competence implies the inability on the part of babies to let others know what their physical needs are, and concomitantly mothers find it very difficult to meet these needs. A question that taps into this scale is the following: "It is unreasonable for
parents to become very angry when their 2 year old repeatedly opens drawers and spills the contents on the floor."

Although the complete set of scoring instructions for the Maternal Attitude Scale may be found in its manual, it is briefly reviewed here to acquaint the reader with its use. It was previously mentioned that the respondent was required to choose a number from 1-6, which corresponded to the continuum from strongly disagree to strongly agree, for each of the questions on the Scale. To obtain a score for any of the five subscales, the numbers (indicating degree of agreement or disagreement) for each item of the subscale are summed and yield a total score. A high total score reflects an adaptive attitude for that subscale, though Cobler (1966) did not establish ranges for possible scores in the manual.

**Aggression Measures.** Each mother's rating of the aggressiveness of her child was measured by a revised version of the Aggression Index developed by Walder, Eron, Walder, and Laulicht (1961). Mothers were asked to use a scale from "0" (representing "never") to "5" (representing "daily") to describe actions of their child such as name-calling, pushing, or rude behavior. This Index was scored by summing the ratings for each behavior. The higher the score, the more aggressive the child was perceived to be.

Teachers also filled out the Aggression Index for every child participant in the study. Teachers' forms were scored in the same manner as for mothers'.

Intelligence Measure. All children were administered the Peabody Picture Vocabulary Test. This IQ measure required the subject to select one of four pictures that corresponded to the stimulus word read by the examiner. This test was administered and scored according to the directions provided in the manual.

Procedure

Mothers were brought individually into the testing area and were told that the experiment in which they would participate concerned how children learn to follow directions. The child was present while the experimenter talked to the mother. They were allowed to manipulate the puzzle pieces according to the directions which were read to their child. Mothers were then informed that most children of this age are successful following directions for a task similar to this one about 60% of the time. Mothers in the tangible reward condition were told that the present experimenter was also interested in whether or not children would work for tokens, such as poker chips, which could later be exchanged by the child for some small gift. However, mothers in the non-tangible reward condition were told to verbally respond to their child following his performance in a way they felt would help to motivate them. These mothers were not told that their child would receive a gift.
At that point, printed instructions (see Appendix C) that described the nature of the experiment were given to the mother. She was allowed to keep the instructions as a reference throughout the experiment.

The experimenter read the instructions (see Appendix C) to the child concerning what he would be doing with his mother (the mother was able to hear the child's instructions). Following this, the child was seated opposite his mother behind the plywood structure. After the experimenter announced that the set of trials was of "moderate" level of difficulty, the form for the pre-expectancy rating of her child's performance was given to the mother. When she had completed this rating, she read the appropriate instructions to her child before each of the 10 tasks comprising the moderate trials. The experimenter, following the predetermined list of correct and incorrect responses, flashed a printed white card with either the word right or wrong for each trial.

After the mother was notified whether her child had performed correctly, the mother could dispense or take away the poker chip reinforcements (tangible reinforcement condition) or rely upon her usual verbal mode of reinforcing her child at home (nontangible reinforcement condition). In this latter condition, responses of the mother were written verbatim and later evaluated by this experimenter as to their being positive or negative.
For half of both high- and low-achieving parent-child dyads, the identical feedback regarding how well their child had done was announced at the end of the 10 trials. This feedback was that their child had performed correctly 80 per cent of the time which was better than the expected 60 per cent right obtained by the average child. The remainder of the subjects were told that their child had 40 per cent right which was worse than the expected 60 per cent. For the situation in which the child had indeed, executed the task correctly and the predetermined list indicated that the experimenter should inform the mother that the child had performed incorrectly, the experimenter made the comment that the child had not executed the task within the time limit allotted.

After the first 10 instructions for each trial in the "moderate" difficulty trials had been read by the mother to her child, the forms for the task difficulty and performance ratings were given to the mother. After the mother completed the forms and returned them to the experimenter, the "easy" task trials were announced by the experimenter and the pre-expectancy rating form was given to the mother. The procedure described above was followed throughout for the "easy" and "difficult" trials.

It may be noted that mothers began with the task of moderate difficulty since this author was most interested in the effect of experimental feedback and reinforcement condition on the easy and difficult tasks.
Upon completing the directions for all of the 30 trials, the child was administered the Peabody Picture Vocabulary Test. The experimenter then gave the child his prize, a small, attractively packaged candy, for his participation.

While the child was out of the room, the mother filled out the Maternal Attitude Questionnaire (Cohler 1970), and the revised form of the Aggression Index (Walder, Eron, Walder, & Laulicht 1961).

Before the mothers left the testing area, they were informed that they would receive a letter explaining the findings of the study. This letter was sent after the data analyses were completed.

In addition, mothers who had received the feedback that their child had only 40 per cent correct on the task were informed by the experimenter that that child had indeed performed the maneuvers of the task accurately, but had failed to work quickly enough to receive full credit. This provided reassurance to the small group of mothers who expressed some concern about their child's lack of success.
Subjects, Tasks, and Mothers' Perceptions

Before testing the major hypotheses, it was important to determine whether certain conditions had been met, i.e., whether mothers had accepted the experimental set and whether the children's groups varied on the basis of achievement. Therefore, it was necessary to determine that: (a) mothers perceived the levels of difficulty of the task (easy, moderate, difficult) in line with the way it had been described by the experimenter and (b) mothers of high and low achievers perceived their children differently. Means and standard deviations for mothers' ratings of task difficulty for the three levels of task can be seen in Table 1. To determine whether there were any differences between levels of difficulty, an analysis of variance was computed. This 2 (achievement) x 2 (experimenter feedback) x 2 (tangible or nontangible reward) x 3 (task levels) analysis, with task being a repeated measure, was used in much of the study. The analysis (Table 2) showed that mothers perceived the levels of task difficulty as they had been presented and this difference was highly significant ($F (2,144) = 125.59, p < .001$). That is, as Table 1 shows, the easy tasks were viewed as the least difficult (lowest ratings), while the moderate level received intermediate ratings,
Table 1

Means and Standard Deviations of Task Difficulty Ratings

Task Level

<table>
<thead>
<tr>
<th>Achievement Level</th>
<th>Low (N=40)</th>
<th>High (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Feedback</td>
<td>4.35</td>
<td>2.46</td>
</tr>
<tr>
<td>Low Feedback</td>
<td>5.20</td>
<td>2.65</td>
</tr>
<tr>
<td>Total</td>
<td>5.20</td>
<td>2.20</td>
</tr>
<tr>
<td>Easy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Feedback</td>
<td>2.20</td>
<td>1.32</td>
</tr>
<tr>
<td>Low Feedback</td>
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<td>1.34</td>
</tr>
<tr>
<td>Total</td>
<td>2.00</td>
<td>2.14</td>
</tr>
<tr>
<td>Difficult</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Feedback</td>
<td>7.35</td>
<td>2.28</td>
</tr>
<tr>
<td>Low Feedback</td>
<td>6.40</td>
<td>2.82</td>
</tr>
<tr>
<td>Total</td>
<td>7.26</td>
<td>2.35</td>
</tr>
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</table>
Table 2

Analysis of Variance for Task Difficulty Ratings

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reward</td>
<td>1</td>
<td>2.60</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>61.00</td>
<td>5.92*</td>
</tr>
<tr>
<td>Feedback</td>
<td>1</td>
<td>.94</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Reward x Achievement</td>
<td>1</td>
<td>.20</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Reward x Feedback</td>
<td>1</td>
<td>18.70</td>
<td>1.82</td>
</tr>
<tr>
<td>Achievement x Feedback</td>
<td>1</td>
<td>3.04</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Reward x Achievement x Feedback</td>
<td>1</td>
<td>14.50</td>
<td>1.41</td>
</tr>
<tr>
<td>Error</td>
<td>72</td>
<td>10.30</td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td>2</td>
<td>413.89</td>
<td>125.59**</td>
</tr>
<tr>
<td>Reward x Task</td>
<td>2</td>
<td>10.05</td>
<td>3.05</td>
</tr>
<tr>
<td>Achievement x Task</td>
<td>2</td>
<td>1.13</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Feedback x Task</td>
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<td>9.01</td>
<td>2.73</td>
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<tr>
<td>Reward x Achievement x Task</td>
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<td>Reward x Achievement x Feedback x Task</td>
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<td>1.90</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Error</td>
<td>144</td>
<td>3.30</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05

** p < .001
and the difficult trials were viewed as the most complicated (highest ratings). Also, the achievement level of children was significantly related to how mothers viewed a task \( (F (1,72)=5.92, p < .05) \) with mothers of low achievers perceiving the task as less difficult than mothers of high achievers. Neither the main effect for experimenter feedback nor reward was significant.

In order to determine whether mothers were sensitive to the differences in achievement exhibited by their children in the school setting, an analysis of variance was computed on the pre-expectancy ratings. These ratings were based on the 10-point scales that required each mother to indicate before each set of 10 trials how many correct responses she believed her child would obtain. Means and standard deviations for the pre-expectancy ratings can be found in Table 3. It can be seen from the analysis of variance (Table 4) that mothers' ratings did not reflect anticipated differences in their children's achievement. This disconfirmed a hypothesis of the study which stated that mothers of high achievers hold higher expectations for their children's performance than mothers of low achievers. A \( t \) test was performed to determine if there were any differences between high and low achievers on the pre-expectancy ratings of the moderate trials since they were not affected by experimenter feedback which was significant. However, such a significant difference between these groups was not found. It can also be seen in Table 4, that reward condition (tangible or nontangible) did not have
Table 3

Means and Standard Deviations of Mothers' Pre-Expectancy Ratings for the Three Levels of Task Difficulty

<table>
<thead>
<tr>
<th>Levels</th>
<th>Task Level</th>
<th>Achievement Level</th>
<th>Low (N=40)</th>
<th>High (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td>M</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>High Feedback</td>
<td>M 6.75</td>
<td>1.37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low Feedback</td>
<td>M 7.00</td>
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</tr>
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<td></td>
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<td>Total</td>
<td>M 7.20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td>SD 1.80</td>
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</tr>
<tr>
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<td>Easy</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>High Feedback</td>
<td>M 8.50</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Low Feedback</td>
<td>M 6.95</td>
<td>1.54</td>
</tr>
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<td>Total</td>
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Table 3 -- Continued

Levels

Task Level

Achievement Level

<table>
<thead>
<tr>
<th>Low (N=40)</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Difficult</strong></td>
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</tr>
<tr>
<td>High Feedback</td>
<td>M 5.75</td>
</tr>
<tr>
<td>SD 1.36</td>
<td>2.06</td>
</tr>
<tr>
<td>Low Feedback</td>
<td>M 3.55</td>
</tr>
<tr>
<td>SD 1.36</td>
<td>2.08</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
</tr>
<tr>
<td>SD</td>
<td>2.10</td>
</tr>
</tbody>
</table>

Feedback  p = .001
Task  p = .001
Table 4

Analysis of Variance for Pre-Expectancy Ratings
for Three Levels of Task Difficulty

<table>
<thead>
<tr>
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<th>ms</th>
<th>F</th>
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<td>.60</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>8.07</td>
<td>1.23</td>
</tr>
<tr>
<td>Feedback</td>
<td>1</td>
<td>58.02</td>
<td>8.87**</td>
</tr>
<tr>
<td>Reward x Achievement</td>
<td>1</td>
<td>21.60</td>
<td>3.30*</td>
</tr>
<tr>
<td>Reward x Feedback</td>
<td>1</td>
<td>2.02</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement x Feedback</td>
<td>1</td>
<td>2.02</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Reward x Achievement x Feedback</td>
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<td>2.82</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Error</td>
<td>72</td>
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<td></td>
</tr>
<tr>
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<td>2</td>
<td>247.16</td>
<td>146.69***</td>
</tr>
<tr>
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<td>2</td>
<td>1.84</td>
<td>1.09</td>
</tr>
<tr>
<td>Achievement x Task</td>
<td>2</td>
<td>2.33</td>
<td>1.38</td>
</tr>
<tr>
<td>Feedback x Task</td>
<td>2</td>
<td>34.18</td>
<td>20.29***</td>
</tr>
<tr>
<td>Reward x Achievement x Task</td>
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<td>1.14</td>
<td>&lt;1.00</td>
</tr>
<tr>
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<td>1.40</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement x Feedback x Task</td>
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<td>.29</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Reward x Achievement x Feedback x Task</td>
<td>2</td>
<td>1.25</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Error</td>
<td>144</td>
<td>1.68</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05
** p < .01
*** p < .001
a significant effect on mothers' pre-expectancy ratings. The main effect for feedback, which was the experimenter's statement to mothers following the children's performance that the children had executed the task with 80 per cent accuracy (half of the subjects) or 40 per cent accuracy (the remainder of the subjects were told this), was significant ($F (1, 72) = 8.87$, $p < .01$). This indicates that mothers' expectations for their children's success on a task was influenced by the experimenter's statements about the children's progress. The descriptive statistics in Table 3 show that mothers receiving high feedback (80 per cent accuracy) had higher expectations for success than mothers receiving low feedback (40 per cent accuracy). The main effect for task was also significant ($F (2, 144) = 146.69$, $p < .001$). It can be seen from the descriptive statistics of Table 3 that mothers had the highest expectations (highest rating) for the success of their children on the easy task, intermediate expectations on the moderate task, and the lowest expectations (lowest rating) for the difficult task. In addition, the feedback x task interaction was also significant ($F (2, 144) = 20.29$, $p < .001$). Mothers had the highest pre-expectancy ratings for the easy tasks when the feedback was high. The main effect for reward, which was the tangible or nontangible reward condition, was not significant.
With regard to the children's groups, it was examined whether there were any differences between these groups on demographic data other than IQ. The $t$ tests provided support for the selection of high and low achievement groups on the basis of teachers' ratings since the mean IQ for the high achievers was significantly higher than the mean IQ for the low achievers (see Table 5). The high and low achiever groups also differed significantly on the socioeconomic status ranking, with the high achievers being in a higher socioeconomic bracket (see Table 5 descriptive statistics and $t$ tests). The high and low achiever groups did not differ significantly in age.

Reinforcement Behavior, Task Difficulty, and Achievement Level

Since it has been established that the mothers accepted the experimental set and that there were two distinct achievement groups, the data relevant to the major hypotheses are presented in this section.

Before presenting the results for the major hypotheses, the two reward conditions, tangible and nontangible, and the scoring systems used in these groups are discussed. The scoring for these two groups yielded two noncomparable sets of scores in terms of means, ranges, and standard deviations. A method for reducing the disparity in the groups for a combined analysis was devised. Scores from each group (tangible and nontangible) were rank ordered next to the cumulative frequency, which was expressed as a percentage. All scores which
### Table 5

Means and Standard Deviations for Age, IQ, and Socioeconomic Status of Children and $t$ Test Comparisons

#### Achievement

<table>
<thead>
<tr>
<th></th>
<th>Low (N=40)</th>
<th>High (N=40)</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQ</td>
<td>M 101.30</td>
<td>118.43</td>
<td>5.61**</td>
</tr>
<tr>
<td></td>
<td>SD 14.84</td>
<td>12.37</td>
<td></td>
</tr>
<tr>
<td>SES</td>
<td>M 3.73</td>
<td>4.45</td>
<td>2.22*</td>
</tr>
<tr>
<td></td>
<td>SD 1.54</td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td>Age (in months)</td>
<td>M 123.50</td>
<td>120.08</td>
<td>1.43</td>
</tr>
<tr>
<td></td>
<td>SD 11.23</td>
<td>10.24</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$

** $p < .01$
were in the first quartile (0-25 per cent) were assigned a new score of 1; scores in the second quartile were given a new score of 2; for the third, a new score was assigned of 3, and for the fourth quartile, a new score was given of 4. In reporting the results from the analyses for reinforcement behavior, tangible and nontangible reward groups are presented separately. For the combined (tangible and nontangible) analyses, the converted scores described earlier were used in order to provide an overall view of the reinforcing process and to check for interaction effects.

The major hypotheses relevant to reinforcement behavior, task difficulty, and achievement level were: (a) mothers of high achievers administer significantly more rewards than mothers of low achievers; (b) mothers administer significantly more rewards and significantly fewer punishments on a hard task as compared with an easy one; (c) mothers receiving high feedback about their children are significantly more positively reinforcing than mothers receiving low feedback; (d) poor performance (low feedback group) on an easy task by a high achiever is significantly more likely to be negatively reinforced than a similar performance by a low achiever, and; (e) low achievers who fail on a difficult task receive significantly fewer punishments than high achievers.

Means and standard deviations for the total rewards and total punishments administered for each of the three difficulty levels of the nontangible reward condition are pre-
sented in Table 6. The analyses of variance for rewards and punishments are presented in Table 7. For rewards there was a significant main effect for achievement ($F (1,36) = 7.39$, $p \leq .05$) and this supported the hypothesis that mothers of high achievers administer more rewards than mothers of low achievers for the nontangible reward condition. The main effect for feedback was also significant ($F (1,36) = 10.65$, $p \leq .01$). Mothers receiving high experimenter feedback about their child (80 per cent accuracy) were more rewarding, i.e., issued more positive verbal statements, than mothers who received low experimenter feedback (40 per cent accuracy).

Therefore, the hypothesis that mothers who receive high feedback about their children would be more positively reinforcing than mothers receiving low feedback was confirmed in the nontangible reward condition. Further, the analysis for rewards in Table 7 showed that the main effect for task was also significant ($F (2,72) = 9.03$ $p \leq .01$). Mothers gave the fewest rewards on the easy tasks, an intermediate number on the moderate tasks and the largest quantity on the difficult tasks.

However, there was no significant main effect for task in the analysis of variance for maternal punishments. Thus, the hypothesis that mothers administer more rewards and fewer punishments on a hard task as compared with an easy one, was confirmed for rewards but not punishments in the nontangible reward group. There were no other significant main effects or interactions in the analysis of variance for maternal rewards.
Table 6

Means and Standard Deviations for Sum of Rewards and Punishments in the Nontangible Reward Condition

Task Levels

<table>
<thead>
<tr>
<th>Achievement</th>
<th>Low (N=40)</th>
<th>High (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td>M 14.60</td>
<td>5.10</td>
</tr>
<tr>
<td></td>
<td>SD 13.40</td>
<td>8.32</td>
</tr>
<tr>
<td>Punishments</td>
<td>M 2.00</td>
<td>5.10</td>
</tr>
<tr>
<td></td>
<td>SD 2.00</td>
<td>4.33</td>
</tr>
<tr>
<td>Total</td>
<td>M 16.00</td>
<td>5.10</td>
</tr>
<tr>
<td></td>
<td>SD 14.66</td>
<td></td>
</tr>
<tr>
<td>Easy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td>M 16.00</td>
<td>2.50</td>
</tr>
<tr>
<td></td>
<td>SD 13.67</td>
<td>6.35</td>
</tr>
<tr>
<td>Punishments</td>
<td>M 1.90</td>
<td>4.60</td>
</tr>
<tr>
<td></td>
<td>SD 1.73</td>
<td>5.06</td>
</tr>
<tr>
<td></td>
<td>M 11.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD 14.66</td>
<td></td>
</tr>
<tr>
<td>Task Levels</td>
<td>Achievement</td>
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</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Low (N=40)</td>
<td>High (N=40)</td>
</tr>
<tr>
<td>Feedback</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Difficult</td>
<td>Rewards</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>Punishments</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td></td>
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</tbody>
</table>
Table 7

Analysis of Variance for Sum of Rewards and Punishments in the Nontangible Reward Condition

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ms</th>
<th>F</th>
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<th>Punishments</th>
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<tr>
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<td>7.39*</td>
<td>9.63 &lt;1.00</td>
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<td>4915.20</td>
<td>10.65**</td>
<td>187.56 7.41*</td>
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<td>73.63</td>
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<td>.53 &lt;1.00</td>
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<td>25.29</td>
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<td>4.36 1.46</td>
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<td>1.06</td>
<td>.58 &lt;1.00</td>
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<td>Feedback x Task</td>
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<td>104.02</td>
<td>4.04</td>
<td>4.22 1.41</td>
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</tr>
<tr>
<td>Achievement x Feedback x Task</td>
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<td>34.26</td>
<td>1.33</td>
<td>1.46 &lt;1.00</td>
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</tr>
<tr>
<td>Error</td>
<td>72</td>
<td>25.73</td>
<td></td>
<td>2.99</td>
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</tr>
</tbody>
</table>

* p < .05

** p < .01
or punishments. The failure to find a significant achievement x feedback x task interaction for either rewards or punishments provided no support for the hypothesized interaction, i.e., poor performance (low feedback) on an easy task by a high achiever is significantly more likely to be negatively reinforced than a similar performance by a low achiever, and low achievers who fail on a difficult task receive significantly fewer punishments than high achievers.

The statistics for the tangible condition, on the other hand, provided both similar and contradictory results. Means and standard deviations for the total rewards and total punishments in the tangible reward condition are found in Table 8. It can be seen from the analysis of variance in Table 9 that the main effect for achievement was not significant thus failing to support the hypothesis that mothers of high achievers give more rewards than mothers of low achievers in the tangible reward condition. This contradicts the results from the analysis of variance for nontangible rewards, and seems to indicate that mothers reacted differentially to the reward condition to which they were assigned. Table 9 also shows that the main effect for feedback was significant ($F (1,36) = 5.62, p < .05$), reflecting the fact that mothers who received high experimenter feedback gave more rewards than mothers receiving low feedback. This finding supported the hypothesis that the high feedback group of mothers were more positively reinforcing than the low experimenter feedback group in the tangible reward condition.
Table 8

Means and Standard Deviations for Sum of Rewards and Punishments in the Tangible Reward Condition

<table>
<thead>
<tr>
<th>Task Levels</th>
<th>Achievement</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Low</td>
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<tr>
<td></td>
<td>Feedback</td>
</tr>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td>M 10.60</td>
</tr>
<tr>
<td></td>
<td>SD 9.50</td>
</tr>
<tr>
<td>Punishments</td>
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<tr>
<td></td>
<td>SD 4.11</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
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<td>SD</td>
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<td>Easy</td>
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<tr>
<td>Rewards</td>
<td>M 9.20</td>
</tr>
<tr>
<td></td>
<td>SD 8.55</td>
</tr>
<tr>
<td>Punishments</td>
<td>M 4.50</td>
</tr>
<tr>
<td></td>
<td>SD 5.08</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>SD</td>
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Table 8 -- Continued

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<tr>
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<tbody>
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<td>Feedback</td>
<td>Low</td>
</tr>
<tr>
<td>Difficult</td>
<td>High</td>
</tr>
<tr>
<td>Rewards</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>SD</td>
</tr>
<tr>
<td>Punishments</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>SD</td>
</tr>
<tr>
<td>Total</td>
<td>M</td>
</tr>
<tr>
<td></td>
<td>SD</td>
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</table>
### Table 9

Analysis of Variance for Sum Tangible Rewards and Punishments

<table>
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<th>F</th>
<th>Source</th>
<th>df</th>
<th>ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rewards</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Punishments</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>4.41</td>
<td>&lt; 1.00</td>
<td>33.08</td>
<td>&lt; 1.00</td>
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</tr>
<tr>
<td>Feedback</td>
<td>1</td>
<td>648.67</td>
<td>5.62*</td>
<td>99.01</td>
<td>1.77</td>
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</tr>
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<td>&lt; 1.00</td>
<td>20.01</td>
<td>&lt; 1.00</td>
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<td></td>
</tr>
<tr>
<td>Error</td>
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<td>55.79</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
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<td>185.23</td>
<td>17.00**</td>
<td>3.10</td>
<td>1.78</td>
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<td></td>
</tr>
<tr>
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<td>1.73</td>
<td>&lt; 1.00</td>
<td>.30</td>
<td>&lt; 1.00</td>
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</tr>
<tr>
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<td>107.20</td>
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<td>2.03</td>
<td>1.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement x Feedback x Task</td>
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<td>&lt; 1.00</td>
<td>.23</td>
<td>&lt; 1.00</td>
<td></td>
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</tr>
<tr>
<td>Error</td>
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<td>10.89</td>
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<td>1.74</td>
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<td></td>
</tr>
</tbody>
</table>

*p ≤ .05

**p ≤ .001
Further, it can be seen that the main effect for task was significant ($F(2,72) = 17.00, p < .001$). Mothers gave the largest quantity of reinforcements on the difficult tasks, an intermediate number on the moderate task and the smallest quantity on the easy tasks. However, there was no significant main effect for punishments. Thus, the hypothesis that mothers administer more rewards and fewer punishments on a hard task as compared with an easy one was confirmed for rewards but not punishments in the tangible reward group. This was similar to the results from the analyses for the nontangible reward condition. There was a significant feedback x task interaction as well ($F(2,72) = 9.84, p < .05$) which indicated that a larger number of rewards was given by mothers who received the high experimenter feedback for the difficult task than mothers who received the low experimenter feedback. There were no other significant main effects nor interactions in the analyses. The failure to find a significant achievement x feedback x task interaction for either rewards or punishments provided no support for the hypothesized interaction, i.e., poor performance (low feedback) on an easy task by a high achiever is significantly more likely to be negatively reinforced than a similar performance by a low achiever, and low achievers who fail on a difficult task receive significantly fewer punishments than high achievers. The failure to support this hypothesis in the tangible reward condition corroborates the nonsignificant finding in the nontangible group.
Finally, the results from the combined tangible and nontangible groups, which used converted scores and yielded a total value by collapsing over task levels, are presented in this section. Means and standard deviations for total rewards and total punishments, using the quartile scores described earlier are shown in Table 10. The analyses of variance reported in Table 11 revealed a significant main effect for achievement ($F (1,722) = 4.72, p < .05$) and this supported the hypothesis that mothers of high achievers administer more rewards than mothers of low achievers for total rewards. The confirmation of this hypothesis corroborated the finding for the separate analyses for the nontangible group but not for the tangible group considered separately. It can also be seen in Table 11 that the main effect for feedback was significant as well ($F (1,72) = 12.09, p < .01$), which supported the hypothesis that mothers receiving high experimenter feedback are more positively reinforcing than are mothers receiving low feedback for the combined reward groups. This finding corroborated the significant positive results from the separate analyses of tangible as well as nontangible groups. It can also be seen in Table 11 that the main effect for feedback was significant ($F (1,72) = 4.42, p < .05$) for total punishments as well. Mothers receiving low experimenter feedback gave more punishments than mothers receiving high experimenter feedback. There were no other significant main effects. Neither the hypothesis that (a) mothers administer more re-
Table 10

Means and Standard Deviations for Total Rewards and Total Punishments for Mothers in Tangible and Nontangible Conditions

Achievement

<table>
<thead>
<tr>
<th>Feedback</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Rewards</td>
<td>M 1.80</td>
<td>2.45</td>
</tr>
<tr>
<td></td>
<td>SD .83</td>
<td>.89</td>
</tr>
<tr>
<td>Punishments</td>
<td>M 2.75</td>
<td>2.85</td>
</tr>
<tr>
<td></td>
<td>SD 1.25</td>
<td>1.18</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td>M 2.75</td>
<td>3.10</td>
</tr>
<tr>
<td></td>
<td>SD 1.21</td>
<td>1.07</td>
</tr>
<tr>
<td>Punishments</td>
<td>M 2.45</td>
<td>2.10</td>
</tr>
<tr>
<td></td>
<td>SD 1.05</td>
<td>.85</td>
</tr>
</tbody>
</table>
### Table 11

**Analyses of Variance for Total Rewards and Punishments for Combined Scores for Tangible and Nontangible Reinforcement Conditions**

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ms</th>
<th>F</th>
<th>ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rewards</td>
<td>1</td>
<td>0.00</td>
<td>&lt;1.00</td>
<td>.13</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>5.00</td>
<td>4.72*</td>
<td>.31</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Feedback</td>
<td>1</td>
<td>12.80</td>
<td>12.09**</td>
<td>5.51</td>
<td>4.42*</td>
</tr>
<tr>
<td>Reward x Achievement</td>
<td>1</td>
<td>1.25</td>
<td>1.18</td>
<td>.31</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Reward x Feedback</td>
<td>1</td>
<td>.50</td>
<td>&lt;1.00</td>
<td>1.01</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement x Feedback</td>
<td>1</td>
<td>.45</td>
<td>&lt;1.00</td>
<td>.13</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Reward x Achievement x Feedback</td>
<td>1</td>
<td>.19</td>
<td>&lt;1.00</td>
<td>.13</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Error</td>
<td>72</td>
<td>1.06</td>
<td>1.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p ≤ .05

** p ≤ .01
wards and fewer punishments on a hard task as compared with an easy one nor (b) poor performance (low feedback group) on an easy task by a high achiever is significantly more likely to be negatively reinforced than a similar performance by a low achiever, could be tested since the combined scores were collapsed over task level, resulting in no main effect for this variable.

Since each of the major hypotheses from this section was tested by referring it to three sets of analyses (tangible, nontangible, and combined) it is important to summarize the results for each hypothesis.

The first hypothesis stating that mothers of high achievers administer more rewards than mothers of low achievers received support in the nontangible reward condition and the combined group (both tangible and nontangible), but was not confirmed for the tangible reinforcement group. The second hypothesis, mothers administer more rewards and fewer punishments on a hard task as compared with an easy one (tested only in the separate analyses for tangible and nontangible reinforcement groups) was confirmed in the analyses of variance for both the tangible and the nontangible reward groups. Next, the hypothesis that mothers receiving high feedback about their children are more positively reinforcing than mothers receiving low feedback was confirmed in all analyses (tangible, non-tangible and combined reinforcement groups). Finally, the hypothesis, poor performance on an easy task by a high achiever
is significantly more likely to be negatively reinforced than a similar performance by a low achiever (tested only in the separate analyses for tangible and nontangible reinforcement groups) did not receive support in either the tangible or nontangible reinforcement conditions.

Reinforcement Behavior and Reports of Children's Aggression

It was hypothesized that there is (a) a significant positive relationship between total punishments and aggression ratings, and (b) a significant negative relationship between total rewards and aggression ratings. These hypotheses suggest that there is a speculative relationship between high or low levels of maternal reinforcements and ratings of aggression by both teachers and mothers. For the purpose of these analyses mothers' reward scores were divided into high or low groups by use of the converted scores which were described earlier in this section. A high reward score indicated that the mothers' reward score was in either the third or fourth quartile, while a low reward score was in the first or second quartile. Thus, the phrase "high or low levels of maternal reinforcements" refers to mothers who scored above and below the median for total rewards or punishments. To determine whether the aggression ratings were associated with mothers' reward behavior or the children's achievement level, an analysis of variance was computed. This 2 (achievement) x 2 (rewards) analysis was used for aggression ratings made by both the mothers and the teachers. Means and standard deviations for mothers' aggression
ratings in the tangible and nontangible groups for both rewards and punishments may be found in Table 12. The analysis of variance for mothers' aggression ratings of combined (tangible and nontangible) groups (Table 13) indicates that there were no significant main effects nor interactions for rewards and therefore the hypothesized relationship between high rewards and low aggression ratings made by mothers was not found. It is important to note, however, that there was a nonsignificant tendency ($F(1,76) = 3.71, p < .06$) for mothers of high achievers to view their child as less aggressive than mothers of low achievers. In the punishment category, there was a significant main effect for achievement ($F(1,76) = 4.00, p < .05$). It can be seen that mothers of high achievers viewed their child as less aggressive than mothers of low achievers. The hypothesized interaction between high total punishments and aggression was not found, however.

Means and standard deviations for teachers' aggression ratings in the tangible, nontangible and combined (tangible and nontangible) groups may be found in Table 14. As the analysis of variance in Table 15 shows, there were no significant main effects nor interactions for either children's achievement level or mothers' reinforcement behavior. Therefore, the hypotheses pertaining to reinforcements and aggression ratings were not supported in the analyses.
Table 12

Means and Standard Deviations for Mothers' Aggression Ratings for Mothers Categorized as High or Low in Rewards x Punishment (Tangible and Nontangible Conditions Combined)

Achievement

<table>
<thead>
<tr>
<th></th>
<th>Low (N=40)</th>
<th>High (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Reward</td>
<td>Low Punishment</td>
</tr>
<tr>
<td><strong>Reinforcement</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tangible</strong></td>
<td>M 21.73</td>
<td>22.67</td>
</tr>
<tr>
<td></td>
<td>SD 6.87</td>
<td>6.98</td>
</tr>
<tr>
<td><strong>Nontangible</strong></td>
<td>M 21.00</td>
<td>21.13</td>
</tr>
<tr>
<td></td>
<td>SD 8.98</td>
<td>10.48</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td>M 21.33</td>
<td>21.94</td>
</tr>
<tr>
<td></td>
<td>SD 7.92</td>
<td>8.55</td>
</tr>
</tbody>
</table>
### Table 12 -- Continued

#### Achievement

<table>
<thead>
<tr>
<th>Reinforcement</th>
<th>Low (N=40)</th>
<th>High (N=40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High Reward</td>
<td>High Punishment</td>
</tr>
<tr>
<td>Tangible</td>
<td>M 19.56</td>
<td>19.18</td>
</tr>
<tr>
<td></td>
<td>SD 8.68</td>
<td>8.05</td>
</tr>
<tr>
<td>Nontangible</td>
<td>M 24.57</td>
<td>23.00</td>
</tr>
<tr>
<td></td>
<td>SD 9.39</td>
<td>8.37</td>
</tr>
<tr>
<td>Combined</td>
<td>M 21.75</td>
<td>21.17</td>
</tr>
<tr>
<td></td>
<td>SD 9.06</td>
<td>8.26</td>
</tr>
</tbody>
</table>
Table 13

Analysis of Variance for Mothers' Aggression Ratings for High and Low Punishment Groups (Combined Tangible and Nontangible)

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ms</th>
<th>F</th>
<th>df</th>
<th>ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reward</td>
<td></td>
<td></td>
<td></td>
<td>Punishment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>198.92</td>
<td>3.71</td>
<td></td>
<td>214.95</td>
<td>4.00*</td>
</tr>
<tr>
<td>Reinforcement Level</td>
<td>1</td>
<td>20.42</td>
<td>&lt;1.00</td>
<td></td>
<td>10.35</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement x Reinforcement Level</td>
<td>1</td>
<td>40.25</td>
<td>&lt;1.00</td>
<td></td>
<td>43.69</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Error</td>
<td>76</td>
<td>53.61</td>
<td></td>
<td></td>
<td>53.69</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05
### Table 14

Means and Standard Deviations for Teachers' Aggression Ratings

in the Combined (Tangible and Nontangible) Reward Conditions

<table>
<thead>
<tr>
<th>Achievement</th>
<th>Low Rewards</th>
<th>Low Punishments</th>
<th>Low Rewards</th>
<th>Low Punishments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible</td>
<td>M 9.55</td>
<td>9.56</td>
<td>11.67</td>
<td>9.18</td>
</tr>
<tr>
<td></td>
<td>SD 8.27</td>
<td>9.41</td>
<td>10.17</td>
<td>10.08</td>
</tr>
<tr>
<td>Nontangible</td>
<td>M 14.23</td>
<td>10.63</td>
<td>12.71</td>
<td>11.17</td>
</tr>
<tr>
<td></td>
<td>SD 13.29</td>
<td>10.70</td>
<td>7.16</td>
<td>11.39</td>
</tr>
<tr>
<td>Combined</td>
<td>M 12.08</td>
<td>10.06</td>
<td>12.13</td>
<td>10.22</td>
</tr>
<tr>
<td>(tangible and nontangible)</td>
<td>SD 11.29</td>
<td>9.73</td>
<td>8.72</td>
<td>10.59</td>
</tr>
</tbody>
</table>
Table 14 -- Continued

Achievement

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>High Reward</td>
<td>14.56</td>
<td>9.55</td>
</tr>
<tr>
<td>SD</td>
<td>14.48</td>
<td>11.29</td>
</tr>
<tr>
<td>High Punishment</td>
<td>13.64</td>
<td>13.03</td>
</tr>
<tr>
<td>Nontangible</td>
<td>M</td>
<td>14.14</td>
</tr>
<tr>
<td>SD</td>
<td>9.74</td>
<td>12.49</td>
</tr>
<tr>
<td></td>
<td>16.58</td>
<td>9.38</td>
</tr>
<tr>
<td>Combined (Tangible and Nontangible)</td>
<td>M</td>
<td>14.38</td>
</tr>
<tr>
<td>SD</td>
<td>12.24</td>
<td>10.73</td>
</tr>
<tr>
<td></td>
<td>15.17</td>
<td>9.38</td>
</tr>
<tr>
<td></td>
<td>12.54</td>
<td>10.82</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9.32</td>
</tr>
</tbody>
</table>
### Table 15

Analysis of Variance for Teachers' Aggression Ratings of Combined Tangible and Nontangible Reward Groups

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>ms</th>
<th>F</th>
<th>ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rewards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>118.01</td>
<td>1.00</td>
<td>85.88</td>
<td>1.24</td>
</tr>
<tr>
<td>Reward (or Punishment)</td>
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<td>1.01</td>
<td>&lt;1.00</td>
<td>159.98</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Achievement x Reward (or Punishment)</td>
<td>1</td>
<td>122.01</td>
<td>1.03</td>
<td>99.37</td>
<td>1.38</td>
</tr>
<tr>
<td>Punishments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>76</td>
<td>118.01</td>
<td>116.22</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The two final hypotheses of the present study were:
(a) there is a significant positive relationship between a high total reward score and highly adaptive scores on the Maternal Attitude Scales of Reciprocity and Emotional Complexity. Means and standard deviations for the five scales of the Maternal Attitude Survey for the tangible, nontangible, and combined (tangible and nontangible) conditions may be found in Table 16. The analysis of variance (2 achievement levels x 2 reward levels) shown in Table 17 indicates that there was no support for the hypothesized positive main effect for total rewards for the scores on the scales of Reciprocity and Emotional Complexity. However, there was a significant achievement x rewards interaction for the Aggression Scale. It can be seen from Table 16 that mothers of high achievers who gave the fewest total rewards had the highest adaptive scores for Aggression. This suggests that these mothers responded most effectively and constructively in managing their child's aggressive behavior. In addition, it can be seen in Table 17 that there is a significant main effect for achievement on the Emotional Complexity Scale. Mothers of high achievers were better able to tolerate their doubts and uncertainties regarding some aspects of child care without loss of self-esteem.
TABLE 16

MEANS AND STANDARD DEVIATIONS FOR THE FIVE SCALES OF THE MATERNAL ATTITUDE SCALES IN TANGIBLE, NONTANGIBLE AND COMBINED (TANGIBLE AND NONTANGIBLE) CONDITIONS

**Aggression**

<table>
<thead>
<tr>
<th></th>
<th>Low Total Rewards</th>
<th>High Total Rewards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Achievers</td>
<td>High Achievers</td>
</tr>
<tr>
<td>Tangible</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 35.64</td>
<td>37.00</td>
</tr>
<tr>
<td></td>
<td>SD 9.28</td>
<td>4.95</td>
</tr>
<tr>
<td>Nontangible</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 35.86</td>
<td>40.43</td>
</tr>
<tr>
<td></td>
<td>SD 9.16</td>
<td>6.16</td>
</tr>
<tr>
<td>Combined</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 35.50</td>
<td>38.50</td>
</tr>
<tr>
<td></td>
<td>SD 9.01</td>
<td>5.60</td>
</tr>
</tbody>
</table>

**Low Total Punishments**

<table>
<thead>
<tr>
<th></th>
<th>Low Total Punishments</th>
<th>High Total Punishments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Achievers</td>
<td>High Achievers</td>
</tr>
<tr>
<td>Tangible</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 36.33</td>
<td>36.18</td>
</tr>
<tr>
<td></td>
<td>SD 9.70</td>
<td>6.77</td>
</tr>
<tr>
<td>Nontangible</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 35.50</td>
<td>36.33</td>
</tr>
<tr>
<td></td>
<td>SD 5.26</td>
<td>8.52</td>
</tr>
<tr>
<td>Combined</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M 35.94</td>
<td>36.26</td>
</tr>
<tr>
<td></td>
<td>SD 7.70</td>
<td>7.56</td>
</tr>
</tbody>
</table>
TABLE 16—Continued

Reciprocity

<table>
<thead>
<tr>
<th></th>
<th>Low Total Rewards</th>
<th></th>
<th></th>
<th>High Total Rewards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Achievers</td>
<td>High Achievers</td>
<td></td>
<td>Low Achievers</td>
<td>High Achievers</td>
</tr>
<tr>
<td>Tangible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>26.91</td>
<td>19.47</td>
<td>29.67</td>
<td>23.27</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>7.33</td>
<td>4.50</td>
<td>8.38</td>
<td>8.24</td>
</tr>
<tr>
<td>Nontangible</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
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<td>27.14</td>
<td>22.43</td>
<td>20.85</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>7.46</td>
<td>4.94</td>
<td>12.27</td>
<td>7.15</td>
</tr>
<tr>
<td>Combined</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>25.38</td>
<td>22.81</td>
<td>23.69</td>
<td>21.96</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>7.38</td>
<td>6.01</td>
<td>9.95</td>
<td>7.60</td>
</tr>
</tbody>
</table>

|                      | Low Total Punishments |                                        |                       | High Total Punishments |                                        |
|----------------------|                       |                                        |                       | Low Achievers         | High Achievers                         |
|                      | Low Achievers        | High Achievers                         |                       | Low Achievers         | High Achievers                         |
| Tangible             |                       |                                        |                       |                   |                                        |
|                      | M                    | 26.89                                  | 21.46                 | 25.09              | 21.67                                 |
|                      | SD                    | 5.99                                   | 7.31                  | 9.06               | 6.87                                  |
| Nontangible          |                       |                                        |                       |                   |                                        |
|                      | M                    | 24.88                                  | 23.74                 | 22.58              | 22.00                                 |
|                      | SD                    | 10.82                                  | 6.68                  | 8.20               | 7.90                                  |
| Combined             |                       |                                        |                       |                   |                                        |
|                      | M                    | 25.94                                  | 22.65                 | 23.78              | 21.82                                 |
|                      | SD                    | 8.38                                   | 6.93                  | 8.52               | 7.14                                  |
TABLE 16--Continued

Closeness

<table>
<thead>
<tr>
<th></th>
<th>Low Total Rewards</th>
<th>High Total Rewards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Achievers</td>
<td>High Achievers</td>
</tr>
<tr>
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</tr>
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<td></td>
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<td></td>
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Low Total Punishments

<table>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Achievers</td>
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</tr>
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<td>Tangible</td>
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<tr>
<td></td>
<td>M</td>
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<td></td>
<td>M</td>
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</tr>
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<td></td>
<td>M</td>
<td>31.00</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>8.17</td>
</tr>
</tbody>
</table>
TABLE 16--Continued

**Emotional Complexity**

<table>
<thead>
<tr>
<th></th>
<th>Low Total Rewards</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>High Achievers</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>M</td>
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<tr>
<td>Tangible</td>
<td>34.91</td>
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<td>SD</td>
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<td>Combined</td>
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<td>40.63</td>
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<table>
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<tr>
<td></td>
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<td>High Achievers</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>M</td>
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<tr>
<td>Tangible</td>
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<td>38.36</td>
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<td>SD</td>
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<td>SD</td>
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<td>Combined</td>
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<td>38.35</td>
</tr>
<tr>
<td>SD</td>
<td>8.96</td>
<td>5.65</td>
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### TABLE 16—Continued

<table>
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<th>Low Total Rewards</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Low Achievers</td>
<td>High Achievers</td>
</tr>
<tr>
<td><strong>Tangible</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>39.82</td>
<td>37.11</td>
</tr>
<tr>
<td>SD</td>
<td>4.36</td>
<td>4.31</td>
</tr>
<tr>
<td><strong>Nontangible</strong></td>
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<td></td>
</tr>
<tr>
<td>M</td>
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<td>37.00</td>
</tr>
<tr>
<td>SD</td>
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<td>5.29</td>
</tr>
<tr>
<td><strong>Combined</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>37.92</td>
<td>32.06</td>
</tr>
<tr>
<td>SD</td>
<td>5.50</td>
<td>4.60</td>
</tr>
</tbody>
</table>

| Competence          | Low Total Punishments | High Total Punishments |
|---------------------|                       |                      |
|                     | Low Achievers         | High Achievers       | Low Achievers | High Achievers |
| **Tangible**        |                       |                      |               |                |
| M                   | 38.33                 | 38.00                | 39.18         | 37.67          |
| SD                  | 4.53                  | 3.82                 | 5.46          | 5.57           |
| **Nontangible**     |                       |                      |               |                |
| M                   | 36.63                 | 37.08                | 38.67         | 41.75          |
| SD                  | 6.78                  | 4.17                 | 7.04          | 7.69           |
| **Combined**        |                       |                      |               |                |
| M                   | 37.53                 | 37.52                | 38.91         | 39.59          |
| SD                  | 5.58                  | 3.94                 | 6.19          | 6.76           |
Table 17

Analysis of Variance for the Five Scales of the Maternal Attitude Scales in the Combined (Tangible and Nontangible) Conditions

Scale 1 - Aggression

<table>
<thead>
<tr>
<th>Source</th>
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<th>ms</th>
<th>F</th>
<th>ms</th>
<th>F</th>
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<tbody>
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<td></td>
<td></td>
<td>Rewards</td>
<td>Punishments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>23.85</td>
<td>&lt; 1.00</td>
<td>47.19</td>
<td>&lt; 1.00</td>
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<tr>
<td>New Total Rewards (or Punishments)</td>
<td>1</td>
<td>46.25</td>
<td>&lt; 1.00</td>
<td>14.39</td>
<td>&lt; 1.00</td>
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<tr>
<td>Achievement x New Total Rewards (or Punishments)</td>
<td>1</td>
<td>325.05</td>
<td>4.56*</td>
<td>68.61</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Error</td>
<td>76</td>
<td>71.27</td>
<td></td>
<td>75.06</td>
<td></td>
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</table>

* \( p < 0.05 \)
<table>
<thead>
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<th>ms</th>
<th>F</th>
<th>ms</th>
<th>F</th>
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</thead>
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<tr>
<td>Achievement</td>
<td>1</td>
<td>88.41</td>
<td>1.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Total Rewards (or Punishments)</td>
<td>1</td>
<td>31.01</td>
<td>&lt; 1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achievement x New Total Rewards (or Punishments)</td>
<td>1</td>
<td>3.33</td>
<td>&lt; 1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>76</td>
<td>60.61</td>
<td></td>
<td>60.38</td>
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</tbody>
</table>
## Table 17 -- Continued

### Scale 3 - Closeness

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<th>ms</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement</td>
<td>1</td>
<td>43.80</td>
<td>&lt; 1.00</td>
<td>36.46</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>New Total Rewards (or Punishments)</td>
<td>1</td>
<td>.05</td>
<td>&lt; 1.00</td>
<td>15.67</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Achievement x New Total Rewards (or Punishments)</td>
<td>1</td>
<td>7.25</td>
<td>&lt; 1.00</td>
<td>22.34</td>
<td>&lt; 1.00</td>
</tr>
<tr>
<td>Error</td>
<td>76</td>
<td>54.42</td>
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</tbody>
</table>
Table 17 -- Continued

Scale 4 - Emotional Complexity

<table>
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<tr>
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<th>F</th>
<th>ms</th>
<th>F</th>
</tr>
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<tbody>
<tr>
<td>Achievement</td>
<td>1</td>
<td>318.50</td>
<td>4.44</td>
<td>377.65</td>
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<tr>
<td>New Total Rewards (or Punishments)</td>
<td>1</td>
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<td>&lt;1.00</td>
<td>192.05</td>
<td>2.77</td>
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<tr>
<td>Achievement x New Total Rewards (or Punishments)</td>
<td>1</td>
<td>9.92</td>
<td>&lt;1.00</td>
<td>.53</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Error</td>
<td></td>
<td>71.72</td>
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</table>

\*P .05
Table 17 -- Continued

Scale 5 - Competence

<table>
<thead>
<tr>
<th>Source</th>
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<th>Punishments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ms</td>
<td>F</td>
</tr>
<tr>
<td>Achievement</td>
<td>1</td>
<td>1.20</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>New Total Rewards (or Punishments)</td>
<td>1</td>
<td>50.70</td>
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<tr>
<td>Achievement x New Total Rewards (or Punishments)</td>
<td>1</td>
<td>7.01</td>
<td>&lt;1.00</td>
</tr>
<tr>
<td>Error</td>
<td>76</td>
<td>31.82</td>
<td></td>
</tr>
</tbody>
</table>
The analysis of variance in Table 17 also failed to support the hypothesized relationship between total punishments and an adaptive score on the scales of Reciprocity and Emotional Complexity. There was a significant main effect for achievement on the Emotional Complexity Scale, however. Mothers of high achievers who gave the higher number of total punishments had the most adaptive scores for Emotional Complexity which is the scale that taps whether mothers can tolerate their uncertainties about childrearing.
Attribution theory suggests that trainers do not respond to the actual level of performance of the trainee in their reinforcing behavior, but to their own view of the competency of this trainee and to the level of the difficulty. This notion was supported in the present study since both high and low achievers performed at the identical levels, yet mothers of high achievers were far more rewarding than mothers of low achievers. The extraperformance variables of task difficulty and perceived trainee competency were found to have a significant effect on the reinforcing behavior of college students (Lanzetta & Hannah 1969). In that study, trainers administered fewer punishments and fewer rewards for a noncompetent subject than they did for a competent subject. Pertinent findings with respect to task difficulty are reviewed initially. The mothers of this study viewed the task as it had been described since their ratings were similar to the experimenter's description of moderate, easy or difficult levels. They gave more positive reinforcements on a task designated as difficult than an easy level task, which again, demonstrates a sensitivity to level of task difficulty. These
mothers were probably more sensitive to the fact that more effort had to be expended to be successful on a difficult task and so responded to this positively by dispensing more rewards. However, mothers did not differentiate between difficulty levels of the task when they punished their children. Apparently, rewarding and punishing have different meanings for mothers and they operate in two behaviorally distinct ways. Subject competence was also regarded as an influential factor in mothers' reinforcing behavior. In this study, mothers were sensitive to the achievement level of their children when they rewarded. Mothers of high achievers in both the nontangible group and the combined tangible and nontangible groups dispensed more rewards to their children than mothers of low achievers. Apparently, mothers of low achievers were less satisfied with their children's performance than mothers of high achievers. However, the mothers of the children in the tangible reward condition did not vary their behavior according to their children's achievement. It was pointed out earlier, however, that giving a tangible item for performance is not as natural behavior for mothers as a verbal statement. Mothers who were placed in the tangible condition may have felt constrained in their behavior by the use of a method that seemed artificial to them.

There was no support in any of the analyses for the hypothesis that poor performance by a high achiever on an easy task will more likely be negatively reinforced than a
similar performance by a high achiever. It is surprising that the hypothesis was not confirmed in light of the evidence that mothers did respond to achievement, task level, and experimenter feedback when rewarding their children. However, as stated earlier, mothers apparently react in distinctly different ways when they reward vs. punish.

Despite the fact that mothers reinforced differentially on the basis of their children's competence or achievement, they did not hold different expectations for performance as hypothesized. This was quite surprising in light of an earlier unpublished study in which mothers of high achievers held significantly higher expectations for success than mothers of low achievers (Fullilove, Note 2).

As hypothesized, mothers were more rewarding when they were given the experimenter feedback that their child had performed well than poorly. The confirmation of this hypothesis has very noteworthy implications. For one, it provided an explanation for the presumed higher rate of rewarding for mothers of children who do well academically than mothers of children who have a poor academic record, since the former group receives consistently positive feedback from teachers. More importantly, it suggests that mothers of low achievers failed to show satisfaction less when their sons' performance was identical to that of high achievers.
There was no correlation found between maternal reinforcements and the Maternal Attitude scales, Emotional Complexity and Reciprocity. Perhaps these two scales are unrelated to how mothers reinforce their children. Should research be continued in this area, an attempt should be made to find an attitude scale which is more relevant to the area of mothers' reinforcing style.

The design of the present study appears very useful for studying parent-child interactions. Specifically, it provides a solution to the somewhat difficult problem of studying mothers' behavior in a situation where it is important to have children's behavior identical for all mothers. The experiment is conducted in a fairly naturalistic setting where the mothers can see and talk with their children. Mothers' moment-by-moment reinforcement behavior can be studied through a very inexpensive procedure where the child's responses are held constant. Further, mothers did not give any indications that they had any doubts about what was presented by the experimenter. Also, these mothers appeared to accept various parts of the experimental set, such as acknowledging the level of task difficulty as described by the researcher.

The present study has important implications for mothers' childrearing practices. It was demonstrated that mothers in this research did not reinforce according to the actual performance level of their children, since mothers of
high achievers gave more rewards than mothers of low achievers for the identical level of performance. However, the punishing behavior did not vary greatly between mothers of high achievers and mothers of low achievers. This suggests that even when a low achiever is doing well, his mother will respond to him as though he were incompetent. It is speculated that such inattention to performance will further a self-fulfilling prophecy for a low achiever.

There is a need for continued research in this area using some of the refinements suggested. Both boys and girls might be included to determine if mothers reinforce differently according to the sex of their children. The role of fathers in the area of reinforcing children is not known, but it is suspected to be a valuable component. A future study in this area might also control mothers' responses and allow the children's behavior to vary.
CHAPTER VI

SUMMARY

The major focus of this study was the investigation of mothers' reinforcement behavior and the achievement of their children in a contrived learning situation. The subjects, boys who were in the upper or lower quarter of their classes, were given the task of working on a puzzle of three difficulty levels while their mothers read the instructions. Experimenter feedback (child's performance good or poor) and task difficulty (easy, moderate, and difficult) were manipulated to test hypotheses on attribution theory. The design of the study required that children in the good and poor performance conditions be predetermined by the experimenter rather than by the children's actual performance. This was achieved by having children sit behind a low screen so that mothers could see them, but not actually observe the children doing the task. Since the evaluation of correctness was supposedly based on errors and time, this made it possible for the experimenter to tell the mother that the performance was "right" or "wrong" after each trial even if the child had followed his mother's instructions. In line with the interest in providing this type of experimental control in a relatively naturalistic situation, the mode of reinforcement was varied with one half of the mothers instructed
to use tangible reinforcers (poker chips) and the remainder to use nontangible reinforcers (verbalizations). Finally, the relationship between mothers' reinforcing behavior and their attitudes toward childrearing as well as their sons' aggressive behavior was investigated.

The subjects were 80 mother-son dyads with 40 considered high achievers and 40 low achievers as defined by teachers' ratings of children in the top or bottom quarter of their classes (the children ranged in age from 8-12).

Mothers were told that this was a study of how children learn to follow directions. They then viewed the puzzle their child was to work on and estimated how many correct (pre-expectancy rating) their child would obtain. There were 30 trials, 10 for each of three levels of difficulty. Each mother read the set of directions to her son for each trial and he attempted to execute the maneuver. Mothers were given the predetermined feedback after each trial (child right or wrong) that their children had 80 per cent correct (high feedback group) or 40 per cent correct (low feedback group) and they then rated task difficulty as well as how their children had performed.

A record was kept of the number of tokens exchanged and a verbatim account was made of the mothers' verbalizations. These records provided the data for an index of mothers' reinforcement behavior.
Mothers were then asked to answer questions from the short form of Cohler's Maternal Attitude Scale and the revised version of the Aggression Index developed by Walder, Eron, Walder and Laulicht. Teachers had already answered questions from this latter form for each child participant.

Although mothers of high achievers did not hold significantly higher expectations for the success of their children than mothers of low achievers as hypothesized, a number of other hypotheses were confirmed. Specifically, it was demonstrated that mothers of high achievers administered more rewards, particularly nontangible ones for the learning performance of their children than mothers of low achievers. Mothers also gave more rewards when the experimenter feedback about children's performance was high than when it was low. Further, mothers gave the most rewards for the difficult task and the fewest for the easy task. It was also demonstrated that mothers did not punish more for the poor performance of a high achiever on an easy task than for a low achiever.

This research suggested that when mothers reward they operate in a behaviorally different manner than when they punish. No relationship was found between the reinforcing behavior of the mothers and the ratings of children's aggression. Also, there was no relationship found between the Maternal Attitude Scales of Reciprocity and Emotional Complexity.

This research provided support for the assumption that extraperformance variables, i.e., subject competence and task difficulty, do influence the reinforcing behavior of mothers.
REFERENCES


Reference Notes


APPENDIX A
Dear Mother:

I am a behavioral science researcher at Loyola University and wish to study the manner in which children learn to follow directions. I want to study the third, fourth, and fifth graders at your child's school, and I need you to participate with your child. This study has been reviewed and has met with the approval of the principal and staff.

The study will be conducted at your child's school. The study will involve 45 minutes of your time. You will initially be asked to fill out some information on your child. Next, you will be asked to read a set of directions to your child for an appropriate task. Your child will then take a very short test while you answer some questions about the family. Since little research has been done with the measures I plan to use, I will not be able to inform you of the meaning of the small amount of feedback you will be given about your child's performance on the task. However, when the study is completed, mothers will be sent a letter which will discuss the results of the study.

In addition, your child will not sign his name to any materials but will be assigned a number to make the study anonymous. In order to conduct the study and to see how the children are doing in school, I need your permission to have the school let me know your child's grades and what his scores on achievement tests are. Needless to say, this information will be treated confidentially.

I hope that both you and your child are willing to participate in this study. If you are, please fill out the consent form on the bottom of this page and have your child return it to school as soon as possible. If you have any questions, you can phone me at 649-8100 between 9 A.M. and 5 P.M.

Thank you for your help.

Sincerely,
Constance Fullilove

I, ___________________, and my son/daughter ___________________ will participate in a study concerned with the manner in which children learn to follow directions. I also give permission for the school to release to the researcher how he (she) is doing in school. I understand that the study will take only one hour.

(phone number) ___________________  (mother's name) ___________________

(address) ___________________
### MODERATE TRIALS

<table>
<thead>
<tr>
<th>40% Condition</th>
<th>80% Condition</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>R</td>
<td>1. Move blocks 6 &amp; 8 opposite block 3; the smaller number (6) should be on top.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>2. Move block 2 to the far right and move block 4 &amp; 1 to the far left.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>3. Move block 6 to the left (don't move another block).</td>
</tr>
<tr>
<td>R</td>
<td>R</td>
<td>4. Move block 8 to the left (don't move another block).</td>
</tr>
<tr>
<td>W</td>
<td>W</td>
<td>5. Place block 3 where block 1 is; place block 1 where block 3 is.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>6. Move block 2 as far left as it will go.</td>
</tr>
<tr>
<td>R</td>
<td>R</td>
<td>7. Place block 1 beside blocks 4 &amp; 3 but don't move blocks 4 &amp; 3; now move block 2 to the lower right corner.</td>
</tr>
<tr>
<td>W</td>
<td>W</td>
<td>8. Place the largest numbered block beside the largest size piece in the leftmost corner; move the same size piece as the largest numbered piece directly under it.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>9. Move block 3 to the left.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>10. Move block 7 beside the smallest numbered piece.</td>
</tr>
</tbody>
</table>

### EASY TRIALS

<table>
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<th>80% Condition</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>R</td>
<td>11. Move block 7 as far right as it will go.</td>
</tr>
<tr>
<td>W</td>
<td>W</td>
<td>13. Move block 2 as far right as it will go.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>14. Move block 5 straight up.</td>
</tr>
<tr>
<td>R</td>
<td>R</td>
<td>15. Move block 6 as far left as it will go.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>16. Move block 8 as far left as it will go.</td>
</tr>
<tr>
<td>W</td>
<td>R</td>
<td>17. Move block 2 straight down.</td>
</tr>
</tbody>
</table>
18. Move block 5 to the right as far as it will go.

19. Move blocks 6 & 8 straight up.

20. Push blocks 4 & 1 to the left.

**DIFFICULT TRIALS**

21. Push block 2 in an upward direction without lifting it from the board; now push block 2 to the left while moving both blocks 6 & 8 to the right without moving any of the other pieces off the board.

22. Find the two pieces on the board which have the same shape and which sum up to 7; alternate their positions.

23. Find the two pieces on the board which will give the largest sum; push the smaller size piece to the left; now push the largest piece directly left as far as it will go.

24. Push 7 upwards; move both 1 & 3 in a downward direction; only one other piece may be moved to do this; now move 2 to the right without moving any other piece from its present position.

25. Move the largest numbered piece to the upper leftmost corner; now move the largest piece to the right bottom corner; you will have to move two pieces to do this.

26. Move the smallest size piece directly beneath a piece of identical size; now position blocks 7 & 5 in the position of 1 & 3.

27. Move block 2 to the blank space; place blocks 3 & 7 in the right bottom corner; now move block 4 straight up.
<table>
<thead>
<tr>
<th>40% Condition</th>
<th>80% Condition</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>28. Find the largest numbered piece; put it in the location of the piece which is 1/2 of its number; Move the piece which was 1/2 the numbered value of the largest numbered piece to the blank space which is the same as its shape; now place 6 beside 8.</td>
<td></td>
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<tr>
<td>W</td>
<td>W</td>
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</tr>
<tr>
<td>29. Push block 2 to the left and push block 1 straight up; now move the three pieces which are of the same size and which are odd numbered as far left as possible.</td>
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</tr>
<tr>
<td>R</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>30. Move block 6 &amp; 8 down without moving any of the other pieces from their positions; now place block 7 directly above these two pieces; shift 5 to the right as far as it will go without moving any of the other pieces.</td>
<td></td>
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</tr>
</tbody>
</table>

(Predetermined Right -- "R" and Wrong -- "W" items are marked before each number; 40% condition = low success experimenter feedback; 80% condition = high success experimenter feedback)
APPENDIX C
Instructions to Mothers

The puzzle task your child will be working on will be used to assess how well your child is able to follow directions. From past work with this task, it has been estimated that most children can successfully carry out instructions in a task such as this about 60% or three times out of five. You will be positioned such that you will only be allowed to see your child's face. Mothers in the past have attempted to help their child out when he came to a rough spot. To avoid this, you will be partially sectioned off from your child.

*Children in schools have learned to work for stars or other token sorts of rewards. We are interested in seeing whether giving or taking away tokens, poker chips, will motivate your child to do his best on this task. Your child has been told that he will be able to exchange his poker chips for a prize at the end. However, all of the children will be given identical prizes for their participation in this experiment. We merely want to see if the poker chips you give or take away will motivate your child to listen carefully to directions and thus to work hard on this task.]*

Your job will be to read the set of numbered instructions one at a time. You will note that the first 10 trials are designated as "moderate", the trials 11-20 are very "easy", and trials 20-30 are designated as "difficult". After you have read the instructions, your child will perform the opera-
tion. At this point, a card with the word "right" or "wrong" printed on it will be placed before you so that you know how your child has performed.

*[Based on whether your child was correct or not and on the level of difficulty of the task, you may either give or take away one or more poker chips, or state "pass" (tokens neither given nor taken away) for any trial. You should then immediately write down on the sheet provided the number, if any, of tokens exchanged. Remember, read each set of numbered instructions in order and at a pace your child can understand; always write down the number of tokens, poker chips, exchanged.]*

*Only mothers in the tangible reinforcement condition had these two sections included in their instructions*
Instructions to Children

You have before you a wooden puzzle. Notice that all of the pieces have been numbered. Your mother will give you directions on how to move each of the puzzle pieces. Do exactly what your mother says. If you do not hear her the first time, tell her and she will repeat the directions to you. After she has read the directions to you, I will tell you to begin. Each trial is timed but you will not know how much time you have so work as quickly as you can. I will also tell you when your time is up. Be sure to make some move on every trial. You may not know if what you are doing is right or not and you may want to ask questions. You cannot ask any questions about how to move the puzzle pieces. You may however ask that a set of directions be repeated.

I will let you know if you are right or wrong. I have worked with other children like yourself and I believe that you will get more right answers than wrong answers. But, be sure to listen carefully to your mother. *[Also, your mother will either give or take away poker chips based on the work you did. You will be able to exchange the poker chips you have at the end for a "prize"). You will get a "prize" just for being here today. However, you will get an extra nice "prize" if you work really hard.

Remember, always make some move after your mother gives you directions. *[If you work hard and remember to always make
a move, even if you are not sure, you can exchange your poker chips for an extra-nice prize.

*only boys in the tangible reinforcement conditions were read these two sections.
Scoring Standards for Nontangible Reward Condition

A. Very positive or improvement

Criteria: 1) Any response which indicates improvement, or;
2) A superlative term which is used in a positive context, or;
3) A positive term which is preceded by an adverb.

Example: "That was really hard but you got it right."

Score: 5

B. Positive or informational statement

Criterion: 1) A positive term or positive statement is necessary.

Examples: "okay"
"alright"
"good"

Score: 4

C. No response or irrelevant response

Criteria: a) mother states the task is confusing or difficult
b) mother states that she is confused
c) mother comments to E about her child's performance.
d) mother blames herself for her child's unsatisfactory performance

Example: "I don't understand"

Score: 3
Scoring Standards for Nontangible Reward Condition

D. Negative

Criteria: a) a response which gives failure information; or,

b) a response which gives instructional information related to the failure

Examples: "No"
"You are wrong"

Score: 2

E. Very negative

Criteria: a) A negative response related to a failure to understand some aspect of the task; or,

b) a response related to some negative aspect of the child's personality

Examples: "You're not concentrating"
"Do you know your right hand from your left?"

Score: 1
The dissertation submitted by Constance Fullilove has been read and approved by the following Committee:

Dr. Jeanne Foley, Chairman
Professor, Psychology, Loyola

Dr. Patricia Barger
Professor, Psychology, Loyola

Dr. Thomas Petzel
Assistant Professor, Loyola

The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

December 2, 1976
Date

[Signature]
Director's Signature