LOCUS OF CONTROL OF DAY CARE MOTHERS: PREDICTION AND CHANGE

Dissertation for the Degree of Ph. D.

MICHIGAN STATE UNIVERSITY
ANNE COSGROVE CUNNINGHAM

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This is to certify that the

thesis entitled

LOCUS OF CONTROL OF DAY CARE MOTHERS:
PREDICTION AND CHANGE

presented by

Anne Cosgrove Cunningham

has been accepted towards fulfillment
of the requirements for

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ABSTRACT

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By

Anne Cosgrove Cunningham

Extensive research has accumulated on the personality and behavioral correlates of an internal or an external locus of control. In general, previous studies show that internals (persons who see events as relatively dependent on their own actions and characteristics) are good information organizers (Seeman, 1963), good teachers (Hersch and Scheibe, 1967; Powell and Vega, 1972), less conforming (Crowne and Liverant, 1963) and capable of adjusting their expectancy of successful performance more closely with prior experiences of success and failure (Rotter, 1966). On the other hand, externals (persons who see events as more dependent on factors outside themselves) are less competent at information organizing, less effective teachers, more conforming and less consistent in adjusting their behavior in accordance with prior success and failure in similar circumstances.

The present research addressed the question of whether behavioral and attitudinal correlates of locus of control take on a special meaning when they are considered in connection with two people who have a relationship to each other--a mother and her young

child. In addition it examined the question of possible change in locus of control for mothers who attend a parent program extending over a three-month period. It further addressed the possible different effect of incentive treatments for attendance at this program on mothers who are internal and mothers who are external.

The subjects were mothers living in midwestern urban areas with children cared for during the day in six federally licensed day care centers. Two hundred fifty-five mothers contributed at least partial data to the study.

The designed used in the predictive model of maternal locus of control employed a pooled sample of mothers and children at one point in time from day care centers in six randomly chosen cities (out of nine). The examination of the interrelationship between the mother's locus of control, attendance at a parent program and incentives for attendance was made in a design in which the six day care centers were randomly assigned to one of three incentive conditions.

The parent program was the Parents Are Teachers Too program (Boger, Kuipers, Beery, Walters, Noble and Waxler, 1971). The program consisted of 12 two-hour sessions held weekly at day care centers in which parents were taught to make materials to use the following week in teaching interaction with the child.

Six measures were utilized to provide information on mothers and children in the present study. These were the Felt Powerlessness Scale, the Brown IDS Self-Concept Referents Test,

the Hess and Shipman Toy Sorting Task, the Educational Survey Instrument, and a Parent Information Form.

Linear multivariate regression analyses were used to predict the locus of control of mothers. The predictors included mother's attitudes and teaching behaviors, the child's learning achievements, age, sex and self-esteem. The results indicate that the external mother was characterized more by skillful teaching behaviors than the internal mother; she also had a child characterized by more learning achievement behaviors and better self-concept. However, the internal mother showed more affectionate behavior in the teaching situation and her child showed more cooperation. Some subgroups of mothers evidenced a greater trend towards internal control than others.

Change in locus of control was examined in a 2 x 3 analysis of covariance fixed effects model in which the independent factors were treatment (3 levels) and attendance at the parent program (2 levels). The dependent variable was the post-score on the Felt Powerlessness test, while the covariate was the pre-score. The results indicate that mothers who participate in a parent program offered over a three month period do not become more internal than mothers who do not participate. In addition, there is no difference in change of locus of control for mothers who participate in the parent program with incentives than for those who participate without them.

The interaction between the mother's locus of control and incentives was addressed in a 2 x 3 analysis of variance fixed effects model in which the independent factors were treatment

(3 levels) and locus of control (2 levels). The dependent variable was attendance at the parent program. The results indicate that internal mothers attend the parent program less with incentives (money or babysitting and transportation) than without them. On the other hand, external mothers attend the parent program more with incentives than without them.

One implication of the present study is that the term "external" implies a heterogeneous group of persons who are categorized by both congruent and incongruent behaviors to the perceived external control of events. However, the generalizations are limited because no control group was utilized. The additional findings of interaction effects between locus of control and incentives support the usual behavioral expectation for internal and external persons in the presence of overt manipulation. The finding that no change towards greater internality takes place over a three-month interval for parent program participants implies that the time was too short for effect on a generalized control expectancy. Perhaps only specific behaviors or a specific locus of control expectancy could be changed in such a short period. Finally, the programmatic implication of the study is that parent programs should be offered without money incentives although babysitting and transportation incentives are useful.

LOCUS OF CONTROL OF DAY CARE MOTHERS: PREDICTION AND CHANGE

By

Anne Cosgrove Cunningham

A DISSERTATION

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For Tommy, Katharine,

and especially Tom

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CHAPTER I

INTRODUCTION

The concept of locus control, which was introduced into psychology two decades ago, has proved to be a highly useful construct in a wide variety of educational and psycho-sociological contexts. According to this theory, as formulated initially by Rotter (1954), internally controlled persons perceive events as dependent on their relatively permanent characteristics and actions. Persons with an external locus of control, by contrast, perceive events as relatively more dependent on luck, chance, fate or powerful others than on their own actions or permanent characteristics. In addition, the change in a person's locus of control from an external locus to an internal locus has drawn attention because of its presumed social application. The more internal person is expected to be more personally effective in using information and achieving goals. Some research has centered on attempts to foster internality among participants in view of its presumed social value.

Statement of the Problem

This study investigates the relationship of the mother's perception of locus of control to characteristics of the mother and of her young child. In addition, it examines an effective parenting program for its predicted impact on day care mothers (mothers with

a child attending a day care center) assessed in terms of changing the mothers' locus of control.

Need and Purpose

The present study contributes to the existing research on locus of control in several ways. It removes the locus of control construct from the highly structured laboratory setting where it has usually been studied and extends it to a field setting. In place of sets of adult strangers who perform ambiguous tasks in the university laboratory, the study investigates the interaction of mother and child, a primary socialization dyad, as they accomplish more meaningful tasks in familiar environments.

The present research also attempts to synthesize the characteristics of persons with external or internal locus of control. While research in a laboratory setting has permitted a series of pertinent characteristics to be isolated and identified, much laboratory research has precluded synthesis. By contrast, the natural, multi-dimensional setting in which the present research has been conducted encourages attempts to unify the diverse characteristics previous investigators have uncovered. Such a setting provides a network of data which can be subjected to multivariate analysis to enable generation of a predictive model of locus of control.

The present research was conducted in conjunction with a larger study, Maternal Involvement in Day Care: A Comparison of Incentives (Boger, Kuipers, Cunningham and Andrews, 1974). The

larger study was designed to examine the impact of specific incentives for mothers to attend instructional sessions and it reports the attendance generated by each incentive. The present study analyzes aspects of those data based on the mother's locus of control with the rationale that mothers with different control expectancies differentially perceive these incentives. This involves a further prediction that when no incentive for attendance is present, participation, or lack of it, can be "explained" by the mother's locus of control. While the larger study focused on incentives for participation in the educational program that might increase a mother's effectiveness as a teacher of her child, the present study examines the predicted impact of these incentives on the mother's locus of control.

Objectives

The objectives of this research are as follows:

1. To develop a predictive model for maternal locus of control based upon mother and child characteristics and parent-child interaction.

2. To investigate the reaction to incentives of mothers with internal and external locus of control.

3. To examine parent program participation of mothers with internal and external locus of control.

4. To develop a predictive model of change in locus of control based upon parent program participation and incentives.

Overview

The present study attempts to relate, in two distinct phases, the concept of locus of control to certain characteristics of mothers and of their youngest children attending a day care center. The study's first phase, a descriptive one, considers the established behavior patterns between mother and child which permit prediction concerning the mother's locus of control. The study's second experimental phase examines both the impact which several specific incentives have on mothers with opposite locus of control and the contributions which various incentives make toward affecting positive change in locus of control. Locus of control is thus examined in the multi-faceted context afforded by a study of mothers of children attending a day care center, by their children, and by a program of parent teaching which sought to involve and affect both mothers and children.

In the first phase a predictive model of the mother's locus of control is built with mother variables, child variables, and both types of variables in an expanded model. The kinds of variables examined as possible predictors of locus of control are, for the mother, behaviors indicating her teaching effectiveness with the child, her educational attitudes and expectancies for the child, and her reported activities engaged in at home to prepare this child for school. The model is built also from a selection of child variables. These include behaviors indicating learning achievement, self-esteem, age, sex and ordinal position.

As a further extension of interest, a general model involving both mother and child predictors is created and examined for subgroups of mothers. The general predictive model provides a pattern of descriptors for the internal and the external mother. Certain variables or groups of variables may prove to be the most general and frequently found predictors of locus of control for all subgroups of women. Also, a pattern may emerge of predictors for women of different status. This descriptive information may provide further insight into the etiology of internal or external locus of control in family women in different socioeconomic groups.

The second phase examines incentives for attending a parent education program offered the mother in a controlled situation. It involves predicting different responses to the incentives based upon the locus of control of the mother. Subsequently, it investigates possible change in locus of control toward greater internality as a function of attendance at the parent program and incentives.

Although the two phases of this research are distinct, the second phase builds upon the first. The enlarged understanding of internally and externally controlled persons which is the product of Phase 1 contributes substantially to the interpretation in Phase 2 of the behaviors of mothers with opposite locus of control and of the change or lack of change in locus of control among women in the different experimental conditions.

Definitions

A series of theoretical definitions are given here to clarify frequently used or important terms for the reader.

Operational definitions of the variables used in the research are presented in Chapter III. The following six definitions derive from Rotter (1966) and Lefcourt (1966, 1972).

Locus of control: This is the individual's perception of control of events as to whether they are internally determined (i.e., under personal control) or externally determined (i.e., beyond personal control).

Expectancy: "Expectancy" used with "locus of control" refers to the generalized perception across many different environments and situations that events are internally determined or externally determined.

Reinforcement: The perception of an event as positive or negative determines a reinforcement.

Internal control: Internal control is the perception of events as internally determined or under personal control. Persons evidencing this are called internally controlled persons or internals.

External control: External control is the perception of events as externally determined or as beyond personal control. Persons evidencing this are called externally controlled persons or externals.

Change in locus of control: This is movement of a person from one locus of control to the other locus of control. Generally, it refers to positive change--change towards greater perceived internal control of events.

The following two definitions are substantially those of Kuipers (1969).

Mother-child interaction: It is viewed as the total communication process existing between mother and child. This includes dimensions of quantity and quality of language behavior, as well as nonverbal communication and a dimension of warmth.

Self-concept of the child or self-esteem: It is designated as the child's concepts or view of him/herself over a wide variety of characteristics. It is considered a function of the child's view of how significant others see him/her as well as how the child perceives self.

Incentives: The specific incentives referred to in this study are those which were offered for attendance at the parent education program. The first two are five dollars and babysitting and transportation. The third is considered a "control," in which there was no additional reward or help for attendance.

Overt influence: This is an obvious attempt to manipulate. In this study, the incentives of money and of babysitting and transportation are considered obvious attempts to manipulate the mothers studied.

Parent education program: This refers to the program offered in conjunction with this research, the Parents Are Teachers Too Program (Boger, Kuipers, Beery, Walter, Noble and Waxler, 1971). The program consists of 12 two-hour sessions held weekly at day care centers in which parents are taught to make materials to use the following week in teaching interaction with the child.

Skill-type activity: This is an action or process viewed as requiring expertise for its performance. In this study, participation

in the parent education program implies teacher effectiveness training and is considered a skill-type activity.

Assumptions

The assumptions for the two research phases are listed below.

Research Assumptions for Phase 1

The mother and child behaviors in the measurement conditions are considered bounded as described in these conditions:

1.1 All the mother's previous experiences in this and other environments have affected her total personality.

1.2 The totality of the mother's past experience affects her behavior in this immediate situation.

1.3 Teaching effectiveness shown by the mother in the research situations will be related to her previous similar experiences with this child.

1.4 The child's developmental level and previous experiences have affected his or her total personality.

1.5 The child's developmental level and previous experiences affect behavior in this immediate situation.

1.6 Learning achievement shown by the child in the semi-structured situation will be related to developmental stage and to previous similar experiences with the mother.

1.7 The young child is a significant person in the life of the mother and his or her actions and attitudes can be expected to affect the characteristics and attitudes of the mother.

Research Assumptions for Phase 2

2.1 The two incentive treatments of money and babysitting and transportation will be perceived by the mothers in this study as incentives for action which are overt rather than covert.

2.2 Attendance at the parent education program will not be perceived as a role demand for mothers. If it were seen as a role demand, then there would be no basis for predicting different behaviors by internal mothers and external mothers.

2.3 Attendance at the parent program predicts more successes in teaching interaction with the child. Attendance predicts increased positive reinforcement from the young child because the program involves adequately preparing the mother to teach the young child and also provides her with appropriate materials.

2.4 The reinforcement received by the mother from the young child will be important enough to her that other sources of positive or negative reinforcement will not obviate its effect.

CHAPTER II

REVIEW OF THE LITERATURE

The present research investigates in a particular context the personality dimension termed locus of control expectancy as it emerges in the socialization process between parent and young child. The literature concerning personality dimensions, the socialization process in general and the particular socialization process between mother and child is extensive and well known; none of these are reviewed here. Only studies concerned with the locus of control are reviewed. It is convenient to survey under three headings the literature concerned with the construct of locus of control. First, the coherent presentation offered by two major researchers in this area, J. B. Rotter and H. M. Lefcourt, is examined. Second, the broad application which the construct has received during the past decade is sketched. Third, the specific researched which find immediate application in the present study are described in greater detail.

The Construct of Locus of Control Expectancy as Presented by Rotter and Lefcourt

Rotter (1966) and Lefcourt (1966, 1972) provide a substantial source of explication of the construct of locus of control expectancy and are the source of much of the synthesis which

follows. Internal control and external control are defined by Lefcourt (1966, p. 207) in this way:

> Internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perception of positive and/or negative events as being unrelated to one's own behaviors in certain situations and thereby beyond personal control.

In this theory, the potential for any behavior to occur in a specific situation is a function of the person and the environment. There are two dynamic factors to consider. The first is the person's expectancy that a given behavior will secure its own proper reinforcement whether positive or negative. If this does not happen, then the generalized perception may change and eventually repeated incongruities may elicit a change in the person's perception of internal or of external control. The second factor that must be considered is the reinforcement that is actually available within the environmental context. Thus the richer the environment is, or the richer it is perceived to be by the person, the more numerous are the possibilities of reinforcement.

Related Constructs in the Social Sciences

There are other concepts in the social sciences which are similar, but not identical, to this locus of control concept. The conception of alienation is similar to powerlessness and to perceived externality (Seeman, 1959). Perceived internal control is related to the concept of autonomy (Angyal, 1941, as reported in Rotter, 1966), to need for achievement (McClelland, Atkinson, Clark and

Lowell, 1953; Atkinson, 1958), to body-orientation as opposed to field-dependency (Witkin, Lewis, Hertzman, Machover, Meissner, Wapner, 1954) to striving for superiority (Adler, as described in Ansbacher and Ansbacher, 1956) and mastery (Strodtbeck, 1958).

Several of these concepts prompted research connecting them with the internal-external locus of control concept and have been identified as behaviors correlated with control expectancy.

Behaviors Correlated With Internal-External Locus of Control Expectancy

To further explain this construct, behaviors correlated with either an internal control expectancy or an external one are now examined. These include (1) achievement motivation; (2) attempts to control the environment; and (3) reaction to subtle suggestion.

Achievement motivation.--Studies have found, in general, that persons with an internal control expectancy are more motivated to achievement than persons with an external control expectancy. Those studies which found external persons as achievement oriented have tended to label these persons as "defensive externals" (Rotter, 1966, p. 21). Their external orienation is explained as a defense against failure which they use if their striving behavior is unsuccessful.

Crandall, Katkovsky and Preston (1962) found free play and achievement test scores in a predominantly middle class sample related to internality for boys. This was not found for girls.

Findings like these are interpreted that some girls tend to be "defensive externals," and therefore both internal and external scoring girls will strive to achieve. Another study of reported achievement motivation (Franklin, 1963) used a national stratified sample. It found a significance (N = 1,000, $\underline{r}$ = .69) between reports of intention to go to college and present internal-external control orientation.

A dimension of achievement motivation is an individual's persistence in attempting a skill-type task as opposed to lesser persistence in a chance-type task. In a controlled lab situation, Rotter and Mulry (1965) studied 120 subjects in an angle-matching situation. Half of the sample was told it was a matter of skill (defining a skill situation). The other half was told it was extremely difficult to match the angles and more a matter of luck than ability (defining a chance situation). The measure of achievement in this study was the amount of time taken to select a matching angle. The results were that internals in the skill group took a longer time to judge a standard than externals. There was also a trend for externals in the chance condition to take longer to judge than externals in the skill condition.

Further related to achievement motivation, and perhaps crucial to it, are attempts to control the surroundings.

Environmental control.--One way of examining the perceived locus of control is to study persons in relatively disadvantaged situations and see if there is a trend for internality among persons

who try to overcome their relative disadvantage. For instance, hospitalized ill persons and reformatory inmates are objectively disadvantaged. Seeman and Evans (1962) studied the behavior of hospitalized tuberculosis patients. They found that the more internally oriented persons knew more about their condition, questioned personnel more, and expressed less satisfaction with the information feedback. The striving for mastery of their situation was appropriate because, in slang terminology, "the bad patient gets better quicker."

Seeman (1963) also studied reformatory inmates. Again there was a relationship between internality (independent of intelligence) and the amount of information remembered about how the reformatory was run (important for daily functioning) and about how parole was achieved. Similar results concerning attempts to control the environment were obtained by studies of minority race students. Internally oriented minority race students were more apt to be activists in the civil rights movement in the early and mid-1960s (Gore and Rotter, 1963; Strickland, 1965). Evidently, in most studies, internal orientation is correlated with attempts to master the environment.

Two behaviors which relate to control expectancy were mentioned; there is another aspect of particular importance in which differences between internals and externals have been found--that is in the area of persuasion.

Overt persuasion.--In a study of a group situation, a tested individual may find that his or her judgment differs from that of the contrived group majority. If the situation is such that the person with normal vision, hearing, etc., would logically decide, when acting alone, on a certain choice, then if he or she gives a different, group-held answer, it is very probable that this person was influenced by the group. In a study of this type by Crowne and Liverant (1963) which involved a reward for giving the objectively correct answer in such a situation, internals yielded significantly less to group opinion than externals. Various studies of conditioning found internals more resistant to manipulation than externals (Getter, 1962; Strickland, 1962). However, this resistance appears to be more to covert than to overt persuasions (Gore, 1962). Internal persons may yield to persuasion as well as external persons, but they are apt to do so when they have a clear choice. If manipulation is subtle, the choice is less clear, and internals may respond negatively. Another condition internals may place on yielding is that they do not disadvantage themselves or lose face by acquiescence.

These differences between internals and externals were observed in controlled lab situations. Replication would appear to be needed. Since three related behaviors which differentiate persons with an internal expectancy from persons with an external one were examined, it is useful to discuss theories of control expectancies.

Development of a General Locus of Control Expectancy

At any point in time a person's expectancy is considered as relatively polarized towards internal or towards external control. However, the present locus of control depends, in theory, on the individual's history of reinforcement. Control expectancies are said to generalize from the pattern of past reinforcements in situations that are perceived as related or similar. One example is that welfare mothers have been shown to exhibit, as a group, an external locus of control (Freijo, Gordon and Bilker, 1968). The finding is reasonable because welfare mothers have presumably endured a series of financial difficulties in which the monetary solution was not in their own hands but rather provided by society. This is the basis of a general perception that powerful others are in control of important reinforcements in their lives. Another example concerns persons of high socioeconomic status who have been shown to exhibit, as a group, an internal locus of control (Joe, 1971). This is consistent with the expectation that they can literally control many aspects of their own lives because of their cultural advantages and economic status.

There are cultural, familial and developmental aspects which may explain the development of a control expectancy. Persons of minority race, of low socioeconomic status, as well as women in general, have been found to perceive themselves more externally controlled than persons of majority race, middle or high socioeconomic status (SES) who are male. However, the family environment for this

development is crucial. The data indicate that a warm, accepting home with predictable consistent behavior standards is more conducive to producing internally oriented children than externally oriented ones, regardless of cultural background. And, at the personal level, the development of an external or an internal expectancy has been studied in connection with development of generalized concepts of causality.

Mechanisms for Change

In an earlier section of this review, relating internality to attempts to control the environment, there was an interest in the information-seeking behaviors of persons who were in an objectively disadvantaged situation. For instance, some ill persons try to achieve some control over illness through knowledge, and some prison inmates try to learn the system so they can "beat it." It seems reasonable that other disadvantaged persons can help themselves through acquiring an internal locus of control. What mechanisms, then, might re-focus an external control expectancy to an internal one?

There are two general types of therapeutic interventions. The first is to assist a person to achieve a goal that has been previously held unsuccessfully. The intervention mechanism is to increase the occurrence of present successes with these goals. For example, Bilker (1970) investigated the control expectancies of indigent mothers before and after they were provided with an educational program, the Parent Education Project (Gordon, 1969, as

reported in Bilker, 1970). The program, it was hypothesized, presented consistent positive reinforcement to mothers for successful "mothering" behaviors in interaction with their infants. His results indicated a trend towards greater internal control for the participating mothers compared to a control group of nonparticipants. The second therapy involves assisting a person to achieve new goals. A person's control expectancy may be altered if old successes can be cognitively linked to new goals.

Several studies report therapeutic changes towards internality. Smith (1970) reports significant decreases in externality over a five-week period for clinic patients engaged in crisis therapy. Dua (1970) notes increased internality for two types of therapy: an action-oriented treatment directed at planning specific behaviors for improving relationships with given persons, and a reeducation approach directed towards influencing the clients' attitudes toward these persons.

Lesyk (1969) tells of a program of operant conditioning with female schizophrenics. After five weeks, women with the highest ratings of positive behavior also had the most internal scores. Similarly, in another therapy program for hospitalized psychiatric patients (Gillis and Jessor, 1970), those patients judged by therapists as improved had a greater increase in internality than a sample of untreated patients.

Besides these studies with a therapeutic purpose, other studies have reported changes in internality. For instance, when reformatory inmates were tested at the time of imprisonment, in the

middle period, and just before release, higher externality is found at the beginning and end than in the middle (Kiehlbauch, 1968). This could reflect the objective uncertainties related to goals at these times. Kiehlbauch suggests that stable routine brings control and that uncertainty brings a challenge to one's coping ability and increases externality.

Other studies of college students found a movement towards externality when Senator Eugene McCarthy lost the presidential nomination (Gorman, 1968). Also, male students facing the Viet Nam war draft who became less draft eligible after a draft lottery scored more external than those whose eligibility had not changed (McArthur, 1970).

In conclusion, research indicates that control expectancies do change, and that intervention programs aimed directly or indirectly at changing expectancies have resulted in such change. They also provide the theoretical basis for expecting change. However, these studies deserve replication and further explication.

Significant Avenues of Research Using the Locus of Control Construct in the Last Decade

Several research themes in the writings of Rotter (1966) and Lefcourt (1966, 1972) produced substantive research in recent years. There are other synthesizing themes not yet mentioned in this present review. These include the study of control expectancy and (1) the individual's response to success and failure; (2) the individual's preference for immediate or deferred gratificiation; and (3) the individual's cognitive ability.

Response to Success and Failure

The research on achievement is closely related to the research on success and failure. For achievement in important areas, persistence is necessary as are appropriate response to cues and the utilization of cumulative experience. Let us consider these in turn as they relate to an internal or an external control expectancy.

The literature on persistence describes studies of preference for immediate or deferred gratification and will be presented in more detail. In brief, the internal person is more prone to delay gratification. The external person is more easily satisfied with small, early success.

The internal person has already been described as a better information processor. The literature on success and failure further examines this aspect. Some early studies linked control expectancy with coping for success and failure by using a level of aspiration paradigm; in such studies subjects stated their expectancies for success through trials in which they experienced success and failure. In studies of skill and chance situations, Phares (1955) and James (1957) found externals behaving like subjects who received chance directions, exhibiting less expectancy shifts reflecting the actual successes and failures, and making more shifts without an objective basis. For instance, an aspiration expectancy might be raised after a failure or lowered after a success. This is considered an unusual shift in aspiration expectancy because it is not built on the actual experience of the individual. This

unusual shift well exemplifies the inappropriate response to success and failure of the external person (Battle and Rotter, 1963; Lefcourt, 1967; Lefcourt, Lewis and Silverman, 1968). Feather (1968) found that internals make more appropriate changes in expectancies (up after success and down after failure) than externals in a series of trials with anagrams.

Other studies suggest that the response to failure by internals and externals is somewhat different from responding appropriately or inappropriately. Some studies report that internals merely "forget" failures or "repress" them (Efran, 1963; Rotter, 1966). Externals, who see the responsibility for the failure outside themselves, do not need to repress to escape self-reproach. This interpretation is further supported by a study of Phares, Ritchie and Davis (1968) who found that externals could remember more negative (incorrect) information about themselves than could internals. However, the internals expressed more interest in making arrangements to confront their (assumed) personal difficulties than externals.

For internal persons, then, the response to success may be to incorporate the information from that event in planning appropriate further actions. The response to failure may be two-fold: to incorporate the information learned and/or to forget deficits and perhaps become less aware of cues related to them, while continuing to take an active stance to solve problems.

External persons, on the other hand, tend to ignore information from successful events insofar as it contributes information

for further action. The response to failure for externals is also two-fold: to ignore information from the failure which could provide a new basis for further action and/or to remember failure or threat-related situations and perhaps let their negative aspects color further thinking out of proportion to their objective meaning.

Immediate or Deferred Gratification

The argument relating control expectancy and choice of immediate or deferred gratification is this: immediate gratification is a sign of lower socioeconomic class; externality is a sign of lower socioeconomic class; so preference for immediate gratification and perceived external control of gratifications are related. Logically, the preference for easy success that is supposed to characterize the external locus expectancy should prompt choice of easy, immediate reinforcement. However, the particular research studies relating these characteristics are somewhat controversial. For instance, laboratory studies have been criticized because the laboratory definition of reinforcements may not generalize to real-life situations (Willems, 1968, p. 35). Also, delay of reward in real life implies an active striving toward the reinforcement rather than an empty waiting, which is the situation in most laboratory studies.

Since movement toward internality is developmentally related to age (Penk, 1969; Walls and Miller, 1970) and increasing preference for delayed reinforcement is also related to age (Walls and Miller, 1970), studies of the cognitive development of children

which do not include both factors may be confounded. The next research thrust considered is that of cognitive activity.

Cognitive Strategies

If success doesn't just happen but must be worked for in most life situations, then those persons who plan and execute goal-oriented strategies should achieve more success than persons who don't. The strategy of information utilization has been mentioned with regard to patients who learn more about their own conditions (Seeman and Evans, 1962), and among reformatory inmates who learn how the system is operated (Seeman, 1963).

Another research investigated differential use of the same information by internals and externals (Phares, 1968). Financial rewards were offered for matching data about four hypothetical men with hypothetical women and occupations. Internals gave more and better reasons for the matchings. This led Phares to conclude that internals made better use of common information than externals and thus could be more effective in their environment.

A different study reported that internals engaged more in preliminary steps of data gathering than externals which might increase their probability of success in the subsequent task (Davis and Phares, 1967).

Internal subjects were found more likely than external subjects to attend to cues providing information that could resolve uncertainties (Lefcourt and Wine, 1969). However, another study reported that both internals and externals were more motivated to

activity in congruent conditions than in incongruent conditions (Watson and Baumal, 1967). That is, internals wanted more practice in the chance-type activities and externals wanted more practice in the skill-type activities. This could be interpreted as in conflict with the Rotter and Mulry (1965) suggestion that internals and externals are more motivated on congruent conditions because of the greater reinforcement value and less motivated in incongruent conditions. However, it could also be interpreted that anxiety is raised by incongruent conditions. If this is so, a low level of anxiety may be described as "motivating" because it leads to greater information seeking, but a high level of anxiety would be self-defeating.

Another variable which has been related to internal-external control is that of field dependence or differentiation. A high level of differentiation or field independence involves a clear separation of what is identified as self from that external to the self. Field dependence theoretically implies a relative reliance on external nurturance and support and less differentiation of self from field. Although relationships between field dependence and internal-external control have been predicted, they have not received much empirical support. However, when measures of locus of control and of differentiation are used together as predictors, they do produce significant interaction effects (Lefcourt, Gronnerud and McDonald, 1971; Lefcourt, Sordoni and Sordoni, 1971; Lefcourt and Telegdi, 1971, as reported in Lefcourt, 1972).

Literature Relating to Research Questions

The study objectives listed in the introductory chapter generate four broad research questions. The first two research questions deal with a predictive model of locus of control in the mother. The corresponding literature is reviewed relating locus of control to mother's teacher effectiveness and educational aspirations and expectancies for the child. Child cognitive achievement, self-esteem, age, sex and ordinal position are also reviewed as these may relate to locus of control of the mother. The third research question deals with locus of control and performance of skill tasks with and without reinforcement of an overt nature. The fourth research question addresses mechanisms of change toward greater internality. The literature is now presented for each specific research question.

Locus of Control and Teacher Effectiveness

Research suggests that internal persons are more effective teachers than external persons (Hersch and Scheibe, 1967; Powell and Vega, 1972). The theoretical reasoning, described earlier in this chapter, is that internal persons in contrast to external persons appear to show a greater tendency to seek information and adopt behavior patterns which facilitate personal control over the environment. They also persist longer in skill-type activities. These behaviors should contribute to their effectiveness as teachers.

A supporting study by Murray and Staebler (1973) found that fifth grade students made significantly more academic progress with

internal teachers than with external ones after a one-year period. Significant differences were found in language, arithmetic and reading skills.

On the other hand, the Bilker study (1970) of indigent mothers participating in the Parent Education Project and their infants did not find differences in child achievement on the Stimulation Series Test or on the Griffiths Mental Development Scale for children of internal or external mothers after six months. However, it is proposed that the developmental level of the infants is such that infants are not yet susceptible to such differences in the environment (when environment is defined as internal- or external-oriented mothers). This may be particularly germane when contact through verbal interaction is the mediating variable, as hypothesized in the Bilker study. It is suggested that the theoretical basis of this study deserves replication with older children and their mothers.

In the Chicago study of the cognitive environments of black urban pre-school children (Hess, Shipman, Brophy and Bear, 1967; Hess, Shipman, Brophy, Bear and Adelberger, 1969), results of the mothers' I-E Scale Score correlate significantly and in the expected directions with Sigel measures of the children's categorical inferential statements and scorable responses measured at the second follow-up (summer prior to second grade) for both the total group (middle class and working class) and for girls analyzed separately. Scores for the working class group were analyzed separately and for boys; they are in the predicted directions although they are

not statistically significant at the 5% probability level (Hess et al., 1969, p. 221). The data support the conclusion that internal mothers are more effective teachers than external ones. One measure studied in the Chicago research may be hypothesized to mediate the teaching effectiveness; it is the "availability and use of home resources" by mothers. At the first follow-up during the summer prior to first grade, this factor correlated significantly at the 5% probability level or better with the Sigel child responses of categorical-inferential. This was true for the total group, for the working class subgroup, and for male and female subgroups of the children.

The Hess, Shipman, Brophy, and Bear study (1968) provided a description generated from their research of the effective mother-teacher. This is given in the form of a comparison in the following listing (1968, p. 191):

Characteristics of the more effective mother-teacher	Characteristics of the less effective mother-teacher
1. orients child to task	1. minimal orienting of child to task
2. elicits more verbal performance than non-verbal performance from child	2. elicits more non-verbal performance than verbal performance from child
3. gives high amount of feedback to child	3. gives a low amount of feedback to child
4. gives relatively more positive reinforcement	4. gives relatively less positive reinforcement
5. uses a warm affective tone	5. uses a less warm affective tone
6. uses specific language to label task-relevant variables	6. uses less specific language to label task-relevant variables

This description provides the source of specific variables to measure an effective mother-teacher which are used in the present

research question relating effectiveness to internality. The hypothesis finds expression in the following related research questions:

(1a) Will mothers who have a higher frequency of behaviors related to their role as effective teacher be more internal on locus of control than mothers with a lower frequency of these behaviors?

(1b) Is the mother's locus of control related to reported activities in the home which are engaged in to prepare the youngest day care child for school?

Locus of Control and Educational Aspirations and Expectancies for the Child

Locus of control is theoretically related to social class under the assumption that higher status persons will in fact have more control over their own reinforcements and will be more internal. As mentioned earlier in this chapter, it is generally agreed that persons of relatively higher social class, greater education and of majority ethnic group will tend to be more internal than the person of relatively lower social class, less education and minority ethnic group.

In the Hess et al. study (1968), mothers of four social groups were questioned on their educational aspirations and expectancies for the pre-school child. The majority of mothers in all four social class groups said they would like their children to finish college. However, this study found that there was minimal discrepancy in middle class mothers between aspiration and expectancy: they wanted their children to finish college and they

believed the children would do so. However, the discrepancy was much higher for unskilled working class mothers, but evident also for the skilled working class mothers (Hess et al., 1968, p. 184). The Chicago study discussed this discrepancy score as a measure of "realism" for these mothers.

In the present study the same question is asked of the mothers and the same discrepancy variable is identified: a measure of "realism" defined as "difference between aspiration and expectancy for the (youngest) day care child's education."

The related research question is the following:

(1c) Will mothers with "realistic" aspirations for the youngest day care child's education be more internal than those whose aspirations and expectancies differ?

The second research question and its subparts deal with the relationship of child characteristics with the mother's control expectancy. The rationale for this is that the child can present the parent with emergent behaviors which can, in turn, modify the parent's behavior (Bell, 1968, 1971). This rationale was explored in the Bilker study, Locus of I-E Control Expectancy and Expectancy Changes of Disadvantaged Mothers (1970). This study hypothesized a mutually interacting relationship between mother and child: that changes in child achievement mediated through successful parental participation in the Parent Education Project would correlate with a change towards greater internality of the participating mother. This study did show a trend towards greater internality of the mother at the 7% probability level, but not theoretically

related greater achievement of the infant. Perhaps the reasoning about mutual causality was not incorrect, but rather the dynamic of causality through verbal interaction between the mother of a very young child (aged three months to two years) was inappropriately operationalized. The same dynamic may prove appropriate for a study of interaction between mother and older, verbal pre-school child.

Locus of Control of the Mother and the Child's Cognitive Achievement and Self-Esteem

It is suggested that a mother's locus of control will be interrelated with the child's cognitive achievement and with the child's self-esteem. A mother internal in orientation, according to the previous research discussed (Hess et al., 1968, 1969), should take steps to improve her mothering skills. Maternal aspirations and expectancies, reward and punishment of the child's behavior, provision of materials and other opportunities to stimulate the child's development and standards for rearing the child have all been found to be related to the development of the pre-school child (Gordon, 1972).

The internal mother has been described as realistic in goal-setting, a good teacher, and a good information organizer. It is also hypothesized that she will have an achieving child.

One measure of the capable mother was "availability and use of home resources." The home resources patterns and scale described in the Hess et al. (1968) study were developed and subsequently

scored by Baker (Hess et al., 1968, pp. 229-246) and subsequently utilized in the doctoral dissertation by Baker, "Patterning of Family Resources for Educability: Conceptualization and Measurement in Costa Rican Families" (1970). The "availability and use of home resources" factor, as reported in the Hess et al. study (1968), correlated significantly at the 5% probability level or better with Binet IQ at age four for the total child group, for the children of the working class subgroup, and for male and female subgroups. As mentioned previously, it also correlated at the 5% probability level or better with the child Sigel responses of categorical-inferential for the total group, for the working class subgroup, and for male and female subgroups. This study also revealed that the child's Sigel responses of categorical-inferential correlated significantly at the 5% probability level with the mother's I-E score for the total group of children, as well as for the subgroup of girls analyzed separately. The I-E score of the mothers also correlated with scorable responses in the Sigel measures for the total group of children and for the subgroup of girls analyzed separately (1969, p. 221).

The manner in which the child perceives self as a person crystallizes through interaction with others, and most especially with the significant persons in the child's family. Self-concept may be viewed as an organized, conceptual pattern of the characteristics of the way the individual perceives himself and the way he believes others perceive him. The internal mother has been described as realistic in goal-setting and a good information

organizer. It is hypothesized that she is apt to elicit appropriate responses from the child and to respond favorably to the child's responses--and that this will be reflected in increased child self-esteem.

As a consequence of the previous discussion, the following research questions appear significant:

(2a) Will children with high self-esteem have mothers who are characterized by internal control?

(2b) Will children with relatively more achievement behaviors have mothers who are characterized by internal control?

The age of a child has been related to his or her internality (Penk, 1969; Walls and Miller, 1970), and female sex has been mentioned as a sometime indicator of lower status and thus externality. Birth order is inconclusively related to locus of control for children (Newhouse, 1974). These three characteristics are used in an exploratory sense in the following research question:

(2c) Is there a relationship between the youngest day care child's age, sex and ordinal position in the family and the mother's locus of control?

The third research question and its subparts deal with predicted behaviors for mothers with different loci of control. The behavior in question is attendance at a parent program designed to assist the parent to help the child prepare for school. The locus of control literature which bears on this behavior includes locus of control and participation in a group and locus of control and performance of skill tasks.

However, there are incentives involved with the attendance at the PTT Program, and thus further literature regarding response to influence is included in the discussion of performance of skill tasks.

The literature for the related research question is now addressed.

Locus of Control and Participation in a Group

Research indicates that locus of control is related to participation in a group; either more internal people affiliate or affiliation engenders internality. For example, Neal and Seeman (1964) using the I-E Control Scale found that members of a work-based organization were significantly lower in externality than controls. The authors concluded that internality was related to affiliation with an organization that can better one's life circumstances. A similar result was found in the correlational study by Hess et al. (1968). For a working class group of black mothers, "powerlessness" was significantly inversely correlated with "mother out of home activities" (Hess et al., 1968, pp. 40-41).

These references suggest the following research question:

(3a) Will more internally oriented mothers participate in the parent program in the "no reward" (self-reward) condition than externally oriented mothers?

Locus of Control and Performance of Skill Tasks With and Without Reinforcement

The overview in the earlier part of this chapter supported the hypothesis that individuals with an internal locus of control perform superiorly on skill tasks to persons with an external locus of control. This is supported by other research studies (Baron, Cowan, Ganz and McDonald, 1974; Baron and Ganz, 1972). One theory for the effectiveness of the self-discovery of success (intrinsic feedback, assumed to create a skill-type task orientation) is that self-discovery feedback

> should provide a setting of conditions where success will cue off a constellation of pride in accomplishment and self-reinforcement, factors which should strongly motivate internals but not externals . . . (Baron and Ganz, 1972, p. 126).

External subjects, on the other hand, may be described as motivated by the gambler's fallacy of expecting to win after a series of failures (James, 1957; Battle and Rotter, 1963).

A recent study by Shepel and James (1973) further investigated the behavior of internal and external individuals in both skill and chance situations, in connection with varied reinforcement schedule conditions. This study of 96 male psychology students gave the following results: internals on an internal (skill) task were more persistent than externals on an external (chance) task. Also, externals on a chance task showed significantly more temporal persistence than externals on a skill task. Pre-arranged reinforcement schedules were used. Internals with 100% reinforcement (feedback on "correctness" of the student response determined by the reinforcement

schedule) on a skill task were more persistent than internals with 33% reinforcement on a skill task. Finally, internals with 100% reinforcement were more persistent than externals with 100% reinforcement.

Other studies already mentioned have found that there was no difference between internals and externals in susceptibility to social influence when the attempt to influence was overt (Gore, 1962; Strickland, 1962). Lefcourt (1967, as reported in Joe, 1971) noted that externals were more achievement conscious than internals when informed that achievement reinforcements were available. This indicates, he theorizes, that the apparent lack of goal-striving behavior of externally oriented persons may be due to being less perceptive of reinforcement opportunities rather than to lack of motivation.

In the present research, offering the parent program under the "no reward" incentive condition is assumed to exemplify the attraction of performance of a skill task activity for the mothers. It generates a research question already cited for another theoretical reason:

> (3a) Will more internally oriented mothers participate in the parent program in the "no reward" (self-reward) condition than externally oriented mothers?

Consider, however, that offering the parent program under the external reward conditions (babysitting and transportation provided each meeting; monetary incentive provided each meeting) may be viewed as attempts to overtly influence the day care mothers. The

hypothesis is that both internal and external mothers will respond in the same way to the overt influence. It suggests the research question:

(3b) Will there be a relationship between the locus of control and mother's participation in the parent program in the two incentive-related (external reward) conditions?

The fourth research question and its subparts deal with hypothesized change in internality. Although the overview reviewed this subject, it will be briefly focused again with regard to the specific research question.

Change in Locus of Control Toward Greater Internality

The general tendency of a person to believe that present events are contingent on his or her own behavior or on relatively permanent characteristics can be changed, although current explanatory evidence is meager (Joe, 1971). For example, Lefcourt and Ladwig (1965) noticed that the behavior of persons holding an external control expectancy could be altered to an internal control expectancy if new goals could be cognitively linked to old successes. A related tactic for increasing internal control is to increase the occurrence of present successes with important goals.

Such research supports the contention entertained that intervention programs can increase internality. Bilker (1970) studied indigent mothers (who were significantly more external than a national sample reported by Rotter); he found that mothers who participated in the Parent Education Project for nine months became

somewhat more internal than control group mothers who did not participate. Similarly, Hunt and Hardt (1969; as reported in Joe, 1971) in a study of the Upward Bound program on Negro and white students found significant increases in internal control for both groups. Positive effects of interventive programs on locus of control are also reported by Gottesfield and Dozier (1966), Gillis and Jessor (1970), Smith (1970), Dua (1970), and Lesyk (1969).

The time periods reported for these intervention programs range from one week to nine months; unfortunately, longitudinal data on long-term effects on internality are not available.

In the present research it is argued that participation in the Parents Are Teachers Too Program, a language-oriented program geared to the developmental level of the pre-school child, may be expected to provide present and continuing success in teaching experiences of the parent with the day care child through early school years. Thus the mother-child interaction which the program participation fosters may both form successes in the present and provide a background of successful experiences; these may generalize so that the parent may expect greater successful teaching interactions and thus perceive greater internal control.

Thus it is hypothesized that positive changes in locus of control will be greater for those who participate in the parent program than for those who do not participate. This is expressed in the following research question:

(4a) Will positive changes in locus of control be greater for mothers who participate in the parent program than for mothers who did not participate?

It is not hypothesized that the overt reinforcements provided as incentives for attendance at the program will affect, in and of themselves, the locus of control of the parent. For one thing, there is no linking of old successes to present goals. For another, any temporal link of these incentives with successful outcomes that are a result of greater success in teaching the pre-school child learned through techniques of the Parents Are Teachers Too Program will reasonably be perceived by the parent as a "chance" occurrence, one that happens by "luck" alone. Therefore, there is no reason to think that generalizations of expectancies for success will occur as a result of receiving these overt incentives, even though in some sense they are under parental control (they can choose to come or not).

There are two external reward conditions and a third control condition in connection with the offer of the parent program. It is the mothers who participate in the program by practicing the skills taught who are hypothesized to achieve greater internality. In the two external reward conditions, it is hypothesized that mothers will attend for the incentives. The mothers without incentives are more likely to attend because they want to learn something. For this reason it is theorized that positive change due to the program, if it occurs, will be greater for mothers in the "no reward" (self-reward) condition. This reasoning prompts the final research question:

(4b) Will positive changes in locus of control be greater for participant mothers in the "no reward" (self-reward) condition than for mothers in the two external reward conditions?

Methodological Considerations

A number of instruments have been devised to measure locus of control. Some of these instruments measure a specific control expectancy, such as the Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky and Crandall, 1964). Others, of greater interest to this study, measure a generalized control expectancy. Three of these instruments, which are developmentally related, are the I-E Control Scale, the Social Reaction Inventory, and the Felt Powerlessness Scale.

The I-E Control Scale was developed by J. B. Robber in 1966. It had a developmental history dating from the James-Phares Likert-type scale of 26 items (James, 1957) to the present 29-item forced choice scale. This scale is intended to measure an individual's expectancies about how reinforcement is controlled. It is considered a measure of generalized expectancy. Rotter reports an internal consistency of between .65 and .79 on university populations, and test-retest reliabilities of between .55 to .83 (Robber, 1966). The usual method of defining internal and external control with this instrument is to divide scores at the median.

For the purposes of the present research, this scale was perused by a panel of experts familiar with the population of mothers in the present study. Since the reliabilities and validities were constructed from a university student population, and because inspection of the items indicated some difficulty in interpretation for the less well-educated mother, it was rejected for use in this study.

A second instrument called the Social Reaction Inventory was developed as a modification of the I-E Control Scale. It is described as appropriate for a fourth grade reading level (Bilker, 1970, p. 30). The instrument has a test-retest reliability of .78 over a two-week interval for a sample of 35. It was used on a trial basis with an indigent population (Freijo, Gordon and Bilker, 1968). Internal and external scores were derived on this instrument by dividing scores at the median (Bilker, 1970).

The Felt Powerlessness Scale was developed by Jaffee (1959) from an earlier version of the I-E Control Scale entitled "Powerlessness Scale" devised by Rotter and Seeman (1959). It is a 25-item instrument in Likert format. This scale was used in a 1971 study of mothers whose children attended a nursery school program or a public health clinic, and the adapted scale was reported as unidimensional by Sims (1971) when factor analyzed on a sample of 163. This scale was chosen for the present research on the basis of review by a panel of experts familiar with the population of persons utilizing day care centers in Michigan, the population of interest. In the present study, it evidenced an internal reliability of .86 as measured by the Hoyt measure of internal consistency on a sample of 146 persons. Internal and external scores are formed in the present study by dividing scores at the median.

CHAPTER III

RESEARCH DESIGN AND IMPLEMENTATION

The present research on locus of control expectancies was planned in connection with a larger study funded by the Office of Child Development entitled Maternal Involvement in Day Care: A Comparison of Incentives (Boger, Kuipers, Cunningham and Andrews, 1974). The larger study offered the advantages of a population of interest for which intervention activities were planned in connection with an appropriate research design. The major goals of the Boger et al. study were these: to determine if the use of financial incentives is an effective method of initiating and maintaining the day care mother's involvement in a parent education program, and to determine if the use of financial incentives influences the quality of mother-child interaction and the child's self-concept. A summary of the parent project, its goals and results, is presented in Appendix A.

The present study proposed that the quality of mother-child interaction and child self-esteem are related to the mother's sense of powerlessness. Also, it proposed that the interaction between the mother's locus of control and incentives impacts on the attendance of mothers at the parent program under the varying incentive conditions.

The measures of mother-child interaction from the Hess and Shipman Toy Sort Task and the indicator of self-esteem from the Brown IDS Self-Concept Referents Test are used in the larger study as well as the present one. The two instruments used solely in the present study, the Felt Powerlessness Scale and the Educational Survey, were administered at the time of data collection for the larger study.

For convenience, the two analytical phases of the present study are presented separately. The purpose of each phase and associated design plan with related research hypotheses are then presented along with the associated analysis strategies. Following this a description of the sample, measures and associated variables is presented. Finally, procedures for data collection and analysis are detailed.

Phase 1

The purpose of the first phase was exploration of the nature and magnitude of the interrelationships between the mother's locus of control and her other behaviors and characteristics. The study explores the nature and magnitude of the interrelationship between the mother's locus of control and characteristics of the child. In addition, the study considers mother and child characteristics concurrently as predictors of control expectancy for status-related subgroups of mothers.

Design Plan--General

The design involves concurrent observations on mothers and children in six day care centers from six different cities chosen randomly from an available pool of nine cities. Data are pooled for all Ss, and analyzed by linear multivariate regression (see Appendix D for the theoretical considerations).

Research Questions for Phase 1

There are two general research questions which are addressed jointly in Phase 1. They are:

Is there a relationship between the mother's locus of control and her other concurrent behaviors, attitudes and characteristics?

Is there a relationship between the mother's locus of control and the concurrent behaviors, attitudes and characteristics of her child?

These are the source of the research hypotheses following.

C_1	C_2	C_3	C_4	C_5	C_6
S_{n_1} +	S_{n_2} +	S_{n_3} +	S_{n_4} +	S_{n_5} +	S_{n_6}

where:

C_i = Center nested within City

S_{n_i} = Sample of size n_i

Figure 3.1.--General Design Matrix for Phase 1.

Research Hypotheses for Phase 1

H_1: There is no relationship between the mother's locus of control and her other concurrent behaviors, attitudes and characteristics.

a. There is no relationship between the mother's locus of control and her teaching behaviors demonstrated in interaction with her (youngest) child attending the day care center.

b. There is no relationship between the mother's locus of control and her number of activities in the home which are reported engaged in to prepare the (youngest) day care child for school.

c. There is no relationship between the mother's locus of control and the realistic aspirations (aspirations of the same level as expectancies) for the (youngest) day care child's education.

H_2: There is no relationship between the day care mother's locus of control and the concurrent behaviors and attitudes and characteristics of the (youngest) child who is attending the day care center.

a. There is no relationship between the mother's locus of control and the self-esteem of the child.

b. There is no relationship between the mother's locus of control and the achievement behaviors of the child in interaction with the mother.

c. There is no relationship between the mother's locus of control and the age, sex and ordinal position of the child.

Design for Phase 1:
Hypotheses 1 and 2

The design for the individual hypotheses 1 and 2 is presented in Figures 3.2 and 3.3. After the preliminary analyses only those variables theoretically important and/or statistically significant will be used in a subsequent analysis still addressed to these hypotheses. The subsequent analysis uses both mother and

Mother Behaviors, Attitudes and Characteristics		
Teaching effectiveness indicators with child (a)	Number of home activities reported for child (b)	Discrepancy score for aspirations and expectancies for child (c)
$S_{n_1} + S_{n_2} + S_{n_3} + S_{n_4} + S_{n_5} + S_{n_6}$		

where: S_{n_i} = Sample of size n_i from Center C_i

and: Criterion variable = Locus of control expectancy

Predictor variables = Teaching effectiveness indicators, number of home activities, and discrepancy score between aspirations and expectancies for child

Figure 3.2.--Design Matrix for Hypothesis 1.

Child Behaviors, Attitudes and Characteristics		
Self-esteem (a)	Achievement behaviors with mother (b)	Age, sex, ordinal position (c)
$S_{n_1} + S_{n_2} + S_{n_3} + S_{n_4} + S_{n_5} + S_{n_6}$		

where: S_{n_i} = Sample of size n_i from Center C_i

and: Criterion variable = Locus of control expectancy

Predictor variables = Child self-esteem, child achievement behaviors with mother, and age, sex and ordinal position of child

Figure 3.3.--Design Matrix for Hypothesis 2.

child variables to predict the mother's locus of control, but stratifies the analysis according to status-related subgroups of mothers. These groups include welfare recipient status of mother (ADC and non-ADC); marital status of mother (married and single); racial background of mother (white, black); employment status of mother (employed and unemployed); terminal education of mother (completed high school and completed some college); and student status of mother (student and nonstudent). The design for subsequent analysis is given in Figure 3.4. The analysis strategy to be utilized in Phase 1 is one of multiple regressions predicting the mother's locus of control by mother and/or child variables. This analysis will be detailed further at the end of this chapter.

Phase 2

The central purpose of the second phase of this study is to investigate the relationship between incentive treatments, the mother's locus of control, and subsequent attendance at a series of parent meetings at the day care centers. A related purpose is to investigate change in locus of control as a possible function of either attendance at the parent programs or of incentive treatments or of both.

Design Plan--General

The overall design involves random assignment of two centers nested within cities to one of three incentive treatment conditions. This overall design plan is presented in Figure 3.5.

Status-Related Subgroup	
Mother behaviors, attitudes and characteristics (1a, 1b, 1c)	Child behaviors, attitudes and characteristics (2a, 2b, 2c)
$S_{n_1} + S_{n_2} + S_{n_3} + S_{n_4} + S_{n_5} + S_{n_6}$	

where: S_{n_i} = Sample of size n_i from Center C_i

and: Criterion variable = Locus of control expectancy

Predictor variables = Theoretically important and/or statistically significant variables measuring mother behaviors, attitudes and characteristics and child behaviors, attitudes and characteristics

and: Status-related subgroups of mothers include:

welfare status, marital status, racial background, employment status, terminal education, and student status

Figure 3.4.--Design Matrix for Subsequent Analyses for Hypotheses 1, 2.

T_1		T_2		T_3	
C_1	C_3	C_4	C_6	C_2	C_5
S_{n_1}	$+ S_{n_3}$	S_{n_4}	$+ S_{n_6}$	S_{n_2}	$+ S_{n_5}$

where: T_1 = Treatment 1 ($5/meeting)

T_2 = Treatment 2 (babysitting and transportation/meeting)

T_3 = Treatment 3 (no additional incentive/meeting-

S_{n_i} = Sample of size n_i

C_i = Center nested within city

Figure 3.5.--General Design Matrix for Phase 2.

The three treatment conditions are as follows:

Treatment 1: $5 per meeting attended by mother.

Treatment 2: Babysitting and transportation per meeting attended by mother

Treatment 3: No additional incentive per meeting attended by mother. This is considered a control condition.

Research Questions for Phase 2

There are two general research questions which are addressed in Phase 2. They are:

Will the mother's locus of control interact with the differing offered incentives to produce different attendance patterns at the parent program?

Will attendance at the parent program interact with the differing incentives to predict different patterns of change in locus of control at the end of the parent program?

Research Hypotheses for Phase 2

H_3: There will be no relationship between the locus of control of the mother and her subsequent attendance at the parent education program under varying incentive conditions.

a. There will be no difference in participation in the parent program by internal or external mothers in the "no reward" (self-reward) treatment condition.

b. There will be no relationship between locus of control and the mother's attendance at the parent program in the two incentive-related (external reward) conditions.

H_4: There will be no relationship between change in the mother's locus of control and her attendance with incentives for the parent education program.

a. There will be no difference in change in locus of control for participating mothers in the parent program than for mothers who do not participate.

b. There will be no difference in change in locus of control for participant mothers in the "no reward" (self-reward) condition than for participant mothers in the two external reward conditions.

Design for Phase 2:
Hypotheses 3 and 4

The design for the individual hypotheses 3 and 4 is presented in Figures 3.6 and 3.7. The analysis strategy utilized in Phase 2 is one of analysis of variance and covariance. This is detailed further in Appendix D.

		Treatments					
		T_1		T_2		T_3	
		C_1	C_3	C_4	C_6	C_2	C_5
Locus of Control	I	n_{11}		n_{12}		n_{13}	
	E	n_{21}		n_{22}		n_{23}	

where: T_1 = Treatment 1 ($5/meeting)

T_2 = Treatment 2 (babysitting and transportation/meeting)

T_3 = Treatment 3 (no additional incentive/meeting)

I = internal control expectancy

E = external control expectancy

C_i = center nested within city

Dependent variable = attendance at PTT Program

Figure 3.6.--Design Matrix for Hypothesis 3.

		Treatments					
		T_1		T_2		T_3	
		C_1	C_3	C_4	C_6	C_2	C_5
Attendance	A	n_{11}		n_{12}		n_{13}	
	NA	n_{21}		n_{22}		n_{23}	

where: T_1 = Treatment 1 ($5/meeting)

T_2 = Treatment 2 (babysitting and transportation/meeting)

T_3 = Treatment 3 (no additional incentive/meeting)

A = Attended the parent program

NA = Did not attend the parent program

C_i = Center nested within city

Dependent variable = post-score on Felt Powerlessness Scale

Covariate = pre-score on Felt Powerlessness Scale

Figure 3.7.--Design Matrix for Hypothesis 4.

The Sample

The sample of mothers was selected from a population of mothers living in midwestern urban areas with children cared for during the day in federally licensed day care centers. The sample was drawn from the sample of the larger study (Boger et al., 1974) described in Appendix A. Six day care centers were located for participation through the following process: the ten largest cities with an approximately 70 mile radius of the Michigan State University campus and at least 20 miles distant from each other were identified. One city (Detroit) was eliminated from the pool because of its large size compared to the other cities. Six cities were then randomly selected from a group of nine possible cities for inclusion into the study (Grand Rapids, Battle Creek, Saginaw, Lansing, Jackson and Flint). Federally licensed centers within these cities were then identified. The federal license implied that the centers were eligible to enroll ADC children. Centers which had less than 25 or more than 60 full-time children enrolled were dropped from consideration. Final selection of locations was made from the remaining day care centers whose directors had indicated a willingness to cooperate in the research project. Later, all mothers with children enrolled were invited to consent in writing to participate in the research study and to permit their children enrolled in the centers to participate also.

In the following section, the sample obtained is described in terms of the six day care centers from which participants were obtained. The centers are identified by a number which stands for

the day care centers within one of the six cities mentioned. The sample is described by the characteristics of mothers with children who were connected with the centers over a six-month period. As previously mentioned, the cluster sampling procedure utilized resulted in six locations from which participants were obtained. For the purposes of the present research, the sample is defined in terms of frequency distributions regarding the following characteritics: (for mothers) welfare status, race, employment status, educational level completed, student status and marital status; (for children) sex, age and ordinal position.

Description of Mothers

Although all of the day care centers which are federally licensed are eligible to enroll ADC mothers, only half of the mothers in the present sample were ADC recipients, as indicated in Table 3.1. One center enrolled no ADC mothers, Center 6. All of the mothers in this center, however, had a certain amount of the tuition subsidized because the center belonged to the Model Cities Program.

About 60 percent of the mothers were black, with a small percentage belonging to other minorities, and the remainder white. Table 3.2 shows that all centers were integrated except for Center 6 which enrolled only black participants.

About 70 percent of the mothers were employed, although some worked through a project intended to assist ADC mothers in a work-study program. Table 3.3 reveals that 15 percent of the mothers

TABLE 3.1.--Mothers Receiving Aid for Dependent Children.

Mother	Total		Day Care Centers					
	% 101	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Receives ADC	52	132	44	16	23	10	39	0
Does not receive ADC	47	119	6	20	22	32	5	34
Undetermined	2	4	0	0	1	2	1	0

TABLE 3.2.--Maternal Race.

Mother	Total		Day Care Centers					
	% 100	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Race: White	37	95	15	8	32	34	6	0
Black	57	145	31	28	8	8	36	34
Other[a]	6	15	4	0	6	2	3	0

[a]Includes mixed racial background.

TABLE 3.3.--Maternal Employment and Type of Work.

Mother	Total		Day Care Centers					
	% 101	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Not employed	29	73	26	9	10	13	11	2
Employed								
Professional or managerial	15	38	2	8	7	9	0	12
Sales	3	7	0	0	2	0	3	2
Clerical and kindred workers	28	71	9	7	17	15	13	10
Blue-collar	3	8	2	3	2	0	0	1
Service workers	15	37	5	6	5	3	12	6
Undetermined	8	21	6	3	3	4	6	1

[a]Categories of employment are an abridgement of those used in the 1970 Census of Population and Housing in the United States.

were employed in high prestige professional or managerial occupations. Nearly 30 percent of the mothers worked at clerical and similar positions.

The group of mothers was relatively well educated, with over one-third having some college experience. Table 3.4 indicates that only 14 percent of the mothers had not completed high school or substituted vocational training.

Thirty percent of the mothers were currently enrolled as students, as shown in Table 3.5. Those listed as students include women enrolled in degree programs, those studying in vocational programs and those taking special courses including participating in Project "Win" for ADC mothers.

More than half of the mothers were single parents living alone, as indicated in Table 3.6. These statistics are similar to the ADC statistics (Table 3.1) but not identical. The reason for this is that mothers who were living with an adult male in the home were included in the "married" category for the purposes of the present study. The mother's behaviors are presumed affected by the interaction with this adult and the child has another role model in the home.

Description of Children

The children described as providing the sample for the present study are the youngest children attending the day care centers. Older children from the same families were eliminated from the sample because they would invalidate the assumption of independence of responses between mother-child pairs.

TABLE 3.4.--Terminal Education of Mothers.

Mother	Total		Day Care Centers					
	% 101	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Did not finish high school	14	35	8	2	2	5	14	4
Finished high school	28	71	14	9	19	11	15	3
Some occupational or professional training[a]	12	30	4	3	5	8	3	7
Some college	24	62	5	17	13	6	11	10
Finished college and/or beyond college	11	27	2	4	3	9	0	9
Undetermined	12	30	17	1	4	5	2	1

[a]After or instead of high school

TABLE 3.5.--Student Status of Mother.

Mother	Total		Day Care Centers					
	% 101	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Student	30	76	16	17	13	6	17	7
Not student	62	157	30	15	30	31	25	26
Undetermined	9	22	4	4	3	7	3	1

TABLE 3.6.--Marital Status of Mothers.

Mother	Total		Day Care Centers					
	% 100	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Married, two[a] parents together	44	112	23	17	16	24	12	20
Single parent[b]	54	138	26	19	29	19	31	14
Undetermined	2	5	1	0	1	1	2	0

[a]Includes living with adult male in home, regardless of legal status.

[b]Includes legally married mother with spouse living elsewhere, divorced mother, widowed, and never married.

A general point of interest about these children is that about 80 percent of them were enrolled at their centers full-time, that is, five full days a week. One center, Center 3, was characterized by a large number of part-time children. At that center 24 out of 46 children attended part time. Another general point of interest is the stability of attendance of the day care child. Least stable was Center 1. It was characterized by a high turnover of enrollees which may have been caused by a change in personnel. At the other extreme was Center 6. This center did not experience any (significant) turnover of attending children in the three months prior to the parent program. It was the only center that enrolled solely black children.

The sex distribution of children was nearly equal in the sample, as shown in Table 3.7, with a slight preponderance of

TABLE 3.7.--Sex of Child.

Child	Total		Day Care Centers					
	% 100	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Sex: Male	45	116	19	19	23	21	22	12
Female	55	139	31	17	23	23	23	22

females. The average age of the children in each center ranged from 43.6 to 48.7 months, as indicated in Table 3.8. The minimum age was 24 months (the child must be toilet-trained) and the maximum age was 76 months. Over half of the children were oldest children in their families (see Table 3.9), and 45 percent were the only children in their families. The maximum ordinal position of any child was seventh, although within centers children averaged second ordinal position or less. With the description of the sample mothers and children concluded, the next section of this chapter describes the instruments used in the study.

Instruments

Six measures were utilized to provide information on mothers and children in the present study. These instruments are described followed by a listing of the variables which they generate.

The Felt Powerlessness Scale

This instrument measures the locus of control expectancy for internal vs. external control of reinforcment contingencies. It was

TABLE 3.8.--Age of Child.

Child	Total		Day Care Centers					
	% 101	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Age[a]								
Under 36 mos.	15	38	9	6	8	7	7	1
36-47 mos.	42	106	18	13	11	23	24	17
48-59 mos.	34	86	17	9	20	13	14	13
60 mos. and over	10	25	6	8	7	1	0	3
Average age			45.9	48.0	48.7	43.6	44.2	47.6
Standard deviation			11.2	13.0	12.3	8.6	8.4	8.3
Minimum age			25.0	25.0	24.0	30.0	29.0	35.0
Maximum age			69.0	76.0	74.0	70.0	59.0	71.9

[a]Age as of January 1, 1973, two weeks prior to the start of the parent program.

TABLE 3.9.--Child's Ordinal Position in Family.

Child	Total		Day Care Centers					
	% 100	N (255)	1 (50)	2 (36)	3 (46)	4 (44)	5 (45)	6 (34)
Child's ordinal position								
1st	57	145	27	30	25	27	18	18
2nd	22	57	10	3	13	12	12	7
3rd	7	17	2	2	2	2	5	4
4th or younger	10	25	5	0	5	1	9	5
Undetermined	4	11	6	1	1	2	1	0
Average ordinal position of child			1.7	1.2	1.7	1.5	2.3	2.0
Standard deviation			1.2	.5	1.0	.8	1.5	1.3
Minimum position			1	1	1	1	1	1
Maximum position			7	3	5	5	7	6

developed by Jaffee (1959) from the "Powerlessness Scale" devised by Rotter and Seeman (1959) which measures an individual's feelings that he is not in control of his own life, that he cannot see any real pattern or meaning to the things that happen to him or to people in general, and that his life is "other-administered" rather than "self-administered."

This instrument consists of 25 statements which are presented in a Likert scale format. A sample item is:

SA MA MD SD 6. Much of what happens to me is probably a matter of chance and luck.

Reliabilities and validities for the original (Rotter and Seeman) instrument were constructed from a university student population. For this reason, and for applicability to a presumably less educated sample of mothers, the Jaffee adaptation was used in this study. This had been previously used in a 1971 study of mothers from varied social-economic backgrounds whose children attended a nursery school program or a public health clinic (Sims, 1971). Face validity for this instrument was ascertained for the sample of mothers by a panel of experts familiar with the day care center population. In the present study an internal reliability of .86 was achieved when the mother scores for the pre-test data were analyzed by the Hoyt method for internal consistency, although the Sims study had discarded five items (items 1, 4, 9, 17, 25) which were reported not "consistently strong in the inter-item correlation matrix."

The Brown IDS Self-Concept Referents Test

This instrument measures self-concept in young children. The test, according to Brown, is applicable to four- to six-year-old children (unpublished manuscript, 1966). It uses a photographic technique. The test attempts to measure the extent to which the child perceives himself, his mother and his peers as seeing him positively or negatively. The test seemed appropriate to use in the present study because of its conceptual framework congruent with a social psychological model of interaction which is the basis for the developing child's growth in self-concept.

The mother and child perceptions were most pertinent to this study, so these items were abstracted and administered. This condensation was also made in previous research (see Boger, Kuipers and Beery, 1969; Boger and Andrews, 1975).

Brown indicates (unpublished manuscript, 1966) that this test minimizes the extent to which psychological interpretation must be imposed on obtained responses, maximizes comparability of responses among children, as well as tests directly the stability of responses over a specified period of time.

There are little data concerning developmental trends in the young child's emerging self-image. It was reasoned that the Brown self-concept measure would provide information about the child's growing ability to make differentiated judgments about him/herself and the family. The recent notice of a curvilinear relationship paralleling developmental changes in the meaning of

the scale (e.g., lack of comprehension versus emerging differentiation both leading to an indeterminate response as suggested by Shipman and Gilbert, 1972, p. 48) suggests that a control for age of child be used with this scale. Nevertheless, Boger and Andrews (1975, pp. 155-156) did not find that age was a significant predictor of self-concept.

Shipman and Gilbert report additional scale properties of the Brown Test in their 1972 technical report. They note that factor analysis of the child test data reveals a factor defined by the self-concept score which correlates .25 with the factor representing general information-processing skills, suggesting the measure has a cognitive task component. The self-concept factor also correlated .22 with a general abilities factor and .30 with a measure of achievement motivation, including feelings of competence as a learner (Shipman and Gilbert, 1972, pp. 50, 51).

Other researchers using the Brown test report that test-retest reliability over three weeks for a sample of 38 four-year-old lower class black subjects and 38 white middle class subjects of the same age was .76 for the white Ss and .71 for the black Ss for the self-referent responses (Brown, unpublished manuscript, 1966). The scale achieved an internal reliability of .81 for mother scores and .76 for child scores when the Brown pre-tests in the present sample were analyzed by the Hoyt measure of internal consistency on a sample of 174 children.

In the present study the structured test was administered in a special room at each day care center; test administration took approximately 10 minutes.

Hess and Shipman Toy Sort Task

The Hess and Shipman Toy Sort Task measures the quality of mother-child (or parent-child) interaction. It essentially involves a semi-structured teaching situation in which the parent teaches the child to sort materials on the basis of color and object. This interaction task evolved from a research project at the University of Chicago early Education Research Center studying differences in material teaching styles related to children's learning (Hess et al., 1968, 1969). Using variables generated from this measure, the Hess et al. research defined behaviors of the effective and less effective mother-teacher, and of the achieving and less achieving child. A theoretical discussion of these variables was provided in the Review of the Literature section of the present research. The pertinent mother variables which indicate teaching effectiveness are orientation, verbal commands, requests for verbal feedback, positive reinforcement, total reinforcement, reference to specific attributes and affectionateness. The significant child variables which relate to child achievement are ability to categorize with verbal rationales, verbal score, cooperation and noncompliant responses.

In the present study mothers and children were brought into a special room in the local day care center where each mother was to teach the same educational game to her child. The teaching situations were structured so that the same information was to be conveyed to the child in each case, while the mother was free to use any techniques she desired to convey it. The session usually

lasted from 10 to 30 minutes. The interaction was audiotaped for later analysis.

The Toy Sort Task has been standardized on four-year-old children with their mothers on a sample of 82 boys and 81 girls (Boger, Kuipers and Beery, 1969). Inter-rater reliability of 85 percent was reached in the present study.

The Educational Survey Instrument

This survey instrument measures educational attitudes of the mother. The 11 question instrument was adapted from a longer instrument used in a home interview in connection with the Hess and Shipman research concerning the cognitive development of black urban preschool children in the 1960s. The shorter version of the present study was prepared for self-administration. It contains three questions about the mother's educational level completed and related aspirations for her own terminal education. There are two factual questions asked about the youngest child in the day care center (so that all mothers will be asked for data on the child participating in the present study). The mother is asked about her aspirations and expectancies for this child's future education, a question about relative power to help the child in educational problems, and she is asked to list those things which she is currently doing in the home to help this child prepare for future schooling. The instrument has not been standardized and was chosen for use in the present study because of face validity.

The PTT Parent Information Form

This instrument records general demographic information about the mother, child and family. It was routinely completed by project staff from the day care center records prior to the parent program's initiation. Some attempts were made to obtain further information from a personal contact with the day care mother.

From the preceding six instruments and from the attendance records and treatment conditions are developed the variables of interest in this study. These variables are presented in the subsequent section.

The Variables

The variables of interest in this study are presented in the following groupings: (1) locus of control expectancy of the mother, measured by the Felt Powerlessness Scale; (2) teacher effectiveness of the mother, demonstrated in the Hess and Shipman Toy Sort Task in interaction with the child; (3) home activity of the mother to prepare the child for school, measured in the Education Survey; (4) the mother's aspirations and expectancies for the child, measured in the Education Survey; (5) status indicators of the mother, reported in the Parent Information Form; (6) achievement of the child, demonstrated in the Hess and Shipman Toy Sort Task in interaction with the mother; (7) self-esteem of the child, measured by the Brown IDS Self-Concept Referents Test; (8) additional child characteristics (age, sex, ordinal position) obtained from the

Parent Information Form; (9) attendance of the mother at the Parents Are Teachers Too Program; and (10) the treatment conditions under which the parent program was offered.

These major variables have been theoretically discussed in the Review of the Literature chapter relating to the specific research questions. They will now be defined operationally, and presented in the indicated order.

Locus of Control Expectancy

The generalized expectancy for internal or external control of reinforcement contingencies is measured by the score on the Felt Powerlessness Scale. Scores are adjusted so that they are measured as the subject's average score for all answered items. The scores range from 1.0000 to 4.0000, with lower scores indicating a low sense of powerlessness (internal control) and higher scores indicating a high sense of powerlessness (external control).

Teacher Effectiveness of the Mother

The teacher effectiveness indicators for the mother are obtained from the Hess and Shipman Toy Sort Task in interaction with the child. These behaviors and attitudes have been implicated as characteristics of effective mother-teachers from the Hess et al. study (1968, 1969) and were reviewed in the literature. The nine variables are now presented in operational form.

Orientation.--This is the total time in seconds devoted to orienting the child to the task. This is composed of time in

general orientation and time in specific orientation. General orientation is defined in terms of any statements made by the mother prior to the beginning of the task that were not task-oriented.

Example: "What have you been doing today?"
"Come over here."

Orientation to sorting is defined as the presence or absence of statements that items are sorted for specific reasons.

Example: "Why does that go there?"
"These go there because . . . ."

Total references to color.--This is defined as a frequency count of the total references made by the mother to the color attributes (total references to red, yellow or blue).

Total references to object.--This is defined as a frequency count of the total references made by the mother to the object attributes (total references to car, chair or spoon).

Total references to specific attributes.--This is defined as the total frequency count of references made to color and object.

Positive reinforcement.--This is defined as the verbal positive reinforcement total divided by the sum of verbal positive reinforcement plus verbal negative reinforcement and expressed as a percent. Verbal positive reinforcement is an affirmative reply to child feedback. Verbal negative reinforcement is a reply to the child in which the mother says the child response was incorrect.

The negative reinforcement may be a statement of fact, of blame or a criticism. It is always task-specific.

Verbal commands.--This is defined as verbal commands divided by the sum of verbal plus physical commands and expressed as a percent. Verbal commands are those in which the child is asked to respond verbally. A statement beginning "Tell me . . ." is generally in this class. The content may range from a simple request for affirmation of understanding to specific requests for information about objects.

Example: "Tell me what color that car is."

A physical command is a request that the child do something physical such as placing a car in a certain space.

Requests for verbal feedback.--This is defined as commands plus questions verbal divided by commands plus questions physical and expressed as a percent. Verbal commands and physical commands were defined in the previous variable. A verbal question is a simple request that the child respond verbally. It is differentiated from a verbal command in that the child has an option in his reply.

Example: "Can you tell me where to put it?"

A question physical is a simple request that the child do something physical. It is differentiated from a command physical in that the child has an option in response. An example of a question physical is, "Would you give me the blue car?"

Total reinforcement.--This is defined as the total frequency of verbal positive plus verbal negative reinforcement divided by the total of all maternal output. Maternal output includes verbal positive reinforcement, verbal negative reinforcement, verbal positive evaluation, verbal negative evaluation, commands physical, commands verbal, questions physical and questions verbal. This is then expressed as a percent. The components of this variable which have not yet been defined in previous variable definitions are verbal positive and verbal negative evaluation. A verbal positive evaluation is defined as a general positive evaluation apart from a feedback message. A verbal negative evaluation is a general negative evaluation apart from a feedback message.

Affectionateness.--This rating measures the mother's general affective reaction to the child during the interaction task. The scale is adapted from the Affectionateness Scale of the Fels Parent Behavior Rating Scales. Mothers are rated on a five-point scale, with low score indicating most affectionate and high score least affectionate.

Home Activity of the Mother to Prepare the Child for School

This variable is grossly comparable to "availability and use of home resources" studied in the Hess and Shipman study, and a very useful predictor of child achievement. It is considered that mothers who report more activity are the mothers who are the more effective teachers. The variable in the present study is

operationally defined as the total number of responses to the question on the Educational Survey: "Are there any particular things that you are doing with your child (youngest child attending the day care center) that you think may help him when he gets to school?"

Realistic Maternal Aspirations

This variable has been implicated in the Hess et al. (1968, 1969) study as a status indicator; i.e., the discrepancy between aspirations and expectancies was least for middle class mothers and most for working class mothers. The variable is used in an exploratory sense in this study--with a greater discrepancy expected to correlate with greater felt powerlessness.

The variable is operationally defined as the absolute value of the difference between the aspirations and expectancies for the child recorded on a 9-item scale ranging from "finish elementary school" to "finish graduate school," as reported in the Education Survey.

Status Indicators of the Mother

These variables are used to stratify groups in order to compare patterns of predictors for the mother's locus of control. The information was obtained from the Parent Information Form. The six status indicators are the following:

ADC status.--Mothers are categorized as ADC recipients or nonrecipients.

Marital status.--Mothers are categorized according to four possible categories (married, spouse present; divorced, separated or widowed; single, never married; and no spouse present (no further information).

Racial group.--Mothers are categorized according to nine possible ethnic groups.

Employment status.--Mothers are categorized according to amount of current employment on a four-point scale from not working to working full time.

Terminal education.--Mothers are categorized on a seven-point scale according to the reported terminal education ranging from eighth grade or less to beyond college.

Student status.--Mothers are categorized as students or nonstudents.

Achievement of the Child

The achievement indicators for the child are obtained from the Hess and Shipman Toy Sort Task in interaction with the mother. These behaviors and attitudes have been implicated as characteristics of effective learners from the Hess et al. study (1968, 1969) and were reviewed in the literature. The six variables are now presented in operational form.

Object sort score.--This is an ordered score ranging from 0 (which indicates the child cannot physically sort into three piles

on the basis of classes of objects (car, chair, spoon) to 3 (which indicates the child can sort and fully explain by naming all three groups).

Color sort score.--This is an ordered score ranging from 0 (which indicates that the child cannot physically sort into three piles on the basis of color--red, yellow, blue) to 3 (which indicates the child can sort and fully explain by naming all three groups).

Total sort score.--This is a composite score formed by adding the object sort score of the child to the color sort score forming a total sort score.

Verbal score.--This is defined as the sum of verbal correct statements divided by the sum of verbal correct plus verbal incorrect responses, and expressed as a percent. Verbal correct statements are those in which the child demonstrates that he/she understands the situation. Verbal incorrect statements are those in which the child indicates he/she does not understand what is going on.

Child cooperation.--This rating measures the most typical character of the cooperation shown by the child in interaction with the mother. It is rated on an ordinal scale with low score (1) most cooperative and high score (5) least cooperative.

Noncompliance.--This variable is defined as the absolute frequency of occurrence of unintelligible or no compliance responses from the child. It is expected to be inversely related to child achievement on the theoretical basis of its significance in relationship to other measures of child achievement as indicated by correlations of Sigel scorable responses in the Hess et al. study (1968, 1969, Vol. II, p. 221).

Self-Esteem of the Child

This vairable is measured as the child's score on the Brown IDS Self Concept Referents Test. It is the sum of scores on the self-referent and on the mother-referent adjusted for total number of responses.

This variable has been theoretically discussed in the introductory chapter and is now expressed in operational form.

Additional Child Characteristics

The following characteristics are considered potentially related to the mother's locus of control, and are considered in an exploratory manner in the study. The three characteristics are now given.

Sex of child.--This is defined on the Parent Information Form.

Age of child.--This is defined as age of child as of January 1, 1973, two weeks prior to the initiation of the parent program at the day care centers. It is expressed in months.

Ordinal position of child.--This is defined as recorded on the Parent Information Form.

Attendance of the Mother at the Parents Are Teachers Too Program

This is the attendance of the mother at the 12 weekly programs as measured by regular records taken by staff members.

The Treatment Conditions Under Which the Parent Program Was Offered

Assignment of day care centers to treatment 1 ($5/meeting), to treatment 2 (babysitting and transportation/meeting) or to treatment 3 (no financial incentive/meeting). Centers were randomly assigned to one of three treatments, resulting in two centers/treatment.

Procedures

The procedures followered were made in conjunction with the larger study by Boger et al. (1974) and can be presented in terms of data collection and management and procedures for implementation of treatments.

Data Collection and Management

Data was collected over an approximate two-month period. Mothers were asked to give written consent for themselves and for their children for particpation in the research. Mothers who agreed to participate and were subsequently available on test days were administered the Hess and Shipman Toy Sort Task in interaction with the child. The Hess-Shipman and Brown tests were chiefly

administered by two white male graduate students in Family and Child Sciences who had achieved satisfactory inter-tester reliability in pre-testing sessions. At least five separate testing days lasting through early evening were held at each day care center to enable working mothers to participate. In a few isolated cases the examiners went to the homes of mothers who could not get to the centers and there administered the Hess-Shipman Toy Sort Task.

Ordinarily the Brown test was administered to the child on the same day as the Hess-Shipman test. The mothers were given the "Attitude Survey" (Felt Powerlessness Scale) and the Education Survey and were asked to fill these out at home and return them to the day care center. The Parent Information Forms were completed at the day care center from existing center records. In a few instances further information was obtained from participating mothers.

Table 3.10 summarizes data collection for type of variable, person measured, instrumental source and time of data collection. It should be indicated that not all mothers and children cooperated with the research, and undoubtedly a selection bias was introduced for this reason. The summary which follows the table indicates the percent of persons who were available and cooperated with testing, the percent who outright refused to be tested, and the percent who did not respond to requests to participate or who were unavailable after at least two attempts to secure their cooperation.

TABLE 3.10.--Measurement of Variables of Interest from Six Instrumental Sources.

Variable	Measured on[a]	Instrumental Source	Time(s) of Data Collection
Generalized expectancy for internal vs. external control of reinforcement	M	"Felt Powerlessness" (adapted by Jaffee, 1959, from Rotter and Seeman, 1959)	pre-, post-PTT Program
Child self-esteem	C	Brown IDS Self Concept Referents Test (1966)	pre-
Maternal educational behaviors, aspirations and expectancies for child	M	Educational Survey (adapted from Hess and Shipman, 1966)	pre-
Attendance at weekly parent program (PTT) sessions	M	Staff records	Concurrent
Maternal teaching behaviors in semi-structured task with child	M	Hess and Shipman Toy Sort Task (1966)	pre-
Child achievment behaviors in semi-structured learning task with mother	C	Hess and Shipman Toy Sort Task (1966)	pre-
Demographic characteristics	M-C	Parent Information Form	pre-

[a]M = Mother; C = Child.

Instrument	% Tested	% Refused	% No Response	Total %
Felt Powerlessness Scale (pre-test)	69	8	23	100
Felt Powerlessness Scale (post-test)	58	13	29	100
Hess-Shipman Toy Sort	75	9	16	100
Education Survey	70	8	22	100
Brown Test	83	12	5	100

Implementation of Treatments

After the sample selection process, two day care centers were randomly assigned to each incentive condition. Six day care centers were involved, with two centers receiving each incentive for attendance at the parent program, Parents Are Teachers Too (PTT). The parent program consisted of 12 weekly two-hour sessions devoted to a model of the parent-as-change-agent. This model involved a home language intervention program in which parents (in the present study only mothers) worked with the day care child using curriculum materials developed in teacher-directed group sessions held at the day care center. The theoretical conceptualization of the parent-as-change-agent model and a sample of lesson objectives are given in Appendix C.

As indicated, the parent program was presented at each day care center. Reinforcements for attendance at each center were systematically varied in the following manner. Two centers were randomly assigned to present the program with an incentive of five

dollars per meeting. Two centers were randomly assigned the incentive of babysitting and transportation for attendance, and two centers were randomly assigned the program with no additional incentives.

The teachers at each day care center were regular personnel. They were trained identically to present the PTT Program by two child care professionals from the Institute for Family and Child Study. The programs ran concurrently and lasted 12 weeks. In addition, approximately two months were used in pre-testing and another two months in post-testing.

Analyses

The Hess and Shipman Toy Sort Task child responses were partly pre-coded at the time of test administration, but the teaching sessions were audiotaped for later rating and coding. The rating was made by graduate students in Family and Child Sciences after sufficient inter-rater reliability was achieved. All instruments were coded by three trained college-level students. The data from all instruments were keypunched and verified. Data were edited by observation of the allowed maximum and minimum for coded data and specified inconsistencies were checked. All derived variables were formed by computer and descriptive statistics were examined prior to the data analysis phase. Further information about the multiple linear regression is given in Appendix D.

Analysis for Phase 1

The purpose of the analysis is to predict the mother's locus of control from other mother and child variables. It is desirable to examine several predictor variables together in the consideration that their joint effect will provide a more accurate prediction of the criterion variable. In addition, the strategy provides statistical control for confounding factors.

Multiple regression methods are used to predict a criterion or dependent variable conceptually continuous and expressed at an interval level. Relationships among predictors, also measured at the interval level, are taken into account by determining the effect of each predictor with the effects of others partialed out and by determining the weights which maximize prediction from a linear combination of predictor variables.

The general form of an unstandardized linear regression equation is:

$$Y' = A + B_1X_1 + B_2X_2 + \cdots B_kX_k$$

where Y' represents the estimated value of the criterion variable Y, A is the Y intercept, and the B_i are partial regression coefficients. B_1 expresses the effect of X_1 on Y' when X_2, ..., X_k are held constant. The B_1 is the expected change in Y with a change of one unit in X_1 when other X_i are held constant.

In the process of regression, the A (if not = 0) and B_i coefficients are selected in such a way that the sum of squared residuals is minimized. Selection of the optimum coefficients

using the least squares criteria implies also that the correlation between the actual Y value and the Y' estimated value is maximized.

The process of multiple regression.--Stepwise multiple regression implements selection analyses which determine the "best" set of predictor variables for a linear regression model. The researcher may have several options for arriving at the predicting equation in a computer program. These include (1) Forward inclusion: The process starts at point zero with no predictor variables yet in an equation. Independent variables are entered one by one, according to their contribution to accounting for the proportion of variance of the criterion variable. (2) Backward elimination: The process starts with all predictor variables initially included, and the predictors are eliminated one by one, deleting those variables which contribute least to account for the variance of the dependent or criterion variable. (3) A combinatorial solution: All possible combinations of predictor variables are examined. (4) Hierarchical solution: The predictor variables are entered into the regression equation in the order set by the researcher.

For the present analyses the hierarchical and combinatorial methods were not used because there was no appropriate theoretical basis either for ordering a hierarchy or for choosing one of many possible combinations of variables over another. The forward algorithm was chosen over the backward one because it produces a parsimony of choice of variables.

The stepwise multiple procedure chosen was the SELECT program from the MIDAS system (Fox and Guire, Statistical Research Laboratory at the University of Michigan, 1973). The forward algorithm was used in which the predetermined significance level for inclusion is .05 and for deletion, .10. In addition, all regressions were constrained to go through the origin as a statistical constraint corresponding to the tendency for the criterion variable to decrease to a theoretical zero point (for further discussion of regression through the origin see, for example, Smilie, An Introduction to Regression and Correlation, 1966, pp. 26-29). For each analysis, cases with data missing for any variable are deleted from that regression.

Assumptions and limitations of multiple regression.--The regression statistics assume additivity or a model which does not contain interaction terms; that for any x, the distribution of y is normal; and that the variance of the distribution of y is the same for any chosen value of x. In addition, it is assumed that a linear model will yield a close enough approximation to the true form of the equation.

From other studies it is known that the criterion variable, locus of control expectancy, can be assumed to have a normal, though leptokurtic, distribution. (This was confirmed for the present sample from plotting pre-test scores.) The small expected variance in a leptokurtic distribution makes the assumption of homoscedasticity appropriate.

The assumption of additivity is the most tenuous one and an assumed limitation of this analysis is that the fit of the regression equation will not be as good as it could be if interactions between the independent variables were taken into account. The large number of interaction terms that would be required to test for all interactions in an equation with an average of 13 predictor variables made the adjustment for interactions too lengthy for present consideration.

Analysis for Phase 2

The purpose of analysis is to examine the effect of interactions between factors as well as the main effects upon the dependent variables. The analyses of variance and covariance, respectively, were chosen as appropriate statistical models. The .05 level of significance was chosen for the overall analyses and also for post hoc analyses, two-tailed. The factors in the design for Hypothesis 3 were treatments and locus of control. For the purpose of analysis, the locus of control scores were divided at the median to form two levels of control, although locus of control is conceptually a continuous variable measured at the interval level.

In this design locus of control is considered a fixed factor because the included levels are the only relevant ones. The treatment factor with its three types of incentives is also considered a fixed effect because the levels provide reasonable coverage of appropriate types of incentives for attendance at the parent program.

The dependent variable, attendance, is measured as the percent of attendance within the group.

The analysis of variance with covariance adjustment design for Hypothesis 4 is also a fixed effects model as both levels of attendance are included in the attendance factor. The treatment factor is again fixed. The dependent variable, post-Felt Powerlessness score, is measured at the interval level. Interest in adjusting for the effects of the metric variable, pre-Felt Powerlessness score, led to its inclusion as a covariate. The model used in both analyses of variance is the classical experimental model which considers interactions first and then main effects. The analysis of covariance model first makes a covariate adjustment on the dependent variable prior to assessing interactions and main effects. The computer programs used are the FINN and SPSS programs and the analyses were implemented on the CDC 6500 computer at Michigan State University.

Assumptions and limitations of analysis of variance.--The assumptions for the analysis of variance and covariance are normality, independent random samples, and equal population variance. The analysis of covariance requires an additional assumption of no interaction between nonmetric factors and the metric covariate. By combining cases across both centers within a single treatment it was assumed to produce a sufficiently large cell size to substantiate the assumption of normality.

Although transformation to another scale could have been made on the dependent variable for the assumption of homoscedasticity, this was not done because such a transformation, e.g., transformation to the natural logarithmic scale, would also decrease the possibility of two-way interactions which are of prime interest in each analysis. The assumption of independent random samples was considered sufficiently appropriate because of the sampling procedure and subsequent random assignment to treatments.

CHAPTER IV

THE RESULTS

Overview

The two hypotheses of Phase 1 are addressed in a series of 16 multiple regressions listed in Figure 4.1 with results in corresponding Tables 4.1-4.16. The regressions predict the mother's locus of control from mother and child variables. In each case it is possible to predict the mother's score on Felt Powerlessness (low score--internal locus of control; high score--external locus of control) from a linear weighted combination of two or more variables.

The general Hypothesis 1 is addressed in the first regression (Table 4.1) and examined in replications for subgroups of mothers as presented in Tables 4.5-4.16. The material prediction variables considered in the first regression are orientation, total references to color, total references to object, total references to specific attributes, positive reinforcement messages, verbal commands, requests for verbal feedback, total reinforcement messages, affectionateness, home activity of the mother to prepare the child for school, and realistic maternal aspirations for the child.

The predicting mother variables in the replications (Tables 4.5-4.16) were limited to these: affectionateness, positive

Table	Regression Name
4.1	Predicting mother's locus of control from other mother variables
4.2	Predicting mother's locus of control from child variables
4.3	Predicting mother's locus of control from child variables (child age 47 months or younger)
4.4	Predicting mother's locus of control from child variables (child age 48 months and older)
4.5	Predicting mother's locus of control from mother and child variables for ADC mothers
4.6	Predicting mother's locus of control from mother and child variables for non-ADC mothers
4.7	Predicting mother's locus of control from mother and child variables for married mothers
4.8	Predicting mother's locus of control from mother and child variables for single mothers
4.9	Predicting mother's locus of control from mother and child variables for Black mothers
4.10	Predicting mother's locus of control from mother and child variables for white mothers
4.11	Predicting mother's locus of control from mother and child variables for unemployed mothers
4.12	Predicting mother's locus of control from mother and child variables for employed mothers
4.13	Predicting mother's locus of control from mother and child variables for mothers who have completed high school
4.14	Predicting mother's locus of control from mother and child variables for mothers who have completed some college
4.15	Predicting mother's locus of control from mother and child variables for mothers who are not currently students
4.16	Predicting mother's locus of control from mother and child variables for mothers who are currently students

Figure 4.1.--List of Stepwise Multiple Regressions.

TABLE 4.1.--Summary of Multiple Regression Predicting Locus of Control from Other Mother (M) Variables.

Summary of the Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 77)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	1,098.2	.0000	.00384	.935	M-Affectionateness	
2	2	1,104.1	.0000	.01910	.967	M-Positive reinforcement	
3	3	809.82	.0000	.02850	.970	M-Total reinforcement	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
M-Positive reinforcement	.58811	.01320	.00211	6.2553	.0000
M-Total reinforcement	.31640	.01458	.00508	2.8692	.0054
M-Affectionateness	.70179	.63246	.07463	8.4744	.0000

TABLE 4.2.--Summary of Multiple Regression Predicting Locus of Control from Child (C) Variables.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with $\underline{k}$ Predictor Variables (N = 100)

Eq. No.	df ($\underline{k}$)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	1,254.2	.0000	.00010	.927	C-Self-esteem	
2	2	806.33	.0000	.00042	.943	C-Verbal score	
3	3	663.81	.0000	.00667	.954	C-Typical cooperation	
4	4	554.95	.0000	.04306	.958	C-Object sort score	
5	5	460.13	.0000	.03981	.960	C-Sex	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Self-esteem	.23174	.73770	.31771	2.3220	.0224
C-Typical cooperation	.46121	.37413	.07384	5.0664	.0000
C-Verbal score	.38219	.01162	.00288	4.0311	.0001
C-Object sort score	.32416	.14602	.04372	3.3399	.0012
C-Sex	.20832	.22976	.11068	2.0760	.0406

TABLE 4.3.--Summary of Multiple Regression Predicting Locus of Control from Child (C) Variables (Age 47 Months or Younger).

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 48)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Delted (Sig. > .10)
1	1	515.86	.0000	.00129	.916	C-Verbal score	
2	2	383.65	.0000	.01166	.943	C-Typical cooperation	
3	3	348.36	.0000	.14473	.959	C-Object sort score	
4	4	301.08	.0000	.16340	.965	C-Sex	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Typical cooperation	.61979	.40850	.07798	5.2387	.0000
C-Verbal score	.47745	.01186	.00329	3.6044	.0008
C-Object sort score	.51834	.23656	.05884	4.0206	.0002
C-Sex	.38231	.38275	.13946	2.7445	.0087

TABLE 4.4.--Summary of Multiple Regression Predicting Locus of Control from Child (C) Variables (Age 48 Months and Older).

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 52)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	912.06	.0000	.02892	.947	C-Self-esteem	
2	2	572.68	.0000	.06384	.958	C-Typical cooperation	
3	3	441.22	.0000	.03849	.964	C-Verbal score	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Self-esteem	.48645	1.5823	.40599	3.8973	.0003
C-Typical cooperation	.43442	.44005	.13034	3.3761	.0014
C-Verbal score	.38287	.01060	.00365	2.9012	.0056

TABLE 4.5.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for ADC Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with $\underline{k}$ Predictor Variables (N = 59)

Eq. No.	df ($\underline{k}$)	R-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	828.22	.0000	.03054	.934	C-Self-esteem	
2	2	486.07	.0000	.02352	.945	C-Age	
3	3	384.62	.0000	.05388	.954	M-Total references	
4	4	306.72	.0000	.06252	.957	M-Positive reinforcement	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Age	.31570	.01765	.00715	2.4675	.0167
C-Self-esteem	.36878	1.2253	.41643	2.9423	.0048
M-Positive reinforcement	.27027	.00738	.00354	2.0819	.0420
M-Total references specific attributes	.43464	.00656	.00188	3.5791	.0007

TABLE 4.6.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Non-ADC Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 45)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	1,043.3	.0000	.03170	.960	C-Verbal score	
2	2	841.94	.0000	.07488	.975	C-Typical cooperation	
3	3	661.80	.0000	.17588	.979	M-Positive reinforcement	
4	4	691.56	.0000	.26785	.985	M-Typical affectionateness	
5	3	900.81	.0000	.26628	.985		C-Verbal score
6	4	730.22	.0000	.31119	.986	M-Total references	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
M-Typical affection	.74454	.58219	.08152	7.1414	.0000
C-Typical cooperation	.31491	.16765	.07892	2.1245	.0397
M-Positive reinforcement	.84476	.01654	.00164	10.108	.0000
M-Total references attributes	.30898	.00203	.00098	2.0803	.0438

TABLE 4.7.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Married Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 52)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	828.65	.0000	.00208	.942	C-Verbal score	
2	2	659.27	.0000	.01895	.963	C-Typical cooperation	
3	3	474.50	.0000	.03766	.967	C-Object score	
4	4	380.00	.0000	.06683	.969	M-Positive reinforcement	
5	5	334.33	.0000	.07120	.973	M-Typ. affectionateness	
6	4	402.76	.0000	.04611	.971		C-Object score
7	3	518.04	.0000	.05074	.969		C-Verbal score
8	4	418.18	.0000	.08428	.972	M-Reinforcement	
9	5	370.80	.0000	.14828	.975	M-Total references	
10	4	464.18	.0000	.13759	.975		C-Typical cooperation

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistics	Significance
M-Typical affection	.68670	.56938	.08700	6.5446	.0000
M-Positive reinforcement	.58220	.01136	.00229	4.9611	.0000
M-Total references attributes	.42374	.00364	.00112	3.2411	.0022
M-Reinforcement	.40040	.01705	.00563	3.0273	.0040

TABLE 4.8.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Single Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 52)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	726.19	.0000	.00819	.934	C-Age	
2	2	447.32	.0000	.02061	.947	C-Self-Esteem	
3	3	343.59	.0000	.05489	.955	M-Pos. reinforcement	
4	4	297.14	.0000	.07268	.961	M-Total references	
5	5	271.11	.0000	.17670	.966	C-Object sort score	
6	4	326.39	.0000	.17540	.964		C-Age
7	5	280.33	.0000	.20871	.968	C-Typ. cooperation	
8	4	339.32	.0000	.19455	.966		M-Total references

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Typical cooperation	.45367	.33131	.09394	3.5270	.0009
C-Self-esteem	.40738	1.0898	.35264	3.0905	.0033
M-Positive reinforcement	.54955	.01326	.00291	4.5572	.0000
C-Object sort score	.42496	.19223	.05910	3.2525	.0021

TABLE 4.9.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Black Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 56)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	791.64	.0000	.00491	.935	C-Verbal score	
2	2	662.76	.0000	.08572	.961	C-Typical cooperation	
3	3	486.36	.0000	.14977	.965	C-Object sort score	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Typical cooperation	.60533	.42330	.07646	5.5364	.0000
C-Verbal score	.86235	.01994	.00161	12.400	.0000
C-Object sort score	.32337	.12543	.05042	2.4878	.0160

TABLE 4.10.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for White Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 42)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	890.34	.0000	.03520	.956	C-Age	
2	2	656.32	.0000	.08822	.970	C-Sex	
3	3	562.05	.0000	.09186	.977	M-Total references	
4	4	480.27	.0000	.11331	.981	M-Positive reinforcement	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Age	.68381	.03098	.00536	5.771	.0000
C-Sex	.33446	.30228	.13817	2.1877	.0349
M-Positive reinforcement	.37682	.00870	.00347	2.5077	.0165
M-Total references specific attributes	.52480	.00578	.00152	3.8005	.0005

TABLE 4.11.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Unemployed Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with $\underline{k}$ Predictor Variables (N = 26)

Eq. No.	df ($\underline{k}$)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	427.51	.0000	.11697	.945	C-Age	
2	2	303.96	.0000	.21289	.962	C-Typical Cooperation	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Age	.90688	.04000	.00379	10.543	.0000
C-Typical cooperation	.55908	.40401	.12230	3.3034	.0030

TABLE 4.12.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Employed Mothers.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 77)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	1,098.2	.0000	.00002	.935	C-Self-esteem	
2	2	838.30	.0000	.01833	.957	M-Pos. reinforcement	
3	3	726.68	.0000	.04947	.967	C-Typical cooperation	
4	4	594.62	.0000	.07798	.970	M-Total references	
5	5	508.53	.0000	.10387	.972	M-Reinforcement	
6	6	443.13	.0000	.09672	.974	M-Typical affect	
7	5	525.44	.0000	.08464	.973		C-Typical cooperation

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
M-Typical affect	.33666	.27763	.09151	3.0337	.0034
C-Self-esteem	.24886	.66497	.30501	2.1802	.0325
M-Positive reinforcement	.59803	.01425	.00225	6.3315	.0000
M-Total references	.40617	.00397	.00105	3.7716	.0003
M-Reinforcement	.31802	.01481	.00520	2.8462	.0058

TABLE 4.13.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Mothers Who Have Completed High School.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with $\underline{k}$ Predictor Variables (N = 36)

Eq. No.	df ($\underline{k}$)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	571.98	.0000	.01394	.942	C-Verbal score	
2	2	430.66	.0000	.03936	.962	C-Typical cooperation	
3	3	325.97	.0000	.09020	.967	M-Reinforcement	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Typical cooperation	.57963	.51296	.12554	4.0861	.0003
M-Reinforcement	.37470	.02135	.00920	2.3216	.0266
C-Verbal score	.62136	.01586	.00348	4.5556	.0001

TABLE 4.14.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Mothers Who Have Completed Some College.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 24)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	462.91	.0000	.04094	.953	C-Age	
2	2	398.65	.0000	.01388	.973	M-Total references	
3	3	374.51	.0000	.11810	.981	M-Reinforcement	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Age	.88963	.04144	.00464	8.9268	.0000
M-Total references specific attributes	.66393	.00703	.00173	4.0686	.0006
M-Reinforcement	.56276	.02118	.00679	3.1198	.0052

TABLE 4.15.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Mothers Who Are Not Currently Students.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with k Predictor Variables (N = 73)

Eq. No.	df (k)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	1,239.4	.0000	.02719	.945	C-Age	
2	2	793.29	.0000	.04362	.957	C-Typical cooperation	
3	3	726.28	.0000	.13563	.969	M-Pos. reinforcement	
4	4	586.25	.0000	.17804	.971	C-Object sort score	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Age	.47031	.02031	.00459	4.4268	.0000
C-Typical cooperation	.57803	.44699	.07597	5.8840	.0000
M-Positive reinforcement	.53181	.01150	.00220	5.2164	.0000
C-Object sort score	.28588	.10390	.04193	2.4781	.0157

TABLE 4.16.--Summary of Multiple Regression Predicting Locus of Control from Mother (M) and Child (C) Variables for Mothers Who Are Currently Students.

Summary of Analyses of Variance of Regression Coefficients for the Regression Equation with $\underline{k}$ Predictor Variables (N = 30)

Eq. No.	df ($\underline{k}$)	F-Ratio	P <	Squared Correlation Between Observed & Predicted Values of Felt Powerlessness	Explained Variance Due to Regression (R^2)	Variable Entered (Sig. < .05)	Variable Deleted (Sig. > .10)
1	1	444.45	.0000	.01043	.939	C-Self-esteem	
2	2	330.93	.0000	.18033	.959	C-Object sort score	
3	3	249.11	.0000	.26494	.965	M-Total references specific attributes	
4	4	232.75	.0000	.27773	.973	C-Age	

Summary Statistics for Included Variables in Final Equation

Variable	Partial Correlation	Regression Coefficient	Std. Error	T-Statistic	Significance
C-Age	.46993	.02059	.00758	2.7146	.0116
C-Self-esteem	.43053	1.1794	.48490	2.4322	.0222
M-Total references	.51978	.00722	.00233	3.1024	.0046
C-Object sort score	.52817	.26111	.08233	3.1717	.0039

reinforcement messages, total references to specific attributes, total reinforcement messages and verbal commands.

The general Hypothesis 2 is addressed in the second, third and fourth regressions (Tables 4.2, 4.3, 4.4) and examined in the replications along with mother variables as presented in Tables 4.5 to 4.16. The second through fourth regressions examined these child variables in connection with the mother's locus of control: object sort score, color sort score, total sort score, verbal score, cooperation, noncompliance responses, self-esteem of the child, sex, age and ordinal position. The predicting child variables in the replications (Tables 4.5 to 4.16) were limited to these: self-esteem, age, cooperation, sex, verbal score and object sort score. Additional technical information about the types of data presented in each table is given in Appendix D.

Hypothesis 1: Mother's Locus of Control and Her Other Concurrent Behaviors, Attitudes and Characteristics

Hypothesis 1a

This hypothesis states that there is no relationship between the mother's locus of control and her teaching behaviors demonstrated in interaction with her youngest child attending the day care center as evidenced in the Hess-Shipman Toy Sort Task. The results of multiple regression analyses shown in Tables 4.1, 4.5-4.8, 4.10, 4.12-4.16 reveal that several variables indicative of teaching effectiveness are significantly related to the mother's locus of control. Therefore, Hypothesis 1a is rejected.

Typical affectionateness rating of mother.--As predicted, mothers with more warm general affect were also more internal, and those tending towards hostility were more external. This result was found when mother characteristics were examined separately for all mothers (Table 4.1). It was also found for specific subgroups of mothers when both mother and child characteristics were examined together as possible predictors of locus of control (Tables 4.6, 4.7, 4.12). This variable contributes most to the reduction of unexplained variation for non-ADC mothers (55%) and for married mothers (47%). The variable achieved significance in the initial regression which included 13 mother variables. It was retained for analyses with specified subgroups of mothers.

Reinforcement messages, total reference to specific attributes and positive reinforcement messages.--These three variables achieved a significant prediction of locus of control, but in the direction opposite to that which was predicted. That is, higher scores on these variables which are considered signs of the more effective teacher are related to external control rather than to internal control. Reinforcement messages accounts for between 10% and 32% of the proportionate increase in explained variation due to its presence in a regression when it is significant. It explains the most for mothers who have completed some college. In decreasing order, it is important for married mothers, for mothers who have completed high school, for employed mothers, and for all mothers when only mother variables are considered. Since this variable had

achieved significance in the initial regression it was retained for consideration in subsequent analyses.

Total reference to specific attributes accounts for between 10% and 44% of the proportionate increase in explained variation when it is significant. It explains the most variation for mothers who have attended some college. Then, in decreasing order, it is important for white mothers, for student mothers, for ADC mothers, for married mothers, for employed mothers, and for non-ADC mothers.

Although this variable had not achieved significance in the initial regression, it was considered theoretically important and retained for subsequent analyses.

Percent of positive to all reinforcement messages contributes to between 7% and 71% of the proportionate increase in explained variation. It explains the 71% for non-ADC mothers. In decreasing order it is important for employed mothers, married mothers, all mothers, single mothers, nonstudent mothers, white mothers, and ADC mothers. It is more important for non-ADC mothers than for ADC mothers, and slightly more important for married mothers than single ones. This variable had achieved significance in the initial regression and was then retained for further analyses.

Verbal commands.--Although this variable had not achieved significance in the initial regression, it was considered theoretically important and retained for subsequent analyses. It was not significant in any of these further analyses.

Orientation, requests for verbal feedback, total references to color and total references to object.--These variables were not significant in the first regression and were not included in subsequent analyses. When descriptive statistics on these were examined (Table 4.17), there was a mean of only 15 seconds devoted to orientation to task, and the maximum time was only 95 seconds. Consequently, this variable was considered inconsequential and dropped from further analysis. Total references to color and to object were dropped as separate variables, and the composite variable, total references to attributes, was retained. Requests for verbal feedback was dropped from analysis because it did not show significance and because it was significantly ($P \leq .001$) related to another variable retained, verbal commands.

Hypothesis 1b

This hypothesis states that there is no relationship between the mother's locus of control and her number of activities in the home which are reported engaged in to prepare the (youngest) day care child for school. The results of the multiple regression analysis in which all mother variables are considered as potential predictors of the mother's locus of control reveal that the variable, number of activities in the home which are reported engaged in to prepare the child for school, was not significantly related to locus of control at the termination of the regression algorithm. Therefore, Hypothesis 1b was not rejected.

TABLE 4.17.--Descriptive Measures of Variables Used in Regression Analyses.

Variable	N	Minimum	Maximum	Mean	Std. Dev.
M-Locus of control	165	1.00000	3.720	2.78940	.48794
M-Orientation to task (secs.)	165	0.00000	95.000	15.15200	21.18800
M-Total references to color	165	0.00000	145.000	21.20000	27.54800
M-Total references to object	165	0.00000	246.000	23.79400	28.65100
M-Total reference to specific attributes	165	0.00000	371.000	44.99400	51.03900
M-Positive reinforcement	161	0.00000	100.000	77.75100	22.66900
M-Verbal commands	164	0.00000	100.000	5.95870	15.60800
M-Requests for verbal feedback	165	0.00000	100.000	42.86400	23.46100
M-Reinforcement messages	165	0.00000	60.000	28.58200	11.59500
M-Typical affectionateness	165	1.00000	4.000	2.20000	.56525
M-Realistic aspirations for child	154	0.00000	7.000	1.24030	1.31880
M-Home activity to prepare child for school	110	1.00000	10.000	3.40910	1.95500
C-Self-esteem	188	.21429	1.000	.78848	.17662
C-Noncompliance responses	165	0.00000	22.000	1.76970	3.51930
C-Typical cooperation	165	1.00000	4.000	1.50300	.78573
C-Verbal Score	153	16.66700	100.000	82.54900	18.84400
C-Object sort score	178	0.00000	3.000	2.02250	1.31890
C-Color sort score	179	0.00000	3.000	1.63130	1.32320
C-Total sort score	178	0.00000	6.000	3.66290	1.97120
C-Age	255	24.00000	76.000	46.22000	10.59400
C-Sex	255	1.00000	2.000	1.54510	.49894
C-Ordinal position	244	1.00000	7.000	1.74590	1.18330

Hypothesis 1c

This hypothesis states that there is no relationship between the mother's locus of control and the realistic aspirations (aspirations of the same level as expectancies) for the young day care child's education. The results of the multiple regression analysis in which all mother variables are considered as potential predictors of the mother's locus of control reveals that the variable, mother's realistic aspirations for the child, was not significantly related to locus of control at the termination of the regression algorithm. Therefore, Hypothesis 1c was not rejected.

Hypothesis 2: Mother's Locus of Control and Child's Achievement, Self-Esteem, Age, Sex and Ordinal Position

Hypothesis 2a

This hypothesis states that there is no relationship between the mother's locus of control and the self-esteem of the child. The results of multiple regression analyses shown in Tables 4.2, 4.4, 4.5, 4.8, 4.12 and 4.16 reveal that self-esteem is significantly related to the mother's locus of control. Therefore, Hypothesis 2a is rejected. However, the results are in the direction opposite to what was predicted. That is, mothers with higher powerlessness had children with more positive self-concept. This result was found when child characteristics were examined for all children and for older children (Tables 4.2, 4.4). It was also found for specific subgroups of mothers when both mother and child characteristics were examined together as possible predictors of locus of control. The

proportional increment of this variable to the variation unexplained by other predictor variables indicates that the effect appears to be greatest in the subgroup of older children. In decreasing order it is important for student mothers, single mothers, ADC mothers, employed mothers, and for the subgroup of all children. The variable of self-esteem was significant in the initial regressions with other child variables. It was retained for analyses with specified subgroups of mothers.

Hypothesis 2b

This hypothesis states that there is no relationship between the mother's locus of control and the achievement behaviors of the child in interaction with the mother. The results of multiple regression analyses shown in Tables 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.15, and 4.16 reveal that several variables indicative of learning achievement are significantly related to the mother's locus of control. Therefore, Hypothesis 2b is rejected.

Typical child cooperation.--As predicted by theory, children with lower cooperation (higher scores) ratings tended to have mothers with higher scores on Felt Powerlessness, which indicates higher external control. This result was evidenced in the regressions involving child variables (Tables 4.2, 4.3, 4.4) and for specific subgroups of mothers when both mother and child characteristics were examined together as possible predictors of locus of control (Tables 4.6, 4.8, 4.9, 4.11, 4.13, 4.15).

This variable appears to contribute most to the reduction of unexplained variation in the regression equations for the subgroups of mothers with younger children and for Black mothers. In further decreasing order it is important for regressions involving high school educated mothers, nonstudent mothers, unemployed mothers, single mothers, all children, older children, and for non-ADC mothers.

In the analysis of employed mothers considered as a subgroup, the variable was entered into the regression equation at step three, but was subsequently deleted when the variable, typical affectionateness, entered the equation. At that point its significance dropped to the level for deletion. In the separate analysis for married mothers, the variable was entered into the regression equation at step two, but was deleted at step ten when the addition of the mother variable, total references to specific attributes, was completed.

Verbal score and object sort score of child.--These two variables were significant predictors of locus of control, but in the opposite sense to that which was expected. That is, higher scores on these variables which are considered signs of learning achievement in the child are related to external control rather than to internal control.

Verbal score is most important in reducing the unexplained variance in locus of control for the subgroups of Black mothers and for mothers who have completed high school. It is also important in the analyses involving only child variables as predictors.

In the analysis of non-ADC mothers, the variable was entered into the regression analysis at step one, but subsequently deleted at step five following the addition of the mother variable, typical affectionateness rating. This same process happens in the regression for married mothers when affectionateness of the mother enters the equation (Tables 4.6, 4.7).

The object sort score was significant in the regression equation for all children and for younger children, but not for older children considered separately. It reduces the unexplained variance in locus of control for student mothers (28%) and nonstudent mothers (8%), single mothers (18%) and for Black mothers (10%). The variable was deleted in the regression for married mothers (Table 4.7) after the mother variable, affectionateness, was entered into the equation.

Color sort score, total sort score, and noncompliance responses of the child.--These variables did not show significance in the regressions involving only child variables as predictors and were dropped from subsequent analyses.

Hypothesis 2c

This hypothesis states that there is no relationship between the mother's locus of control and the age, sex or ordinal position of the child. The results of multiple regression analyses reveal that age and sex are significantly related to the mother's locus of control. Therefore, Hypothesis 2c is rejected.

Age of child.--When the same variables were analyzed for younger children and for older children (Tables 4.3, 4.4), cooperation of the child and verbal score are significant predictors in each group. In addition, sex and object sort scores are significant for the younger children, and self-concept for the older children. The variable of age was subsequently used in the regression analyses utilizing both mother and child variables. The variable of age appears to be most important in decreasing the unexplained variation in locus of control in the analysis for unemployed mothers and for mothers with some college education. It appears to be of equal importance for student and nonstudent mothers. In addition, it is important for white mothers and ADC mothers.

In the analysis for single mothers, age was the first variable entered into the regression. However, it was deleted in step six after the variable, object sort score of the child, was entered into the regression equation.

Sex of child.--When the same child variables were analyzed as predictors for all children and separately for younger children, the sex of the child was a significant predictor. The results indicate that female children had mothers with a higher rating of powerlessness. This variable also contributed to the decrease in unexplained variation in locus of control in the analysis for white mothers.

Ordinal position of child.--This variable was not significant in the initial regressions involving only child variables as

predictors of the mother's locus of control and it was dropped from subsequent analyses.

Summary of Results for Hypothesis 1

The general hypothesis that there is no relationship between the mother's locus of control and her other concurrent behaviors and attitudes is summarized for its three subparts as listed below.

(1a) Locus of Control Predicted by Teaching Behaviors of the Mother

Variable	Regression Number(s) (Tables) in Which Significant at $p < .05$	Relationship in Direction Predicted by Theory*
Orientation to task	--	--
Total references to color	--	--
Total references to object	--	--
Total references to specific attributes	4.5, 4.6, 4.7, 4.10, 4.12, 4.14, 4.16	No
Positive reinforcement	4.1, 4.5, 4.6, 4.8, 4.10, 4.12, 4.15	No
Typical affectionateness	4.1, 4.6, 4.7, 4.12	Yes
Requests for verbal feedback	--	--
Verbal commands	--	--
Reinforcment material messages	4.1, 4.5, 4.6, 4.7 4.8, 4.10, 4.12, 4.15	No

Conclusion: Since variables were significant predictors of the locus of control of the mother, the null hypothesis was rejected.

*For significant relationships at the final equation.

(1b) Locus of Control Predicted by the Number of Activities in the Home Which Are Engaged in to Prepare the Child for School

Variable	Regression Number(s) (Tables) in Which Significant at $p < .05$	Relationship in Direction Predicted by Theory*
Home activity of mother to prepare child for school	--	--

Conclusion: Since the variable was not a significant predictor of the locus of control of the mother, the null hypothesis could not be rejected.

(1c) Locus of Control Predicted by the Realistic Aspirations (Aspirations of the Same Level as Expectancies) for the Child's Education

Variable	Regression Number(s) (Tables) in Which Significant at $p < .05$	Relationship in Direction Predicted by Theory*
Mother's realistic aspirations for the child	--	--

Conclusion: Since the variable was not a significant predictor of the locus of control of the mother, the null hypothesis could not be rejected.

Summary of Results for Hypothesis 2

The general hypothesis that there is no relationship between the mother's locus of control and the child's achievement, self-esteem, age, sex and ordinal position is summarized for its three subparts as listed below.

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*For significant relationships at the final equation.

(2a) Locus of Control Predicted by the Child's Self-Esteem

Variable	Regression Number(s) (Tables) in Which Significant at $p < .05$	Relationship in Direction Predicted by Theory*
Self-esteem	4.2, 4.4, 4.5, 4.8, 4.12, 4.16	No

Conclusion: Since the variable was an effective predictor of the locus of control of the mother, the null hypothesis was rejected.

(2b) Locus of Control Predicted by the Achievement of the Child

Variable	Regression Number(s) (Tables) in Which Significant at $p < .05$	Relationship in Direction Predicted by Theory*
Object sort score	4.2, 4.3, 4.8, 4.9, 4.15, 4.16	No
Color sort score	--	--
Total sort score	--	--
Noncompliance responses	--	--
Verbal score	4.2, 4.3, 4.4, 4.9, 4.13	No
Typical cooperation	4.2, 4.3, 4.4, 4.6, 4.8, 4.9, 4.11, 4.13, 4.15	Yes

Conclusion: Since variables were significant predictors of the locus of control of the mother, the null hypothesis was rejected.

*For significant relationships at the final equation.

(2c) Locus of Control Predicted by the Age, Sex and Ordinal Position of the Child

Variable	Regression Number(s) (Tables) in Which Significant at $p < .05$	Direction of Relationship (Not Predicted)
Age	4.5, 4.10, 4.11, 4.14, 4.15, 4.16	Positive
Sex	4.2, 4.3, 4.10	Females have more external mothers
Ordinal position	--	--

Conclusion: Since two of the three variables were significant predictors of the locus of control of the mother, the null hypothesis was rejected.

Hypothesis 3: Effect of Locus of Control and Incentives on Attendance

In its general form, Hypothesis 3 states that there will be no relationship between the locus of control of the mother and her subsequent attendance at the parent education program under the varying incentive conditions. The two sub-hypotheses and results are presented.

Hypothesis 3a

This hypothesis states that there will be no difference in participation (attendance) in the parent program by internal or external mothers in the no reward treatment condition. The results of the analysis of variance shown in Table 4.19 reveal that there is a significant interaction effect between the factors of incentive

TABLE 4.18.--Cell Means of Percent Attendance Used in 2-Way ANOVA.

Locus of Control[a]	Incentive Treatments[b]		
	1	2	3
Internal (I)	T_{11}	T_{12}	T_{13}
	30.77 (26)	58.33 (12)	50.00 (22)
External (E)	T_{21}	T_{22}	T_{23}
	57.14 (21)	64.29 (28)	14.29 (14)

Note: The numbers in parentheses indicate the number of mothers upon which the percentage is based. The calculated harmonic mean cell size is 18.6.

[a]The scores on the Felt Powerlessness Scale were divided at the median to form internal (score of 1.000-2.7600) and external (score of 2.800-3.7200) groups.

[b]Incentive treatments for attendance are: Treatment 1, $5.00; Treatment 2, babysitting and transportation; Treatment 3, no additional incentive.

TABLE 4.19.--Two-Way ANOVA on Attendance.

Source of Variation	df	Sum of Squares	Mean Square	F-Ratio	Level of Probability
Treatment	2	1.318	.659	2.831	.061
Locus of control	1	.009	.009	.039	.999
Interaction	2	1.920	.960	4.123	.018
Residual	117	27.241	.233		
Total	122	30.650	.251		

treatment and locus of control. The illustration of the interaction is graphed in Figure 4.2. (The data used are averages for all groups as listed in Table 4.18 on page 118.) One may see from the illustration that nearly half of the internal mothers attended, compared to 14% of external mothers, in Treatment 3. This difference is in the predicted direction. To test for the significance of the difference in these two groups, a Scheffé contrast was calculated for:

Contrast 1: $\mu_{13} - \mu_{23} = 0$

The numbers identifying population means correspond to the sample means in Table 4.18. The observed variable is the percent of mothers who attended the parent program. The results of this comparison are given in Table 4.20 (page 121). The decision at the confidence coefficient of 95% is that there is no significant difference between the attendance of internal and external mothers in Treatment 3, the no reward condition. Thus, Hypothesis 3a is not rejected.

Hypothesis 3b

This hypothesis states that there will be no relationship between the locus of control and the mother's attendance at the parent program in the two incentive-related conditions. The significant interaction effect in the analysis of variance is summarized in Table 4.19 and is illustrated in Figure 4.3 (page 122). In the figure the two lines show an increase in attendance in

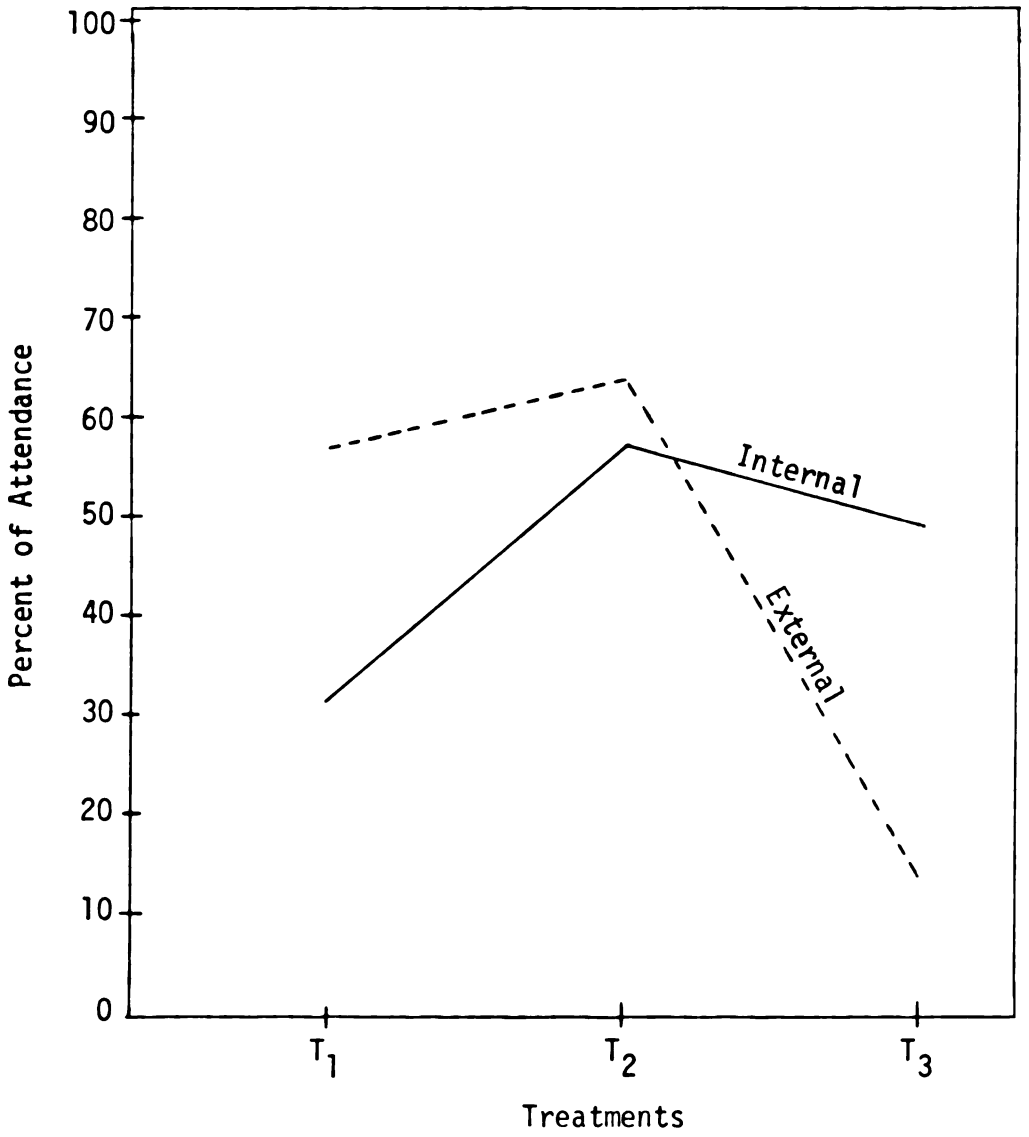

Figure 4.2.--The Average Percent of Attendance Within All Treatments for Internal and External Mothers.

TABLE 4.20.--Summary of Scheffé Contrasts.

Contrast	Test of Difference Between	Point Estimate of Difference	$\underline{S}$	SE	$\underline{S}$ x SE	Decision
1	I vs. E in T_3	35.71	3.38	15.83	53.51	Not sig.
2	I vs. E in T_1 and T_2	16.17	3.38	1.12	3.78	Sig.
3	I in T_1 and T_3 vs. E	4.66	3.38	1.12	3.78	Sig.
4	I in T_2 and T_3 vs. E	14.87	3.38	1.12	3.78	Sig.
5	I in T_1 and T_2 vs. T_3	-5.45	3.38	1.37	4.63	Sig.
6	E in T_1 and T_2 vs. T_3	46.42	3.38	6.81	23.02	Sig.

Note: $\underline{S}^2 = [(ab - 1) F (1 - \alpha); ab - 1, (n - 1) ab]$

where a = no. of levels of treatment
b = no. of levels of locus of control
$(1 - \alpha) = .95$
$n = \overline{n}_h = 18.6$

[The formula for the Scheffé multiple $\underline{S}$ in multiple contrasts in 2-factor studies is that given in J. Neter and W. Wasserman, Applied Linear Statistical Models--Regression, Analysis of Variance and Experimental Designs (Homewood, Illinois: Richard D. Irwin, Inc., 1974), p. 594.]

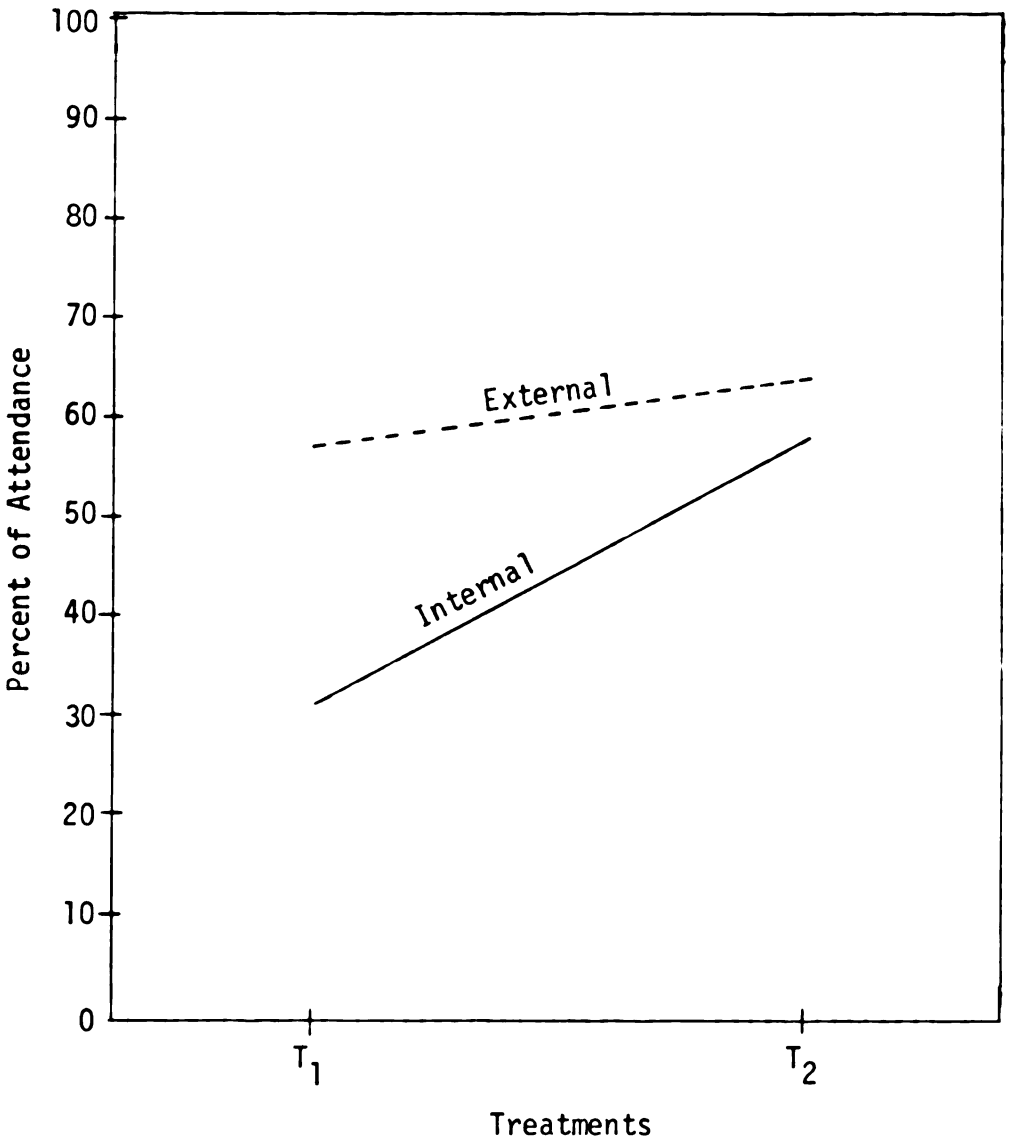

Figure 4.3.--The Average Percent of Attendance Within Treatment 1 and Treatment 2 for Internal and External Mothers.

Treatment 2 over Treatment 1 for both internal and external mothers. To further test for an interaction within just the two incentive treatments, a Scheffé contrast was calculated for:

$$\text{Contrast 2: } (\mu_{21} + \mu_{22}) - (\mu_{11} + \mu_{12}) = 0$$

The results of this contrast are given in Table 4.20. The decision at the confidence coefficient of 95% is that there is a significant difference between external and internal mothers in their responses to overt incentives. The external mothers respond more similarly to each incentive, while the internal mothers respond relatively less to money and relatively more to babysitting and transportation. The Hypothesis 3b of no difference between internal and external mothers in Treatments 1 and 2 is rejected.

Additional Results for Hypothesis 3

The use of the Scheffé comparison permits the post hoc analysis of other differences suggested by the data. In the present case there are four further comparisons which are presented.

Comparison of internals in T_1 and T_3 with externals in T_1 and T_3, symbolically expressed as

$$\text{Contrast 3: } \frac{\mu_{11} + \mu_{13}}{2} - \frac{\mu_{21} + \mu_{23}}{2} = 0$$

Comparison of internals in T_2 and T_3 with externals in T_2 and T_3 symbolically expressed as

$$\text{Contrast 4: } \frac{\mu_{12} + \mu_{13}}{2} - \frac{\mu_{22} + \mu_{23}}{2} = 0$$

Comparison of internals in T_1 and T_2 vs. T_3 symbolically expressed as

$$\text{Contrast 5: } \frac{\mu_{11} + \mu_{12}}{2} - \mu_{13} = 0$$

Comparison of externals in T_1 and T_2 vs. T_3 symbolically expressed as

$$\text{Contrast 6: } \frac{\mu_{21} + \mu_{22}}{2} - \mu_{23} = 0$$

The confidence interval for the first contrast is:

$$35.71 - (3.38)(15.83) \leq \underline{C}_1 \leq 35.71 + (3.38)(15.83)$$
$$35.71 - 53.51 \leq \underline{C}_1 \leq 35.71 + 53.51$$
$$-17.80 \leq \underline{C}_1 \leq 89.22$$

In similar fashion, the confidence intervals are obtained for the other contrasts, and the remaining set is:

$$12.39 \leq \underline{C}_2 \leq 19.95$$
$$.88 \leq \underline{C}_3 \leq 8.44$$
$$11.09 \leq \underline{C}_4 \leq 18.65$$
$$-10.08 \leq \underline{C}_5 \leq -.82$$
$$23.40 \leq \underline{C}_6 \leq 69.44$$

This set of confidence intervals has a family confidence coefficient of 95%, so that any chain of conclusions derived from the intervals has associated with it this confidence coefficient. The principal conclusions drawn from the set of estimates are as follows. No overall effect on attendance for the no incentive condition is

indicated. However, there is an effect on attendance within the incentive given conditions. External mothers attend more than internal mothers, the percent of increased attendance being somewhere between 12% and 20%. There is also a difference in attendance for internals in Treatment 1 and Treatment 3 and externals in these conditions. This is illustrated in Figure 4.4. Externals attend less than internals in these conditions, although the differences are small, with externals attending between 1% and 8% less overall. There are significantly more attendances by internals in Treatment 2 and Treatment 3 shown in Figure 4.5, and these range from between 11% and 19%. When the attendance of internals is compared with incentives and without them, the attendance is less with incentives than without them, ranging from 1-10% less. On the other hand, the attendance of externals is greater with incentives than without them, with a possibility of almost 70% increase in the presence of incentives compared to that without them.

Hypothesis 4: Effect of Attendance and Incentives on Change in Locus of Control

In its general form Hypothesis 4 states that there is no relationship between change in the mother's locus of control and her attendance with incentives for the parent education program. The two sub-hypotheses and related results are given below.

Hypothesis 4a

This hypothesis states that there will be no difference in positive change in locus of control for participating mothers in

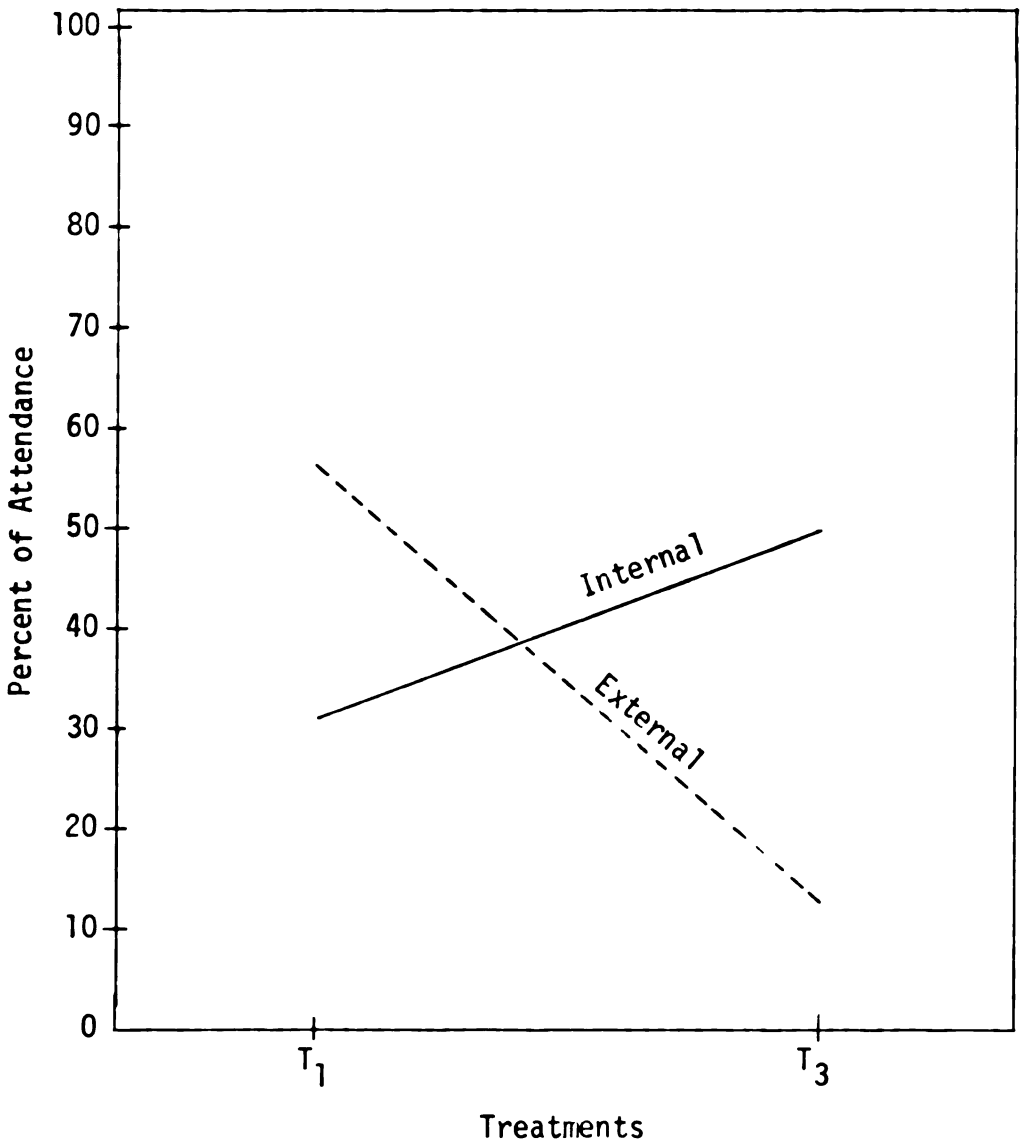

Figure 4.4.--The Average Percent of Attendance Within Treatment 1 and Treatment 3 for Internal and External Mothers.

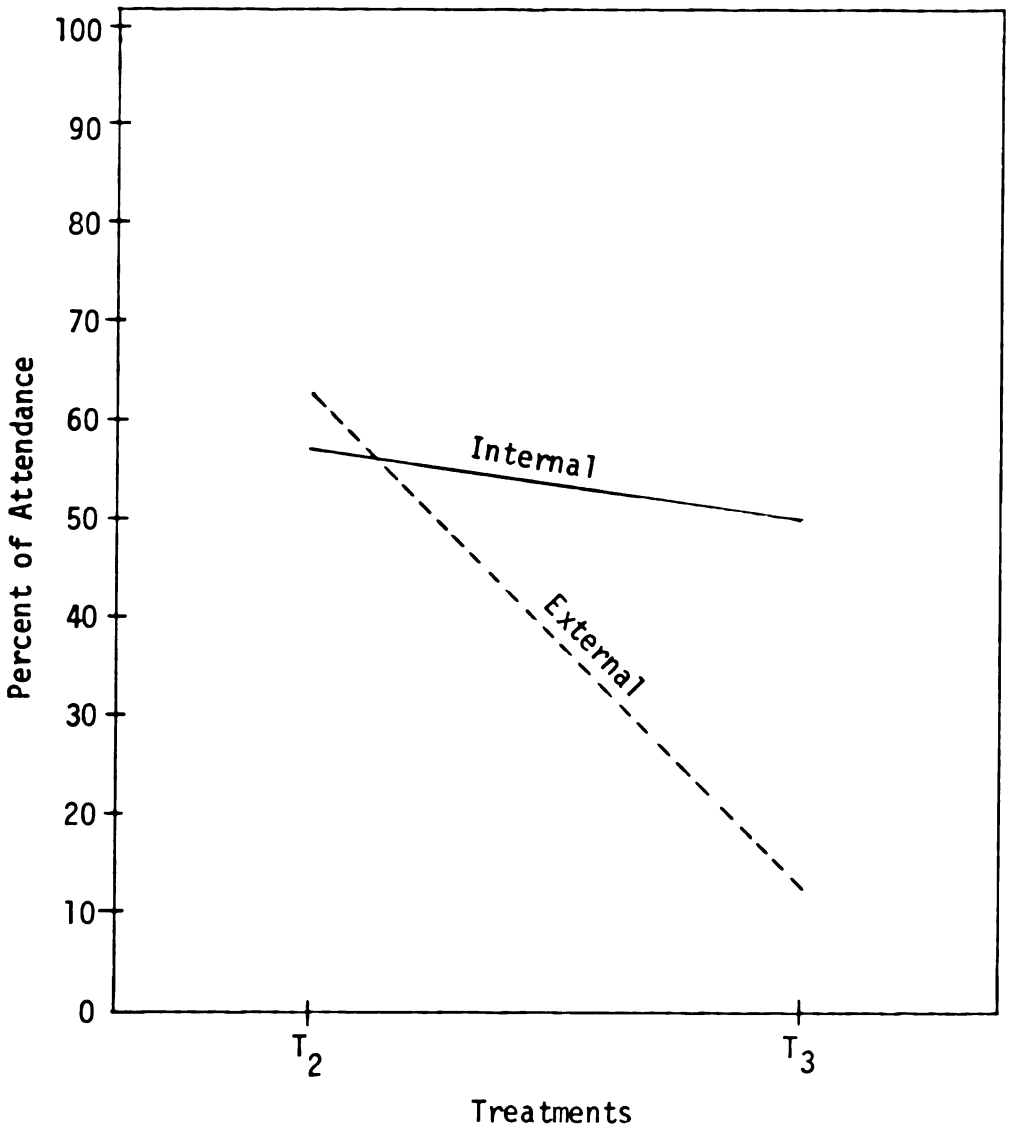

Figure 4.5.--The Average Percent of Attendance Within Treatment 2 and Treatment 3 for Internal and External Mothers.

the parent program than for mothers who do not participate. The cell means for the analysis of covariance are given in Table 4.21. The results of the analysis of covariance related to this hypothesis are listed in Table 4.22. The analysis reveals that there is no interaction effect and no main effects. There is a significant relationship between the covariate, the pre-test score on Felt Powerlessness, and the post-test score which is the dependent variable. The overall F test for main effects and interactions indicates that one cannot reject the hypothesis that all possible contrasts equal zero. Therefore, one cannot reject Hypothesis 4a that

$$\text{Contrast 1: } (\mu_{11} + \mu_{12} + \mu_{13}) - (\mu_{21} + \mu_{22} + \mu_{23}) = 0$$

(The numbers identifying populations correspond to sample mean numbers given in Table 4.21.) Observation of the cell means for internal and external mothers as presented in Table 4.21 provide additional clarification of the result.

Hypothesis 4b

This hypothesis states that there will be no difference in positive changes in locus of control for participant mothers in the "no reward" (self-reward) condition than for participant mothers in the two external reward conditions. It may be stated symbolically as:

$$\text{Contrast 2: } \mu_{13} - \left(\frac{\mu_{11} + \mu_{12}}{2}\right) = 0$$

TABLE 4.21.--Cell Means of Adjusted Post-Scores on Felt Powerlessness Test Used in 2-Way ANCOVA.

Attendance of Mothers	Incentive Treatments[a]		
	1	2	3
Attenders	T_{11}	T_{12}	T_{13}
	2.8725	2.8203	2.7991
	(18)	(9)	(14)
Nonattenders	T_{21}	T_{22}	T_{23}
	2.8022	2.7421	2.9354
	(17)	(14)	(10)

Note: The numbers in parentheses indicate the number of mothers upon which the Felt Powerlessness adjusted post-score is based.

[a]Incentive treatments for attendance are: Treatment 1, $5.00; Treatment 2, babysitting and transportation; Treatment 3, no additional incentive.

TABLE 4.22.--Two-Way ANCOVA on Post-Score on Felt Powerlessness.

Source of Variation	df	Sum of Squares	Mean Square	F-Ratio	Level of Probability
Covariate (pre-score)	1	11.296	11.296	93.941	.001
Treatment	2	.072	.036	.300	.999
Attendance	1	.003	.003	.023	.999
Interaction	2	.176	.088	.734	.999
Residual	75	9.018	.120		
Total	81	20.571	.254		

Since the overall F test for interactions indicated there were no significant effects, this contrast cannot be rejected, and thus Hypothesis 4b cannot be rejected. The group means listed in Table 4.21 provide further clarification of this conclusion.

Summary of Results for Hypotheses 3 and 4

Hypothesis	Probability Level: $P \geq .05$
Hypothesis 3	
Hypothesis 3a	Do not reject null hypothesis.
Hypothesis 3b	Reject null hypothesis.
Hypothesis 4	
Hypothesis 4a	Do not reject null hypothesis.
Hypothesis 4b	Do not reject null hypothesis.

CHAPTER V

DISCUSSION

Hypothesis 1

Hypothesis 1a

The only aspect of effective teaching as measured by the Hess and Shipman Toy Sort Task that was greater for internal mothers was their expressed warmth during the teaching session. This warmth was not merely a function of the child's learning performance because the child who achieved more, as indicated by a higher final score on sorting of objects, was the child of the more external mother. Both positive and negative reinforcements were used proportionately more by the external mother than by the internal mother when considered as a percentage of all the messages given. This means that other types of maternal output were relatively decreased such as evaluation of the child (apart from feedback messages which would be defined as reinforcements), commands to do things and say things, and requests to do and say things.

The use of task specific language was reported in the doctoral dissertation of Kuipers (1969, p. 110) as a sign of an effective teacher. It was expected in the present study that internal mothers would refer more to task attributes, but the opposite was found. External mothers used more task specific language.

There were no differences between internal and external mothers on other characteristics which distinguish effective teachers: on the length of time spent in orienting the child, on verbal commands, on requests for verbal feedback, or on the total references to the colors and the objects considered separately.

Hypothesis 1b

The study did not find a significant relationship between the number of activities which the mothers report that they are engaged in at home to prepare the child for school and the mother's locus of control. This result may be confounded by the fact that the question was analyzed for all mothers, regardless of the age of the children. It may be that internal mothers of older children are sensitive to this, but that internal mothers of younger children are not. Another possibility is that if the variable had been operationalized exactly as it was in the Hess et al. study (1968), involving a home interview and observations in the home by an examiner, then a significant relationship may have been found. A third possibility is that the number of home activities is not related to the mother's locus of control expectancy.

Hypothesis 1c

The study did not find a significant relationship between a discrepancy in the aspirations and expectancies for the child's education and the mother's locus of control. One possible explanation for this result is that the average discrepancy score was not large enough for the hypothesized difference to occur. The average

aspiration for all mothers was that the child would finish college. The minimum educational expectancy was that the child would attend some high school. The minimum aspiration was that the child would have some vocational work instead of high school. It was predicted that mothers with an internal locus of control would be more realistic and have a lower discrepancy score. This was not supported by the data. Since the discrepancy scores were low for all mothers, it seems that they were fairly equally realistic--or unrealistic--and that this expressed attitude does not relate to the control expectancy of the mother.

Hypothesis 2

Hypothesis 2a

The study found that the child's self-esteem was related to the mother's locus of control--that external mothers have children with higher self-esteem. In one sense this seems paradoxical because earlier research ascribed more "good" qualities to the internal person (Rotter, 1966), and it would be expected that this internal person could also influence similar "good" qualities, like better self-esteem, for her child.

It may be that it is the child's influence on the mother that is the critical factor. Suppose, for instance, that a child who is achieving a higher self-esteem shows signs of independence of the mother that are interpreted by her as signs of her inability to control the child. Then the mother may react to this "failure" by becoming frustrated, and she may tend towards a more external locus

of control. Another explanation is that the self-concept of the child may increase with age through the preschool years as suggested by Shipman and Gilbert (1972). If developmental level is the crucial factor, then increase in self-concept occurs largely independently of the locus of control of the mother.

Hypothesis 2b

The data reveal a relationship between the locus of control of the mother and the learning achievement of the child. The relationships are mostly in the opposite direction to that predicted. That is, various achievements of the child usually relate to an external locus of control of the mother. The pattern of relationships seems to reveal a successful mother-teacher who shapes the child's responses until they become correct, and this success is unexpectedly related to an external locus of control. This indicates that the external mothers in this study behave in a fashion which is not congruent with the behavior usually exhibited by externals in laboratory situations.

Hypothesis 2c

The possible relationship between age, sex and ordinal position of the child with the mother's locus of control was explored. Results reveal that older children have mothers with more external locus of control. The relationship is undoubtedly not a simple one. There are additional factors related to the cognitive and affective growth of the child that deserve investigation with regard to this correlational finding. External control

expectancy related to female sex of the child. This result also deserves replication in a study with design controls as well as statistical controls. The ordinal position of the child does not relate significantly at the 5% probability level or better to the locus of control of the mother. Since the sample mothers tended to have small families, there is the possibility that a relationship might be found in a group with a larger variation in family size.

Discussion for Subgroups of Mothers

ADC and Non-ADC Mothers

The trend towards decreasing powerlessness was greater in non-ADC mothers (31%) than ADC mothers (6%). The mother's total reference to specific attributes and positive reinforcement predicted control expectancy in both groups. For ADC mothers, age and self-concept of the child were additional predictors. For non-ADC mothers typical child cooperation and maternal affectionateness were additional predictors.

Married and Single Mothers

The respective trends towards decreasing powerlessness are similar--19% for single mothers and 14% for married mothers. In each case there are four predictor variables in the final equations. Positive reinforcement is a predictor for both, but the other three variables differ. For married mothers the other three variables involve maternal characteristics: affectionateness, total reference to specific attributes and total reinforcement.

For single mothers the other three variables involve child characteristics. These are child cooperation, self-esteem and object score. Based upon these data, therefore, the married mother's locus of control is most related to her own characteristics, as the non-ADC mother's were. The single mother, like the ADC mother, has more of her control expectancy related to child characteristics.

Black Mothers and White Mothers

The trend towards decreasing powerlessness is similar and small in both groups--11% for white mothers and 15% for black mothers. For black mothers the final predictors of locus of control were all child characteristics: verbal score, cooperation and object sort score. For white mothers there were two child and two mother predictors. The child predictors are age and sex, and the mother predictors are total references to specific attributes and positive reinforcement. An additional analysis of the scores of mothers of other racial groups was deleted from the results because of the small number of mothers.

Employed and Unemployed Mothers

There is a higher trend for decreasing powerlessness among unemployed mothers (21%) than employed mothers (8%). This is somewhat unexpected and may be due to the confounding effect that college-educated women with lower powerlessness contribute to the score of the unemployed women. Alternatively, it may be due to "defensive internality" (Lefcourt, 1972, p. 20) among unemployed women. There are only two predicting variables for the unemployed

mothers, and these are the age and cooperation of the child. For employed mothers there are five predicting variables: the child's self-concept, the mother's affectionateness, her positive reinforcement, her total reinforcement, and her total references to specific attributes.

Mothers Who Have Completed High School and Mothers Who Have Attended Some College

Analyses within five groups according to the terminal education of the mothers were planned, but the sample sizes were too small to be reported for mothers who had less than a high school education, occupational or professional training, and those who had finished college and/or went beyond it. The two groups which are compared are those which had sufficient numbers. There were mothers who had completed high school, with no additional schooling, and those who had attended some college without completing it.

The trends for decreasing powerlessness were small and similar (12% for those with some college; 9% for those who had completed high school).

For both groups there were three predicting variables. College mothers had two mother variables (total reference to specific attributes and total reinforcement) and one child variable (age) while high school mothers had two child variables (cooperation and verbal score) and one mother variable (total reinforcement).

Student and Nonstudent Mothers

There was a greater trend towards decreasing sense of powerlessness among student mothers (28%) than among nonstudent mothers (18%).

For both groups there were three child variables and mother variable as predictors. Age of child and object sort score were predictors for both groups. However, cooperation was an additional predictor for nonstudent mothers, while self-concept was an additional child predictor for student mothers. The significant mother variable was total references to specific attributes for student mothers, and positive reinforcement for nonstudent mothers.

A pattern stands out within the predicting equations for the different subgroups of mothers. Although mother actions and attitudes are not independent of the child's, the mother variables are better predictors for non-ADC, married, employed, college educated women. Child variables are more frequent predictors for ADC mothers, single, unemployed and high school educated women. There are also trends towards decreasing powerlessness, which are greater for non-ADC mothers compared to ADC mothers, for students compared to nonstudents and for unemployed women compared to employed women.

Hypothesis 3

Hypothesis 3a

Research on the behaviors of persons with an internal locus of control indicates that persons who may be described as internal perform superiorly to persons described as external on tasks which

require skill for their performance (Baron, Cowan, Ganz and McDonald, 1974; Baron and Ganz, 1972; Rotter and Mulry, 1965). One theory for this is that persons with an internal locus of control are sensitive to the self-discovery of success which could result in superior performance. This feedback of success should further motivate persistence in other skill task situations which are similar.

Persons who may be described as external, on the other hand, appear to perform less well on tasks which require skill for their performance. External persons have been described as motivated by the gambler's fallacy of expecting to win after a series of failures (Battle and Rotter, 1963; James, 1957; Shepel and James, 1973). In the case of the present research, the offering of the parent education program was considered in the restricted sense that it offers the opportunity for parents to learn skills of parenting. It was, in fact, presented to parents in this manner. Because internal mothers are expected to be more sensitive to the self-reinforcement factor in the program, it was hypothesized that they would attend more than external mothers in the condition, Treatment 3, where there was no additional incentive offered. The results of the analysis of variance of locus of control and incentives reveal that about 50% of the internal mothers attend when no additional incentive is present, but that only 14% of the external mothers do in this same condition. Although this difference was in the direction predicted by theory, the difference did not achieve the required significance. One would expect that if this difference had occurred

in a larger sample of women, it would have achieved significance. An alternative explanation is that the meaning of "superior performance on a skill task" for internal persons does not apply when the skills are related to the mother's role expectations. In that case, both external and internal mothers could persist similarly.

Hypothesis 3b

Theory indicates that internal mothers and external mothers behave similarly in the presence of overt attempts to manipulate (Gore, 1962; Strickland, 1962). In the present study it was considered that money and services offered in Treatment 1 and Treatment 2, respectively, would be perceived by all mothers as an obvious encouragement for attending the parent program. There was a difference found between the attendance of internal and external mothers. External mothers responded more to the incentives than did internal mothers, as shown in some interesting post hoc comparisons. The confidence interval indicates that as much as 70% increase in attendance is evidenced in the presence of incentives for external mothers. For internal mothers there is a different response. They attend less in the incentive conditions than in the no incentive condition. This result appears to be heavily influenced by a relatively negative reaction to the money incentive, because the attendance of internals in the babysitting and transportation incentive is, in fact, slightly higher (58%) than in the no incentive condition (50%). Overall, all mothers responded well in the babysitting and transportation condition, with a minimum of 55% attendance for both internal and external mothers.

Hypothesis 4

Hypothesis 4a

The rationale for expecting greater positive change in locus of control for participant mothers than for nonparticipants is that the PTT Program is considered geared to the developmental level of the preschool child, and that it should make more likely the experience of successful teaching of mother with child. It is hypothesized that the pleasant and effective mother-child interaction will provide a background of positively reinforcing experience that will generalize so that the parent may expect greater successful teacher interactions and thus perceive greater internal control after participation. The results of the analysis of covariance reveal that there was not an attendance effect on the locus of control of the mother. The results from the larger study of maternal involvement (Boger et al., 1974) indicate that mothers who attended had children with more positive change in self-concept than for children of mothers who did not attend. This indicates that the program had a positive effect on children as hoped. There were not significant differences in mother-child interaction as measured by the Hess and Shipman Toy sort based on attendance. These related findings may be further focused by the descriptive results of Phase 1. It may be recalled that more positive self-concept of the child predicted greater external control of the mother. This unexpected relationship may indicate a complex bond between attendance and locus of control. If the mother's successful work with the child increases his/her self-concept, but if that is interpreted by the mother as

movement away from her; if she regrets the greater independence of the child, a complex of events turns a success in one area into perceived negative reinforcement in another area. Thus, the mother does not change towards greater internality. This explanation seems likely because of the descriptive background in Phase 1.

There are other competing explanations for lack of positive change in locus of control for attending mothers as compared to nonattenders. The parent program could have worked on the more affective aspects of mother-child interaction and then might have effected the child's cooperation and the mother's affectionateness and more closely the mother's locus of control. Another explanation is that the PTT Program may have provided some successes, but that the outside activities in the mother's life are more important in comparison.

Hypothesis 4b

The mothers who participate in the program are those who were hypothesized to achieve greater internality. In the two external reward conditions, it was further supposed that the mothers will attend for the incentives, without attempting or perhaps without persisting in the practice of the skills of parenting to the extent that the mothers in the no reward condition would. For this reason, it was theorized that positive change in the program, if it occurs, will be greater for mothers in the no reward condition than for mothers in the reward conditions.

The results of the analysis of covariance reveal that the expected differences were not evidenced. The larger study results (Boger et al., 1974) report that the children of mothers in the no incentive treatment evidenced greater positive change in self-concept than children in centers assigned financial incentives. Similar reasonings as those given for Hypothesis 4a provide a basis for expecting that a greater sense of external control is related to increase in self-concept of the child. This may be a result of a hypothesized negative reinforcement provided the mother due to a perceived loss of the child's dependence on her. Alternately, it may be that the presence of incentives does not, in fact, preclude attempts to achieve success in the program as previously suggested. The incentives may have no relationship to change in locus of control, as indicated by the lack of an interaction effect between attendance and incentives in the analysis of covariance.

CHAPTER VI

CONCLUSION

Prediction of Locus of Control

Extensive research has accumulated on the personality and behavioral correlates of an internal or an external locus of control. In general, previous studies show that internals (persons who see events as relatively dependent on their own actions and characteristics) are good information organizers (Seeman, 1963), good teachers (Hersch and Scheibe, 1967; Powell and Vega, 1972), less conforming (Crowne and Liverant, 1963) and capable of adjusting their expectancy of successful performance more closely with prior experiences of success and failure (Rotter, 1966). On the other hand, externals (persons who see events as more dependent on factors outside themselves) are less competent at information organizing, less effective teachers, more conforming and less consistent in adjusting their behavior in accordance with prior success and failure in similar circumstances.

The present research addressed the question of whether behavioral and attitudinal correlates of locus of control take on a special meaning when they are considered in connection with two people who have a relationship to each other--a mother and her young child. The design used in the predictive model of maternal locus of control employed a pooled sample at one point in time of mothers

and children from day care centers in six randomly chosen cities. The findings of this descriptive study indicate that affective dimensions of the mother-child relationship are congruent with the current research profile of the internal and of the external person. That is, internal mothers are more affectionate mothers and have children who are more cooperative. External mothers are more hostile and have children who are less cooperative. Some of the results were incongruent, however. These data would indicate that external mothers do not have less realistic aspirations for the young child's future academic achievement than internal mothers. Also, external mothers were better teachers than internal mothers in the study situation. In addition, the children of external mothers had higher self-concept and achieved more in the study situation. The greater number of teaching effectiveness behaviors of external mothers may be a function of a different reaction to the experimental situation. More specifically, the external mother may have tried harder to teach in the study situation to please the experimenters because she is more susceptible to covert influence. Internal mothers may have perceived the situation more negatively and therefore resisted the covert influence they possibly perceived.

Change in Locus of Control

Previous literature suggests two general types of therapeutic interventions which may assist a person in shifting an external control expectancy to an internal one. One approach involves assisting a person to cognitively link old successes to new goals. A second

involves helping a person achieve a goal that he or she sought previously with limited success. Bilker's (1970) study of control expectancies of indigent mothers before and after they were provided with the Parent Education Project program used the latter strategy. He found a trend towards greater internal control for the participating mothers compared to a control group of nonparticipants. This approach was also used in the present study. The design involved random assignment of six day care centers serving the mothers to three treatment conditions. It was hypothesized that participation in the Parents Are Teachers Too program would increase success with present goals, but the hypothesized change towards greater internality did not occur for participant mothers compared to nonparticipants. Results of the larger study (Boger et al., 1974) show that children of mothers who attended the program achieved higher adjusted post-scores on the self-referent of the Brown IDS Self-Concept Referents Test than the children of mothers who did not attend. No significant differences, however, were found in mother and child interaction measures for participant mothers and their children compared to non-participants (Boger et al., 1974, pp. 108-109).

The descriptive part of the present research suggests that there is a complex relationship between the self-concept of the child and the locus of control of the mother. The child of the external mother has a higher self-concept than the child of the internal mother. If the mother who attends the parent program works successfully with the child on the various lessons, the child may increase his/her self-concept. If the mother interprets the

greater independence of the child as movement away from her, she may resent it. The result of this sequence of events is that a positive interaction with the child may for some mothers result in an event perceived negatively, and in no net movement towards greater perceived internal control for the mother who participates in the Parents Are Teachers Too program than for the mother who does not participate.

A simpler explanation for the finding of no change towards greater internal control for participant mothers is that the program had too brief a positive impact to relocate the generalized perceptions of internal or external control. If the program ran for nine months, as the Parent Education Project program did, the results may or may not have been different.

Locus of Control and Performance of Skill Tasks With and Without Incentives

Two avenues of research are connected in the present study. One set of findings indicates that individuals with an internal locus of control perform superiorly on skill tasks compared to persons with an external locus of control (Baron, Cowan, Ganz and McDonald, 1974; Baron and Ganz, 1972). A second set of findings indicates that individuals with an external locus of control are more susceptible to overt attempts at influence (Gore, 1962; Strickland, 1962).

The present research investigates both avenues in a research design in which the six day care centers were assigned to the three treatment conditions of a monetary incentive, a babysitting and

transportation incentive and a third condition, considered a control, in which no additional incentive was given. The participation in the parent program of persons with an internal or external locus of control was observed with incentives and without them. Internals attended the parent program (considered a skill-type activity) more than externals when the program was offered without incentives, although the difference was not significant. This pattern was reversed when the program was offered with incentives. In this case externals attended significantly more than internals. Internals responded significantly more to the babysitting and transportation incentive than to the monetary incentive, although in both cases less than externals. This suggests that overt attempts to influence are more effective for internal persons when they facilitate clear goals. In the present study persons who desired to attend the program were assisted by the service of babysitting and transportation. The other incentive, money, is less specifically goal-oriented and may have aroused a less positive response from internal persons.

Limitations of the Research

The present research combines the exploratory results of a descriptive study with the more rigorous findings of a comparative one. An overall bias was introduced by using in analysis only that part of the sample which cooperated in data collection. This meant that the random selection of cities did not provide a truly random selection for analysis. It also meant that the random assignment

of day care centers to incentives did not provide a truly random sample for analysis. Three further limitations apply to the descriptive study. First, although the study contributes descriptive information about the child's effect on the mother's locus of control, the predictive model would be enhanced by considering all family members rather than just mother and child. Second, the toy sorting task may not have been equally appropriate for all participants due to the individual differences in the developmental levels of the children and to the difference in teaching experience of the mothers. Third, the mother and child variables used as predictors in the regression analyses are potentially interrelated and their use in a statistical model which assumes no interaction is questionable. A final limitation applies to the comparative study. Although the hoped-for change in locus of control towards greater internality did not occur at the end of the three-month program, the possibility of change in some future time as a "sleeper" effect was not ruled out. The resources for implementing the research did not allow for such a longitudinal assessment.

Conclusions

The following eight conclusions were drawn from the first phase descriptive study. They apply to the present sample without necessarily generalizing to a larger population.

1. A predictive model for maternal locus of control can be built based upon mother and child characteristics and parent-child interaction.

2. Mothers who are more external in locus of control exhibit more hostility to the child in a teaching situation.

3. Internal and external mothers do not differ in their realistic aspirations for their children's education.

4. The children of mothers who are more external in locus of control are less cooperative with the mother in a teaching situation.

5. Children of external mothers are older, female, and exhibit a better self-concept. They do not differ in ordinal position from children of internal mothers.

6. External mothers exhibit more techniques considered indicators of teaching effectiveness than do internal mothers.

7. Children of external mothers appear to learn more than children of internal mothers in the teaching situation.

8. Some groups of mothers evidence a greater trend towards internal control than others. These include non-ADC mothers compared to ADC mothers, student mothers compared to nonstudent mothers, unemployed mothers compared to employed mothers, and mothers of younger children compared to mothers of older children.

The following conclusions were made from the comparative study of the attendance of internal and external mothers at the parent education program with incentives and without them. They comprise a set of confidence intervals with a family confidence coefficient of 95%.

1. There is no difference in attendance at the parent program for internal and external mothers in the no incentive condition.

2. External mothers attend the parent program between 12-20% more than internal mothers when incentives are offered.

3. When attendance is considered across the monetary incentive condition and the no additional incentive condition, externals attend less than internals, between 1-8% less overall.

4. Internals attend the program more than externals in the combined babysitting and transportation condition and no additional incentive condition, and this ranges from 11-19% more.

5. Internals attend the parent program from 1-10% less with incentives than without them.

6. Externals attend the parent program from 23-69% more with incentives than without them.

7. Mothers who participate in a parent program offered over a three-month period do not become more internal than mothers who do not participate.

8. There is no difference in change in locus of control for mothers who participate in the parent program with incentives than for those who participate without them.

Implications for Theory and for Action Research

The present study reveals a different model of internal and external control than that usually found in the literature. It is the external mother who exhibits more behaviors indicative of teacher effectiveness and whose child shows higher self-concept and more behaviors indicating learning achievement. One possible interpretation is that the usual relationship between control expectancy and behavior is not applicable in the situation involving two persons with a special relationship to each other, a mother and her young child.

The present study contributes to the theoretical understanding of the reaction of internal persons to overt attempts at influence. Internal mothers reacted more positively to one incentive, suggested that overt incentives which facilitate goals of internal persons are more effective than overt incentives which are more general. These results suggest that internals respond selectively to certain overt attempts at influence. Future experimental studies may systematically vary incentive and associated skill

tasks to further clarify this behavior. The present research also provided descriptive information which can be used to amplify a model of the prediction of locus of control in mothers in terms of parent-child interaction and mother and child characteristics.

The nearly identical reaction of internal and external mothers to attendance at the parent program in the babysitting and transportation situation suggests that rewards that are clearly facilitative of personal goals are most effective for the general population including both internal and external mothers. This could be tested in future studies by using the same type of incentive for different programs which might facilitate different personal goals such as those relating to family management, leisure time use, and other educational programs.

Finally, the research suggests that parent education programs of a short-term nature should not be expected to show immediate effects on the parent's generalized perception of internal or external locus of control expectancy. Short-term effects may be expected for only specific behaviors or specific control expectancies.

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APPENDICES

APPENDIX A

MATERNAL INVOLVEMENT IN DAY CARE: A COMPARISON OF INCENTIVES

Robert P. Boger
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May 31, 1974

APPENDIX A

MATERNAL INVOLVEMENT IN DAY CARE: A COMPARISON OF INCENTIVES

Purpose

The day care center serving working parents may find that the parents are frequently uninterested in collaboration with the center, even for the good of the children. The study, Maternal Involvement in Day Care: A Comparison of Incentives, addressed itself to this problem. The major goals of the study were these: (1) to determine if the use of financial incentives is an effective method of initiating and maintaining the day care mother's involvement in a parent education program; and (2) to determine if the use of financial incentives influences the quality of mother-child interaction and the child's self-concept.

Method

The design of the project involved offering a parent education program, Parents are Teachers Too (PTT), at six day care centers in six different cities under three incentive conditions. Two day care centers were randomly assigned to each incentive condition. Each center received the same parent program. The PTT Program consisted of 12 weekly two-hour sessions devoted to a model of parent-as-change-agent. The program consisted of a home language project

T_1	C_1	S_1 . . S_n
	C_2	S_{n+1} . . .
T_2	C_3	. . . .
	C_4	. . . .
T_3	C_5	. . . .
	C_6	. . . .

T = Treatment

C = Center

S = Subject (Mother-child pair)

T_1 = $5/meeting to attend

T_2 = Babysitting and transportation provided/meeting to attend

T_3 = No financial incentives/meeting to attend

Figure A.1.--Design Matrix.*

*As reported in R. P. Boger, J. Kuipers, A. Cunningham, and M. Andrews, Maternal Involvement in Day Care: A Comparison of Incentives (East Lansing, Michigan: Institute for Family and Child Study, Michigan State University, Final Report, 1974), p. 36.

in which the parents, usually mothers, worked with the day care child using curriculum materials developed in teacher-directed group sessions held at the day care centers. The teachers at each center were trained identically to present the PTT Program to parents.

The financial incentives used in the project were these: Treatment 1 consisted of five dollars per meeting attended; Treatment 2 consisted of babysitting and transportation per meeting attended; and Treatment 3 consisted of no additional incentive per meeting attended. The third treatment was considered a control condition. The day care mother's involvement in the parent education program was measured as the number of meetings attended. The quality of mother-child interaction was measured in terms of mother and child performance in a version of the Hess and Shipman Toy Sort Task (Hess and Shipman, 1966). The self-concept of the child was measured using the Brown IDS Self-Concept Referents Test.

The design of the study allowed for the control of "history" by giving the experimental and control groups the same parent program with identical materials. The PTT Program was presented for the same period of time across all day care centers. The initial differences between characteristics of parents at the six centers was compensated for by the use of covariance techniques in data analysis. The major sources of differences which could not be controlled within the research design are these: (1) ability of the PTT teachers to relate to parents outside the research situation; (2) change of personnel in centers; and (c) financial

difficulties encountered at centers. For instance, Center 6 closed operation within a month after the PTT Program termination due to lack of continuing federal funds.

Subjects

The sample consisted of 282 preschool children and their parents, a total of 249 families. It included equal numbers of families receiving ADC and families that did not, and equal numbers of boys and girls. The ratio of Black to Caucasian children over the entire sample was three to two.

Results

The principal dependent measure was maternal attendance at PTT sessions analyzed in a 3 x 2 nested design through multivariate analysis of variance. The secondary measures were child self-esteem as measured by the Brown IDS Self-Concept Referents Test and quality of mother-child interaction as assessed by the Hess and Shipman Toy Sort Task. The analyses of these variables utilized a 3 x 2 nested design with a multivariate analysis of covariance. The results of the main analyses are given below (as listed in the study Abstract).

1. There was significantly more attendance in the financial incentive conditions (Incentive 1 and 2) than in the no incentive condition (Incentive 3).

2. More attendance was initiated as well as maintained by the $5 incentive over the babysitting and transportation incentive, and by the babysitting and transportation incentive over the no incentive condition.

3. There was significant positive change in child self-concept for the children whose mothers attended the PTT Program in all conditions.

4. Children in centers assigned no financial incentives evidenced greater positive change in self-concept than children in centers assigned financial incentives.

5. No significant changes on mother-child interaction measures were evidenced based on incentives or on attendance.

APPENDIX B

INSTRUMENTAL REFERENCES

APPENDIX B

INSTRUMENTAL REFERENCES

Instrument	Source
Felt Powerlessness Scale (Jaffee, 1959)	L. S. Sims, Nutritional Status of Preschool Children in Relation to Selected Factors Characterizing the Family Environment--An Ecological Approach. Doctoral dissertation, Michigan State University, 1971.
Brown IDS Self-Concept Referents Test (Brown, 1966)	R. P. Boger, J. Kuipers, A. Cunningham, and M. Andrews, Maternal Involvement in Day Care: A Comparison of Incentives. East Lansing, Michigan: Institute for Family and Child Study, Michigan State University, Final Report, 1974.
Hess and Shipman Toy Sort Test	Boger et al., 1974 (see above).
Educational Survey	Boger et al., 1974 (see above).
Parents Are Teachers Too Information Form	Boger et al., 1974 (see above).

APPENDIX C

PARENTS ARE TEACHERS TOO PROGRAM

(CONCEPTUAL FRAMEWORK AND

SAMPLE LESSON)

APPENDIX C

PARENTS ARE TEACHERS TOO PROGRAM (CONCEPTUAL FRAMEWORK AND SAMPLE LESSON)

Judith L. Kuipers and Robert P. Boger
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1971

The conceptualization of the PTT Program is built upon two primary bases. These are:

(1) enhancing the role of the mother as the primary teacher and socializer of her child; and
(2) encouraging the mother to recognize the critical nature of her relationship to her child in mediating the learning of the child both directly and indirectly.

There are three overall goals of the PTT Program. These are:

(1) to increase the vitality of the mother-child interaction (through lessons and activities the mother builds during the parent program session for her use with the child in the home).
(2) to increase the communication between the teaching staff and the mother (through the teacher's identification with the mother as a "teacher too" and the resultant home lesson development sessions).
(3) to increase the child's skills and abilities in the language and perceptual-motor content areas around which the lessons are built.

Finally, the specific objectives of the PTT Program are:

(1) to increase the amount and quality of mother-child interaction;
(2) to develop an attitude of teamwork between the day care center and the mother;
(3) to increase the self-confidence and skills of the mother in her nonroutine interaction with her child;
(4) to increase the mother's covert reinforcement of the preschool or day care program;
(5) to expedite the acquisition of linguistic and perceptual-motor skills by the child.

The parent's self-esteem and esteem for others is enhanced as the mother gains greater sense of control over her parenting role. Evidence from previous research indicates that the child develops a more positive view of himself and a more positive perception of his mother's attitude toward him as a result of participating in this program.

The program is based on the assumption that constructive positive inter- and intra-group attitudes cannot be conveyed to children when parents have little confidence in their own abilities. Therefore, lessons are designed to provide the parents with understandings and techniques that allow positive, successful interaction with their child.

This model is based on the assumption that children's affective as well as cognitive development is promoted optimally when they are presented interesting and challenging activities. These activities require the child to be actively involved with the game materials--touching, manipulating, listening, seeing. They require that the child combine his sensory experiences and exercise his sensory memory to remember and label how things feel, look, and act.

The games in this program have been placed in an order roughly to match the development of children. This does not mean that there is a set order in which each child must go. Obviously, just as no two children look the same, neither are they all interested in the same types of activities at any one time. For these reasons, more than one activity is presented in each weekly lesson and suggestions for different ways to play each game are offered.

Materials are designed to be easily constructed, inexpensive, and of high appeal to children. We have found that the games are of special delight to the children because "mommy (or daddy) made it for me." Although materials are largely cardboard and were expected to have a short "life," parents have reported that after months of use the materials are still intact.

A developmental teaching model is the basic foundation for the program. The developmental approach emphasizes that much of the learning in early childhood is spontaneous and comes to the child in many ways. It is not necessarily sequential. It cannot always be carefully structured and ordered. This learning takes place long before langugage comes into existence and remains.

Physical movement and life experiences provide the first vocabulary for the child. Seeing, touching, tasting, smelling, and manipulating tell him what the world is like. The crucial modality of the young child is play behavior. To the child, play is essentially a research activity or an internal transactional process. It is free because the child's activity is still tentative and

uncommitted. It is capable of exploration, revision, renunciation, and replacement. In play the child can manipulate objects, events, and even people with less restriction than that imposed on adults. Therefore, play provides not only a means for practicing, consolidating, and assimilating what one knows, but provides an opportunity to challenge or revise the knowledge.

All activity previously mentioned implies a thoughtfully prepared environment--with space, freedom, and challenging materials to explore and experiment with. Further, it implies that parent and teacher understand how patterns of thought and commensurate language abilities develop in the young child. This is, of course, the basis for this specific developmental approach.

The core of the program consists of twelve PTT sessions adapted from twenty-two in the original combined focus. Day care professionals are trained to administer the parent program. The director or head teacher from the day care center conducts the sessions for his/her participating parents. After emphasizing the primary role of the parent in the education of the child, the teacher works with mothers in constructing materials to be used by the mother and child in the home in educational games stressing language and perceptual skills. It is stressed that only the mother use the program lessons and materials during the time of the twelve workshop sessions. This is to protect the critical catalytic quality of the material on the resulting mother-child interaction. The "My mama made this for me" phenomenon is powerful. This reaction from the child has a powerful motivational effect on the mother and thus produces a dynamic and positive affective interaction.

PTT Lesson III
Flannelboards to Facilitate Language Development

General Objectives

To establish an atmosphere of learning together--parent and teacher.

To extend parent's awareness of the importance of the early years by discussion of the developmental nature of intellectual and language growth in the preschool years.

To provide the parents with the general theory and philosophy of the developmental language approach.

To provide parents with a variety of relevant skills which they can apply in teaching situations at home to enhance their child's developing discriminative skills and concept acquisition.

To provide parents with materials and techniques to teach the child color identification and ability to verbally express himself fully and accurately concerning color.

Specific Objectives

1. To explain the use of the flannelboard as a versatile educational tool for enriching the language of their children.

2. To assist mothers in construction of a flannelboard and materials to use with it.

3. Provide the mothers with exemplary demonstrations and guided opportunity to experiment with the materials.

4. To provide specific activities that develop

   a. Visual discrimination (Special Animal Games)
   b. Concepts of specific community places (Pretend Time) and people (Thinking Cap Games)
   c. Auditory sequencing (Story Cut-Out, Finger Plays, Songs)
   d. Auditory discrimination (Silly-Funnies Game)

5. To encourage mother to listen to child, pay particular attention to his questions, and build her activity from there.

APPENDIX D

FURTHER DISCUSSION OF RESULTS OF REGRESSION ANALYSES IN TABLES 4.1-4.16

APPENDIX D

FURTHER DISCUSSION OF RESULTS OF REGRESSION ANALYSES IN TABLES 4.1-4.16

The summary tables of each regression analysis contain two types of data. The first type of data concerns the predicting equation which contains weighted combinations of predictor variables. The F-test of the analysis of variance tests the overall chance probability of the significance of the regression equation. The degrees of freedom are equal to the number of variables in the equation. The variable entered or deleted for each F-test is listed. The accuracy of the prediction is revealed by the amount of explained variance in the criterion variable due to the regression (R^2). A separate measure of accuracy is the squared correlation between the observed and predicted values of the criterion variable. This statistic measures a trend towards decreasing powerlessness down to a theoretical zero point.

The second type of data in each summary focuses on the specific predicting variables which have achieved significance at the conclusion of the regression. The partial correlation of each variable is listed; this measures the strength and direction of the variable's relationship with the criterion variable when the other variables are statistically controlled. The unstandardized partial

regression coefficient is also listed for each variable, along with the standard error, t-statistic and significance. The regression coefficient is used in a prediction equation to weight the value of the predicting variable. For example, if one used the summary data from Table 4.1 and examined the contribution of the variable, affectionateness, one could predict that a person with a score of 1 on affect (warm) would add .6325 (1) = .6325 to the predicted score in Felt Powerlessness (the range is from 1.0000 to 4.0000). A person with a score of 4 on affect (hostile) would add .6325 (4) = 2.530 to the predicted score in Felt Powerlessness.

The square of the partial correlation is easily obtained from the summary table. This measures the proportional increment of the variable in question to the explained variation of the criterion variable. This is expressed as a porportion of the variation unexplained by the remaining predictor variables. It represents a proportional reduction of the unexplained variation (unexplained by the other remaining predicting variables). This additional statistic is calculated for discussion of specific variables of interest.

The Predictive Accuracy of the Linear Regression Equations

The overall accuracy of the predicting equations is revealed by the R^2 statistic, i.e., the amount of total variance in the criterion variable, Felt Powerlessness, which is due to the regression. In each case the final explained variance is at least 95%. The pattern is that the first variable entered into

the regression explains a large amount of variance. Additional variables add small increments to the predicting accuracy of the equation and also reduce its standard error.

Observed and Predicted Values of Felt Powerlessness

An additional measure of overall prediction accuracy of the regression equation besides the explained variance is the squared correlation between the observed and predicted values of the criterion variable. This measures the overall trend towards greater internal control, a trend towards a zero score on Felt Powerlessness. (There is no zero score on the scale itself, but it is still possible to measure a trend in a group towards a zero score.) The data indicate that the trend is small, ranging from 31% to 2%. Those subgroups evidencing relatively greater trend towards greater internal control are the non-ADC mothers (31%) compared to the ADC mothers (6%), student mothers (28%) compared to nonstudent mothers (18%), unemployed mothers (21%) compared to employed mothers (8%), unemployed mothers (21%) compared to employed mothers (8%), and mothers of younger children (16%) compared to mothers of older children (4%). These statistics are found, respectively, in Tables 4.5, 4.6; 4.16, 4.15; 4.11, 4.12; 4.3, 4.4.