MATERNAL EXPECTATIONS AND MOTHER-CHILD INTERACTIONS

Ph.D. PSYCHOLOGY

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Berenice S. Mandelcorn

Abstract

Thirty-seven girls and thirty-seven boys, all nine years of age, were observed with their mothers in an interaction situation involving several achievement tasks. Measures were obtained of mothers' expectations for their children before and during the interaction session. Mothers' behavior was rated on a number of different scales. Halfway through the experiment mothers' expectations were manipulated positively or negatively. Expectancy was found to be a diverse concept. Sex differences were found both in mothers' expectations and in the behavioral expression of these expectations. Experimental manipulation of their expectancy produced significant changes in mothers' expectations, attitudes and behavior with their children.

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by

Berenice Secter Mandelcorn

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Department of Psychology
McGill University
Montreal, Quebec

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Introduction

The assumption that the formation of cognitive and intellectual skills can be modified by variations in the environment is well accepted by most theorists. Bruner (1964) believes that cultural effects on intellectual functioning are to some extent "from the outside in". Bloom (1964) goes one step further. He states that we are at a level where one can actually "specify some of the major characteristics of an environment which will positively or negatively affect the development of general intelligence or school achievement" (p. 196). Hunt (1961) touches upon the need for such knowledge when he states that "if the manner in which encounters with the environment foster the development of intellectual interest and capacity were more fully understood, it might be possible to increase the average level of intelligence within the population substantially" (p. 346). The consensus of opinion, then, is that one must identify some of these meaningful measures of the environment which relate to cognitive performance.

One of these factors that has received attention recently and with which this study is concerned is the factor of interpersonal self-fulfilling prophecies. The growing body of evidence which suggests that one person's expectation

for the behavior of another can come to be a significant determinant of that other person's behavior, has been shown to have far-reaching effects. It has been studied in psychological research, in the experimenter-subject relationship, in psychological testing, in the tester-testee relationship, and in the medical profession, specifically the doctor-patient relationship (Frank, 1961, 1968). An increasing number of recent investigations have concentrated on these interpersonal self-fulfilling prophecies in the area of education. Studies have shown that a teacher's expectations about her pupil's performance can serve as a significant determinant of that performance (Rosenthal & Jacobson, 1968). The implications of such findings are tremendous. It would seem then, that the principle of interpersonal self-fulfilling prophecy is universal in almost any dyadic interaction.

An important dyadic interaction in which expectancy has been neglected in the past is the mother-child relationship. Parents, particularly, have definite expectations for their children. Furthermore, they have a definite interest in having their expectations come true. It is the purpose of this study to investigate mothers' expectations for their children in the area of intellectual achievement,

and to attempt to discover the behavior by which mothers communicate their expectations to their children.

In this review, the findings which support the idea of interpersonal self-fulfilling prophecies in dyadic relationships in general will be examined. The mother-child literature will be surveyed for evidence of mothers' expectancy for their children and for the behavioral expression of this expectancy. Within the context of the available information on mothers' expectancies for their children, several questions which still await an answer will be considered.

Expectancy Effects in Psychological Research

The literature on expectancy effects draws on data from numerous fields, as unrelated as the healing professions, survey research, laboratory psychology, and educational psychology. The bulk of this information points toward the idea that there exists an interpersonal self-fulfilling prophecy effect. This evidence has been thoroughly reviewed by Rosenthal (Rosenthal, 1964a, 1964b, 1966; Rosenthal & Jacobson, 1968). Some examples of this information are noteworthy. In the area of animal learning, Rosenthal and Fode (1963a) demonstrated that rats which were believed to be maze-bright by a group of experimenters

performed significantly better in a simple T-maze than rats thought to be maze-dull. This phenomenon carried over to other tasks such as operant acquisition, stimulus discrimination, and chaining of responses (Rosenthal & Lawson, 1964). Also well known are the experiments on person perception in which subjects are asked to rate the apparent success or failure of persons in photographs on a scale ranging from -10 to +10. Results showed that subjects who performed the task for high-biased (+5) experimenters obtained significantly higher mean ratings than subjects of low-biased (-5) experimenters.

The idea that a person's expectation for another may serve as an unintended self-fulfilling prophecy takes an even greater impact as one begins to examine real-life situations for its effect. Research on the clinician expectancy effects has shown that results from tests of human abilities and personality, and structured interviews are all subject to the examiner's bias. Larrabee and Kleinsasser (1967) found significant expectancy effects on the Verbal Intelligence Scale of the Wechsler Intelligence Scale for Children. Projective testing, especially the Rorschach, also shows the effects of experimenters' expectancies (Marwit & Marcia, 1967; Masling, 1965), as do structured

laboratory interviews (Raffetto, 1968). Frank (1968) reports studies which suggest that among the situational factors affecting patients' responses to medication are the physician's expectations.

Expectancy Effects in Education

The extent to which the idea of expectancy effects has taken hold in the educational literature is tremendous although not surprising in view of its implications. A study by Rosenthal and Jacobson (1966) on intellectual "blooming" was immensely important in that it introduced a way of thinking that has led to a spate of publications on the same subject which continue to point to very definite teacher expectancy effects on pupil performance. Meichenbaum, Bowers and Ross (1968) reported that an increase in teachers' favorable expectations led to a significant increase in the appropriateness of their students' classroom behavior. Beez (1968) found a significant effect on the symbol-learning behavior of Project Headstart pupils when their teachers had their expectations experimentally increased. Rosenthal and Evans (1968) and Conn, Edwards, Rosenthal and Crowne (1968) found children who were expected to bloom intellectually showed greater gains in reasoning I.Q. than a control group. Numerous other

investigators have noted that effect (Asbell, 1963). Teachers' expectations manipulated not for specific children within a classroom but rather for classrooms as a whole (Biegen, 1968; Flowers, 1966), also produced significant effects with greater performance gains achieved by those classrooms expected by their teachers to show the better performance.

Negative Findings and Reversals

Despite the large number of studies confirming the effects of interpersonal self-fulfilling prophecies, one must point out that not all the results are in support of this hypothesis. Wessler found no differences in speed of hand tapping (Wessler, 1969) or in reaction times to visual stimuli (Wessler, 1968) attributable to experimenters' expectancies. Barber, Calverley, Forgione, McPeake, Chaves and Bowen (1969) failed to demonstrate the experimenter bias effect on the person perception test. Ekren (1962) and Getter, Mulry, Holland and Walker (1967) did not get the effect on the Block Design subtest of the Wechsler Adult Intelligence Scale (WAIS) or on the complete WAIS respectively. Negative results have also been obtained in Rorschach testing (Strauss & Marwit, 1970). Working with male teachers and fifth grade boys, Pitt (1956) found no effect on achievement scores of arbitrarily adding or

subtracting ten I.Q. points to the children's records. Heiserman (1967) found no effect on teacher expectations on her 7th graders' stated levels of occupational aspiration.

By contrast, some studies show significant reversals. Claiborn (1968) found a tendency among first graders for children designated as potential bloomers to gain less in I.Q. on the Flanagan Tests of General Ability than a control group. A similar tendency was reported by Anderson and Rosenthal (1968). Their subjects were older, however, and drawn from a state school for the mentally retarded. Geiger (1971), on the other hand, using a standardized I.Q. test found no significant differences between experimental and control groups but discovered that both groups made significant I.Q. gains and that teachers showed significantly more positive behavior towards both groups after the experimental induction of expectancies.

All the studies quoted represent only a small fraction of the total number conducted on the effects of interpersonal expectancies. The bulk of the evidence, in general, points to the existence of the effect. Although the negative results obtained on some studies do not rule out the existence of this effect they call into question its universality. The disputes over these negative results

will not be reviewed at this time (Barber & Silver, 1968a, 1968b; Harrington, 1967, 1968; Harrington & Ingraham, 1967; Ingraham & Harrington, 1966; Rosenthal, 1967, 1968). It is sufficient to note, however, that interpersonal expectancy effect is accepted as a significant determinant of behavior in some situations and that this effect has been demonstrated in real-life situations such as the teacher-pupil dyad. The interesting question is not the existence of the effect but rather the conditions which determine whether the effect is operative or not, to what extent, and how it operates, that is, how does one individual transmit an expectation to another.

Intervening Variables of Expectancy

Several studies have pointed out that the expectancy effect may be mediated by certain attitudes of the experimenter and of the subjects. Silverman (1968) found in a word association test that when the experimenter and the subjects were opposite in sex there was a greater expectancy effect than when they were the same sex. Friedman, Kurland and Rosenthal (1965) showed in a person perception experiment that experimenters whose behavior during the experiment reflected greater interpersonal involvement or warmth obtained ratings of the perception photos labelled as more

successful. Experimenters whose behavior reflected a more professional manner obtained ratings significantly more in accordance with their expectancy, regardless of the particular nature of that expectancy. McQueen (1971) found that a teacher's experience played a part in how likely the teacher was to assign biased grades to pupils: the greater the experience, the less likely the teacher was to be influenced by an experimenter bias effect. Furthermore, this influence occurred only when the teacher instructed the allegedly slow pupils first.

Several other studies have examined subject variables which might influence whether or not the expectancy of the experimenter would have an effect on the subjects. Minor (1970), using the photo rating task, assigned subjects to one of two experimenter-expectancy conditions. In addition within each condition some subjects were made to feel apprehensive or ego-involved in their performance, while the remaining subjects were assured that their performance would not be utilized to evaluate their functioning. The findings revealed that the expectation held by an experimenter only led to confirmatory responses from the subjects when the subjects were personally concerned with their performance.

The age of the subject might also determine whether expectancy effects are found although this evidence is not conclusive. Larrabee and Kleinsasser (1967) working with children found verbal WISC I.Q.s to be arfected by the expectancy of the examiner, whereas Ekren (1962) and Getter et al. (1967) found no such effects when dealing with an adult population.

Examination of teacher expectancy studies conducted with children from a lower socioeconomic background on the West Coast (Rosenthal & Jacobson, 1968), with upper middle class children on the East Coast (Conn et al., 1968), and with middle-class children in a small town in the midwest (Rosenthal & Evans, 1968), demonstrated several variables that influence the effects of teacher expectations. These included the interaction of the sex and social class of the pupils. A study by Asbury (1971) showed that a subject's locus of control rating was a determinant of the expectancy effect in a teacher-pupil situation.

The information a teacher has about a pupil also influences whether the teacher's expectancy will affect the teacher-student relationship in a learning situation. Brown (1970) gave teachers varying kinds of psychological reports. Some had information about the children's I.Q.

scores, others about socioeconomic background, and others had personality descriptions of the pupils. Results showed that only the I.Q. information yielded significant results in the number of paired associates that the teacher attempted to teach the child and also in the expectancy-fulfillment rating by the teacher. The pupil's actual performance, that is, the number of paired associates learned, was not affected by this information.

Mediating Processes of Expectancy

Obviously, numerous variables are involved in whether and how one individual's expectancy influences another. The next question is how an experimenter or teacher unintentionally informs his subject or pupil of his expectancy. Examination of the mediating processes in the highly controlled experimenter-subject relationship demonstrates the process to be very subtle. Only a few methods of unintentional communication of expectancy have been clearly defined. Both visual (Rosenthal & Fode, 1963b), and auditory cues (Adair & Epstein, 1968) are important. Placing a screen between experimenter and subject reduces the expectancy effect, although the effect can still be brought about by just the tape recordings of the experimenter's voice reading standard instructions to his subjects. The manner in which instructions

are read has also been shown to have bearing on the determination of experimental results (Rosenthal, Friedman & Kurland, 1966). Regardless of which of two contradictory hypotheses they held, male experimenters obtained significantly more hypothesis-confirming data if they read the instructions more rapidly and less accurately, glanced less at their subjects, exchanged fewer glances with them and showed less general body movements. Interestingly, the instruction reading of female experimenters was less predictive of their biasing effect upon subjects' subsequent responses. The possibility that a process of operant conditioning might be responsible for the operation of self-fulfilling prophecies was examined (Rosenthal, 1966) and discarded. It seems that a learning curve does exist but it is for experimenters and not for their subjects; that is, experimenters increase the unintended influence of their prophecy as the experiment progresses.

In less controlled, real-life situations, interpersonal self-fulfilling prophecies have more freedom to operate. The teacher who has a specific expectation for a pupil is free to express this bias in whichever way she chooses. She is not restricted to reading a standard set of instructions as must an experimenter. Consequently, studies which

have looked at the mediating operation of interpersonal self-fulfilling prophesies in the teacher-student dyad have been more successful in discovering some of the factors involved in the unintentional communication of expectancies. Beez (1968), for example, employed 60 teachers to teach preschool children the meaning of a series of symbols. He found that teachers expecting superior learning actually tried to teach more of the symbols than did teachers expecting inferior learning. Despite the dramatic difference in teaching behavior, however, not all the differences obtained in the pupils' learning could be attributed to discrepancies in the teachers' method of teaching. Some other unexplained mechanism must have been at work as well. Brown (1970) investigated the effects on teacher expectancy of psychological reports, and found results similar to those of Beez (1968). Although he found no significant performance difference for children of different expectancy groups he did find significant differences in the number of paired-associates that teachers attempted to teach and in the expectancy-fulfillment rating that they filled out. McQueen (1971) also found that a teacher's bias affected the number of words she presented to her pupils on a vocabulary learning task. Meichenbaum et al. (1968) suggested that increasing

teachers' positively toned attention is the factor associated with the fulfillment of favorable teacher expectations. This suggestion is supported by Rosenthal and Jacobson (1968). They asked all teachers to describe the classroom behavior of their pupils at the end of the school year. Those children for whom intellectual growth was expected were described as having a significantly better chance for future success, and as being significantly more interesting, curious, and happy. There was a tendency too for these children to be seen as more appealing, well-adjusted, and affectionate and as having less need for social approval. "Attention" was found by Willis (1970) to be an important mediating factor of teacher's expectancy. In this study, teachers ignored the "least efficient child" significantly more than the "most efficient child", and gave significantly more verbal consequences for the behavior of the "most efficient child" than for the behavior of the "least efficient child."

Most of the studies on teacher expectancy have induced experimentally different expectations in teachers regarding different children and have then noted whether this induced expectation has had any influence on the child's actual performance. A number of studies, as we have noted, have also attempted to determine how these differential

expectations are directly manifested in the classroom. A recent study by Rist (1970) examined teachers' expectations and their behavioral expression in the natural classroom setting, with no attempt at experimental manipulation. It is interesting that precisely those variables found in studies in which expectation was experimentally induced are also found to be significant in the behavior of teachers in the natural milieu of the classroom. Rist (1970) notes that, for the students of high socio economic background who were perceived by the teachers as possessing desirable behavioral and attitudinal characteristics, the classroom experience was one in which their teachers displayed interest in them, spent a large proportion of teaching time with them, directed little control-oriented behavior towards them (disciplinary statements), held them as models for the remainder of the classroom and continually reinforced statements that they were "special" students. Here clearly is the difference in teaching behavior also reported by Beez (1968), Brown (1970), and McQueen (1971), the discrepancy in amount of attention found by Meichenbaum et al. (1968) and Willis (1970), and the differences in positive reinforcement called "positively-toned" attention by Meichenbaum et al. (1968).

In summary, an individual's expectation for the behavior of another person is a significant determinant of the other person's behavior. The effect is widespread and can be observed in such different areas a laboratory psychology, medicine, and teaching. We have also noted that these effects depend on many variables such as the sex of both the experimenter and the subject, age, status, and social class. Some of the important mediating processes operating in these situations do so through visual and auditory cues. In the more real life example of the teacher-pupil interaction variables such as the amount of time teaching, attention, and positive reinforcement given to a student distinguish the behavior of the high expectancy teacher from that of the low expectancy teacher.

Maternal Expectancy

What can we say about expectancy in the mother-child dyad? Research in the area of mother expectation for intellectual achievement as it relates to her child's actual achievement is not extensive. Even less so is the identification of the mediating factors whereby mother communicates her expectations to her child.

Studies which deal with the question of mother expec-

tation differ from one another in a number of different dimensions: (1) the measure of mother expectation used; (2) the criterion measures of intellectual achievement: (3) whether or not the significant parental attitudinal and behavioral variables are measured and how they are measured; (4) age of the children; (5) sex of the children; (6) social class of the sample; (7) birth order; (8) change of expectancy.

The following review will examine the studies under these various headings.

Measures of Expectancy

There are wide differences in the methods used to measure a mother's expectation for her child's intellectual achievement. These range from college freshmen's perceptions of grades parents expect them to get (Poffenberger & Norton, 1963) to mothers' estimates of the number of blocks their children can use to build a tower while blindfolded with one hand behind their back (Rosen & D'Andrade, 1959). Wolf (1964) and Dave (1963) interviewed mothers to determine their ideas about what aspects of their home they thought were most relevant to the development of general intelligence. These items were then used as a basis for ratings on 13 scales designated as "Environmental Process

Characteristics". Among the items were included several dealing with the parents' intellectual expectations for their child. This expectancy measure was among those that had the best relationship with the criterion achievement measures which, in this case, were the I.Q. and achievement test scores. Crandall, Dewey, Katkovsky and Preston (1964) also made use of the interview situation with a parent to determine what level of competence the parent felt his child characteristically demonstrated in intellectual activity. Baumrind and Black (1967) similarly determined intellectual achievement expected. Boerger (1971) used a mailed questionnaire to obtain maternal aspiration levels for their sons and mothers' estimates of their sons' I.Q.'s. Lynn and Sawrey (1962) got measures of future expectations in interviews with 80 Norwegian mothers. Barry, Bacon and Child (1957) used ratings of ethnographers' reports of child rearing practices in 110 primarily non-literate cultures in order to get measures of achievement expectations. A totally different approach taken by Solomon, Parelius and Busse (1969) was designed to have raters obtain frequency measures of parents' positive and negative expectations concerning their child's abilities in an interaction situation. Rosen and D'Andrade (1959) also used an interaction

situation to get measures of parental aspiration and evaluations of their sons. These researchers used a number of different expectancy measures, although all were based on specific tasks. For example, parents had to estimate how their child would do in unfamiliar situations where performance norms were at times not set by the experimenter. Later, after they had observed his performance, they had to re-estimate the child's subsequent performance in the same situation. Similarly, estimates of a child's probable performance on a puzzle task were used by Rothbart (1967) and Hilton (1967). A variation of mother expectancy measures was employed in studies with stutterers using a modified Rotter Board level of aspiration test (Goldman & Shames, 1964; Quarrington, Seligman & Kosower, 1969). In these experiments parents predicted a series of scores which the child would achieve based on a knowledge of his immediately preceding performance. Scores reported to the parents were not dependent upon the actual scores but on a prearranged schedule of success and failure. The measures of parental goal setting used were (1) the Initial Estimate Measure which represented the first parental guess as to the next level of performance following a standard initial report by the experimenter of "18 out of a possible 50"; (2) the Total

Average Estimate; (3) the D-Score (mean of the differences between the estimate and the preceding performance) under conditions of success; (4) the D-Score under conditions of failure.

In summary, measures of expectation that have been used in experimental situations differ strikingly from one another. They range from global self-reports to specific estimates in specific achievement situations. They can be either concerned with the present, the immediate future or the long range future.

Criterion Measures of Achievement

The many studies reported vary almost as much in the criterion measure of achievement chosen as in the expectancy measure that they attempt to relate achievement to. Part of the problem is undoubtedly due to the ambiguity of the concept of achievement. It has been used to refer to "need" or motivation for achievement, measured proficiency, and opinions about achievement (Freeberg & Payne, 1967). Crandall (1963) clarifies the confusion somewhat by distinguishing achievement variables from other behavioral variables such as dependency and aggression on the basis of "positive reinforcement for demonstrated competence." Crandall (1963) also distinguishes achievement situations

from others on the basis of "cues pertaining to some standard of excellence" (p. 418). Contrasted with this is the concept of achievement motivation or "need achievement."

Measured intelligence (I.Q.) has been used as a criterion variable by Wolf (1964), Boerger (1971), and Baumrind and Black (1967). Wolf (1964) demonstrated a high correlation ($r = 0.69$) between a child's I.Q. score and the total score of the 13 scales which comprised the "Environmental Process Characteristics". He found some of the best correlations were with those scales dealing with the parents' intellectual expectations for their child. Boerger (1971) found that maternal aspirations were significantly related to the three achievement measures that he used--group intelligence, achievement test scores, and a discrepancy measure in which achievement test scores were corrected for intelligence. Furthermore, as mothers' and fathers' aspirations became more similar, their child's achievement increased; as father's aspirations became greater than mother's, achievement declined. In estimating I.Q.'s he found that parents tended to estimate their child's I.Q. as average, thereby getting over- and under-estimations. Baumrind and Black (1967), on the other hand, found no significant relationship between their measure of intellectual

achievement expected as measured in the "Maternal Socialization Demands" and girls' I.Q. scores.

Another criterion variable used to correlate with mother's expectancy is the child's score in a particular area of achievement. Crandall et al. (1964) found significant correlations between mothers' evaluations of their children's general intellectual competence and their children's academic performances. The children's reading test performances were positively related to their mothers' assessments of their general intellectual competence; the arithmetic test performances were also positively correlated with mothers' evaluations, though they fell just short of statistical significance. Dave (1963), using the same interview schedule as Wolf (1964), formed an "Index of Educational Environment". The correlation of this overall "Index" with an "Educational Achievement Score" (comprising word knowledge, spelling, reading and arithmetic computation) was high ($r = 0.799$). Poffenberger and Norton (1963), using algebra grades as their criterion, found that sutdents' perceptions of parents' expectations for math grades were related to their actual grades in algebra. The higher their perception of their parents' expectations, the higher was their grade.

Rosen and D'Andrade (1959) combined criterion measures of both achievement behavior and achievement motives in their study. They found that boys whose mothers had high aspirations and a high regard for their competence, also had a high need for achievement and performed better on the achievement tasks. In particular, they built higher towers of blocks, constructed patterns faster and made up more words in the Anagrams task.

In some studies no criterion achievement measure was used. Expectancy measures themselves in these studies were compared among various groups. Goldman and Shames (1964) and Quarrington et al. (1969) were only interested in comparing the goal setting behavior of parents of stutterers and nonstutterers. Mothers of early stutterers set significantly lower goals for their children than matched controls (Quarrington et al., 1969); mothers of chronic stutterers set higher goals for their children than matched controls (Goldman & Shames, 1964). Lynn and Sawrey (1962) and Barry et al. (1957) compared differences in mother expectancy for boys and girls without correlating expectancy with performance. Similarly Rothbart (1967) related expectancy to birth order.

Significant Behavioral and Attitudinal Variables

Most studies differ in the manner and degree to which they identify mediating factors involved in the relationship between mother's expectation for her child's intellectual achievement and his actual achievement. Wolf (1964) incorporated in his interview both parental intellectual expectations for the child and aspects of the home considered most relevant to the development of general intelligence. The highest relationships with the child's I.Q. score were not only the parents' intellectual expectancies but also the amount of information that the mother had about the child's intellectual development, the opportunities provided for enlarging the child's vocabulary, and the extent to which the parents created situations related to school and non-school activities. What emerges from examining these correlations is a general picture of the kind of behavior that distinguishes the high from the low expectancy mother and the relevant aspects of the home environment that distinguish the high from the low I.Q. child.

Crandall et al. (1964), in trying to identify the antecedents of differences in children's intellectual achievement motivations and performances, studied both the mother's evaluation of her child's intellectual competence and other

attitudinal and behavioral variables. In two separate interview sessions they obtained information regarding the following attitudinal and behavioral variables.

(1) The value the parent attached to his child's intellectual achievements.
(2) The parent's satisfaction-dissatisfaction with his child's intellectual achievements.
(3) The parent's minimal standards for his child's intellectual achievement i.e., the level of competence below which the child's performance produced parental dissatisfaction and above which the parent felt more satisfied than dissatisfied with his child's efforts.
(4) The frequency and intensity of the parent's attempts to increase his child's participation and competence in intellectual activities.
(5) The parent's participation with his child in intellectual-achievement activities.
(6) Specific positive parental reactions (both frequency and intensity) to his child's intellectual-achievement behaviors.
(7) Specific negative parental reactions.
(8) General parental affection and acceptance of the child.
(9) General parental rejection of the child.
(10) General parental nurturance.

Results of the study showed that not only are mothers' expectations for their child's general intellectual competence related to the child's academic performance, but also that variables besides expectancy are related to test performance. For example, girls who are competent readers, have less affectionate and less nurturant mothers than do their less competent peers. Girls who perform better on an arithmetic achievement test have mothers who are relatively less nurturant.

Some but not all the other attitudes and behaviors of the mother towards her child's intellectual achievements were also predictive of the child's academic performances. The values a mother placed on her child's intellectual experiences were not associated with the child's performance, yet satisfaction with the child's general intellectual competence was related. Mothers' instigation and participation in intellectual activities were either negatively or not associated with the child's academic performance. Positive and negative reactions of the mother to the child's intellectual-achievement efforts were not predictive of their achievement test performances. Hence, the investigation of the many behaviors and attitudes of parents to their child's achievement provides insight into the mediating factors operating between the mother's expectation and the child's performance in the area of intellectual achievement.

The question of mediating factors is dealt with by Rosen and D'Andrade (1959) in their direct observations on parents and children working at a number of achievement tasks. Besides measuring the parents' evaluations of and aspirations for their child, and their child's subsequent performance, these authors carefully studied the interaction process. They tried to determine how the use of sanctions,

i.e., rewards and punishments, by the parents ensured that the parents' expectations would be fulfilled. This study is unique in that it relies on direct observation to study the mediating factors involved and thereby avoids the errors inherent in parental reporting of aspirations and evaluations (McCord & McCord, 1961; Mednick & Shaffer, 1963; Pyles, Stoltz & MacFarland, 1935; Yarrow, 1963). Rosen and D'Andrade (1959) found that high need achievement scores occurred in boys with mothers who had not only higher aspirations for them and a higher regard for their competence but also who were quick to disapprove of poor performance and quick to approve of good performance, who continued to exert pressure on them to do better, who were domineering, and who expected less self-reliance than mothers of boys with low need achievement scores. These findings parallel those of Baumrind and Black (1967) for girls.

To summarize what is known about mediating factors that communicate expectancy in the mother-child interaction, the most important variables that have been identified are general affection and nurturance, specific reinforcement both positive and negative, and the degree of control exerted and autonomy permitted.

Age and Sex

Mother expectancy measures have been described for children of all ages. For example, Baumrind and Black (1967) used pre-school children with a mean age of 4 years, while Poffenberger and Norton (1963) used college freshmen. The children in the Fels study (Crandall et al., 1964) were equally distributed in the second, third and fourth grades; the boys in Rosen and D'Andrade's study (1959) were older, ranging from 9 to 11 years of age. The effect of the child's age on a mother's expectation has not been completely elucidated, although expectancy research in other areas indicates age to be an important variable as Rosenthal and Jacobson (1968) demonstrated in comparing teacher expectancy advantages for children in the first two grades with children in the next four grades.

Evidence in parent-child interactions also supports the notion that age is important. Schaefer and Bayley (1967) found an age correlation for the parental behavioral factor of Love-Hostility between infancy and adolescence and between adolescence and maturity. They found no relation between infancy observations and adult retrospective reports. Autonomy-Control behavioral scores were not consistent with age; in addition, significant correlations

between Love-Hostility and Autonomy-Control were found only in the case of adolescents. It is interesting that these same kinds of behavior have been previously found to mediate mother's expectancy and her child's achievement behavior. There is, therefore, a strong possibility that mother's expectancy also changes with the age of her child.

The issue of changes in mother expectation with age is closely related to the effect of sex differences on mother's expectation. All studies on mother expectation have pointed out significant differences between mothers' expectations for girls and boys. Interviews with mothers of second grade Norwegian children (Lynn & Sawrey, 1962) revealed that mothers stressed achievement of positive goals in their hopes for their sons' futures and avoidance of bad influences in their hopes for their daughters' futures. Poffenberger and Norton (1963) compared male and female college students in terms of grades they thought their parents expected of them. They then compared their actual grades. The results showed that boys thought their parents expected higher math grades from them than girls thought; in keeping with these expectations boys showed a greater increase in overall grades and in algebra grades. Crandall et al. (1964) found no sex differences in the

relationship between mothers' evaluations of their children's general intellectual competence and the children's academic performances, nor in the mothers' reported satisfaction or dissatisfaction with their children's achievement efforts. They did find, however, significant relations between mothers' attitudes and behaviors and daughters' academic proficiency.

There is no question that mothers of boys and mothers of girls behave differently (Baumrind & Black, 1967; Bing, 1963; Hatfield, Ferguson & Alpert, 1967; Sears, Maccoby & Levin, 1957; Solomon et al., 1969). Maternal attitude and behavior differences have in fact been described both by mothers in interviews (Bing, 1963; Crandall et al., 1964; Moss & Kagan, 1958) and by children on questionnaires (Bronfenbrenner, 1960; Devereux, Bronfenbrenner & Suci, 1963; Dropplemen & Schaeffer, 1963). Freeberg and Payne (1965) suggest that these differences stem from differences in parental expectation for later intellectual and vocational achievement, as well as for present achievement. Boys and girls themselves, over various ages, differ in the estimates they give of their intellectual and academic capabilities; girls give consistently lower estimates than boys (Crandall, 1969). An examination of mothers'

expectations for boys and girls separately therefore might explain some of these discrepancies.

Social Class

The number of studies comparing the expectations of mothers of different social class backgrounds for their children's intellectual achievement is small. This is surprising since differences in intellectual ability between children of different classes have long been known to exist (Anastasi, 1958; Eells, Davis, Havighurst, Herrick & Tyler, 1951). These differences have often been attributed to "cultural deprivation" (Deutsch, 1965; Deutsch & Brown, 1964; Wiener, Rider & Oppel, 1963).

The few studies that have been carried out emphasize the part played by mother expectations and aspirations. Whiteman and Deutsch (1968) have delineated a few specific environmental factors that explain the disadvantaging effects of such global background factors as lowered socioeconomic status and/or membership in an underprivileged racial group. These make up their "Deprivation Index". One of the factors in the "Deprivation Index" is the educational aspiration level of the parent for the child. This variable was found to be significantly correlated with the scholastic achievement of reading.

By contrast, Rosen and D'Andrade (1959) in their study of boys and their parents from lower and middle class backgrounds found that, by controlling I.Q. and achievement motivation levels, no significant differences could be found in the boys' performances, in the parents' aspirations for and evaluations of their children, or in the parents' behavior with their children, regardless of their social class.

The fact still remains, however, that intelligence scores and measures of achievement motivation and expectation are generally not equal across social groups (Anastasi, 1958; Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld & York, 1966; Eells et al., 1951; Rosen, 1956, 1959). The general consensus seems to be that mothers' expectations and aspirations are important determinants of children's achievement behavior. Therefore, it becomes important to discover to what degree these factors determine achievement and how they are communicated to the child.

A few observational studies show differences between lower and middle class mothers in their behavior toward young children during achievement related tasks. Hess and Shipman (1965) found middle class Negro mothers were more likely to praise and show affection to their child and less likely to criticize than were lower class Negro mothers.

Walters, Connor and Zunich (1964) obtained data in an interaction situation between lower class mothers and their children and derived cross-class comparisons by using results of related studies with middle class mothers done by Merrill (1946) and Zunich (1961). Middle class mothers scored higher on a large number of behavioral categories and showed a greater amount of interaction than lower class mothers. Solomon et al. (1969) used apartment condition as the measure for social class. Their results were consistent with those of Hess and Shipman (1965) and Walters et al. (1964). They found, for example, a relationship between apartment condition and factors of Maternal Warmth and Encouragement of Independent Achievement Efforts. These social class differences both in behavior of mothers and in the achievement abilities of their children support the notion that differences in mothers' expectations have some role to play in determining the differences in mothers' behavior and their children's achievements.

Birth Order

Many studies examining birth order have found differences in the area of achievement, with the first born child usually the greatest achiever (Rothbart, 1967). A number of hypotheses have evolved about the sources of the first-

born's achievement. One suggestion has been made that since parents have no frame of reference in their expectations for the first born, they tend to overestimate his ability and set higher standards for his performance (Phillips, 1956; Rosen, 1961). The implication is, therefore, that the higher expectation on the part of the parent for the first-born acts as a self-fulfilling prophecy with the result that the first born achieves more.

Rothbart (1967) tested the hypothesis that a mother of a first born has higher expectations for her child's performance but found only a few significant effects of birth order. Solomon et al. (1969), on the other hand, found that mothers in their study gave significantly lower expectancy estimates for first-born girls than for later-born girls while their estimates for first- and later-born boys were not different. Furthermore, these differences in expectation were reflected by differences in mothers' behavior with the first born girls; they gave significantly more direct participation to their daughters during the achievement tasks.

In summary, the few studies that have been reported on expectancy and birth order illustrate the complexity of the relationship. Other variables such as age, sex, and social

class must always be taken into account in studying the association between a mother's expectancy and the birth order and achievement behavior of her child.

Change of Expectancy

A few studies have been done in which mothers were given false feedback, usually negative, about the level of performance of their child. The mother's subsequent behavior was then observed (Hilton, 1967; Merrill, 1946; Walters et al., 1964). One can regard this false feedback as serving to modify mother's expectation for her child's performance. Of interest in this situation is how a mother's attitudes, expectancy, and behavior with her child change, and how her child's performance changes. Merrill (1946), in a middle class sample, and Walters et al. (1964), in a lower class sample, observed the behavior of mothers and their pre-school children in an unstructured laboratory setting and found similar changes in the facilitory and inhibitory patterns of the mothers after negative feedback had been given about their children's performance. Hilton (1967) was interested in how negative and positive feedback would affect mothers of children of different birth orders. She found, regardless of birth order, that mothers of children in the failure condition changed their ratings to a

more negative evaluation significantly more often than mothers of children in the success condition.

Whether a mother's expectation for her child has really changed as a result of the feedback depends on a number of factors such as the measure of expectation used, the personality of the mother, and her general evaluation of her child. It would seem from these few studies, however, that negative feedback can affect a mother's evaluation of her child's performance and her behavior with him.

Related Studies

A large number of studies have tried to identify parental behavior and attitudes associated with children's school achievement and achievement behavior (Baldwin, Kalhorn & Breese, 1945; Drews & Teahan, 1957; Watson, 1957; Winterbottom, 1958). These studies have not directly examined mothers' expectations for their children's performance. Nevertheless they are important to this review since many of the dimensions of maternal behavior and attitudes identified as being related to children's achievement efforts are also related to mothers' expectations for their children. Although it is beyond the scope of this review to report all their findings in detail, a few of the emergent issues will be discussed.

Despite many different techniques for measuring mother behavior, such as observers' ratings of behavior, retrospective interviews with mothers, and retrospective questionnaire ratings by children, and despite the different ages and sex of the children studied, certain consistent dimensions emerge from all studies. These dimensions may, therefore, be basic elements in parental behavior. These dimensions deal with love, affection, and acceptance as opposed to hostility and rejection, and with control and domination as opposed to autonomy and permissiveness.

In relating these dimensions of behavior to the achievement performance of the child, a controversy has developed over what kind of environment fosters higher I.Q. scores. Baldwin et al. (1945) and Watson (1957) favored the Acceptant-Democratic-Indulgent families, while Drews and Teahan (1957) favored those with "authoritarian and restrictive" mothers.

A similar and parallel controversy has arisen over a related constellation of variables concerned with fostering dependence and independence. Some authors report that independence training goes hand in hand with achievement training (Shaw, 1964; Sontag, Baker & Nelson, 1958; Stewart, 1950; Winterbottom, 1958); others hold that the

demands for achievement and for independence are unrelated (Smith, 1969; Torgoff, 1961). Others find effects in the opposite direction with earlier demands for independence associated with less adequate school progress. Studies by McClelland (1961) and Moss and Kagan (1961) suggest that the age at which parental demands are made and the strength of the achievement motive may be curvilinear rather than linear, with very early and very late demands producing high achievement motivation. Bartlett and Smith (1966) found neither linear nor curvilinear relationships between age of demands and strength of achievement motivation in groups other than middle class Protestants.

No behavioral evidence was found by Crandall, Preston and Rabson (1960) to confirm the association between independence training by the mother and her child's achievement behavior. They stated that "neither maternal affection nor independence training was predictive of the child's achievement behavior". Obviously the relationship between independence training and the development of achievement motivation and behavior is not entirely clear.

Another important aspect of child-rearing is the Love-Hostility dimension of maternal behavior. Crandall (1960) as mentioned previously, found that both independence training

and general maternal affection were unpredictive of the nursery-school child's achievement behavior but they found that direct maternal rewards of achievement efforts and approval-seeking behavior were. Winterbottom (1958) found that mothers of boys with a high need achievement responded more often with physical affection in reaction to their sons' attainment of independent accomplishments than mothers of boys with a low need achievement. Rosen and D'Andrade (1959) found that parents of high need-achievers displayed more warmth and involvement toward their sons' performance than did the parents of low need-achievers. In another study by Crandall et al. (1964), mothers of academically competent girls were found to be less affectionate and less nurturant than mothers of less competent girls. Smith (1969) found that high need achievement is associated with infrequent kissing and hugging but is also associated with parent encouragement to the child that he should be proud of his success and should always try to do better.

Despite the inconclusiveness of all these findings, a knowledge of the maternal behavior related to a child's achievement behavior and motivation is important in a study of mother expectancy. No doubt much of this same behavior communicates a mother's expectations to her child.

In summary, expectancy in the mother-child relationship has been studied using many methods and population samples. These studies differ in their measures of mother expectancy, their criterion measures of the child's achievement, and in their maternal behavior measures. The populations studied have differed with respect to age, sex, social class, birth order, and the presence or absence of associated variables such as stuttering and need achievement.

Despite these differences, however, nearly all studies indicate the important role parental expectancy plays in a child's intellectual achievement. In those studies which do not deal directly with expectancy but which investigate the relation of maternal behavior to the development of a child's intellectual and academic competence, it remains to be elucidated what the maternal expectancy is and how it is specifically communicated.

In all these studies, measurement is always a great stumbling block. One approach is to interview mothers about their attitudes towards achievement and their evaluations of their children. Crandall et al. (1964) found this measurement to yield valuable information in relating parental attitudes and behavior to school children's academic achievement. Smith (1969) used the questionnaire method to obtain

similar information. The dangers of introducing biases based on such effects as social desirability and poor recollection of past activities have been pointed out by many authors (McCord & McCord, 1961; Taylor, 1961; Yarrow, 1963).

Although mother-child interaction in the home provides the closest approximation to everyday mother-child behavior, especially when the observer spends enough time in the home so that his presence becomes unobtrusive (Yarrow & Raush, 1962), this desirable situation may be closely simulated by structuring situations experimentally to elicit a particular kind of parent-child interaction. This latter approach has been used successfully by many researchers (Bee, 1967; Bing, 1963; Merrill, 1946; Moustakas, Siegel & Schalock, 1956; Rosen & D'Andrade, 1959; Solomon et al., 1969; Zunich, 1961).

Of particular interest are the studies by Bee (1967), Bing (1963), Solomon et al. (1969), and Rosen and D'Andrade (1959) who used achievement situations to observe mother and child behavior in order to measure their attitudes and expectations.

A structured interaction situation thus seems the most appropriate method for investigating a mother's

expectancies for her child's achievement, the behavior which relates to these expectancies and the resultant performance of the child. This is also very much in keeping with a suggestion by Crandall (1969). She feels that explanations for the wide and consistently observed differences in the expectancies of boys and girls for their own performance might be found "through direct observation in the home and on structured tasks that are presented to the child in the parents' presence or on which parents and child work together --situations similar to those used by Hess and Shipman, Rosen and D'Andrade and Solomon and colleagues" (p. 42).

Summary and Remaining Questions

The studies mentioned above have drawn on two sources for their data. The first deals with the effect of the interpersonal self-fulfilling prophecy, namely, that one's expectation of the behavior of another may be a significant determinant of the other individual's behavior. Evidence for this effect comes from many dyadic interactions. Most relevant to the present study is the finding that a teacher's expectation can have a powerful influence on the academic performance of her pupils. In view of these findings, the paucity of studies dealing with expectancy in the mother-child relationship is striking, particularly in view of the

important role parents play in influencing their children. If it is true that a child, who, working under the disadvantage of his teacher's low expectation, suffers academically, how much more must he suffer if he must also deal with his mother's low expectation?

The studies which have touched on mother expectation have more often than not been indirect studies. The one direct study of mother expectancy effects (Crandall et al., 1964) used the self-report method in its investigation. As we have seen, this technique is fraught with great difficulties.

The present study was designed to examine the relationships among a mother's expectations, her behavior and her child's performance. The following questions will be considered.

(1) Determination of Expectancy

How does one determine what is a mother's expectation for her child's intellectual achievement? A variety of measures have been used to date. These include reports of children's perceptions of their mother's expectations (Poffenberger & Norton, 1963), interviews with mothers (Crandall et al., 1964; Dave, 1963; Wolf, 1964), mothers' estimates in achievement tasks given variable amounts of

information about the norms of the task and her child's performance on it (Quarrington et al., 1969; Rosen & D'Andrade, 1959; Rothbart, 1967). The relationship among all these measures has never been determined. In planning the present study it was decided to use all these expectancy measures in order to describe the relationships among them, as well as their relationships to mother's recorded behavior and to her child's performance.

Ratings of the value mother placed on her child's intellectual achievements, her satisfaction with her child's performances, her minimal standards for him, and her participation with him in intellectual achievement activities (Crandall et al., 1964) were also devised. Since these attitudes previously had been examined by Crandall and associates (1964), with respect to only one measure of expectation, this study was further designed to study the relationship of these related attitudes to many other measures of expectation and to the actual behavior of the mother in the achievement situation.

Finally, to clarify the controversy concerning the relationships between independence and achievement, mothers' ratings of their children's independence-dependence behaviors and motivations to achieve were included along with

ratings of their children's intellectual potential and academic abilities (Smith, 1969).

(2) Criterion Measures of Achievement

What criterion measures of achievement would be most germane to the measures chosen for the determination of expectancy? The numerous criterion measures of achievement (i.e., academic performance, need achievement, measured intelligence, performance on achievement tasks) used in previous studies have been reviewed, and the confusion they created has been commented upon. The present study chose to use only criterion measures which resulted naturally from the expectancy measures chosen. Since mother was asked about her evaluations of her child's general intellectual potential, the I.Q. measure was selected as one criterion measure. Similarly, performance measures on the various achievement tasks were chosen to coincide with mothers' expectancy measures taken on these same tasks.

(3) Mother Behavior

What kinds of maternal behavior would be most likely to communicate mothers' expectations? A large variety of behavioral measures were tried in an attempt to determine which maternal behaviors communicate mother's expectations

to her child. The scales used were adapted from studies that have used a similar structured interaction situation (Bee, 1967; Bing, 1963; Rosen & D'Andrade, 1959; Shapiro, 1968; Solomon et al., 1969).

(4) Change of Expectancy

Do a mother's expectations for her child's intellectual achievements cause the child's achievements or are they a response to them? It is entirely possible that the more intelligent children shape their mothers' high expectations for them. This is particularly likely to occur when the child begins school and mother has feedback from the teacher to mould her evaluations.

Rosenthal and Jacobson (1968) argue that one must "disentangle the self-fulfilling nature of a prophecy from its non-self-fulfilling but accurate nature" (p. 26) if we are to clearly demonstrate that the prophecy leads to its own fulfillment. To accomplish this, Rosenthal (1966) designed experiments in which only the prophecy was varied experimentally, uncontaminated by past observation of the events prophesized. He gave his experimenters positive and negative expectations in random order regarding their subjects and observed the resultant behavior. A similar procedure was applied to experiments with teachers who received

positive feedback about a random group of students (Rosenthal & Jacobson, 1968).

The present study attempts a similar design with mothers and children. More specifically, three kinds of expectations--control, positive and negative--were induced in mothers regarding the performance of their children on tasks which, they were told, were associated with performance on I.Q. tests.

The study attempts to solve several questions about changing a mother's expectations for her child:

(1) Can one affect a mother's expectation for her child? Will her attitudes and evaluations of him change as a result of feedback?
(2) How does this change in expectation affect her behavior with her child?
(3) What are the differences between giving a mother positive or negative feedback? No feedback? How does a no feedback group react? Do their evaluations remain the same?
(4) How is the child's performance affected relative to his mother's expectation?

(5) Sex

The differences in the expectancies of boys and girls for their own performance (Crandall, 1969) and the differences in their mothers' behavior with them in achievement situations (Bing, 1963; Crandall et al., 1964; Solomon et al., 1969), and in their own achievement performances (Sontag et al., 1958), suggest that one must deal separately

with boys and girls in any investigation of the mother-child interaction. The questions of interest are: 1) Are a mother's expectations for girls different than for boys? 2) Do these expectations express themselves in the same kinds of behavior or in different behavior? 3) Do these expectations similarly affect how a girl or a boy performs? 4) Are there differences in the experimenter's ability to manipulate the expectations of girls' mothers as compared with boys' mothers? 5) Are there differences in the behavior with which this manipulated expectation is expressed? 6) Are there differences in the resulting performances of boys and girls?

Method

Subjects

The sample of this study consisted of 74 mother-child pairs--37 mothers and daughters, and 37 mothers and sons. The mean age of the girls was 9.6 years of the boys was 9.7 years. No significant difference was found in their ages. All the children were in grade four throughout the study. They came in equal numbers from two schools in a large metropolitan city, both of which are quite similar in their general approach to education, in that they stress the new open classroom method of teaching, and the noncompetitive self-comparison method of evaluation. The children were intellectually at the national norm; the mean Wechsler Intelligence Scale I.Q. of the child sample was 101 with a SD of 13. No significant difference was found between the I.Q. scores of the boys and girls.

The families lived in a low income district. More than half of them lived in apartments specially built by Provincial Housing to help families with financial difficulties. The rest were slightly better off in that they did not qualify for Provincial Housing. Nevertheless, the district as a whole is a low rental one.

The educational level of the parents and the vocational

status of the fathers was slightly lower than current national norms. Approximately sixty per cent of the fathers and seventy per cent of the mothers had never completed high school. Only one mother and two fathers were college graduates. Families were rated as to occupational level according to the occupational class scale developed for Canada from the decennial census of 1951 (Blishen, 1958). This scale ranks occupations through the use of combined standard scores determined for income and years of schooling for each of the recorded occupations. The mean Blishen score of the population in this study is 45.4, with a standard deviation of 17 which is in the normal range. Blishen also assigned the occupations to seven classes, and found that almost one-third of the Canadian population is in class 5. This is the greatest proportion found in any class. Most of the families in the present sample are in class 5, indicating a high proportion of skilled and semi-skilled trades.

About three-quarters of the mothers were full-time housewives. The other twenty-five per cent worked; over half of these were divorced or separated.

Over ninety per cent of the children had at least one sibling and seventy-five per cent had two or more. The birth order was nearly equally distributed between first

borns, middle and youngest children.

Subject Procurement

Mothers were first introduced to the study by a letter from the experimenter, accompanied by a short introductory letter from the principal of the school stating his support of the project. The letters were handed out by the teachers to the children who brought them home to their mothers. The letter from the experimenter described the purpose of the study as one which wanted to investigate how children solved problems out of the school setting (Appendix A).

Mothers were to indicate on an attached sheet of paper whether they were interested in participating in the study, when they were available for the interview, whether during school hours, or after school hours, and their phone numbers. This information was brought again by the child to the teacher and then to the experimenter. Mothers were then contacted by telephone and an interview time was scheduled. Most mothers and children were seen during school hours. Mother came to the public school where she and her child were picked up by car and taken to the nearby university, ten minutes away, where the session was held. Afterwards both were driven home. The mothers' response to the request to participate in this study was unexpectedly positive. Of

a hundred mothers contacted by letter, eighty-nine agreed to participate. Of these, 7 were used in sessions to train raters, 8 served in pilot tapes to assess interrater reliability, and 74 comprised the experimental sample.

Procedure

Physical Setting for the Study

All interaction sessions were held in one room provided by the university's Psychology Department. The room was large. In the middle there was a rectangular table and two chairs one next to the other. Mother and child sat there throughout the interaction session with mother always on the child's left. Two microphones, one attached to a Sony 1/2" video-tape unit and the other to a tape recorder, were placed on the table facing the pair. The video-tape unit was at the other end of the room facing the table. The placement of the video-tape camera was established by determining the point at which one could get a picture of the mother, child and the table in front of them. There were two other desks in the room. One held the tape recorder; the other was used by mother to fill out the Mother Questionnaire privately before the interaction session itself began (Appendix B). With the table and chairs thus arranged the child was unable to see what the mother was writing.

This arrangement provided an ideally constant physical situation for all subjects (Appendix C).

The Interaction Session

The study was designed to allow the experimenter to compare mother-child interactions in a group of 74 nine-year-old boys and girls and their mothers. Each session with a mother and her child lasted approximately 90 minutes and was divided into two parts. Mother was asked to supervise her child in the performance of five different tasks, three of which were repeated in part 2 of the session. During the intermission between Parts 1 and 2 every mother received feedback regarding her child's performance. In each case the feedback was determined at intermission randomly to be either positive, negative or neutral. Immediately before beginning the tasks themselves, mother completed a Mother Questionnaire dealing with her expectations about her child's intellectual abilities and her assessment of some of her child's behaviors (Appendix B).

During this time the child practiced his first task, the Rotter Board, to ensure that learning would be negligible once the session proper began (Rotter, 1942). The procedure was concluded by a short interview with mother to determine her ideas about her child's performance in the second half

of the session, and to explain to the mother the nature of the experiment (Figure 1).

The author was the sole experimenter and was present for all sessions. When the mother and her child arrived, introductions were made and the subjects were shown into the testing room. Mother was asked to sit at one of the desks and wait a few minutes while the experimenter showed the child to his seat at the central table where he found the Rotter Board. He was told to practice on the Rotter Board, to see how many times he could get the marble in the ten position which represented the highest score. When the child was settled into the game, mother was handed a copy of the Mother Questionnaire and the format was explained to her in detail. She did a few of the sample items with the experimenter present to help her if she needed help. She was then left on her own and was told to call the experimenter over whenever she was unsure how to answer a question. The Mother Questionnaire took mothers an average of 20 minutes to fill out.

The Mother Questionnaire served as a pre-test measure of mother's present expectations and attitudes towards her child's intellectual achievement, her vocational goals for her child, the child's behavior whether dependent or independent

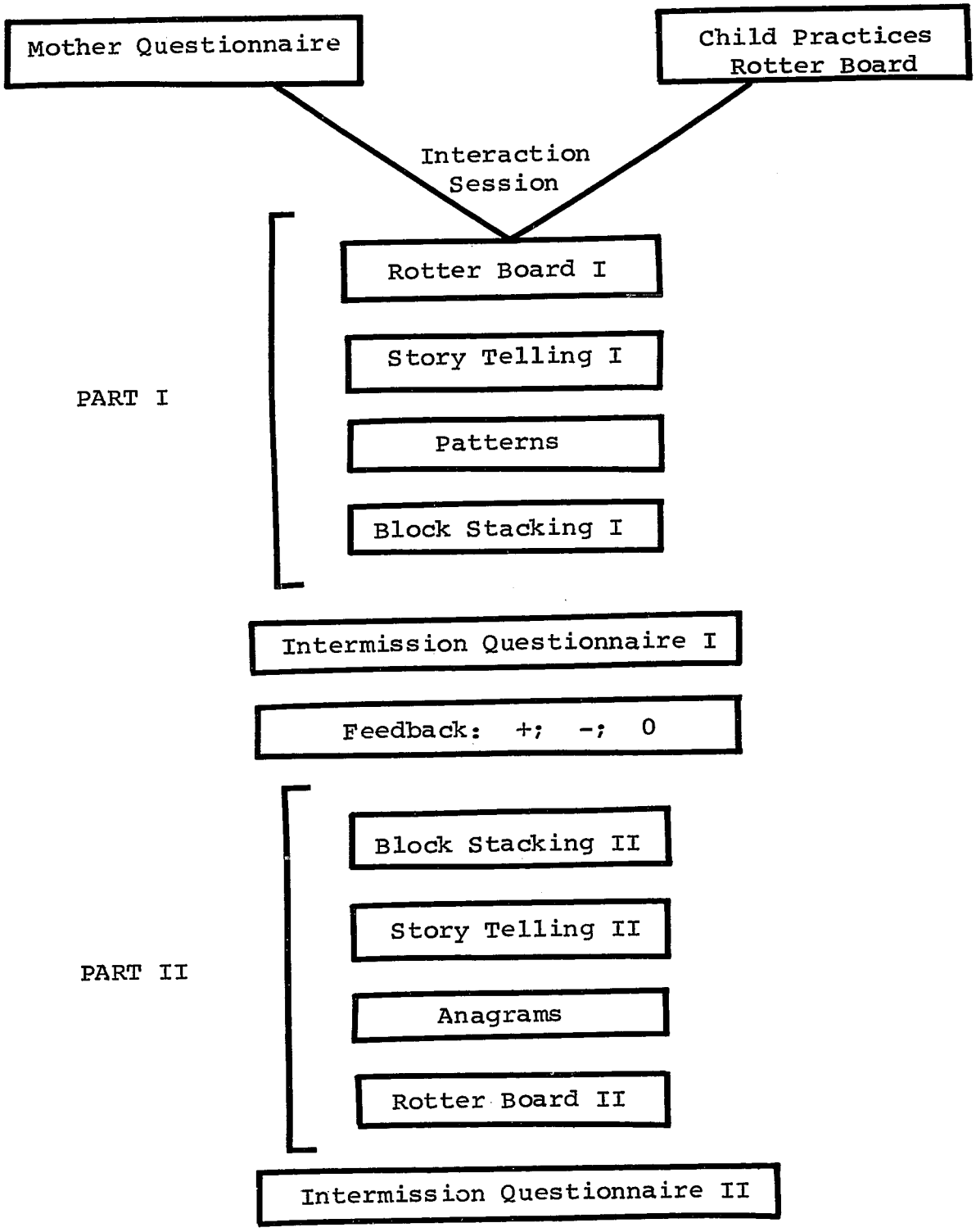

Figure 1. Schematic diagram of interaction session.

(e.g., "ability to work at tasks independently after directions are given"), his achievement-motivation (e.g., "desire to do well in school work"), and other related behavior. Most of the items in Section 1 were adapted from part of a large interview with mothers used by Crandall and associates (1964). The only area in their work of interest to the present study was the child's intellectual achievement. Mothers' ideas about nonintellectual achievements, such as social and athletic achievement, were not examined here. Many of the items in Section 2 were taken from a teacher and mother rating form used by Smith (1969). Unlike these other rating forms, the present questionnaire used a straight line bipolar scale format with only the extremes of the scales marked off to encourage a more normal distribution of responding for mothers and raters (Ramsay & Case, 1970).

During this time the child continued to practice his Rotter Board while the experimenter talked to him about school and tried to put him at ease.

When mother had finished completing the Mother Questionnaire she came to sit next to her child at the central table. The general purpose of the experimental session was repeated to mother and child, this time in much more detail than previously in the introductory letter. Instructions

for the specific tasks in the experiment were given. Since the instructions are crucial to the mother's interpretation of the entire experiment great care was taken in devising them. In general the instructions were developed by adopting parts of instructions in similar testing situations previously reported (Bing, 1963; Hilton, 1967; Solomon et al., 1969), and verifying them on 8 pilot pretest mother-child pairs. Since most of the instructions were long and detailed to ensure adequate understanding by the mother and child, they will not be presented verbatim here but are found in Appendix D. Instead the relevant points in the instructions for each task will be summarized for each subsequent section.

The main purpose of the introductory remarks (Appendix E) was to give mothers the idea that the tasks or "problems" that were to follow were strongly associated with children's I.Q. scores, such that the child who performed well on the tasks would also very likely score high on an I.Q. test and the child who performed poorly would score low. It was hoped that this kind of information would increase mother's motivation to have her child perform "well" during the session. The degree of this increase in motivation would undoubtedly depend on the worth which she placed on intellectual achievement. Second, the information in the instructions

would provide mother with a reference point for estimating how her child would do on a particular task like Rotter Board or Block Stacking. Presumably these tasks were unfamiliar to mother. Thus, she did not have specific expectations for her child's performance in these situations. It was hoped, therefore, that by suggesting that these tasks were linked to general intellectual ability, mother would fall back on her general intellectual expectations for her child in setting goals for him. If this was truly the case, these specific task expectations should be highly related to the general expectations for her child that mother revealed in the Mother Questionnaire.

The third purpose of making these instructions highly motivating was to ensure a greater impact for the feedback given during intermission. The suggestion made to the mother that her child's performance on such tasks as Rotter Board and Block Stacking was somehow related to intellectual ability should increase her idea of the significance of the feedback.

The Experimental Tasks

The rationale behind using structured tasks was to derive from the experimental situation objective measures of a mother's behavior towards her child as he engaged in

achievement tasks. The tasks chosen were those which previous studies had shown children could do and parents would become involved in. Five different tasks were used. These varied along a number of different dimensions. They differed:

(a) according to the degree to which mother was allowed to become involved.
(b) in how dependent the child was forced to become by the task rules and, therefore, how much help mother would interpret he needed.
(c) in the extent to which mothers were permitted to structure the situation according to their own norms and in the extent to which the experimenter was able to set the norm.
(d) as to whether mother was asked to verbalize or not to verbalize her norm to the experimenter.

In observing mother's behavior during the different tasks information was obtained about how self-reliant mother expected her child to be, what kinds of and how much reinforcement she used, and what and how much affect was generated in problem-solving situations. The repetition of a number of these tasks after mother's expectations had been experimentally manipulated also provided information about how a mother's behavior changes when she receives positive or negative feedback about her child's performance.

Since each of the tasks differed from one another in the kinds of demands they placed upon mother it was felt that all should be included and the behavior of mother during each task examined.

Description of Tasks

Task 1: Rotter Board

The Rotter Board consists of a long narrow board with a trough in the center. Starting halfway up the trough and extending to the far end are a series of grooves with a score beside each groove. The scores range from one to ten and back down to one. The child in order to obtain a score is required to roll a marble down the trough. Each score consists of child's performance on 5 trials; a perfect score equals 50.

When mother had taken her place beside the child, after she had completed the Mother Questionnaire, the rules of the game were repeated to her and she was given a score sheet (Appendix F). The experimenter then told mother that the average child on the first trial of this task earned a score of 25. She was asked to write down privately on her score sheet the score she expected her child to get. Mother and child were then given a practice turn to be certain that both understood the rules. The experimenter's "Go" coincided with the start of the video-taping which continued until the experimenter said "Time is up" at the end of 5 minutes. Mother and child took as many turns as possible during this time. The experimenter called out the child's

total score after each turn which mother wrote down beside her estimate at the end of 5 trials. The score sheets containing both the mother's estimates and the child's actual scores were later used in the analysis.

Although the Rotter Board is a level of aspiration test developed to study individual personality factors operating in a level of aspiration situation (Rotter, 1942), a modified Rotter Board has also been used to study the goal-setting behavior of one person for another (Goldman & Shames, 1964; Quarrington et al., 1969). The Rotter Board was chosen in this experiment to provide a measure of mother's goal-setting behavior for her child. This very specific task-related expectancy measure, it was thought, might then be compared with the more general measures provided in the Mother Questionnaire.

The Rotter Board also provided a means of examining mother's behavior during a task in which there was very little she could do to affect her child's score. She was not permitted to operate the Rotter Board herself and because of the nature of the game there was little strategy that she could devise that could help her child's performance. Because she was forced to be passive due to the nature of the game, nearly all she could do was estimate

the score her child would achieve based on her knowledge of his immediately preceding performance. Thus it was interesting to observe the mother in this kind of situation and to relate her behavior in it to her specific task expectations and her general expectations for her child.

Three different kinds of expectation measures were derived from this task. The first was a measure of maternal evaluations and aspirations not affected by the child's performance; this was provided by the initial trial of the task. The second was a measure of expectation affected by the child's performance. This came from averaging all the subsequent trial estimates. The third was a measure of how her estimates changed relative to her child's performance. This was the D-score, and was computed by subtracting her new estimate from his immediate past score.

Task 2: Story Telling

In this task mother and child were presented with a set of three T.A.T. pictures. They were instructed to make up a story together that would be both of theirs and that they both agreed upon, which would link the three pictures together in a story in the order in which they were presented. They were asked to describe what the characters were doing in the pictures and what the outcome would be.

The set of T.A.T. cards used were 7GF, 5, and 10 for the first story session, and 1, 5, and 13B for the second. They were given three minutes in which to make up the story. If they were finished before three minutes, they reported this to the experimenter. The choice of who made the decision that the story was ready was noted.

The T.A.T. story telling task has been used successfully in family interaction research to determine patterns of interaction for the families of various kinds of children--schizophrenic, neurotic, emotionally maladjusted, delinquent (Winter, Ferreira & Olsen, 1965). Despite methodological problems the system of Interaction Process Analysis (IPA) developed by Bales (1950) was used in each of these studies to classify the behavior, act by act, into twelve specific categories. These categories were then combined to form special ratios which could be used to compare the interaction patterns among the different groups.

The task was used in this study for a number of reasons. First, it had proven in the past to be a sound method of producing reliable verbal interaction between two or more people. Pilot work demonstrated that the cards lent themselves to immediate interaction between a mother and her child. It also was shown to be an attractive and

interesting task for both mothers and children since the task is sufficiently at the child's level that he can take over if the mother encourages him.

The story-telling situation provided a powerful measure of the amount a mother may take over in a task which is supposed to be shared. In the instructions to the mother and child it was stressed that the story was to be both of theirs. It was, therefore, significant to measure what proportion of the total time mother spent talking, how much structure she provided and how much she let her child assume the leadership. By using a shortened version of the IPA (Appendix G) it became possible to also get a measure of the kind of structure mother provided, whether she spent her time voicing her own opinions, asking the child for his, repeating the instructions of the task to her child, agreeing or disagreeing with him. Finally, the situation provided a very clear measure of the kind of affect mother generated, whether she was generally pleased and proud of her child's story-telling ability and imagination, or whether she was dissatisfied or ashamed of him or thought him silly. All these behaviors could then be related to the mother's general expectations for her child. These behaviors could also be compared before and after the mother's expectation had been experimentally

manipulated.

Task 3: Patterns

Mother and child were presented three geometric patterns on cards, numbers III, V, X, in order, that could be copied by correctly arranging KOHS blocks. They were told that the child had to reproduce the three patterns accurately in six minutes. As soon as the child had finished one pattern he was to go immediately to the next. Mother could help him as much or as little as she wished. She was only permitted, however, to put a block in place for the child three times during the six minutes, at whatever points she chose. Once she had taken her three turns, she could continue to help the child but was no longer permitted to touch the blocks. A note was made of those mothers who disregarded these instructions and either did not use their three turns or who continued to place blocks for their child more often than the three times allowed. It was stressed again to mother than the important thing was that the child do his best.

Variations of the patterns task have been used extensively in mother-child interaction research (Bee, 1967; Bing, 1963; Rosen & D'Andrade, 1959). It provides an excellent opportunity to measure many kinds of mother

behavior in an achievement situation.

The first general question that interested us was how are a mother's expectations for her child's intellectual potential and achievement related to her behavior with her child in an achievement situation? How does a mother's expectancy affect the amount and kind of help and structure she gives her child? How does it affect how quickly she initially offers him help? How does it affect how much she pushes him to do the task more quickly? What is the relationship between the general expectation for her child that she expresses and how important it seems to be to her that he do well? How does her general expectation affect how cooperatively she works with her child on this task? Does it result in her working as a team with her child or is she more often at odds with him, taking over against his wishes? How do her attitudes about her child influence the kind of affect generated in a problem-solving situation?

The second general question of interest was how are all these behaviors affected when a mother receives positive, negative or no feedback about her child's performance? Does she become less approving or more disapproving? Does she help more or less? Does she hide her disappointment or pleasure and appear to remain basically the same?

Task 4: Block Stacking

In this experiment the child was given a large pile of irregularly shaped blocks (Playskool Blocks, No. 655 by Meccano Tri-ang, Playskool Manufacturing Company) and asked to build a tower. The child was blindfolded and told to keep the non-dominant hand behind his back. This created a situation in which the child was relatively dependent upon his mother for help. The mother was told that she could help her child in any way she wished but she could not actually pile the blocks for him.

Before proceeding, the mother was asked to write down privately her estimate of how high she thought her child's tower would be. Since no performance norm was set by the experimenter in this task and since the task was very likely unfamiliar to all the subjects each estimate probably would have a different subjective meaning for different mothers. The mother, therefore, was required to rate how her child would perform compared with other children his age on this task (Appendix H).

The procedure for the second trial was different from the first. The mother and child were asked to write down privately and individually how high the child should build his tower and then to come to a decision together. Whatever

number of blocks they chose became the number of blocks the child would have to use.

This kind of procedure forces mother and child to estimate very realistically. If they choose a low number to aim for, the child receives a low score; if they choose a high number, the tower might topple before the estimated number of blocks is reached, in which case the child would receive a score of zero. The decision-making process was scored for whose decision was finally accepted and how much pressure was exerted by the other person.

Two estimates were thus obtained in these two trials. The first provided a measure of mother's evaluation and aspiration not affected by her child's performance; the second provided a measure affected by his performance.

The Block Stacking situation is a popular test adopted from the mother-child interaction literature (Bee, 1967; Rosen & D'Andrade, 1959). It provides an excellent opportunity to observe the behavior of a mother in a situation where her child is almost entirely dependent upon her. Secondly, it forces mother and child to interact and to become very involved together in the task. In this way it seems to encourage honest interaction behavior rather than 'company behavior' which is the danger with respect to validity

of behavior in all observational studies.

One of the most interesting questions from our point of view was whether a mother's general expectations for her child were related to her specific expectancies on specific tasks. The objective measures of mother's aspiration-evaluation levels in this task could be compared with the more general measures obtained in the Mother Questionnaire. Furthermore both her specific and general expectations could be related to her specific behaviors in this task. As in the Patterns task, the observers obtained data describing the kind and amount of help mother gave her child, the speed with which she initially interfered, the amount she pressured him to improve, the importance she placed on his doing well, her cooperation with her child, the kind of affect she generated in a stressful situation. Again, as previously, the change in these behaviors was observed when mother's expectancies were experimentally manipulated.

Task 5: Anagrams

In this task the child was asked to make up as many words as possible of any length out of six prescribed letters in six minutes: I N G H K R. The letters, which could be reused after each word was made, were regular Scrabble blocks which could be easily and quickly manipulated.

Mother was given three additional Scrabble pieces, lettered "T", "A", "B". She was allowed to give her child a new letter (in the sequence "T", "A", "B") whenever she wished, and could help him in any way, except by putting the blocks together for him to make a word.

The Anagrams task provides an excellent method of observing how self-reliant a mother expects her child to be (Bee, 1967; Rosen & D'Andrade, 1959). It creates a situation in which one may observe how much and what kind of help mother offers her child, how much pressure she exerts on him to do better and at what point she believes her child requires help. The Anagrams task allows the experimenter to observe the kind of affect generated by the problem-solving situation and the degree of approval or disapproval the mother communicates to her child.

Instructions and the Interaction Session

The general purpose of the experiment was explained again to mother and child. Then the interaction session itself began. The order of the first four tasks was: Rotter Board I, Story Telling I, Patterns, and Block Stacking I. The experimenter remained in the room at all times. As soon as the instructions for the task were given, the experimenter turned on the video-tape equipment, and with the cue "Go",

the subjects began the task and the experimenter started the stop-watch. When the time for each task was up, the experimenter said, "Stop" and turned off the video-tape camera. Consequently, the raters were exposed to a uniform viewing session for each subject.

After the first four tasks were completed, the experimenter walked to the table where mother and child were seated and said:

> That's enough for now. I think (child's name) needs a little rest. We'll take a break now before we go on. (Child's name), why don't you walk out into the hall for a few minutes and stretch your legs. There's a lovely view of the campus out there. We'll call you back when we're ready to begin again.

The experimenter then led the child out to a large picture window outside the experimental room which proved to be of interest to all the children. When she came back to the experimental room, the experimenter said to mother who was still sitting at the center table,

> I'd like to find out what you think of your child's performance so far. I have a short questionnaire here that I want you to fill out and then we'll talk a little about what your feelings are.

The Intermission Questionnaire given the mother (Appendix I) asked her to rate her child's performance in comparison with other children his age, and in comparison with

his usual problem solving ability. It also asked her how pleased or displeased she was with her child's performance. Identical items were used by Hilton (1967) to get a measure of success of manipulation.

After mother had completed the Intermission Questionnaire, the experimenter collected it, and asked mother verbally again how she thought her child was doing, how he or she performed in school, etc. This provided a check on whether mother had validly filled out both the Mother and Intermission Questionnaires. At this point the experimenter randomly assigned the mother to one of three experimental conditions: positive feedback, negative feedback, no feedback. Part of the experimenter's feedback which follows was adapted from Hilton (1967).

In the case of positive feedback the experimenter said:

> I want to tell you before we go on that (child's name) is really doing extremely well on these tasks. I know it's hard for you to judge his ability relative to other child his age because you haven't seen any others doing these kinds of problems but as you can imagine I've seen lots of children (child's name) age at them so I can tell you that (child's name) did much better than most other children do. He really did extremely well.
>
> What we're trying to measure with these tasks is motor intelligence; how much motor

control does a child have, for example, on the Rotter Board where he has to get a marble into a certain position, how realistically can he estimate his motor control, how much control does he show when he is blindfolded and has to work with only his sense of touch. We're also interested in verbal intelligence and creativity. How does he use words in making up a story? How imaginative is he? (Child's name) did well on all these things.

Well, let's go on. We have a few more things to do. Most of the tasks are the same as before. I don't like to let the children go on too long at one sitting. They get too tired.

In the case of negative manipulation, the experimenter said:

I want to tell you before we go on that (child's name) is doing rather poorly so far. I'm sorry to tell you this but I guess you'd want to know. I know it's hard for you to judge his ability relative to other children his age because you haven't seen any others doing these kinds of problems but as you can imagine I've seen lots of children (child's name) age at them so I can tell you that (child's name) performed below average on these problems. He seems to be doing worse than most children his age.

What we're trying to measure with these tasks is motor intelligence, how much motor control does a child have, for example, on the Rotter Board where he has to get a marble into a certain position, how realistically can he estimate his motor control, how much control does he show when he is blindfolded and has to work with only his sense of touch. We're also interested in verbal intelligence and creativity. How does he use words in making up a story? How imaginative is he? (Child's name)

didn't do so well on all these things.

> We're going to do most of the problems again and see how (child's name) does this time. We find it helps to give these problems twice because the reason some children do so badly is that they are so nervous; this nervousness goes away if they get another chance. So we do them again and then we can pick out the children who did poorly because of nerves and those that just don't have the ability to handle these problems.

In the case of no manipulation, the experimenter said:

> Well, I guess we can go on now. We have a few more things to do. Most of the tasks are the same as before. I don't like to let the children go on too long at one sitting. They seem to get too tired.

The experimenter then called the child back into the room and Part 2 of the experiment began. Four tasks were administered using the same procedure as in Part 1 for recording and timing. The order of the tasks in Part 2 was: Block Stacking II, Story Telling II, Anagrams, Rotter Board II.

For the tasks that were being repeated the experimenter gave a very summarized version of the instructions. The subjects remembered exactly what they were expected to do on each occasion. Mother received new unmarked scoring sheets for Block Stacking II and Rotter Board II, and had no access to those from Part 1. In this way, to some extent, independence of evaluation was ensured for Part 2 of the experiment.

The only task which required a lengthy explanation was Anagrams since this task had not been used in Part 1.

During the entire session, the experimenter made a note of any significant remark the mother made about her child's performance when the video-tape camera was not operating.

After the last task was over, the child was again sent out of the room. Mother was asked to fill out a new copy of the Intermission Questionnaire (Appendix I). After completing it she was asked again to verbalize the opinions she expressed in writing on the questionnaire.

At the close of the session, the whole purpose of the experiment was interpreted to her. She was assured that these tasks had really nothing to do with intelligence, that her child had done as well on the tasks as other children his age. Mothers were sincerely thanked for their willingness to participate, and were told that they would be notified about the results of the study at a later date.

Coding Procedures

Coding for the data analysis was based almost entirely on video-tape recordings of the eight tasks completed by the mother and child. A combination of techniques was used to measure mother behavior, including observer ratings and

frequency counts of various categories of behavior. A description of these measures follows.

Personality Description Form (PDF)

This instrument was devised by Shapiro (1968) as a means of rating patient-therapist interaction. Ten of the 18 scales used here are primarily measures of mother's genuineness, empathy, warmth, potency, and activity (Appendix J). The PDF was useful from two points of view. First, it allowed one to rate global measures of the mother's behavior. Second, since Shapiro found high correlations between the ratings of neophyte and well-trained raters on these scales (Shapiro, 1968), it was hoped that high interrater reliability could easily be established.

Two raters (Raters A) viewed the video-tapes of each session and rated mothers at the end of Part 1 and Part 2 separately using the PDF. Each item in PDF was rated on a straight line with only the extremities of the line marked off to encourage a more continuous distribution of the variable (Ramsay & Case, 1970). In this respect the rating scale differs from the original Personality Description Form which was rated on a 7-point scale. When it came time to assigning a number to a rating made on such a scale, an IBM card was placed on the line and a number from 1 to 67

was given to the rating.

Global Rating Scale (GRS)

This instrument was adopted from parts of the GRS and the Teacher Behavior Rating Form used by Solomon et al. (1969). It consisted of 15 bipolar items (Appendix K). Ratings were made at the end of Part 1 and again at the end of Part 2 by Raters A. Among the items on GRS are the amount of positive emotionality, amount of negative emotionality, encouragement of independence, and general interest on the part of the mother.

Specific Rating Scale (SRS)

At the conclusion of each of six tasks (Rotter Board I and II, Block Stacking I and II, Patterns, Anagrams), Raters A rated each mother on four different items (Appendix L). Each rating was again made on a bipolar scale with only the extremities marked off. The items were degree of importance to mother that her child do well, amount of structure mother imposed, degree to which she kept pushing her child to improve, the degree of cooperation between mother and child. The specific scale for the Story Telling tasks differed somewhat due to the nature of this task (Appendix M). Of interest in this task was whose story it was--mother's

or child's--how much structure mother imposed, and how much pleasure she generally seemed to derive from her child's performance.

Category Interaction Scoring System (CISS)

A second set of raters (Raters B) were trained to score the video-tapes according to a category coding system. The categories used were largely adopted from those of Bee (1967), Bing (1963), Bales (1950), and Rosen and D'Andrade (1959). The Rotter Board, Patterns, Block Stacking and Anagrams were coded privately and individually by each rater of the Rater B pair using the same set of categories (Appendix N). The two Story Telling tasks, on the other hand, required different categories; for this task six of the twelve Bales' (1950) categories were used (Appendix G).

The tapes were scored in 15-second units. A buzzer was turned on whenever the experimenter said "Go" on the tape. It buzzed every 15 seconds at which time the raters skipped a line of their Category Scoring Sheet (Appendix O) to indicate the passing of a 15-second segment. They stopped coding whenever they heard the experimenter on the tape say "Time is up". Each task was scored on a separate scoring sheet to maximize independence of judgment and to allow evaluation of change between Parts 1 and 2. The raters coded

in units of behavior. A unit of behavior was defined as the smallest segment of verbal or nonverbal behavior which could be recognized as belonging to one of the 23 categories in the system. A completed scoring sheet showed both the frequency counts of the various categories of behavior and the number of 15-second time units in the task. Since different subjects took different amounts of time to complete the tasks, the rate of occurrence of a particular behavior was used as the final measure.

Timing Scores

These were purely objective measures (Appendix P). Of interest was the amount of time mother spent talking during the story telling tasks, the latency until she first gave help in the Patterns, Anagrams, and Block Stacking tasks, the amount of time elapsed until the first, second, and third blocks were placed in the Patterns task, and the amount of time elapsed until the first, second and third letters were given in the Anagrams task.

Reliability

Rating Scales

Before the start of the actual experiment Raters A were instructed and trained in how to rate each item on the

PDF, GRS, and SRS. Seven tapes were used in the training sessions. The experimenter worked with the raters to clarify all the scales that presented difficulties. The raters were encouraged to obtain a normal distribution of scores. Extensive training of the raters proved to be unnecessary since the scales utilize non-technical terms and only require such judgments as are commonly made about interpersonal relationships in general. No attempt was made to minimize halo effects despite the fact that many of the scales are not independent of one another (Shapiro, 1968). Raters were told to rate overt rather than inferred characteristics.

The reliability of these judgments for each of the five scales were assessed in a pilot session of eight tapes in which the raters achieved a median reliability of 0.89 before starting to rate the actual tapes of the experiment. Both raters of Raters A continued to rate independently each of the 74 experimental tapes. A check on their reliabilities was made every seven tapes. The raters then met with the experimenter to discuss any differences found in order to maintain a consistent set of definitions. No changes in ratings were made. The Pearson Product Moment correlation was used to calculate the interrater reliability for each scale separately. The ratings made over all the 74 tapes

were used in the calculations (Appendix Q). The range and median ratings for each of the scales were as follows:

	Median	Range
PDF	0.93	0.84 - 0.95
GRS	0.91	0.84 - 0.95
SRS	0.91	0.75 - 0.97

One of the Raters A was chosen at random to be the criterion rater for the experiment and her ratings were used throughout.

Interaction Categories

Interrater reliability for Raters B was achieved only after a great deal of time and effort. A number of different systems of rating were tried and discarded before the final system was adopted. The major difficulty was coordination of data. The raters understood the category definitions but found it impossible to coordinate viewing of the video tapes, listening to the dialogue, and scoring on their rating sheets in the short space of time available. Adequate reliability was only established after transcripts were prepared of the verbal portion of the interaction which the raters could refer to. Furthermore, it was found that

Raters B had to watch each task twice before coding it. Eight pilot tapes were used to assess the reliability of the observers' judgments. The raters achieved a reliability of 0.92 by the start of the experimental study. One rater, the criterion rater, scored all the tapes; the other rater scored approximately every fifth tape until the end of the experiment. The reliability was constantly checked throughout to ensure consistency of category definitions. The overall reliabilities were computed by the Pearson Product Moment for each category separately (Appendix R). The 15 experimental and the eight pilot tapes that both raters had independently coded were used in the analysis.

Timing Scales

Even though both Raters A took timing measures, no attempt was made to formally compute a reliability measure since a quick check showed that these measures were sufficiently similar as not to warrant it. The final timing measure used in each instance was the average of the individual measures attained by the two raters.

Controls for Blind Observers and Experimenter

Two steps were taken to ensure that Raters A and B developed no biases in coding Parts 1 and 2. First, neither

set of raters was ever given the slightest hint that any experimental manipulation had occurred between Parts 1 and 2. As far as they were concerned, the intermission was simply to give the child a rest. Second, in order to avoid a definite set developing in scoring Part 1 first and Part 2 second, raters had to alternate their scoring of Parts 1 and 2 randomly.

To avoid any differences in behavior towards mother and child before manipulation, the experimenter did not look at the table of random numbers to see what feedback group the subjects belonged to until just before the feedback was to be given.

Analysis of the Data

Three basic kinds of analysis were done for the variables:

1. Grouping by Factor Analysis of the independent (expectancy measures) and dependent variables (behavioral measures).
2. Correlations between expectancy measures and certain behavioral measures.
3. Two-way multivariate analysis of variance (sex by feedback).

When individual variables failed to fall into factors, separate analyses were done for each measure.

Two-tailed tests of significance were used in all the correlational analyses because of the exploratory nature of the study.

All analyses were performed on a constant population sample with N = 37 for girls, and N = 37 for boys.

Results

Results will be grouped under four major headings: (1) Expectancy: Measures of Expectancy and Sex Differences; (2) Expectancy: Its Relationship to the Child's Intelligence Quotient and Performance; (3) Expectancy: Behavior of Mothers and Correlates with Expectancy Measures; (4) Expectancy: Effects of Manipulation.

Expectancy: Measures of Expectancy and Sex Differences

Factor Analysis of Expectancy Variables

The concept of expectancy in this study is very broad. Its measurement depends on a large number of different variables. For the purpose of grouping these variables in a meaningful way, a factor analysis was done on the scores of the 38 variables theoretically considered to be related to expectancy. These included the mother's general evaluations of her child's ability, her child's behavior--whether it was dependent or independent, her child's need achievement, and the amount of time she spent with her child in reading, general discussions and other intellectual activities. These variables comprised the Mother Questionnaire (Appendix B). The factor analysis also included more task-specific expectancy measures like the Rotter Board (Appendix F) and Block Stacking estimates, and the task-specific ratings comparing

her child's ability with that of his peers (Appendix H).

The factor analysis program (Dixon, BMD Computer Programs, 1970a) performed a principal component solution and an orthogonal rotation of the factor matrix. Diagonal elements were unity for communality estimation. By the criterion of a minimum eigenvalue of 2.0, five factors were rotated and retained. These accounted for 47.56% of the total variance.

Expectancy Factors

Factor loadings and communalities for all items in the mother expectancy factor analysis are presented in Table 1. A description of each factor follows:

Expectancy Factor 1: General Intellectual Evaluation of Child. Expectancy Factor 1 accounts for 20 per cent of the variance which represents nearly half the total variance accounted for by all the five factors together. The items with high loadings on this factor, in general, involve mother's ratings of her child which may be conveniently considered in three groups. These ratings are found in Sections 1 and 2 of the Mother Questionnaire (Appendix B). The first group is her evaluation of her child's general intellectual potential and his achievement in comparison with his peers. The second deals with her feelings about her child's academic

Table 1

Factor Loadings of Items from Factor Analysis of Expectancy Variables

(Items Loading ±.30 or Greater)

Instrument[a]	Items	Factors[b] 1	2	3	4	5	Communalities
MQ-I	Evaluate child's general intellectual potential; high---low	.71					.60
MQ-I	How child does in comparison with peers in academic subjects; better---worse	.65					.61
MQ-I	Satisfaction with child's performance in school; satisfied---dissatisfied	.69				-.30	.62
MQ-I	What do you tell child about how satisfied or dissatisfied you are with his performance in school subject; I tell completely satisfied---dissatisfied	.72					.62
MQ-I	Minimal standards; does except. better than others---except. worse				.35		.15
MQ-I	Importance to mother of child doing well in school; very imp.---comp. unimp.					-.48	.42
MQ-II	Child's ability to work at tasks independently; very independent---not at all indep.	.47				-.47	.45

Table 1 (continued)

Instrument	Items	Factors 1	2	3	4	5	Communalities
MQ-II	Child's estimation of own abilities; very realistic---very unrealistic	.45				-.36	.37
MQ-II	Child's need for praise; a lot--- minimal					.38	.26
MQ-II	Child's perseverence and effort; gives up easily---sticks with it	-.62					.48
MQ-II	Child's initiative and resourcefulness; high---low	.64					.52
MQ-II	Child's confidence; high---low	.66					.48
MQ-II	Child's general competitiveness; high---low	.31			.34		.30
MQ-II	Child's desire to do well in schoolwork; high---low	.59				-.34	.54
MQ-II	Child's frequency of asking for help with schoolwork; high---low					.36	.28
MQ-II	Child's enthusiasm and interest in learning; low---high	-.49				.54	.55
MQ-II	Child's need for emotional support; low---high					.51	.34

Table 1 (continued)

Instrument	Items	Factors 1	2	3	4	5	Communalities
MQ-II	Explorative and curious; high---low	.59					.49
MQ-II	Ability to make hiw own decision; low---high	-.46				.51	.56
MQ-II	Child trying new things on his own; high---low	.66			.34		.57
MQ-II	Child's ability to carry out difficult tasks without assistance; low---high	-.38				.58	.58
MQ-II	Child tries to improve his performance at things he learns; low---high					.79	.71
MQ-II	Child does his best at academic tasks; high---low	.61			.33		.52
MQ-II	Child's self-reliance; high---low	.68					.49
MQ-II	Child takes pride in doing things well; low---high					.62	.45
MQ-III	How often do you do with child: (everyday ---never): Schoolwork		.67				.48
	Reasoning games		.50				.37
	Teaching information		.69				.53
	General discussions		.55				.38
	Read story		.58				.37

Table 1 (continued)

Instrument	Items	Factors 1	2	3	4	5	Communalities
BTSS	Block Tower I: Estimate 1		-.47				.49
BTSS	Block Tower I: Estimate 2		-.48				.28
BTSS	Block Tower I: Comparison with peers No. 1; high---low				.65		.70
BTSS	Block Tower I: Comparison with peers No. 2; high---low				.72		.67
BTSS I	Block Tower I: D-Score (Estimate 2-Child's 1st score); low---high			.54			.42
RBSS I	Rotter Board: D-Score			.75			.57
RBSS I	Rotter Board: RBE-Score (initial estimate minus 25)		.39	.64			.59
RBSS I	Rotter Board: Average of estimates			.55			.40

[a]Letters refer to instruments from which each item came:
MQ-I = Mother Questionnaire Section I
MQ-II = Mother Questionnaire Section II
MQ-III = Mother Questionnaire Section III
BTSS I = Block Tower Score Sheet - I
RBSS I = Rotter Board Score Sheet - I

Table 1 (continued)

[b]Expectancy Factor 1: High score = Low Intellectual Evaluation of Child.
Expectancy Factor 2: High score = Little Participation with Child in Intellectual Achievement Activities.
Expectancy Factor 3: High score = High Expectancy Related to Performance Feedback.
Expectancy Factor 4: High score = Low Expectancy without Performance Feedback.
Expectancy Factor 5: High score = High Evaluation of Child Effort and High Value on Intellectual Achievement.

performance. The third comprises the mother's ratings of her child's initiative, self-confidence, perseverence and effort, his need achievement, independence and his self-reliance. It is particularly interesting that, for mothers in this study, ideas about her child's intellectual competence parallel her general evaluations of her child's independence and need achievement. A child rated as intellectually superior is also regarded by his mother as being independent and motivated to achieve.

Expectancy Factor 2: Participation with Child in Intellectual Achievement Activities. The items which have high loadings on this factor (9% of the variance) are those which indicate how much the mother participates with her child in reading, general discussions, and other intellectual activities. Although not direct measures of expectancy, these items give some insight into the importance she places on such activities and, thus, to some extent, the importance she places on intellectual attainment in general.

Alsc loading on this factor but to a lesser degree is mother's estimate of how high her child can build a tower. This is an explicit measure of mother's expectancy where no norm is set. It would appear therefore that the mother who reports that she participates to a large extent with her

child in intellectual achievement activities also estimates that her child will build a high tower of blocks.

To approximately the same degree, the RBE score also loads on this factor. This score provides a measure of expectancy where a performance norm has been given. Low involvement in intellectual activities at home is associated with a high RBE score (cf., Expectancy Factor 3).

Expectancy Factor 3: Expectancy Related to Performance Feedback. The items loading on Expectancy Factor 3 (7% of the variance) are all consistent with one another. They relate to a specific goal set by the mother as a result of her having concrete information regarding the past performance of her child. In particular, the D-scores of both the Block Stacking and Rotter Board tasks load on this factor. In the case of Rotter Board, the D-score is computed by taking the mean of the differences between the mother's estimates and the child's preceding performance score, taking sign into account. For Block Stacking, the D-score is computed by subtracting the child's score from the mother's estimate on the second trial. It represents, therefore, how a mother changes her estimate of her child's subsequent performance as a result of knowing how he just performed. If she estimates that on his next turn he will get

the same score, D-score equals zero. If her expectations are that he will do better, the D-score is positive and if she expects him to do worse the D-score will be negative. As unrelated as the Block Stacking and Rotter Board tasks were in what they required the child to do, nevertheless the mother dealt with these two tasks as if they were related in that her method of estimating her child's future performance in relation to his immediately past performance was the same on both tasks.

Two other items are strongly represented in this factor. These are the average of mother's sequential estimates on the Rotter Board task and her initial estimate measure (RBE Score). The RBE Score is the one expectancy measure where mother was given a performance norm before she made her estimate. She was told that the average child on the first trial of the Rotter Board gets a score of 25. The RBE Score is computed by subtracting 25 from the mother's initial estimate. An RBE Score of 0 represents a mother who thinks of her child as able to perform no better than average. A positive RBE Score represents a mother who thinks her child can perform better than average. The converse holds for a negative RBE Score. Since mother had never seen her child perform on a Rotter Board task,

it is very probable that an element of aspiration is dominant in this measure.

It would appear from Expectancy Factor 3 that how a mother deals with her child's past performance in setting future goals for him is directly related to her aspirations for and general evaluations of her child. A mother who thinks her child is average (RBE Score equals zero) will estimate that he will get exactly the same score on his next trial as he got on the previous trial. On the other hand, a mother who initially thinks her child is above average (RBE Score, positive), always thinks that he will do better next time.

Expectancy Factor 4: Expectancy Without performance Feedback. The two highest items on this factor (7% of variance) are both from the Block Stacking task, and the few other loadings are consistent with them. The two strongest elements loading on Expectancy Factor 4 are mother's comparison of her child's performance with that of his peer group in a situation with no explicit standards. Presumably, mother had never seen her child or any other child for that matter stacking blocks blindfolded, one hand tied behind his back.

Other items load on this factor. The first is mother's

minimal standards for her child's intellectual achievement performance. This item is regarded as the "personal yardstick" (Crandall et al., 1964) that the mother uses to judge her child's intellectual performance, i.e., the point below which the child's performance produces parental dissatisfaction and above which the parent feels more satisfied than dissatisfied with her child's efforts. It seems that in a situation where no performance norm is stated and where mother has no past performance samples to refer to, she falls back on her "personal yardstick" to provide the performance norm.

The other items which load on this factor are mother's estimates of her child's competiveness, desire to do well in school, and frequency of trying new things on his own. Mother seems to view her child's performance on the Block Stacking task as directly related to his general competitiveness in achievement situations, his need achievement and general adventurousness in life. Thus, left with no norms in a new achievement situation mother uses both her "personal yardstick" and her ideas about her child's competitiveness, need achievement, and sense of adventure, to assess his future performance. In fact, even after she sees her child build one tower, her estimate of his abilities does

not change and she expects his next performance also to conform to her "personal yardstick" and her ideas of his competitiveness, need achievement, and sense of adventure in achievement situations. These latter two ideas are the only measures that give meaning to this achievement situation. Her child's actual performance is irrelevant.

Expectancy Factor 5: Child Effort and Mother Involvement. Three kinds of items characterize Expectancy Factor 5 (5% of variance), namely, mother's ideas about her child's attitudes and efforts, her ideas about his need for reinforcement and emotional support, and her attainment value for her child's intellectual performance.

The items which load highest on this factor describe mother's ideas about her child's attitudes and efforts in achievement situations. When asked to rate how much her child "tries to improve his performance at the things he learns" or "how much pride he takes in doing things well", the mother who loads high on this factor gives her child a high rating.

Since mother's ideas about her child's need for reinforcement and emotional support also load on Expectancy Factor 5 she obviously recognizes that she has a definite role in relation to her child's attitudes and efforts. The mother

who believes her child is striving to improve his performance also believes that he needs minimal praise but a great deal of reassurance from her when he is in difficulty.

Finally, mother's attainment value for her child's intellectual performance is also involved in Expectancy Factor 5. The higher the value she places on his intellectual achievement, the more she believes he is trying to do things well, and the more emotional support and the less praise she thinks he needs in achievement situations.

It is noteworthy that the value mother places on intellectual achievement (Expectancy Factor 5) does not load on the same factor as her actual evaluation of her child's intellectual competence (Expectancy Factor 1).

Intercorrelations Among Expectancy Factors

Even though the factor analysis produced five orthogonal expectancy factors for the entire experimental sample, the question of whether these factors were related to each other for the boy and girl subgroups within the sample was studied.

Factor scores were computed for each expectancy factor (Dixon, BMD Computer Programs, 1970a). Correlations between these scores for boys and girls separately are presented in Table 2. For mothers of girls, none of the cor-

Table 2

Expectancy Factor Score Intercorrelations

Expectancy Factors[a]		1	2	3	4	5
1. General Intellectual Evaluation of Child:	Girls					
	Boys					
2. Participation with Child in Intellectual Achievement Activities:	Girls	-.05				
	Boys	.02				
3. Expectancy Related to Performance Feedback:	Girls	-.01	.24			
	Boys	.04	-.38**			
4. Expectancy Without Performance Feedback:	Girls	.19	.01	.10		
	Boys	-.28*	-.04	-.14		
5. Child Effort and Mother Involvement:	Girls	.07	.05	.07	.08	
	Boys	-.06	-.01	-.25	-.10	

NOTE: N's: Girls = 37 families; Boys = 37 families; Total = 74 families.
*p<.10; **p<.02.

[a]Expectancy Factor 1: High score = Low Intellectual Evaluation of Child.
Expectancy Factor 2: High score = Little Participation with Child in Intellectual Achievement Activities.
Expectancy Factor 3: High score = High Expectancy Related to Performance Feedback.
Expectancy Factor 4: High score = Low Expectancy without Performance Feedback.
Expectancy Factor 5: High score = High Evaluation of Child Effort and High Value on Intellectual Achievement.

relations are significant. For mothers of boys, the correlation between Expectancy Factors 2 and 3 is significant ($r = -0.38$, $p < .02$) and the correlation between Expectancy Factors 1 and 4 shows a trend toward significant ($r = -0.28$, $p < .10$). For boys, a mother's general ideas of her son's competence influences her judgment of him in a situation where she has no standards with which to compare him with his peers. Where she has a performance norm against which to rate him, furthermore, mother's reported involvement in intellectual activities at home have significant bearing on her evaluations of and aspirations for her son. Mothers who say they spend a lot of time in intellectual activities at home estimate that their son will do well compared with the norm and estimate that he will continue to do better with each trial. The reverse holds for those mothers who report little time spent in intellectual activities at home. In the case of girls, mothers' general evaluation of her daughter's intellectual competence has little bearing on her estimates of her ability in more specific situations.

Sex Differences in Expectancy Factors

Mothers' differential expectations for their sons and daughters were compared. Using the factor scores computed for each factor (Dixon, BMD Computer Programs, 1970a), a

multivariate analysis of variance was done comparing mothers of boys and mothers of girls on the five expectancy factors (Table 3). The analysis showed a highly significant difference ($p < .008$) between boys' and girls' mothers on Expectancy Factor 1 (General Intellectual Evaluation of Child) but no sex differences for the other four expectancy factors. In other words, mothers of girls report much more favorable general evaluations of their daughters than do mothers of boys.

A second comparison was made to find sex differences in the measures of future expectation (Mother Questionnaire, Section III). In particular, mother was asked how far she expected her child would continue in his education. She was given five alternatives: (1) professional degree or graduate school degree, (2) college degree, (3) technical school or trade school degree, (4) high school degree, (5) public school. No mother chose the fifth alternative, i.e., they all expected their child to complete more than just public school. For the remaining four alternatives mothers of boys had significantly different future expectations from mothers of girls ($X^2 = 8.84$, $p < .05$; Table 4). Mothers of girls did not foresee their daughters going to technical or trade school. The rest who did not hope for

Table 3

Multivariate Analysis of Variance of Five Expectancy Factors by Sex

Approximate F: 2.15

Degrees of Freedom: 5, 68

$p < .07$

Univariate Analysis of Variance:

Factor	Mean Square	Univariate F (DF: 1, 72)	Significance Level
1	6.79	7.39	.0083
2	1.24	1.24	n.s.
3	0.18	<1	n.s.
4	0.92	<1	n.s.
5	0.85	<1	n.s.

Table 4

Projected Expectations of the Mother for the Child

Degree	Boys	Girls
Professional or Graduate School	9	9
College	12	13
Technical or Trade School	10	3
High School	6	12

$X^2 = 8.84$, $p < .05$

college or graduate school education expected their daughters to stop after high school. Mothers of boys, on the other hand, saw technical school or trade school as an alternative for their sons, and, in general, did not foresee their sons completing just high school. When mothers were asked to indulge in wishful thinking and answer how far they would like to see their child reach in his education, no sex differences were found (Table 5). Nearly all mothers wanted their children to get at least a college degree.

The contrast is interesting between present and future expectations with regard to sex differences. For present assessments, mothers of girls gave significantly better evaluations. For future expectations mothers of boys were much more keen than mothers of girls that their sons get some training beyond high school.

Expectancy: Its Relationship to the Child's Intelligence Quotient and Performance

The relationship between a mother's expectancy for her child in intellectual achievement situations and the child's performance in these situations was examined. Table 6 presents the correlations between the factor scores for each of the five expectancy factors and the child's Wechsler Intelligence Scale score. These were computed separately

Table 5

Projected Aspirations of the Mother for the Child

Degree	Boys	Girls
Professional or Graduate School	22	16
College	14	16
Technical or Trade School	0	2
High School	1	3

$X^2 = 1.99$, p = n.s.

Table 6

Correlations Between Expectancy Factors and Children's I.Q. Scores

Factors[a]	I.Q. Boys	I.Q. Girls
Factor 1: General Intellectual Evaluation of the Child	-.45**	-.32*
Factor 2: Participation with Child in Intellectual Achievement Activities	.05	.21
Factor 3: Expectancy Related to Performance Feedback	-.07	.08
Factor 4: Expectancy Without Performance Feedback	.07	-.16
Factor 5: Child Effort and Mother Involvement	-.02	.14

*$p \leq .10$; **$p \leq .01$

[a]Expectancy Factor 1: High score = Low Intellectual Evaluation of Child.

Expectancy Factor 2: High score = Little Participation with Child in Intellectual Achievement Activities.

Expectancy Factor 3: High score = High Expectancy Related to Performance Feedback.

Expectancy Factor 4: High score = Low Expectancy Without Performance Feedback.

Expectancy Factor 5: High score = High Evaluation of Child Effort and High Value on Intellectual Achievement.

for boys and girls. Of the five expectancy factors, only Expectancy Factor 1 correlated significantly with I.Q. scores for boys ($r = -0.45$, $p < .01$). The correlation for girls between Expectancy Factor 1 and the WISC score was just short of statistical significance ($r = -0.32$, $p < .10$). Hence, a mother's general intellectual evaluation of her son is highly related to her son's actual intellectual ability as measured by an I.Q. test. This relationship is not as strong in the case of girls. The question of whether mother's expectation acts as a self-fulfilling prophecy or whether mother's expectations are reactions to the child's intellectual ability cannot be answered by these results. The results merely reveal that there is, in fact, a significant relationship.

The lack of correlation between Expectancy Factors 3 and 4 which are specific expectancies and the child's general intellectual achievement as measured in the I.Q. score, further emphasizes the independence of general expectations and specific expectations.

To test whether there was any relationship between specific expectations and the child's performance, several correlations were computed, namely, between a mother's estimate of how high her child would build a tower (Block Stacking I; estimate for trials 1 and 2), and the actual

height of that tower in both trials. Correlations were also computed between Expectancy Factor 4 (Expectancy Without Performance Feedback), which refers specifically to Block Stacking I, and the child's score on trial 1 of that task where there was no performance feedback (Table 7). The results showed that in the case where no performance norm was given to mother and where she had no knowledge of the past performance norm of the child for comparison, a mother's estimate of the height of her child's tower (estimate for trial 1) was related to the actual height of that tower only for boys ($r = 0.34$, $p < .05$). It has previously been pointed out that the element of aspiration level is no doubt dominant in this measure since presumably the parents had never seen their child perform the task before.

On the other hand, mother's evaluation of this estimated score in comparison with how other children her child's age would do (Expectancy Factor 4) was not related to the child's actual performance. Her second estimate (estimate for trial 2) was, however, highly related to performance for both boys ($r = 0.80$, $p < .01$) and girls ($r = 0.69$, $p < .01$). In other words, after mother has observed her child performing the task once, she is better able to estimate his performance on the second trial. Furthermore, since the

Table 7

Correlations Between Expectancy of Mother and Performance of Child on the Block Stacking Task

Expectancy	Performance	
	Boys	Girls
1. Estimate for Trial 1	.34*	.23
2. Estimate for Trial 2	.80**	.69**
3. Expectancy Factor 4: Expectancy Without Performance Feedback	-.15	-.16

*$p \leq .05$; **$p \leq .01$

procedure of trial 2, as already pointed out, encourages realistic goal-setting, her second estimate is very much an evaluation of her child's competence rather than her aspirations for him as it was in the case of the estimate for trial 1.

Thus, a mother's aspirations for her son in a specific achievement situation are significantly related to actual performance. Furthermore, a mother's evaluations of her son's or daughter's competence are significantly related to their actual performance. Her evaluation of her child's competence in comparison with his peers, however, is not related to this child's actual performance.

Mother's expectancy for her child's performance on the Rotter Board, a situation where a performance norm was given, and her child's actual performance on that task, was computed by correlating mother's score on Expectancy Factor 3 (Expectancy with Performance Feedback) and her child's average score on the Rotter Board. Examination of Table 8 reveals that there is no relationship between this expectancy measure and the child's achievement on Rotter Board.

Table 8

Correlations Between Expectancy of Mother and Performance of Child on the Rotter Board Task

Expectancy	Performance	
	Boys	Girls
Expectancy Factor 3: Expectancy with Performance Feedback	.11	.19

Expectancy: Behavior of Mothers and Correlates with Expectancy Measures

Mother Behavior

Factor analysis of mother behavior. Mother behavior was measured in a number of ways. Her behavior as a whole was scored at the end of Parts 1 and 2 in the Personality Description Form and the Global Rating Scale. In addition her behavior within each task was scored in the Interaction Categories, the Specific Rating Scale, and the Timing Scale. All these ratings generated a large number of mother behavior measures.

An overall factor analysis of all the behavioral measures failed to reduce the data meaningfully. Separate factor analyses were then done for Parts 1 and 2 on the scores from the Personality Description Form, Global Rating Scale, and the Specific Rating Scale. Since all these measures represented global overall observations of the mother's behavior it seemed likely that they would group themselves in a factor analysis. The factor analysis program (Dixon, BMD Computer Programs, 1970a) performed a principal component solution and an orthogonal rotation of the factor matrix. Diagonal elements were unity for communality estimation. By the criterion of a minimum eigenvalue of 6.0, two factors

were rotated. These accounted for 44.4% of the total variance.

Factor loadings and communalities for all items in the factor analysis of global mother behavior for both Parts 1 and 2 are presented in Tables 9 and 10. The two factor analyses of Parts 1 and 2 yielded identical factors. It should be noted, however, that there were differences in the loadings of some items in the two factor analyses. A description of each factor follows.

(1) Global Factor I: Warmth. Nearly all the items which load on Global Factor I have a loading of 0.60. The items which load on Global Factor I include mother's overall understanding, genuineness, and warmth, how good a mother she is rated to be, and the amount of unconditional positive regard she has for her child. These items, it is of interest to note, also relate to how active and strong she appears, how closely she cooperates with her child on all the specific tasks, and how important it is to her that her child do well.

(2) Global Factor II: Autonomy. The items which load on Global Factor II also form a consistent picture. They indicate an excitable, pushy, highly controlling and demanding mother at one extreme, and a calm and flexible one

Table 9

Factor Loadings of Items from Factor Analysis of the Global Behavior Measures in Part 1

(Items Loading: ±40 or Greater)

Source[a]	Items	Factors 1	Factors 2	Communalities
PDF	Understanding---Not understanding	-.88		.88
PDF	Passive---Active	.61	-.45	.58
PDF	False---Genuine	.59		.41
PDF	Warm---Cold	-.86		.84
PDF	Strong---Weak	-.40		.24
PDF	Bad---Good	.83		.84
PDF	Remote---Intimate	.86		.83
PDF	Attentive---Indifferent	-.76		.59
PDF	Rejecting---Accepting	.76	.44	.77
PDF	Excitable---Calm		.74	.55
GRS	Disorganized---Systematic	.62		.46
GRS	Rigid---Flexible		.65	.58
GRS	Inappropriate help giving---appropriate help giving	.86		.80
GRS	Lethargic---Energetic	.64		.54
GRS	Relaxed---Tense	-.43		.25
GRS	No positive emotionality---High degree positive emotionality	.66		.44
GRS	No negative emotionality---High degree negative emotionality	-.44	-.67	.63

Table 9 (continued)

Source	Items	Factors 1	Factors 2	Communalities
GRS	Participation never---High degree participation		-.64	.66
GRS	Highly permissive, doesn't structure---Highly controlling, structures everything		-.68	.46
GRS	No encouragement or independence ---High degree encouragement of independence	.40		.29
GRS	Very proud of child---Ashamed or embarrassed of child	-.80		.79
GRS	Interested, involved---Disinterested, uninvolved	-.81		.68
GRS	Sets very high standards, demanding, constant push to improve--- Sets low standards, undemanding, no push to improve		.77	.60
SRS-RB	Importance to Mother that Child do well on (high-low) Rotter Board	-.56		.39
SRS-Patterns	Importance to Mother that Child do well on Patterns (high-low)	-.64		.46
SRS-Patterns	Amount of structure and control - Patterns		.41	.17
SRS-Patterns	Degree push to improve - Patterns (high-low)		.62	.38
SRS-Patterns	Cooperation between Mother and Child - Patterns (high-low)	-.65		.44

Table 9 (continued)

Source	Items	Factors 1	Factors 2	Communalities
SRS-BT	Importance to Mother tha Child do well on B Tower (high-low)	-.65		.59
SRS-BT	Amount of structure and control - B Tower (high-low)		.68	.48
SRS-BT	Degree push to improve - B Tower (high-low)		.81	.66
SRS-BT	Cooperation between Mother and Child - B Tower (high-low)	-.53		.34

[a]PDF = Personality Description Form.

GRS = General Rating Scale.

SRS-RB = Specific Rating Scale - Rotter Board I.

SRS-Patterns = Specific Rating Scale - Patterns.

SRS-BT = Specific Rating Scale - Block Tower I.

Table 10

Factor Loadings of Items from Factor Analysis of the Global Behavior Measures in Part 2

(Items Loading: ±40 or Greater)

Source[a]	Items	Factors 1	2	Communalities
PDF	Understanding---Not understanding	-.87		.77
PDF	Passive---Active	.44	-.53	.47
PDF	False-Genuine	.62		.40
PDF	Warm---Cold	-.90		.84
PDF	Strong---Weak	-.42		.19
PDF	Bad---Good	.89		.85
PDF	Remote---Intimate	.87		.78
PDF	Attentive---Indifferent	-.74		.54
PDF	Rejecting---Accepting	.83	.40	.82
PDF	Excitable---Calm		.73	.57
GRS	Disorganized---Systematic	.71		.53
GRS	Rigid---Flexible		.59	.49
GRS	Inappropriate help giving---Appropriate help giving	.90		.82
GRS	Lethargic---Energetic	.54		.56
GRS	Relaxed---Tense	-.50		.34
GRS	No positive emotionality---High degree positive emotionality	.71		.50
GRS	No negative emotionality---High degree negative emotionality	-.54	-.59	.65

Table 10 (continued)

Source	Items	Factors 1	Factors 2	Communalities
GRS	Participation never---High degree participation		-.71	.74
GRS	Highly permissive, doesn't structure---Highly controlling, structures everything		-.66	.48
GRS	No encouragement of independence---High degree encouragement of independence	.43		.35
GRS	Very proud of child---Ashamed or embarrassed of child	-.81		.67
GRS	Interested, involved---Disinterested, uninvolved	-.77		.32
GRS	Sets very high standards, demanding, constant push to improve---Sets low standards, undemanding, no push to improve		.79	.47
SRS-RB	Importance to Mother than Child do well on Rotter Board (high-low)	-.57		.46
SRS-Anagrams	Importance to Mother that Child do well on Anagrams (high-low)	-.40		.33
SRS-Anagrams	Amount of structure and control - Anagrams (high-low)		.47	.23
SRS-Anagrams	Degree push to improve - Anagrams (high-low)		.41	.28
SRS-Anagrams	Cooperation between Mother and Child - Anagrams (high-low)	-.50		.32
SRS-BT	Importance to Mother that Child do well on B Tower (high-low)	-.42		.54

Table 10 (continued)

Source	Items	Factors 1	Factors 2	Communalities
SRS-BT	Amount of structure and control - B Tower (high-low)		.73	.39
SRS-BT	Degree push to improve - B Tower (high-low)		.63	.27
SRS-BT	Cooperation between Mother and Child - B Tower (high-low)	-.42		.35

[a]PDF = Personality Description Form

GRS = General Rating Scale

SRS-RB = Specific Rating Scale - Rotter Board II

SRS - Anagrams = Specific Rating Scale - Anagrams

SRS-BT = Specific Rating Scale - Block Tower II

at the other. It is interesting that the highly controlling mother makes use of negative emotions and hostility to convey her demands to her child.

Interaction categories. Preliminary analysis of the interaction categories showed that 35 of the categories had a mean occurrence of less than one per mother per session. These categories were therefore excluded from further analysis. The remainder of the categories (Appendix S) occurred frequently enough to be analyzed. Since the same interaction categories were used for these tasks, intercorrelations were then done between Patterns and Block Stacking I in Part 1 (Table 11) and Anagrams and Block Stacking II in Part 2 (Table 12) to see if categories of the same name were measuring the same thing so that these could be combined across tasks. It is obvious in Tables 11 and 12 that although some of the intercorrelations are significant they are not, for the most part, very high.[1] Therefore, these variables were not combined across tasks. Instead each task was treated individually in the subsequent analyses.

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[1]Rosen and D'Andrade (1959) report no relationship between help-giving responses on the Patterns and help-giving responses on Block Stacking.

Table 11

Intercorrelations Between Interaction Categories for Patterns and Block Stacking I

Category	Correlation Coefficient
High Approval - Spontaneous	.38**
Low Approval - Spontaneous	.11
Low Disapproval - Spontaneous	.25*
Suggestions - Spontaneous	.10
Suggestions - Requested	-.06
Low Approval - Requested	-.13
Low Disapproval - Requested	-.02
Latency - Time till first help	-.02

N = 74

*$p \leq .05$; **$p \leq .01$

Table 12

Intercorrelations Between Interaction Categories for Block Stacking II and Anagrams

Category	Correlation Coefficient
High Approval - Spontaneous	.61*
Low Approval - Spontaneous	.11
Low Disapproval - Spontaneous	-.04
Suggestions - Spontaneous	.08
Suggestions - Requested	.06
Low Approval - Requested	.08
Low Disapproval - Requested	.11
Positive Encouragement	.05
Gives Procedure	-.06
Latency - Time till first help	.03

N = 74

*$p \leqslant .01$

The categories from each task which were used in the analysis measured mother's approval, mother's spontaneous help-giving, and her help-giving in response to her child's request for help. Since the tasks differ from one another in what they demand of the child and mother, and what dependency relationship is created between them, it is not surprising that a mother's help-giving responses turn out to be inconsistent on the two sets of tasks depending on mother's interpretation of her role in each task. Furthermore, since only those categories with a large frequency of acts were used in the final analysis, one would not expect high intercorrelations between tasks (Rosen & D'Andrade, 1959).

Intercorrelations among mother behaviors. Factor scores were computed for each of the Global Factors--I: Warmth, and II: Autonomy--in Part 1 (Dixon, BMD Computer Program, 1970a). Correlations between Global Factors, Interaction Categories, and Timing Scales are presented for girls and boys separately. The correlations between the two Global Factors are not significant for both sexes (Table 13). In other words, there was no relationship between a mother's warmth and how much autonomy she allowed her child in achievement situations. In the case of boys'

Table 13

Intercorrelations Among Mother Behavior Measures

(Global Measures)

		I	II	III	IV
I	Global Factor I: Warmth[a]				
	Girls				
	Boys				
II	Global Factor II: Autonomy				
	Girls	0.00			
	Boys	0.00			
III	Humour: Much---None				
	Girls	-0.02	-0.19		
	Boys	-0.33*	0.21		
IV	Consistency: None---Much				
	Girls	0.14	0.30	-0.12	
	Boys	0.02	0.65**	0.21	

*$p \leq .05$; **$p \leq .01$

[a]Global Factor I: High Score = High Warmth
Global Factor II: High Score = High Autonomy

mothers, however, mother's warmth expressed itself in the amount of humour she used ($r = 0.33$, $p < .05$). Secondly, those boys' mothers who allowed their sons little autonomy and tended to "take over" were inconsistent in their behavior in the sense that they changed it when given any kind of feedback about their son's performance ($r = 0.65$, $p < .01$).

Correlations between the two Global Factors and mother's behavior in the specific task situations showed sex differences. For girls' mothers on the Story Telling Task (Table 14), a mother's warmth is related to how much pleasure and approval she shows in her daughter's story ($r = -0.587$, $p < .01$), how much she encourages her to tell the story by asking her opinion ($r = 0.35$, $p < .05$), and how much she agrees with the story once it has been told ($r = 0.33$, $p < .05$). For boys, the situation is entirely different. Mother's warmth has no significant relationship to her behavior on the Story Telling task. Her behavior does correlate with the degree of autonomy she gives her son. Her pleasure and approval of her son's story is expressed by flexible, uncontrolling, non-interfering attitude ($r = -0.44$, $p < .01$). She disagrees little with what her son is saying ($r = -0.39$), $p < .02$). This seems to indicate a somewhat different quality of encouragement to achievement for

Table 14

Intercorrelations Among Mother Behavior - Global Factors and Specific Interaction Categories and Timing Measures for Story Telling Task

		Global Factor I: Warmth[a]	Global Factor II: Autonomy[a]
Structure on Story (lots---none)			
	Girls	-.31	.10
	Boys	-.02	.09
Pleasure-Approval (lots---none)			
	Girls	-.59***	-.15
	Boys	-.10	-.44***
Asks Opinion			
	Girls	.35*	.04
	Boys	.05	.02
Gives Opinion			
	Girls	.20	.08
	Boys	-.11	-.20
Agrees	Girls	.33*	.17
	Boys	.26	.06
Disagrees	Girls	.21	-.14
	Boys	.08	-.39**
Gives Procedure	Girls	.10	.29
	Boys	.22	-.25
Percentage of Time Mother Speaks			
	Girls	.14	.01
	Boys	.06	-.26

*$p \leq .05$; **$p \leq .02$; ***$p \leq .01$

[a]Global Factor I: High Score = High Warmth
Global Factor II: High Score = High Autonomy

mothers of girls compared with mothers of boys. For mothers of girls, encouragement combines with warmth and some degree of structuring of the task; for mothers of boys encouragement is associated with very little control or interference. The mother plays the role of a passively approving observer.

On the Rotter Board task (Table 15), the only correlation found was between the degree of autonomy mothers of boys gave their sons and the number of suggestions she offered them ($r = -0.35$, $p < .05$). Mothers who were rated as giving their sons autonomy gave few suggestions on the Rotter Board task.

On the Patterns task[1] (Table 16), for mothers of girls, there is a relationship between mother's overall warmth and the number of times she verbally expresses approval of what her daughter is doing ($r = 0.42$, $p < .01$). For boys' mothers, as in Story Telling I and Rotter Board I, the degree of autonomy she allows her sons correlates with the amount of "low approval" she expresses. The "low approval" category differs from the approval category by the intensity of the

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[1]Care must be taken in interpreting these results since the number of significant correlations does not far exceed the number that would be gotten by chance alone.

Table 15

Correlations Among Mother Behavior - Global Factors and Help-Giving on the Rotter Board Task

		Global Factor I: Warmth	Global Factor II: Autonomy
Suggestions			
	Girls	0.16	0.00
	Boys	-0.05	-0.35*

*$p \leq .05$

Table 16

Correlations Among Mother Behavior - Global Factors and Specific Interaction Categories and Timing Measures for Patterns Task

		Global Factor I: Warmth	Global Factor II: Autonomy
High Approval - Spontaneous			
	Girls	.42**	-.01
	Boys	.15	.01
Low Approval - Spontaneous			
	Girls	.16	.16
	Boys	-.20	.33*
Suggestions - Spontaneous			
	Girls	.16	-.19
	Boys	-.13	-.03
Suggestions - Requested	Girls	.00	-.21
	Boys	.10	.00
Low Disapproval - Spontaneous			
	Girls	.03	.05
	Boys	-.07	.03
Low Disapproval - Requested			
	Girls	.29	-.10
	Boys	.25	.04
Low Approval - Requested			
	Girls	.22	-.21
	Boys	.20	.05
Latency - Time till first help			
	Girls	-.11	-.02
	Boys	.11	.22

*$p \leq .05$; **$p \leq .01$

approval. For example, a mother who gives a "low approval" might indicate this by saying "yes" in a matter-of-fact tone of voice when her child is doing well. This is to distinguish her from the mother who approves of good performance in an excited tone of voice when she says, "That's wonderful", "Good". Hence boys' mothers who give their sons a large degree of autonomy are likely to express "low approval" when their son is doing well.

On the Block Stacking task (Table 17), girls' mothers' warmth ratings correlate with the number of times mother verbally approves of her daughter's performance ($r = 0.36$, $p < .05$), the speed with which she first begins to help her ($r = -0.42$, $p < .01$), and the number of suggestions she continues to offer her throughout the task ($r = 0.38$, $p < .02$). For boys' mothers the amount of autonomy she gives her son correlates with the amount of time that elapses until she offers the first help-giving response ($r = 0.39$, $p < .02$), with how little she disapproves of his performance ($r = -0.59$, $p < .01$), and with how few pressuring statements she makes ($r = -0.41$, $p < .01$). The more autonomy she gives him the longer she waits until she first offers him help, the less she disapproves of his performance, and the less she pushes him.

Table 17

Correlations Among Mother Behavior - Global Factors and Specific Interaction Categories and Timing Measures for the Block Stacking Task

		Global Factor I: Warmth	Global Factor II: Autonomy
High Approval - Spontaneous			
	Girls	.36*	-.10
	Boys	.11	-.17
Low Approval - Spontaneous			
	Girls	.24	.08
	Boys	-.04	-.25
High Disapproval - Spontaneous			
	Girls	.01	-.24
	Boys	-.05	-.59***
Low Disapproval - Spontaneous			
	Girls	.20	-.18
	Boys	.09	-.09
Suggestions - Spontaneous			
	Girls	.38**	-.33*
	Boys	-.03	-.21
Suggestions - Requested	Girls	-.01	-.24
	Boys	-.05	.01
Low Approval - Requested			
	Girls	-.07	-.18
	Boys	-.13	.17
Low Disapproval - Requested			
	Girls	.30	-.15
	Boys	.04	-.29
Positive Encouragement	Girls	.08	-.25
	Boys	.02	-.41***

Table 17 (continued)

		Global Factor I: Warmth	Global Factor II: Autonomy
Gives Procedure	Girls	.10	.04
	Boys	.09	-.08
Latency - Time till first help			
	Girls	-.42***	.17
	Boys	-.12	.39**

*p≤.05; **p≤.02; ***p≤.01

Summary of Intercorrelations Among Mother Behaviors

The correlations on all the tasks point to two consistent but different pictures. For mothers of girls both the degree of mother's participation and the amount of her positive reaction and encouragement in achievement situations are related to her general expression of warmth and affection for her daughter. For mothers of boys positive reactions are related not to how warm she generally appears but how flexible and uncontrolling she is rated to be and to how little she actually participates in the tasks. This seems to indicate a totally different quality of relationship in achievement situations for girls and their mothers compared with boys and their mothers.

Correlates of behavior and expectancy factors. The relationship between a mother's expectations and attitudes about her child's intellectual abilities and her behavior towards her child in achievement situations was examined (Table 18). The significant correlates of each of the Expectancy Factors with mother's behavior will be discussed separately.

Expectancy Factor 1

Expectancy Factor 1, the mother's general evaluation of her child's intellectual abilities, his achievements,

Table 18

Correlations Between Expectancy Factors

and Mother Behavior

Mother Behavior		Expectancy Factors[a] 1	2	3	4	5
Global Factor I: Warmth						
	Girls	.00	.16	.08	-.02	-.11
	Boys	-.11	-.03	.17	-.19	.03
Global Factor II: Autonomy						
	Girls	-.22	.05	.07	-.22	.02
	Boys	-.15	-.16	.00	-.02	.37**
Rotter Board - Suggestions						
	Girls	.16	.40***	-.03	-[c]	.00
	Boys	-.09	-.13	.03	-	-.28*
Story Structure (lots---none)						
	Girls	.11	.28*	-[b]	-	.04
	Boys	-.43****	.22	-	-	.03
Story Agree	Girls	.18	.09	-	-	-.11
	Boys	-.18	-.12	-	-	.11
Story Disagree	Girls	-.14	-.03	-	-	-.13
	Boys	.03	.39***	-	-	.05
Story Pleasure (lots---none)						
	Girls	-.21	.19	-	-	-.06
	Boys	-.34**	.25	-	-	.27
Story - Time Mother Speaks						
	Girls	-.06	.31*	-	-	-.21
	Boys	-.04	.16	-	-	.06
Patterns - High Approval - Spontaneous	Girls	-.03	.15	-	-	-.05
	Boys	.07	.03	-	-	.07

Table 18 (continued)

Mother Behavior		Expectancy Factors 1	2	3	4	5
Patterns - Low Approval - Spontaneous	Girls	.10	-.04	-	-	-.10
	Boys	-.38***	.03	-	-	.05
Patterns - Suggestions - Spontaneous	Girls	.15	-.22	-	-	.04
	Boys	.22	.05	-	-	-.39***
Patterns - Suggestions - Requested	Girls	-.20	.00	-	-	-.11
	Boys	.06	.07	-	-	-.06
Patterns - Low Disapproval - Spontaneous	Girls	.20	-.08	-	-	.07
	Boys	.22	-.14	-	-	.06
Patterns - Low Approval - Requested	Girls	-.16	-.09	-	-	-.14
	Boys	-.04	.11	-	-	-.23
Patterns - Low Disapproval - Requested	Girls	-.14	.05	-	-	-.03
	Boys	.01	.18	-	-	-.21
Patterns - Latency till 1st help	Girls	-.33**	.00	-	-	.13
	Boys	-.15	-.04	-	-	.03
Block Stacking - High Approval - Spontaneous	Girls	-.19	.04	.09	.03	-.39***
	Boys	.17	.35**	-.07	-.26	-.02
Block Stacking - Low Approval - Spontaneous	Girls	-.19	.11	-.09	-.19	-.42****
	Boys	-.03	.16	-.10	-.02	-.16
Block Stacking - High Disapproval - Spontaneous	Girls	-.11	-.06	.11	.27	.03
	Boys	.08	.35**	-.01	-.15	-.19

Table 18 (continued)

Mother Behavior		Expectancy Factors 1	2	3	4	5
Block Stacking - Low Disapproval - Spontaneous	Girls	-.24	.08	.24	-.53****	-.11
	Boys	.20	.13	.02	.00	.11
Block Stacking - Suggestions - Spontaneous	Girls	.00	.04	-.09	-.03	-.06
	Boys	.20	-.16	.33**	.05	-.49****
Block Stacking - Suggestions - Requested	Girls	-.25	.04	.02	.34**	.07
	Boys	.13	-.29	.29*	.04	-.37**
Block Stacking - Low Approval - Requested	Girls	.00	.01	-.04	.33**	-.24
	Boys	-.05	.13	-.17	.21	-.10
Block Stacking - Low Disapproval - Requested	Girls	.09	-.01	-.12	.36**	-.10
	Boys	.13	.10	-.04	.03	.37**
Block Stacking - Positive Encouragement	Girls	-.07	.01	.05	.24	.05
	Boys	.24	.23	.17	-.09	-.18
Block Stacking - Gives Procedure	Girls	-.33*	.00	.09	.06	.01
	Boys	.00	.06	-.03	.13	-.21
Block Stacking - Latency till 1st help	Girls	-.07	-.04	.16	-.07	.18
	Boys	.06	-.09	-.18	.24	.20

*p≤.10; **p≤.05; ***p≤.02; ****p≤.01

[a]Expectancy Factor 1: High score = Low Intellectual Evaluation of Child

Expectancy Factor 2: High score - Little Participation with

Table 18 (continued)

	Child in Intellectual Achievement Activities
Expectancy Factor 3:	High score = High Expectancy Related to Performance Feedback
Expectancy Factor 4:	High score = Low Expectancy without Performance Feedback
Expectancy Factor 5:	High score = High Evaluation of Child Effort and High Value on Intellectual Achievement

[b]Correlations were not computed for Expectancy Factor 3 and Mother Behavior measures on Story Telling and Patterns as this expectancy measure refers specifically to Rotter Board and Block Stacking.

[c]Correlations were only computed between Expectancy Factor 4 and the two Global Factors and behavior on the Block Stacking task as this expectancy measure refers specifically to the Block Stacking task.

efforts, etc., is related to different behaviors for boys' and girls' mothers. In the case of girls, the evaluation is correlated with how quickly mother steps in to help the child on the Patterns task ($r = -0.33$, $p < .05$), and how much mother repeats the rules of the task to her daughter, e.g., "You must keep one hand behind your back", "You have to pile them until you reach your estimate" ($r = 0.33$, $p < .05$). The mother who has a generally low opinion of her daughter's abilities jumps in quickly to help her get started and tries to structure the situation for her by reminding her about the rules of the game. For mothers of boys, the correlations are with how much structure she provides on the Story Telling task ($r = -0.43$, $p < .01$), how much positive feedback she gives on the Patterns task ($r = -0.38$, $p < .02$), and how much pleasure she seems to be deriving from her child's story ($r = 0.33$, $p < .05$). In general, it would appear that low evaluations, in the case of boys' mothers, are expressed by more involvement and participation in the task itself, by the mothers' giving opinions of their own and encouraging their sons to give theirs. Girls' mothers with low opinions are more concerned with structuring the task in a general way, getting their daughters started, or repeating rules to them. General

evaluations in the case of boys are also related to a mother's positive affect, with low evaluations giving rise to less positive feelings and vice versa.

Expectancy Factor 2

Expectancy Factor 2, Participation with Child in Intellectual Achievement Activities, shows different correlations for boys and girls. For girls, there is a contradiction in how much time mother reports she participates at home in achievement activities and how much she interferes in the experimental achievement situations. A reported low involvement at home is related to her offering many suggestions or helping responses on the Rotter Board, a task where there is really little room for mother involvement ($r = 0.40$, $p < .02$). There are also consistent trends for the Story Telling task where reported low involvement at home correlates with lots of structure being given, such as, giving opinions, asking the child for his opinion, giving procedural suggestions ($r = 0.28$, $p < .10$), and with mother's spending a good deal of the time telling the story herself ($r = 0.31$, $p < .10$). For boys, mother's reported involvement is related not to her help-giving and structuring of situations, as it is in the case of girls' mothers, but rather to the variations in her affect during the experimental achievement situations.

Thus, the report of little participation at home is related to mother's disagreeing a great deal with her son when he is telling a story ($r = 0.39$, $p < .02$). It is also related to her showing strong approval ($r = 0.35$, $p < .05$) and disapproval ($r = 0.35$, $p < .05$) of his performance when he is stacking blocks and with how much she pressures him to do better ($r = 0.29$, $p < .10$). Although they express it with different behavior, both mothers of boys and mothers of girls tend paradoxically to be involved in one kind of achievement situation, namely the experimental one, and yet report little involvement in another achievement situation, namely at home.

Expectancy Factor 3

Expectancy Factor 3, Expectancy Related to Performance Feedback, is not related to the behavior of mothers of girls. Table 18 shows the correlations for boys' mothers. There is an indication that mother's estimate of her child's future performance based on his immediately preceding score is related to the number of help-giving responses she spontaneously offers him in the Block Stacking task ($r = 0.33$, $p < .05$), and the way she responds to his demands for help ($r = 0.29$, $p < .10$). When her son asks her if what he has done is correct or whether his subsequent step is a wise one, she tends to give him specific suggestions rather than

a simple "yes" or "no".

Expectancy Factor 4

Table 18 shows the intercorrelations between mother's behavior on the Block Stacking task and Expectancy Factor 4, Expectancy Without Performance Feedback. No significant relationships appear for boys' mothers. Girls' mothers, however, do behave in predictable ways depending on their expectations. Expectancy Factor 4 correlates negatively with how much "low disapproval" mother gives her daughter, i.e., mother says "no" in a matter-of-fact tone of voice every time she does not approve of her daughter's performance ($r = -0.53$, $p < .001$). Expectancy Factor 4 correlates positively with mother's giving specific suggestions in response to her daughter's demands for help ($r = 0.34$, $p < .05$), or with simply "yes" or "no" if she is on the right or wrong track ($r = 0.33$, $p < .05$; $r = 0.36$, $p < .05$). Thus, the mother who has a low estimate of her daughter in this achievement situation lets her daughter decide when she wants mother to help her. Mother gives her as little spontaneous negative feedback as possible. In the case where her expectation is high, mother structures the situation by giving her daughter a great deal of spontaneous negative feedback and very little specific help when she

requests it.

A confounding variable here is the extent to which the daughter finds it necessary to ask for help. Since mother only gives "requested suggestions" and "requested" negative and positive reactions in response to her daughter's demands for help, this really may be indicating the daughter's lack of self-reliance or inability to perform well on this task. Perhaps the daughter who is always asking for help really needs it because she cannot succeed at the task; therefore, her mother's low expectancy of her ability in this task is valid (Expectancy Factor 4).

Expectancy Factor 5

Expectancy Factor 5, Child Effort and Mother Involvement, is also related differently to the behavior of boys' and girls' mothers. In the case of girls' mothers, the mother's high evaluation of her daughter's efforts in achievement situations, and the importance she places on her daughter's excelling in these situations are negatively correlated with the amount of both mild and intense approval she shows on the Block Stacking task, in which the child is almost totally dependent ($r = -0.39$, $p < .02$; $r = -0.42$, $p < .01$). This finding is not unexpected since mother's specific expectation for her daughter's performance in the Block

Stacking task (Expectancy Factor 4) was already shown to be related to the amount of negative feedback she gave. A low expectancy is correlated with little negative feedback, and a high expectancy with much negative feedback. Thus, a mother with high expectancy provides her daughter with lots of negative feedback, very little positive feedback, and very few spontaneous, positive reactions to her daughter's highly dependent situation. A low expectancy mother, on the other hand, gives her daughter lots of encouragement, positive feedback and approval, and very little negative feedback under the same circumstances.

Expectancy Factor 5, in the case of boys' mothers, bears little relationship to mother's positive and negative reactions as it does for girls. Rather, it is very much related to how much mother helps her son in the various achievement situations, how much she pushes him to do better, and how much she "takes over". More specifically, Expectancy Factor 5 is correlated with Global Factor II, Autonomy, of the two Global Behavior Factors ($r = 0.37$, $p < .05$). It is negatively related to the number of help-giving responses mother spontaneously gives in the Patterns task ($r = -0.39$, $p < .02$), in the Block Stacking task, ($r = -0.49$, $p < .001$) and, to some extent, on the

Rotter Board ($r = -0.28$, $p < .10$). Thus, a mother who has a high evaluation of her son's effort in achievement situations, and who thinks it important that her child do well, will generally tend to interfere very little with him, and offer him few suggestions for improvement. Furthermore, this same mother will tend to answer her son's demands for help, in such dependent situations as the Block Stacking task, by offering few specific suggestions ($r = -0.37$, $p < .05$). Instead, she just lets him know when he is on the wrong track when he asks ($r = 0.37$, $p < .05$).

It seems that the expectations of boys' mothers are much more often translated into how much or how little mother helps her son, how much she controls situations and pressures her son to do better. By contrast, the expectancy of mothers of girls is related behaviorally to how they reinforce their daughter's performance. Furthermore, a boy's mother's expectations are expressed in the reverse direction to that of a girl's mother when one looks at their positive and negative reactions. Whereas a girl's mother with high expectancy approves little and disapproves much of her daughter, a boy's mother with low expectancy approves little and a boy's mother with high expectancy approves much of her son.

Expectancy: Effects of Manipulation

Positive or negative feedback was given to mothers in the intermission between Parts 1 and 2 in an attempt to modify mother's expectations and evaluations of her child. The tasks in Part 2 provided post-manipulation measures of her expectations for her child's performance and of her behavior towards her child. The second Intermission Questionnaire at the end of the session provided measures of her post-manipulation attitudes about her child's performance.

A 2 x 3 (sex by manipulation) multivariate analysis of variance was done on the different pre- and post-manipulation measures (Dixon, BMD Computer Programs, 1970b). The results are described under the following headings.

General evaluations of the child. Mother's general evaluations and feelings about her child's performance were measured by asking her to rate her child at the end of Part 1 before feedback was given and then again at the end of Part 2 after she had seen him perform again on nearly the same tasks. The 2 x 3 multivariate analysis of variance on her ratings yielded highly significant treatment effects ($p < .001$) but no sex differences or interaction effects (Table 19). The Scheffé method was applied to testing differences between the pairs of means. This revealed that

Table 19

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' General Evaluations of the Child

Source	Approximate F	df	Significance
Sex	0.80	10, 59	n.s.
Manipulation	4.08	20, 118	$p < .0001$
Interaction	0.99	20, 118	n.s.

the negative feedback group accounted for the overall significant effect. These mother ratings of their children's performances in Part 2 relative to Part 1 changed significantly (Table 20). They saw their children as performing worse than other children the same age and more poorly than they usually performed. Mothers also expressed greater dissatisfaction with their performances. The positive feedback group did not differ significantly from the control group. Examination of the means of these two groups reveals that the ratings of mothers in both groups increased. Thus, a mother who was given no feedback and the mother who was given positive feedback concerning their children's performances thought their children were doing better on the whole in Part 2 than in Part 1.

Specific expectations. Mother's expectations for her child's performance were compared before and after manipulation for the two tasks where these measures were taken, namely Block Stacking I and II, and Rotter Board I and II.

In the Block Stacking I task, correlations between mother's initial rating and her rating after she had seen her child perform were significant. In other words, in a situation with no performance norm, seeing her child perform once did not change a mother's estimate of how he would

Table 20

Univariate Analysis of Variance: Changes with Manipulation in Mothers' General Evaluations of the Child

Variable	Mean Square	Univariate F (df: 2, 68)	Significance
1. How well do you think your child is doing compared to other children his age (better---worse)	1328.97	25.97	$p < .0001$
2. How well do you think your child is doing in comparison to his usual ability of solving problems. (better---worse)	698.11	9.06	$p < .0004$
3. How pleased or displeased are you with his performance (pleased---displeased)	1745.08	14.68	$p < .0001$

perform a second time. These two ratings were transformed to standard scores and combined. An analysis of variance on the difference between this Part 1 rating and mother's initial rating on the Block Stacking task in Part 2 after feedback showed highly significant treatment effects ($p < .001$) but no sex or interaction effects (Table 21). The Scheffé method was applied to compare the means two at a time. This procedure demonstrated that it was again the negative feedback group which was responsible for the effect. Mothers in this group expected their children to perform worse than their peers. The positive feedback group did not differ from the control group. Examination of the means revealed that both these groups expected better performance from their children.

A second comparison was made, this time within the Block Stacking II task itself. The question being asked in this comparison was whether and how a mother's rating of her child changed after she had observed him perform the task once, taking into account the kind of feedback she had had. Table 22 shows the results of the analysis of variance which yielded a significant treatment effect ($p < .01$) but no sex or interaction effects. The Scheffé method was applied to compare the means two by two. This revealed a

Table 21

Analysis of Variance: Changes with Manipulation in Mothers' Comparison of Child with Peers from Block Stacking I to Block Stacking II

Source	df	Mean Square	F	Significance
Sex	1	19.92	<1	n.s.
Manipulation	2	1126.52	22.02	$p < .001$
Interaction	2	80.11	1.57	n.s.
Within	68	51.17		

Table 22

Analysis of Variance: Changes with Manipulation in Mothers' Comparison of Child with Peers from Trial 1 to Trial 2 of Block Stacking II

Source	df	Mean Square	F	Significance
Sex	1	0.09	<1	n.s.
Manipulation	2	651.67	8.47	$p < .01$
Interaction	2	2.31	<1	n.s.
Within	68	76.98		

significant negative feedback group effect. Thus, after watching their child perform the task, the negative feedback mothers anticipated that the child would do even worse next time, while both the positive feedback and control mothers expected him to do better next time.

A multivariate analysis of variance was done on the changes in mothers' estimates and D-Scores for Block Stacking I and II and Rotter Board I and II (Table 23). This revealed no significant sex, treatment, or interaction effects. Thus, there was no difference in mother's actual estimates of the height of the towers that her child would build due to feedback. This is not surprising in view of the fact that the height of towers has little meaning in itself for these mothers who had no performance norm for comparison. What was important was the significance they attached to a child's building a tower of such a height, i.e., what their child's performance represented in comparison with other children. This measure, as was just seen, did change dramatically as a result of feedback from the experimenter.

Another measure of interest was the D-Score, namely the difference between mother's next estimates and the score that her child had just got. Two D-Scores were examined

Table 23

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' Estimates and D-Scores: Block Stacking I and II; Rotter Board 1 and 2

Source	df	Approximate F	Significance
Sex	6, 63	0.57	n.s.
Manipulation	12, 126	0.59	n.s.
Interaction	12, 126	0.81	n.s.

for differences among the three manipulation groups. The first of these was the transition D-Score. This took the difference between mother's first prediction of the height of her child's tower in Block Stacking II and the height of the previous tower her child had built before manipulation in Block Stacking I. These did not change with manipulation. The second D-Score analyzed was the one computed for Block Stacking II between the first and second trials. This again revealed no differences among the three feedback groups.

Comparison of mother's Rotter Board estimates and mean D-Scores in Parts 1 and 2 also revealed no differences among the three groups. Thus, although mother's reported evaluations of her child's performance were significantly different after feedback, her concrete estimates of her child's performance in specific tasks, like the Rotter Board and Block Stacking tasks, did not change.

General behavior. Changes from Part 1 to Part 2 were measured for mother's Warmth and Autonomy (Global Factors I and II), and for the consistency of her general behavior, humour and mood. A 2 x 3 (sex by manipulation) multivariate analysis of variance revealed significant treatment effects but no sex or interaction effects (Table 24). The treatment

Table 24

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' Global Behavior

Source	df	Approximate F	Significance
Sex	10, 59	0.61	n.s.
Manipulation	20, 118	4.08	$p < .0001$
Interaction	20, 118	0.99	n.s.

Table 24

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' Global Behavior

Source	df	Approximate F	Significance
Sex	10, 59	0.61	n.s.
Manipulation	20, 118	4.08	$p < .0001$
Interaction	20, 118	0.99	n.s.

effects were for the consistency of mother's behavior ($p < .0007$); trend effects were found on her general humour ($p < .09$; Table 25). There were no changes observed in her general Warmth and Autonomy. The Scheffé method was used to compare the pairs of means. The negative feedback groups was rated to be significantly more inconsistent in their general behavior and mood than the positive feedback and control groups. The positive and control groups did not differ significantly from one another.

The humour ratings revealed a trend in the same direction with mother's humour decreasing as a consequence of negative feedback. The positive and control feedback groups did not differ from one another on these measures. Examination of the means showed that mother's humour ratings increased for both groups.

Specific task behaviors. Mother's behavior on the various tasks was compared in a 2 x 3 (sex by manipulation) multivariate analysis of variance. The comparison of mother's behavior on Rotter Board I and II and on Patterns in Part 1 and Anagrams in Part 2 (Table 26) revealed no significant treatment, sex or interaction differences. The two Block Stacking tasks were also compared. The multivariate analysis of variance again showed no significant differences (Table 27).

Table 25

Univariate Analysis of Variance: Changes with Manipulation in Mothers' Global Behavior

Variable	Mean Square	Univariate F (df: 2, 68)	Significance
1. Global Factor I: Warmth	0.55	<1	n.s.
2. Global Factor II: Autonomy	9.12	1.08	n.s.
3. Humour	196.93	2.47	$p < .09$
4. Consistency	1402.79	8.27	$p < .0007$

Table 26

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' Specific Behavior: Rotter Board I and II; Patterns and Anagrams

Source	df	Approximate F	Significance
Sex	10, 59	0.73	n.s.
Manipulation	20, 118	0.77	n.s.
Interaction	20, 118	1.04	n.s.

Table 27

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' Specific Behavior: Block Stacking I and II

Source	df	Approximate F	Significance
Sex	10, 59	1.28	n.s.
Manipulation	20, 118	0.61	n.s.
Interaction	20, 118	0.76	n.s.

Multivariate analysis of variance of mother's behavioral ratings for Story I and II (Table 28) revealed a significant manipulation effect (Table 29) on the variable which rates mothers on the degree of pleasure they seem to be deriving from the whole situation and how approving they are of their child's story ($p < .004$). The Scheffé method revealed that the positive feedback group was significantly different from the negative and control groups. Mothers in this group were rated as showing more approval in the story and appearing generally to be deriving more pleasure from the task as a whole. The control and negative groups were not rated to be significantly different. There were no sex differences or interaction effects.

Children's performance levels. The question of whether a mother's expectation would affect her child's performance was examined by comparing her child's performance on Part 1 with that of Part 2. The differences in the heights of the child's towers of blocks and in his scores on the Rotter Board were analyzed. A multivariate analysis of variance revealed no significant differences among the three feedback groups (Table 30). All children seemed to perform the same on the Rotter Board and Block Stacking tasks in Part 2 than in Part 1. There were no sex

Table 28

Multivariate Analysis of Variance: Changes with Manipulation in Mothers' Behavior: Story Telling I and II

Source	df	Approximate F	Significance
Sex	9, 60	1.01	n.s.
Manipulation	18, 120	1.22	n.s.
Interaction	18, 120	1.29	n.s.

Table 29

Univariate Analysis of Variance: Changes with Manipulation in Mothers' Behavior: Story Telling I and II

Variable	Mean Square	Univariate F (df: 2,68)	Significance
1. Amount of Structure (lots---none)	265.34	<1	n.s.
2. Amount of Pleasure and Approval (lots---none)	1506.12	6.01	$p < .004$
3. Asks Opinion	0.38	1.73	n.s.
4. Gives Opinion	0.05	1.96	n.s.
5. Agrees	0.06	<1	n.s.
6. Disagrees	0.01	<1	n.s.
7. Gives Procedure	0.06	<1	n.s.
8. Percentage of Time Mother Speaks	0.24	2.47	n.s.

Table 30

Multivariate Analysis of Variance: Changes with Manipulation in Children's Performance: Block Stacking I and II; Rotter Board I and II

Source	df	Approximate F	Significance
Sex	3, 66	0.46	n.s.
Manipulation	6, 132	0.59	n.s.
Interaction	6, 132	0.92	n.s.

or interaction effects.

In summary, randomly giving mothers positive, negative or no feedback in an achievement situation caused mothers to change their evaluations of their child's abilities regardless of whether they were boys or girls. This change was particularly significant when the feedback was negative. Mothers demonstrated this change in attitude and feeling by changing their behavior. How they changed it was not revealed since neither the specific nor the general behavioral measures revealed regular changes. Perhaps different mothers dealt with the feedback in different ways and changed in different ways; any consistent effects might thereby have been cancelled out. One change was suggested, namely, that depending on the feedback she received mother's humour and good mood changed. The change in mother's expectancy, however, had no immediate effect on her child's performance.

Discussion

The findings in these experiments elucidate and touch on a number of facets of the problem of the self-fulfilling prophecy and on the effects of changing the prophecy experimentally in the mother-child interaction. To adequately interpret these findings this discussion will be divided into three separate sections: Measures of Expectancy, Sex Differences, and Effects of Manipulation of Expectancy.

Expectancy: Measures of Expectancy

One of the most striking findings that emerged from the factor analysis of the expectancy variables is that mother's expectation for her child's intellectual achievement can have a great many meanings. Thus, it would seem that expectancy is not a unitary concept that can always be measured in singular fashion. Rather, the meaning of expectancy depends both on the way it is measured and on the kind of information mother already has about her child's performance. Despite the fact that every attempt was made in the introductory remarks given to the mother before the start of the session to ensure that mother would think all the tasks were associated with intellectual achievement, which was the subject matter of the Mother Questionnaire,

there was found little relationship between her evaluations of her child on the questionnaire (Expectancy Factors 1 and 5) and her evaluations of him in the specific tasks (Expectancy Factors 3 and 4). This fact was true, particularly for girls. Furthermore, her estimates on the specific tasks alone given without the benefit of a performance norm for comparison (Expectancy Factor 4) were independent of her estimates on specific tasks when she had either his past performance or a performance norm for comparison (Expectancy Factor 3). On the whole, all the different measures of expectancy were relatively independent of one another for boys and completely independent for girls. Only an insignificant trend ($p < .10$) was found for boys' mothers that related their estimates of their sons in a situation with no norms (Expectancy Factor 4) to their general intellectual evaluations of them (Expectancy Factor 1).

Many of the measures in the present study have been used previously by others to discover the nature of maternal expectancy. Despite an attempt in the prelininary instructions of the present experiment to draw upon the same source of expectancy throughout, namely, mother's expectancy for her child's intellectual achievements, no relationship was found between these different expectancy measures.

Factor analysis of these measures yielded orthogonal expectancy factors. The conclusion from this analysis must be that maternal expectancy is a diverse concept with many different meanings even for a particular mother.

One might argue that there are other possible explanations for the independence of the various expectancy measures. First, the methods of arriving at each of these expectancy measures differed. In the case of Expectancy Factors 1, 2 and 5 mother had to fill out a questionnaire; for the other measures, she was participating in an interaction session with her child. Zunich (1961) found no significant relationship between maternal attitudes toward child-rearing measured with the PARI Attitude Scale and selected behaviors of mothers observed in interaction with their children. It might be argued that the reason for the lack of relationship between measures in our experiment was that the Mother Questionnaire which is basically an attitude scale is much more subject to the influence of social desirability effects than is observable behavior (Taylor, 1961). This explanation is hard to accept since Smith (1958) in comparing the interview situation and the observed behavior measures in an interaction situation found that these two different types of measures correlated significantly.

Because no relationship was found between expectancy measured with performance norms and expectancy measured without performance norms, even within the observational situation itself, the argument is strongly supported that expectancy is a diverse concept.

Another reason for the independence of these expectancy measures is that despite the attempt to have mothers think the tasks were related to I.Q. measures, it must have been difficult for them to do so because of the nature of the tasks themselves. A mother who has to estimate how well her child will do in rolling a marble down a trough or in building towers blindfolded with one hand behind his back is affected more by the nature of the particular task than by some general notion of her child's ability. Rothbart (1967) also found a lack of correlation among different measures intended to assess mother's estimate of her child's ability. In her experiment, however, there was no attempt to emphasize the relationship between the tasks and general intelligence.

The data from the factor analysis throw some light on an entirely different problem, namely, whether achievement training and independence training occur together or are independent of each other (McClelland, 1961;

Moss & Kagan, 1961; Rosen & D'Andrade, 1959; Torgoff, 1958; Winterbottom, 1958). Independence items are strongly represented in Expectancy Factor 1 and to some extent in Expectancy Factor 5. Thus, a mother who has a high evaluation of her child's intellectual competence describes her child as independent, full of initiative, resourceful, curious, confident, and self-reliant. A number of the same items also load on Expectancy Factor 5 which deals with the child's efforts in achievement situations and the value mother places on achievement.

Our results argue strongly for the existence of a relationship between independence training and achievement training. Smith (1969) on the other hand, found the opposite fact, namely, that "for mothers, independence values appear to be essentially orthogonal to achievement values" (p. 125). The crux of our differences lies first in the definition used for achievement, and second, in the emphasis in each of our questionnaires about independence and achievement training. Smith (1969) regards achievement as "doing well in competitive games", "being skillful at athletic activities", "being a leader with other children", and "doing his best at tasks", that is, achievement in a social or athletic sense. In our study, achievement is specifically

intellectual. Obviously, the problem of whether independence training and achievement training are dependent or independent of each other must be examined in the light of the particular kind of achievement being considered. With regard to the different emphasis in each of our questionnaires, Smith asked mothers to rate what value they placed on independence and achievement items; our study determined mother's actual rating of her child on independence and achievement items. For intellectual achievement, therefore, independence and achievement training appear not to be orthogonal to one another.

Sex Differences

Sex differences are strikingly apparent at nearly every point in this study. These differences impress one with the conclusion that a totally different quality of relationship for mothers of girls compared with mothers of boys must exist in intellectual achievement situations. Because of their far-reaching implications these sex differences will be examined in detail.

Initially, sex differences were found in comparing mothers' general intellectual evaluations of their sons and daughters (Expectancy Factor 1). Mothers of girls showed significantly higher intellectual evaluations than mothers

of boys. This fact, in itself, is not surprising since nine-year-old girls do receive more positive feedback at least in the form of higher school grades than boys (Coleman, 1961; Norman, Clark & Bessemer, 1962; Northby, 1958; Phillips, 1962; Schmuck & Van Egmond, 1965). What is surprising is that despite their higher evaluations of present achievements of their daughters compared with their sons, mothers, when asked to project into the future, foresee their daughters as achieving less than their sons academically; many in fact expect their daughters merely to finish high school. By contrast, mothers of boys, despite lower present evaluations, expect their sons not only to finish high school but also to go further in their education at least to technical or trade school. In other words, sex differences exist both for present expectations in school and for the future. Furthermore, these sex differences in mothers' expectations reverse themselves from higher present expectations for girls to higher future expectations for boys.

The second surprising result was the different relationship found between a mother's expectation and her child's performance in achievement situations. Mothers of boys were more accurate in their evaluations of their son's intellectual

abilities than mothers of girls. In fact, their evaluations were highly predictive of the child's actual performance on an I.Q. test. Furthermore, in a situation with no performance norms and no performance feedback (Block Stacking I, trial 1), mothers of boys could very accurately predict how well their child would perform.

Mothers of girls, on the other hand, were not as tuned in to their daughter's capabilities as mothers of boys. Their general intellectual evaluations of their daughters were not significantly related to their daughter's performance on an I.Q. test. This lack of familiarity with their daughter's general abilities was especially evident in a situation where the task was new both to mother and daughter and also where no performance norm was available. Mothers of girls could not accurately predict how well they would perform on the Block Stacking task (Trial 1).

These findings are startling. Even though mothers of girls have, on the whole, higher expectations than mothers of boys, their expectations have little to do with their child's actual performance. It is, therefore, entirely possible to imagine a situation in which a girl with high intellectual ability has a mother who fails to recognize this since she is not in tune with her daughter's capabilities.

If the idea of the self-fulfilling prophecy is correct, this mother's low expectation would eventually come true. Conversely, a girl with less intellectual ability may have a mother who has very high expectations for her which the daughter cannot possibly fulfill. Here, the mother's unrealistic expectations make it impossible for the girl to do anything that will earn her mother's approval.

Sex differences in mothers' expectations and predictions of their children's actual abilities and performance also occurred to a striking extent in mother's behavior with their children in achievement situations.

The evidence for these sex differences came first from the intercorrelations beteen the two Global Behavior Factors (I: Warmth, and II: Autonomy) and the more specific task behavioral measures. These intercorrelations compared the general quality of mother's relationship with her child which prevailed throughout the entire experiment with the more specific features of her behavior exhibited during the performance of each task. The sex differences obtained here emphasize that a different relationship exists for mothers of girls compared with mothers of boys. For girls' mothers a high rating on the Warmth factor, for example, was related to a high degree of mother participation in

the tasks, a large amount of positive reaction to her child's performance, and a large amount of direct encouragement to her daughter. For boys' mothers, general Warmth had nothing to do with mother's behavior during the tasks.

For boys' mothers, a high rating on Global Factor II, the Autonomy factor, was associated with little mother participation, much positive reaction to her performance, and much direct encouragement. Furthermore, the quality of the positive reaction exhibited a sex difference. Mothers of girls generally showed more enthusiasm in their expression of approval than did mothers of boys.

A second source of evidence for sex differences in mothers' behavior which is far-reaching in its implications was found in the intercorrelations between the Expectancy Factors and mothers' behavior. In comparing all the measures of maternal expectancy in this experiment with maternal behavior, a general picture which indicated important sex differences emerged. Mother's expectations for their daughters when expressed behaviorally, in general, were related to how mothers reinforced their daughters. Girls' mothers with high expectancy approved little and disapproved a great deal during the tasks. Conversely to the above pattern, boys' mothers expressed their expectations in the

amount of help they gave their sons and not in their reactions to their son's performance. The higher their expectations, the less help they gave their sons. When a boy's mother did express a positive or negative reaction to his performance, it was in the reverse direction compared with the behavior of girls' mothers. Boys' mothers with high expectations, for example, approved a great deal of their sons. On the other hand, it was the girls' mothers with low expectation who approved a great deal of their daughter's performance.

To more clearly define the nature of the sex differences found between maternal expectations and maternal behavior, the relationship between each expectancy factor and maternal behavior will be examined individually.

Expectancy Factor 1, which measures a mother's general intellectual evaluation of her child, expresses itself, for boys' mothers, in specific task-related involvement, both in mother's help-giving behavior and in her reinforcements. For girls' mothers, Expectancy Factor 1 expresses itself in mother's merely repeating the rules of the game rather than giving relevant help during the task, such as help in making patterns with blocks, building a tower, or telling a story.

This finding underlines the conclusion previously drawn that girls' mothers are not as tuned in to their daughter's needs as mothers of boys. Girls' mothers have expectations for their daughters which are not significantly related to their daughters' actual general intelligence; mothers' behavior associated with these expectations does not in any way indicate an attempt to act upon her expectation to help her daughter constructively. Boys' mothers, on the other hand, hold expectations which do reflect the boys' general intelligence and moreover, their behavior expresses their expectations. Thus, when a boy's mother's expectation is low, she gives her son more help in the tasks and gives her son less positive reinforcement.

Behavioral expressions of mothers' evaluations of their children's efforts in achievement situations and the importance mothers place on their children's excelling in these situations (Expectancy Factor 5) are also different for boys' mothers in comparison with girls' mothers. A boy's mother who evaluated her son's efforts highly and who considered it important that he do well in achievement situations interfered very little with him during the tasks and offered him few suggestions for improvement. By contrast, a girl's mother who evaluated her daughter's efforts

highly and placed a high value on her attainment gave her daughter mostly negative reactions.

It is difficult to know whether these sex differences in maternal behavior had any effects on the child's achievement behavior since the I.Q. was found to have no relationship with Expectancy Factor 5 for boys and girls. It is surprising that attainment value is not related to actual attainment. Crandall et al. (1964), however, also reported no association between the value mother placed on her child's intellectual experience and her child's reading and arithmetic achievement test scores.

If girls, whose mothers place a high value on intellectual achievement, are only given negative reinforcement by their mothers, which produces no significant effects on actual achievement, what other effects may result from such treatment? Does a girl in an achievement situation try, for example, to win parental approval to minimize the disapproval that she usually gets? Crandall et al. (1964) report that in ratings of free play behavior of young school-age children, the amount of children's achievement efforts and the amount of their approval-seeking from adults were positively and significantly related for girls but unrelated for boys. Our data does not allow us to comment

further on this effect or on any other possible effects in girls resulting from such maternal behavior.

In contrast to Expectancy Factors 1 and 5 which measure general expectations, Expectancy Factors 3 and 4 deal with mothers' expectations in specific tasks and also deal with how this expectancy is affected by feedback during the performance of the tasks. The sex differences in the relationship between maternal behavior and Expectancy Factor 3 demonstrated that where mother has a norm against which to compare her son's performance, and where she has a high expectation for his performance, she reacts by giving him many suggestions about what he should do to perform better. There is no effect of mother's knowing a norm on her behavior with her daughter in this task. In a situation where there are no norms (Expectancy Factor 4), on the other hand, it is the girls' mothers who interfere characteristically by giving their daughters for whom they have a high expectation a great deal of negative feedback but very little specific help when they request it. For boys' mothers there is no relationship between mothers' expectations and their behavior in a situation with no norms.

In keeping with the interpretations already given for the other four expectancy factors, Expectancy Factor 2 also

points to a difference in the mother-child relationship for girls and boys. The sex differences found in Expectancy Factor 2 are interesting sources for speculation, although in themselves are somewhat confusing.

The items loading on Expectancy Factor 2 are the amount of maternal participation with her child in intellectual activities at home and the RBE score. A low degree of participation at home is associated with a high RBE score. That is, mothers who participate little with their children at home have a high estimate of their children in comparison with the norm. This effect in the case of boys is overridden because of the negative relationship between Expectancy Factor 2 and Expectancy Factor 3. The items loading on Expectancy Factor 3 are the RBE score, the average of the estimates on the Rotter Board, and the D-Scores. A low degree of participation at home for boys (Expectancy Factor 2), therefore, is correlated with a low expectancy with performance feedback (Expectancy Factor 3), in particular with a low RBE score. In other words, low participation at home for boys is correlated with a low expectancy, while a low participation at home for girls is correlated with a high expectancy. This discrepancy suggests that mothers' reports of involvement at home with their children mean

different things for mothers of boys compared with mothers of girls.

Crandall et al. (1964) suggested that parental participation at home might be "reactions to the children's efforts rather than antecedent and causal factors in these performances" (p. 63). According to Crandall's hypothesis low involvement at home may be a reaction to the child's good performance since these parents feel little need to spend additional time with their child in intellectual activities. This explanation in our study may be relevant for girls since low involvement at home correlated with mother's high expectations for their daughters. This hypothesis cannot explain the finding for boys since low participation at home correlated with low expectancy. Rather than the amount of participation being a reaction to expectations, for mothers of boys, it may be a manifestation of their expectancies. In other words, in translating a low expectancy behaviorally, mothers demonstrate little participation with their sons at home.

Two striking sex differences in the quality of the relationship between mother and child stand out. For girls, mothers express their expectations behaviorally by approving or disapproving of their daughter's performance. For boys,

mothers express their expectations by helping or not helping them during their performances. In other words, boys whose mothers have a low expectation are given specific task-related help designed to improve their performance. Girls, whose mothers have a low expectation, are not given the kind of specific help that they need to improve their performance. These mothers, instead, express approval rather than give specific help.

What can we speculate about the outcome in the long run of this difference in behavior towards boys and girls? Studies in this area have shown that achievement behavior in the free-play of nursery school children is directly related to their mothers' approving of their children's achievement efforts at home (Crandall et al., 1960). These investigators found that although general maternal affection and independence training were not predictive of achievement behavior, direct maternal reward of specific achievement efforts was predictive. It must be added, however, that not all studies demonstrate that positive and negative reactions by the mother are associated with children's achievement test performance (Crandall et al., 1964). The weight of the available evidence seems to support the concept that maternal approval fosters achievement behavior.

One may speculate, therefore, about what happens to girls with mothers who have high expectations. We found in this experiment that such a girl experiences a lot of disapproval in achievement situations despite the high expectancy she knows her mother has for her. To avoid disapproval she may, therefore, purposefully achieve less in order to lower her mother's expectations and concomitantly decrease the amount of disapproval she is shown. That this does happen to some extent is supported by Sontag et al. (1958) who found significantly fewer girls than boys increased their intelligence scores over the elementary school years; significantly more girls' than boys' mental test scores decreased over the same period.

A girl, on the other hand, whose mother has a low expectation for her is given approval during her performance in achievement situations. As previously mentioned, we might predict that because these girls get a lot of approval they should demonstrate a lot of achievement behavior. This prediction, however, contradicts the concept of the self-fulfilling prophecy which proposes that a low expectancy on the part of the mother results in poor achievement by the child.

Boys, on the other hand, whose mothers have high

expectations for them do not interfere with their performance and often show approval. This tends to help them fulfill and maintain their mother's high expectations. Boys whose mothers have low expectations for them offer task-related help designed to better their performance. In other words, regardless of their mothers' expectations, boys are assisted by their mothers in either improving or maintaining optimum performance.

The above ideas give rise to important questions which still await an answer. Many of the sex differences found in children's achievement behavior depend upon a full understanding of the relationship between children's achievement behavior and their mothers' expectations for them and the behavioral expression of their expectations.

Expectancy: Effects of its Manipulation

The effects of randomly giving mothers positive, negative, or no feedback produced highly significant changes in certain behaviors.

Mother's evaluations of her child's abilities were affected and she also expressed greater satisfaction or dissatisfaction with her child's performance. This was particularly true of mothers given negative feedback. Hilton (1967) also reported that mothers given negative feedback

changed their ratings of their children to a greater degree than mothers given positive feedback. The impact of giving a mother negative feedback in our experiment was especially evident in the ratings given by mothers in this group compared with the ratings given by mothers in the control and positive groups. Mothers in the control group gave their children better ratings in Part 2 than in Part 1 just like mothers in the positive feedback group. The fact that mothers in the negative feedback group gave their children a more negative evaluation in Part 2 emphasizes the extent of the negative feedback effect.

Manipulation did more than just produce a change in mother's rating of her child. It also produced changes in behavior from Part 1 to Part 2. Mothers in the negative feedback group demonstrated this change by becoming more inconsistent behaviorally. The nature of this change was not clearly demonstrated since neither the specific nor the general behavioral measures revealed regular changes. One change was clearly observed; mothers, after negative feedback, tended to show less humour and geniality than before the feedback.

It is difficult to know why not all the behavioral measures showed changes as a result of feedback. There are

a number of possible explanations. First, since it was the negative feedback group that was most affected by the feedback, the way they might have wanted to act after the negative feedback may have been socially undesirable; hence, they did not demonstrate any change in overt behavior. In support of this notion there is the finding that for this group of mothers, on the whole, categories which measured negative reactions were among the lowest in frequency.

Second, the situations might have been too structured to allow for any change in behavior. Merrill (1946) and Walters et al. (1964) found significant changes in the behavior of mothers and nursery school children after negative feedback. These authors, however, used an unstructured play situation where mother and child could do anything they wanted, the only restriction being that they had at their disposal only certain specific toys. Hilton (1967) also measured feedback effects on behavior when mother and child were left to do whatever they pleased. In the present study all the tasks made very specific demands upon the mother in both Parts 1 and 2; the rules of each task were identical in Parts 1 and 2 whether the feedback was positive, negative or neutral. On the other hand, we know that some change occurred, especially in the negative group, which was rated

as significantly more inconsistent in their behavior in Part 2 compared with Part 1. It is difficult to explain why this was one of the only behavioral changes observed after feedback. In the studies of Merrill (1946) and Walters et al. (1964) mothers were led to infer that their children were not performing satisfactorily "in terms of their potentialities". The implication was that the experimenter or "expert" thought the child could do better. Consequently mothers were motivated to make this expectation of the experimenter come true. The feedback given in our study did not offer as much hope. Hence, instead of being motivated to fulfill the experimenter's prophecy, mothers after receiving the feedback from the experimenter continued doing what they had previously been doing but perhaps with the resignation that their child was not as able as they formerly had thought. This then might have led to a change in mood which would account for their being rated as being more inconsistent in their behavior.

The significant change in the "pleasure" rating on Story Telling for the positive feedback group might also be adduced to explain the hypothesis that the inconsistency rating reflected a change in mood. If feedback actually had caused a change in mood, making the negative group feel

generally more resigned and the positive group generally happier, it is not surprising to find that this happiness of the positive group most clearly was observed during the Story Telling task in which mother and child were talking directly to each other as they might readily do in less structured situations at home.

In review, all mothers behaved more inconsistently in Part 2 than in Part 1. The negative feedback group showed the greatest degree of inconsistent behavior. The positive and control feedback groups did not differ from each other in this respect. The only behavioral ratings which changed along with the inconsistency rating of mother's behavior were the humour and geniality ratings and the pleasure rating. One might hypothesize, then, that what took place as a result of the feedback was a change in mother's mood which might not necessarily have been expected to result in a great change in her overt behavior but would nevertheless make her appear generally inconsistent to the raters.

If the idea of self-fulfilling prophecy is correct, expectancy of one person for another person should have significant effects on the performance of the other person. The expectations set up in the mothers of the two feedback groups should have influenced the child's performance. In

our experiment this did not happen. Children did not significantly change their performance on the Rotter Board or Block Stacking tasks as a result of the change in their mother's expectations for them. Nor was their performance affected on the Anagrams task. The reasons for this failure to demonstrate the effects of the self-fulfilling prophecy are several. First, the nature of the tasks undoubtedly influenced the results. The Rotter Board task, for example, was specifically designed to eliminate the individual's ability to influence his performance on the task: performance for all subjects occupy a fairly narrow range, although performance varies from trial to trial; the learning factor moreover is negligible (Rotter, 1942). Hence there was almost no possibility for either improvement or deterioration of performance regardless of any intrusions by another person. Similarly performance on the Block Stacking task was not influenced by feedback. In this task the child's performances were almost totally dependent on his mother's help. As shown previously, mother's help-giving behavior did not change as a result of feedback. Hence the child's performance on Block Stacking did not change either.

Another explanation for the fact that a change in expectancy did not result in a change in performance is related

to the fact that the subject was blindfolded during Block Stacking. Rosenthal and Fode (1963) showed that visual cues are important in communicating expectancy. These cues were eliminated in this task.

Experimentally-induced expectation produced significant changes in the attitudes, feelings, subjective expectancy, and overall behavior of the mother; the change in mother's expectancy, however, did not affect her child's performance.

There was also evidence that mother's evaluations of her child in the negative feedback group deteriorated even as Part 2 continued. Immediately after feedback she rated her expectations for her child's performance on the first trial of Block Stacking II. After the child had built his first tower, not significantly higher than in Part 1, mother's expectancy rating from trial 1 to trial 2 in Block Stacking II significantly decreased ($p < .01$). One might speculate that given a setting where mother could express this very low expectancy very freely, such as at home, and over a longer period of time than the twenty minutes given to the experiment, very significant behavioral changes in the child would probably occur.

In conclusion the results of this study of maternal

expectations and mother-child interaction demonstrate three important findings.

Expectancy is not a unitary concept that can always be measured only in one way. Rather, the meaning of expectancy depends both on the way it is measured and on the context in which it is measured.

There is a different quality of relationship that exists between mothers and their daughters compared with that existing between mothers and their sons. These sex differences involve both present and future expectations and are expressed by different behaviors on the part of mothers towards their sons and daughters.

Finally, maternal expectations can be manipulated experimentally to produce changes in the expectations of mothers and also in their attitudes and feelings about their children's performance. These changes in maternal expectations can be observed in the changes that occur in mothers' mood following manipulation.

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APPENDICES

APPENDIX A

Dear Parents:

Under the auspices of McGill University and York University, I am doing some research with children to investigate how they solve problems in their mothers' presence. It is hoped that the study which I am doing will be of considerable benefit to both parents and teachers. A study of this kind may enable us to eventually set up programs which will allow parents to take a more active role in the education of their children.

I am writing to request you to kindly give me your cooperation in this research study. To participate in this study it will be necessary for you to give about fifty minutes of your time during which we will give your child some problems to solve while you are there. At another short session the child will be given some problems to solve in your absence. The session in which you will be present will be recorded on videotape which will be erased as soon as the study is completed and will not be seen by anyone but my assistants and myself. I also would like to assure you that the study will not in any way affect your child's other activities at school. Furthermore, the results will at all stages remain anonymous.

I am aware that the explanation I have given in this letter may be far short of the questions you might want to ask about this study. For this reason we are arranging a meeting to which all mothers will be invited to answer any and all questions that you may have.

In view of the importance of this study, I once again request that you give your cooperation. Would you please indicate this on the next page?

Sincerely yours,

(Mrs.) Berenice Mandelcorn

Please return this form to the teacher.

1. I would be interested in attending a meeting for further information.

YES _____ NO _____

2. I am willing to participate in this study.

YES _____ NO _____

3. It would be convenient for me to participate

during school hours _____

after school hours _____

weekends _____

_____
(please sign here)

_____
(telephone number)

We will contact you at some future date about setting up an appointment.

APPENDIX B

Mother Questionnaire

NAME: _____

CHILD'S NAME: _____

ADDRESS: _____

TELEPHONE: _____

RELIGION: _____

NO. OF OTHER CHILDREN: _____

PLEASE LIST ALL CHILDREN FROM OLDEST TO YOUNGEST

	SEX	AGE
1.		
2.		
3.		
4.		
5.		

HUSBAND'S OCCUPATION: _____

MOTHER'S OCCUPATION: _____

If working, please indicate number of hours/week: _____

EDUCATIONAL LEVEL (Father): _____

EDUCATIONAL LEVEL (Mother): _____

GENERAL INSTRUCTIONS

On the following pages you will be asked to answer different kinds of questions about your child and yourself. Each question will be followed by a straight line and on each end of the line will be a word or a phrase, opposite in meaning to the word or phrase at the other end. To answer the question, reach each word carefully and place a small mark at the point on the line where you think your child or yourself fall.

Here are some examples of how to answer these kinds of question.

Example I:

Please evaluate your child's athletic ability.

Very good, excellent ——————————— Very poor

Example II:

How important is it to you that your child do well in sports?

Extremely important ——————————— Completely unimportant

Example III:

How satisfied or dissatisfied are you with his ability at sports?

Completely satisfied ——————————— Completely dissatisfied

Example IV:

How often do you play sports with your child?

Very often ——————————— Never

Example V:

Please estimate your best friend's:
(a) Sense of humour

Has a fabulous sense of humour ——————————— Has no sense of humour

(b) Cooking ability

Excellent ——————————— Very poor

SECTION I

1. We would like you to evaluate your child's general intellectual potential.

Very high — Very low

2. Next we would like you to give us your idea of how your child does in comparison with other children his age in such things as reasoning, learning, memory, reading, spelling, arithmetic and other formal school subjects.

Exceptionally better — Extremely worse

3. Please indicate how satisfied or dissatisfied you are with your child's performance in school subjects.

Completely satisfied — Completely dissatisfied

4. What do you <u>tell</u> your child about how satisfied or dissatisfied you are with his performance in school subjects?

I tell him that I am completely satisfied with his performance. — I tell him that I am completely dissatisfied with his performance

5. Now we would like you to indicate your <u>minimal standards</u> for your child's performance in school work.
The phrases below indicate two opposite levels of competence of performance. As previously, make a mark on the line at the point which best represents the level of competence where you would begin to feel dissatisfied with your child's performance. In other words, how poorly would your child have to do before you would <u>begin</u> to feel dissatisfied?

Does exceptionally better than others his age — Does extremely worse than others his age

6. This time we would like to know how important you feel it is <u>for your child</u> to do well in academic subjects.

It is extremely important to me that he do well — It is completely unimportant to me that he do well

SECTION II

In this section you will find listed about twenty different qualities that children might possess.

On the straight line under each of these we would like you to indicate the extent to which your child possesses the quality described.

Example I:

Being well organized.

Very well organized — Very poorly organized

Example II:

Friendliness with other children.

Very friendly — Very unfriendly

Example III:

Neatness.

Very neat — Very messy

SECTION II

1. Ability to work at tasks independently after directions are given.

Very independent — Not at all independent

2. His (or her) estimation of own abilities.

Very realistic — Very unrealistic

3. Need for praise.

Needs a lot of praise and encouragement — Needs minimal praise and encouragement

4. Perseverence and effort.

Gives up very easily, doesn't try — Sticks with it, tries hard

5. Initiative and resourcefulness

Always finds things to do if left on his own — Always waits to be told what to do.

6. Confidence

Very confident, trusts his own ability — Feels very inferior, distrusts his own ability

7. General competitiveness

Extremely competitive — Not at all competitive

8. Desire to do well in schoolwork.

Strong desire to do well — Doesn't care at all about how he does

9. Frequency of asking for help with schoolwork.

Very frequently — Almost never

Section II (contd.)

10. Enthusiasm and interest in learning.

Not at all enthusiastic or interested — Very enthusiastic and interested

11. Need for emotional support.

Never comes to me for reassurance when in difficulty — Always seeks reassurance when in difficulty

12. Explorative and curious.

Is extremely explorative and curious — Is not at all explorative and curious

13. Ability to make his own decisions.

Is unable to make his own decisions — Is extremely good at making his own decisions

14. Trying new things on his own.

Always tries things on his own — Never tries things on his own

15. Ability to carry out reasonably difficult tasks on his own without assistance or guidance.

Extremely poor at this sort of thing — Exceptionally good at this sort of thing

16. Tries to <u>improve</u> his performance at the things he learns.

Never tries to improve — Always tries to improve

17. Does his best at academic tasks.

Always — Never

18. Self-reliance.

Extremely self-reliant — Not at all self-reliant

19. Takes pride in doing things well.

Doesn't care when he does something well — Takes a great deal of pride

SECTION III

Please circle the appropriate number or, as before, make a mark on the line at the point which best describes you or your child.

1. How far do you think your child will go in his education?

   1. professional degree or graduate school degree
   2. college degree
   3. technical school or trade school degree
   4. high school degree
   5. public school

2. How far would you like to see him get in his education?

   1. professional degree or graduate school degree
   2. college degree
   3. technical school or trade school degree
   4. high school degree
   5. public school

3. How often do you do the following with your child?

   (1) Schoolwork, e.g.,reading, spelling, arithmetic.

Everyday ——————————————— Never

   (2) Playing reasoning or thinking type of games.

Everyday ——————————————— Never

   (3) Teaching my child specific information about any topic.

Everyday ——————————————— Never

   (4) Having discussions with my child (with father, brother, sister present) on such things as history, current events, etc.

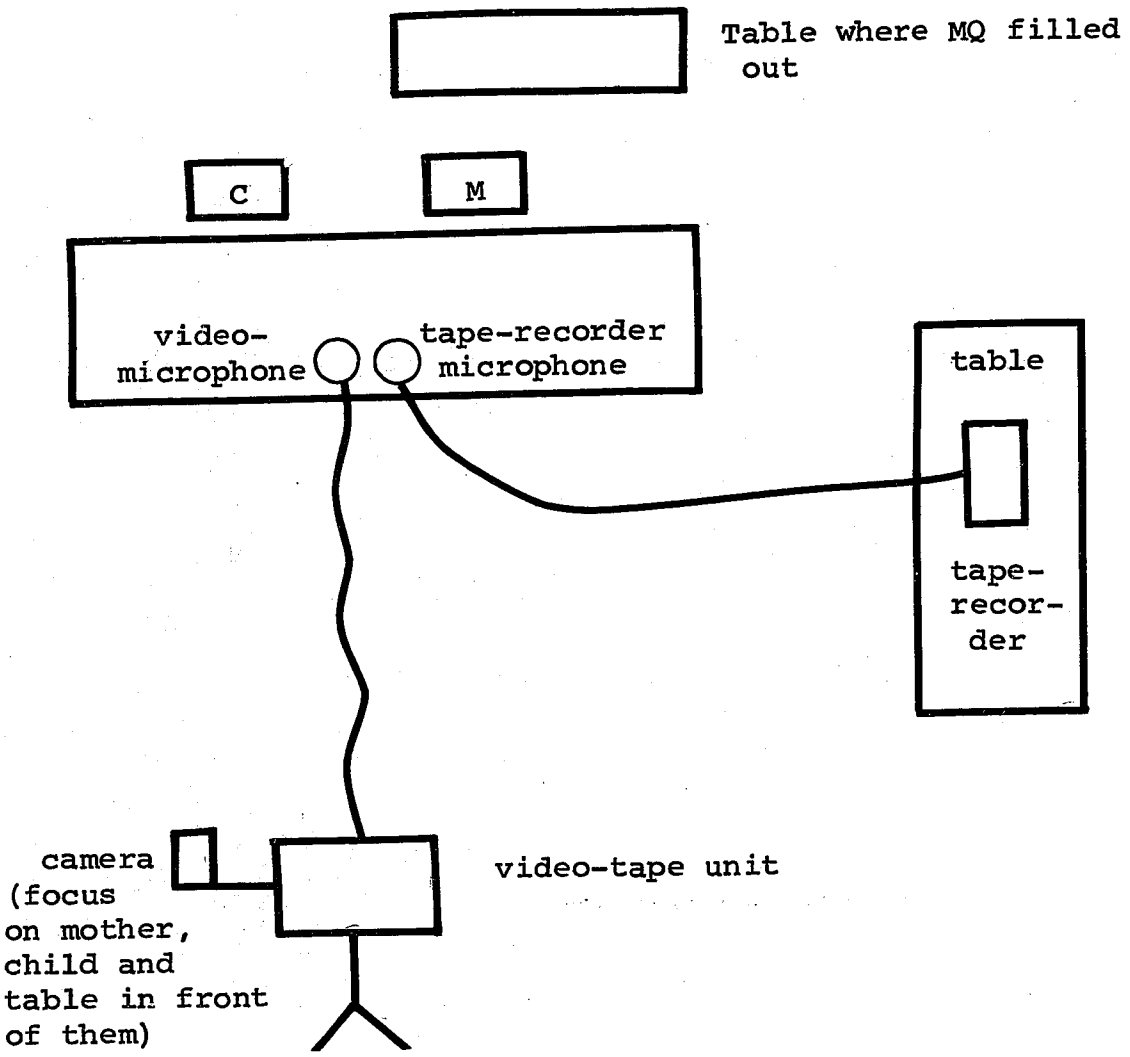
Everyday ——————————————— Never

   (5) Listening to him (her) read a story to me.

Everyday ——————————————— Never

APPENDIX C

Layout of Experimental Room



APPENDIX D

Instructions for the Experimental Tasks

Rotter Board

Now we're going to start the Rotter Board. (Child's name) has been practising the Rotter Board, Mrs. _____ and what he has been trying to do is to get the marble from the starting position (E points to it) to the ten position (E points to it) which is the highest possible score he can get on one trial. If the marble lands in any of the other numbered grooves, (Child's name) gets the lower score, depending on what number it lands. If the marble goes off the board or lands in one of the grooves that has no number beside it, he/she gets a score of zero for that trial.

Now there's another rule to this task. Your mother, (Child's name), will have this score sheet (E hands Rotter Board Score Sheet to Mother) and she will write down what total score she thinks you will earn over 5 trials. Then you will take your 5 trials and I'll call out your score as we go along. When you finish your 5 trials, your Mom will write down the score you got in this column (E points to score column of Rotter Board Score Sheet) and then she will estimate again what score she thinks you'll get on the next 5 trials and so on. We'll do this for 5 minutes.

Just to make sure you understand, (Child's name), if you get 10 on each trial for 5 trials what total score would you get? (Child's answer: 50). Right. If you get zero on each trial for 5 trials what total score would you get? (Child's answer: zero). So the most you can get on 5 trials is 50 and the least you can get is zero.

Now let's try one for practice. Mrs. _____, you'll have to write down your estimate here (E points to Estimate column of Rotter Board Score Sheet). But before you do that I should tell you since you've never seen this kind of problem before, that on the first 5 trials of this task, the average child gets a score of 25. Write down your estimate and turn your paper over as soon as you've done that....O.K. (Child's name), take your turn.

(C takes his turn and E calls out his total score after each trial)

Now, Mrs. ____ you write down (Child's name) score beside your estimate in this column. Do you get the idea?

We're going to do this for five minutes starting when I say "Go" and (Child's name) will try to take as many 5-trial turns as possible.

We'll have the video-tape running during the 5 minutes. When the 5 minutes are up, I'll say "Stop" and you can stop what you are doing.

Get ready. On your mark, get set, "Go" (E turned on video-tape and started a stop watch running and came over to stand near M and C and called out the score.

At the end of 5 minutes, E said "Stop" and turned off the video-tape.

Story Telling

Now I have 3 cards for you (E places the cards on table in front of M and C in prearranged order) and what you, (Child's name), and your mother have to do is make up a story using the three cards in that order. The story is to be both of yours. You and your Mom have to make it up together. The story has to have a beginning, middle, and end, like every story. You have three minutes in which to make it up. If you happen to finish before 3 minutes are up, just let me know and I'll turn the video-tape off.

Don't start till I say "Go". Remember the story is to be both of yours and you have three minutes for it.

On your mark, get set, "Go" (E turns on video-tape machine and stop watch).

Patterns

I have some blocks for you, (Child's name) (E scatters Kohs Blocks in front of M and C). As you can see from examining the blocks they are all the same size and they have different colors on their different sides (E demonstrates by picking a block up and turning it for C and M). Some of the sides have 2 colors on them. You see, here

you have half red and half white and here you have half yellow and half blue.

I have 3 cards here (E shows them to M and C) which have designs on them that can be copied exactly with these blocks. As you can see the design on card 2 is harder to make than the design on card 1 and the design on card 3 is harder than the design on card 2. What you have to do (Child's name), is to copy the designs using the blocks, in this order. You have 6 minutes in which to do that. Your mother can help you as much or as little as she likes but she can't actually place the blocks for you, except for 3 times in the 6 minutes. Once you've placed a block for (Child's name) 3 times Mrs. ____, you can go on helping him/her short of placing a block for him/her.

As soon as you've finished one design go on to the next one. I'll be close by to make note of which designs you do, (Child's name).

Let's do one for practice (E placed a different card--- not one of the three in front of C: Design 1 of Kohs Blocks which any child this age can do).

"Good". Now remember you have 6 minutes. Don't start till I say "Go".

On your mark, get set, "Go" (E turns on video-tape and stop watch).

Block Stacking

Now I have some more blocks for you (E scatters the Playskool blocks in front of M and C). This time they're all different sizes. What you have to do, (Child's name), is make a tower using these blocks. Your tower should be as high as you can make it, and your score will be the number of blocks you have piled up just before the tower falls.

Now here's the trick. You have to build your tower blindfolded with one hand behind your back. Your Mom can help you as much or as little as she likes but she can't actually pile the blocks up for you. Do you understand?

OK. Let's start. Before we do that (E gives M the

Block Tower Score Sheet), Mrs. ____, I'd like you to write down privately here how many blocks you think (Child's name) will be able to pile up before the tower falls here and also to answer this question. You remember how the straight line works from the questionnaire, don't you?

Blindfolds on, one hand behind your back. What hand do you do things better with, (Child's name)? OK., then, put the other one behind your back. Don't start till I tell you to.

On your mark, get set, "Go" (E turns on video-tape).

Trial 2:

We're going to do this again but this time the rules are a little different. This time if the tower falls you could get a score of zero, (Child's name). So what you have to do is think carefully of the number of blocks you think you can pile up without the tower falling. Remember if you choose a number that's too high, you have to keep going till you pile up that number of blocks and there's a good chance that your tower will fall and you'll get zero. If you choose a number that's too small you won't earn a very high score.

You and your Mom will decide privately what number you should try for and then come to a final decision together. Remember whatever number you decide on, will be the number of blocks you will have to use.

Blindfolds on, one hand behind your back. Don't start till I tell you. Remember Mrs. ____ the rules are the same as last time. You can help as much or as little as you want but you can't actually pile the blocks up.

On your mark, get set, "Go" (E turns on the video-tape).

Anagrams

I have some letters for you (Child's name) (E placed letters in front of C and M in prearranged order). What you have to do is to make up as many words as you can in the six minutes you will have for this task. Once you have made up a word, you can break it up and use the letters

again to make new words. I'll be watching and writing down the words you make up.

Your Mom can help you as much or as little as she likes but she can't actually put the letters together to make up the words. She can also help you in another way. You see she has 3 letters of her own and she can give you these letters, one at a time, anytime during the six minutes. Once she's given you a letter you keep it and use it to make new words.

Do you understand? OK, wait till I tell you to start. Remember you have six minutes.

On your mark, get set, "Go" (E turns on the video-tape and stop watch).

APPENDIX E

Introductory Remarks

First let me mention again briefly what this study is all about. What we're trying to do here is find out how children solve problems when they're out of the school setting. We have some pretty good ideas about how children learn and solve problems when they are in school; we have teachers to tell us about it and lots of people have observed children learning in school and can tell us about it. But we know very little about how children solve problems out of school and it's very important that we find out because as you know so much of a child's learning takes place outside the school. We hope that what we learn from this study will give us ideas about ways to help children learn better.

I have a few problems for (Child's name) to work on. I should point out that the problems I will be giving you have been found to be quite closely related to the kinds of problems that you get on intelligence tests such as the Wechsler Intelligence Scale for Children and the Stanford-Binet. These problems haven't been taken from these tests but research has shown in most cases that children who do well on these problems also do well on the items of the intelligence tests I mentioned and vice versa, children who do poorly at these will often do poorly on the intelligence test items.

I'd like you to pretend that (Child's name) has come to you Mrs. ____ for help on homework problems or a puzzle or something like that. Some of the problems are quite difficult and some aren't and (Child's name) may need some help or may not. Because of this you (looking at mother) may given him/her as much or as little help as you wish to. Whatever you think will help (Child's name) do his/her best.

As you can see by the microphone and the piece of video equipment in front of you, we're going to be taping this. Some of the problems you'll be doing take long answers and it's easier to record the session than to try to write down everything (Child's name) does and says. If you would like it, after the session we will play back parts of the tape so you can see yourselves and hear yourselves talking.

Just relax and try to feel at home and remember Mrs. _____, you can help (Child's name) as much or as little as you wish. The important thing is that he/she do her best. OK, let's begin.

APPENDIX F

Rotter Board Score Sheet

NAME: _____ TRIAL NO: 1 ; 2

DATE: _____

TRIAL NO.	ESTIMATE	SCORE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

APPENDIX G

IPA Categories Used to Rate Story Telling Task

Gives Opinion	- statement which gives an evaluation, opinion, feeling about the story.
Asks Opinion	- question about the child's opinion regarding what is happening in the story.
Gives Procedure	- gives orientation, information, rules of procedure about the general task.
Asks for Procedure	- asks for orientation, information, rules of procedure about the general task.
Agrees	- statement which shows acceptance of what the child has just said.
Disagrees	- shows rejection of what the child has just said.

APPENDIX H

BLOCK TOWER TEST - M

NAME: _____ TRIAL NO.: _____

DATE: _____

How well do you expect your child to do on this test?

Estimate No. 1: _____
(number of blocks)

What do you think of this estimated score in comparison with how other children your child's age would do?

Exceptionally better than most — Extremely worse than most

Actual Score: _____
(height of tower) (number of blocks)

Estimate No. 2: _____
(number of blocks high)

Comparison with other children same age.

Exceptionally better than most — Extremely worse than most

Final Estimate No. 2: _____

Actual Score: _____

APPENDIX I

INTERMISSION QUESTIONNAIRE

NAME: _____ NO.: _____

DATE: _____

1. How well do you think your child is doing compared to other children his age?

Much better than most — Much worse than most

2. How well do you think your child is doing in comparison to his usual ability at solving different problems?

Much better than usual — Much worse than usual

3. How pleased or displeased are you with his (her) performance?

Extremely pleased — Extremely displeased

APPENDIX J

Personality Description Form

NAME: _____ PART: 1 ; 2

DATE: _____ RATER: _____

1. Understanding — Not understanding

2. Passive — Active

3. False — Genuine

4. Strong — Weak

5. Warm — Cold

6. Bad — Good

7. Remote — Intimate

8. Attentive — Indifferent

9. Rejecting — Accepting

10. Excitable — Calm

APPENDIX K

Global Rating Scale

NAME: _____ PART: 1 ; 2

DATE: _____ RATER: _____

1. Disorganized — Systematic

2. Rigid — Flexible

3. Inappropriate help-giving — Appropriate help-giving

4. Lethargic — Energetic

5. Relaxed — Tense

6. No positive emotionality — High degree P.E.

7. No negative emotionality — High degree N.E.

8. Participation never — High degree participation

9. Highly permissive doesn't structure — Highly controlling Structures everything

10. No encouragement of independence — High degree encouragement of independence

11. Very proud of child — Ashamed or embarrassed of child

12. Interested, involved — Disinterested, uninvolved

13. Much use of humour — No use of humour

14. Sets very high standards, demanding, constant push to improve — Sets very low standards, undemanding, no push to improve

15. Inconsistent, very changeable — Consistent throughout, unchangeable

APPENDIX L

Specific Rating Scale

1. Importance to M that Child do well.

Very important — Not important

2. Amount of Structure and Control by Mother.

Much structure — No structuring

3. Pushing to improve.

Constant push to improve — Not pushy

4. Co-operation between Mother and Child.

Very co-operative — Antagonistic

APPENDIX M

Story Telling I and II

1. Mother's - Child's - story.

2. Amount of Mother's Structure.

Much None

3. Amount of Mother's Pleasure and Approval of the Story.

Very pleased Displeased

APPENDIX N

Category Interaction Scoring System

- use for Rotter Board I and II
  Patterns
  Block Stacking I and II
  Anagrams

1. Approval - High - Spontaneous (High App-s)

   - expression of praise, approval regarding the specific performance of the child. Said with lots of enthusiasm "Great", "Very Good".

2. Approval - Low - Spontaneous (Low App-s)

   - expression of approval regarding the specific performance of the child. Said in a matter-of-fact tone, informational in quality. "Yes", "Right".

3. Disapproval - High - Spontaneous (High Disapp-s)

   - expression of criticism, disapproval regarding the specific performance of the child. Said with anger and exasperation "That's no good".

4. Disapproval - Low - Spontaneous (Low Disapp-s)

   - expression of disapproval regarding the specific performance of the child. Said in matter-of-fact tone, informational "No", "Not quite".

5. Approval - High - Requested (High App-r)

   - expression of praise, approval regarding the specific performance of the child. Said with enthusiasm in answer to a child's request for help.

6. Approval - Low - Requested (Low App-r)

   - expression of approval regarding the specific performance of the child in answer to a child's request for help. Said matter-of-factly, information in quality.

7. Disapproval - High - Requested (High Disapp-r)

   - expression of criticism, disapproval regarding the specific performance of the child in answer to the child's request for help. Said with anger and exasperation.

8. Disapproval - Low - Requested (Low Disapp-r)

   - expression of disapproval regarding the specific past performance of the child in answer to the child's request for help. Said matter-of-factly, informational in quality.

9. Positive Encouragement - Spontaneous (P Enc)

   - attempts to push up the child's performance, to make him persist, do better, keep going, go faster where there's a time limit. Said in a positive way with enthusiasm "Keep going".

10. Negative Encouragement - Spontaneous (N Enc)

    - attempts to push up the child's performance, to make him persist, do better, keep going, go faster where there's a time limit. Said with annoyance, disapproval "You'll never finish at this rate".

11. Suggestion - Spontaneous (Sugg-s)

    - a statement which gives the child information about how to solve the problem at hand given spontaneously, "Build a good base".

12. Suggestion - Requested (Sugg-r)

    - a statement giving the child information about how to solve the problem at hand given in answer to a child's request for help.

13. Suggestion - Spontaneous - Disapproving (Circle Sugg-s)

    - a suggestion given in an angry tone of voice.

14. Suggestion - Requested - Disapproving (Circle - Sugg-r)

    - suggestion given in an angry tone of voice in answer to a child's request for help.

15. Withholds Help (WH)

    - a statement in which mother refuses to help the child when he requests help, "You figure it out for yourself".

16. Interruption (Int)

    - any statement which interrupts the child's activity because mother is not clear about what's going on, "Take your hand away so I can see what you're doing".

17. General Reassurance - Requested (Reas-r)

    - any statement of general approval or reassurance which mother makes regarding the overall performance of her child given in answer to a child's request for reassurance.

      C: "Am I doing all right?"
      M: "You're doing just fine."

APPENDIX O

Scoring Sheet

NAME OF RATER: _____ TAPE NO.: _____

DATE: _____ FAMILY NAME: _____

Time	App L-H	Dis-app L-H	P Enc	N Enc	Sugg S-R	WH	Int	App-R L-H	Dis-app-R L-H	Reas	Agr	Dis-agr	A Pro	A Op	G Pro	G Op

APPENDIX P

Timing Scale

NAME: ..... RATER: .....

DATE: .....

Story Telling #1

Mother .....

Child .....

Story Telling #2

Mother .....

Child .....

Block Design

1. .....

2. .....

3. .....

Latency till 1st help giving response by Mother .....

Anagrams

1st .....

2nd .....

3rd .....

Latency till 1st help giving response by Mother .....

Block Stacking #1

Tower 1: Latency till 1st help giving response by Mother .....

Tower 2: Latency .....

Block Stacking #2

Tower 1: .....

Tower 2: .....

APPENDIX Q

Interrater Reliability for Global Measures

I Personality Description Form (N = 74)

Scale	Interrater Reliability
1. Understanding - Not understanding	.93
2. Passive - Active	.95
3. False - Genuine	.89
4. Strong - Weak	.92
5. Warm - Cold	.91
6. Bad - Good	.93
7. Remote - Intimate	.84
8. Attentive - Indifferent	.90
9. Rejecting - Accepting	.94
10. Excitable - Calm	.95

II Global Rating Scale (N = 74)

Scale	Interrater Reliability
1. Disorganized - Systematic	.83
2. Rigid - Flexible	.87
3. Inappropriate help-giving - Appropriate help-giving	.93
4. Lethargic - Energetic	.94
5. Relaxed - Tense	.89
6. No positive emotionality - High degree PE	.92
7. No negative emotionality - High degree NE	.95
8. Participation never - High degree participation	.90
9. Highly permissive - Highly controlling	.91
10. No encouragement of independence - High degree encouragement of independence	.86
11. Very proud of child - Ashamed of child	.92
12. Interested, involved - Disinterested, uninvolved	.91
13. Much use of humour - No use of humour	.89
14. Sets very high standard - Sets very low standards	.87
15. Inconsistent, changeable - Consistent throughout, unchangeable	.91

III Specific Rating Scale (N = 74)

	Anagrams	Rotter Board	Patterns	Block Stacking
1. Importance to M that C do well	.90	.78	.92	.92
2. Amount of Structure and Control	.95	.79	.93	.93
3. Pushing to Improve	.96	.81	.86	.88
4. Co-operation Between M and C	.92	.75	.93	.90

IV Specific Rating Scale: Story Telling (N = 74)

Scale	Interrater Reliability
1. Whose Story?	.97
2. Amount of Mother's Structure	.91
3. Amount of Mother's Pleasure and Approval of the Story	.94

APPENDIX R

Interrater Reliability of Category Interaction Scoring System

(N = 23)

Categories	Tasks			
	Rotter Board	Patterns	Block Stacking	Anagrams
1. High Approval - Spontaneous	.87	.94	.97	.93
2. Low Approval - Spontaneous	.84	.95	.92	.94
3. High Disapproval - Spontaneous	.77	.97	.95	.96
4. Low Disapproval - Spontaneous	.88	.90	.90	.93
5. High Approval - Requested	-	.71	.69	.72
6. Low Approval - Requested	-	.89	.97	.93
7. High Disapproval - Requested	-	.70	.68	-
8. Low Disapproval - Requested	-	.91	.95	.95
9. Positive Encouragement	.76	.74	.85	.88
10. Negative Encouragement	.69	.68	.66	.65
11. Suggestion - Spontaneous	.91	.94	.95	.97
12. Suggestion - Requested	-	.90	.93	.96
13. Suggestion - Spontaneous - Disapproving	-	.70	.79	.72

Categories	Tasks			
	Rotter Board	Patterns	Block Stacking	Anagrams
14. Suggestion - Requested - Disapproving	-	.67	-	.69
15. Withholds help	-	-	-	.72
16. Interruption	-	-	-	-
17. General Reassurance	-	-	.70	-

Story Telling:

Categories	Interrater Reliability
1. Gives Opinion	.90
2. Asks Opinion	.89
3. Gives Procedure	.92
4. Asks for Procedure	.61
5. Agrees	.85
6. Disagrees	.83

APPENDIX S

Categories Used in Final Analysis

Categories	Tasks				
	Rotter Board	Story Telling	Patterns	Block Stacking	Anagrams
1. High Approval - Spontaneous			X	X	X
2. Low Approval - Spontaneous			X	X	X
3. High Disapproval - Spontaneous				X	
4. Low Disapproval - Spontaneous			X	X	X
5. Low Approval - Requested			X	X	X
6. Low Disapproval - Requested			X	X	X
7. Positive Encouragement				X	
8. Suggestions - Spontaneous	X		X	X	X
9. Suggestions - Requested			X	X	X
10. Gives Opinion		X			
11. Asks Opinion		X			
12. Gives Procedure		X		X	

Categories	Tasks				
	Rotter Board	Story Telling	Patterns	Block Stacking	Anagrams
13. Agrees		X			
14. Disagrees		X			
Timing Measures					
1. Time Mother Speaks		X			
2. Latency till first help			X	X	X