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**Predictors and consequences of maternal attributions among
families with children at risk for developmental delays**

Trivette, Carol Marie, Ph.D.

The University of North Carolina at Greensboro, 1990

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PREDICTORS AND CONSEQUENCES OF MATERNAL ATTRIBUTIONS
AMONG FAMILIES WITH CHILDREN AT RISK
FOR DEVELOPMENTAL DELAYS

by

Carol M. Trivette

A Dissertation Submitted to
the Faculty of the Graduate School at
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1990

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APPROVAL PAGE

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This research investigated the attributional biases of mothers with one-month-old infants. First this study examined to what extent maternal at-risk status (poor marital quality, depression, and low family income), social support, infant at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability related to maternal attributional biases infants. Second, this project investigated the extent to which infant at-risk status, the discrepancy between maternal assessment of infant ability and actual infant ability, and maternal attributional biases influenced each of four styles of mother-infant interaction. To address these questions, data were collected on 65 mother-infant dyads across three points in time: prenatally, when the infants were one month old, and when the infants were six months old. Thirty-four of the infants were not at risk for developmental delays, while thirty-one were at risk for developmental delays. Regression analyses were used to determine what factors influenced attributional biases and styles of interaction.

The first research question explored the influence of maternal at-risk status, social support, infant at-risk status, and maternal discrepancy on maternal attribution biases. The results of these analyses revealed no significant relationships among maternal attributions and maternal at-risk status, infant at-risk status, social support, and maternal discrepancy.

The second research question explored the influence of SES, maternal attributional biases, infant at-risk status, and maternal discrepancy on each of four styles of maternal interaction. In all four of the analyses, some combination of the predictor variables accounted for between 28% and 55% of the variance in maternal styles of interaction. Mothers' orientation to their infants and the quantity of stimulation mothers provided were both influenced by SES, infant at-risk status, and maternal discrepancy. Socioeconomic status was the only variable that was a significant predictor of the level of control observed during mother-infant interactions. Infant at-risk status and maternal discrepancy were the only two significant predictors of the amount of reciprocal play. The measures of maternal attributional biases were not significant predictors in any of the four analyses.

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CHAPTER I
INTRODUCTION

The study of attributions--the assignment of intent to the behavior of another person--has made a significant contribution to the understanding of social interactions. Researchers have looked at interactions between parents and children, siblings, and peers and asked why individuals respond to the behavior of others in particular ways. In studying such interactions within families, attribution theory offers insight into factors which influence parent-child interactions. According to attribution theory, individuals make causal inferences about the intentionality that underlies another's behavior (Dix & Grusec, 1985). Fundamental to understanding how this process influences interactions between people in general and interactions between parents and children, in particular, is the concept of attributional bias. Dix and Grusec (1985) describe attributional biases as the tendency to make negative inferences about someone's intent, even when that person's intent is unclear. One factor hypothesized by Dix and his colleagues (1986) that influences negative inferences between parents and children is parents' inaccurate estimates of children's basic knowledge, ability and motivation in a particular situation. These inaccurate assessments may lead to misperceptions of children's intentions which then affect parental styles of interaction with their children.

This study focused on maternal attributional biases and asked how these biases influence a mother's style of interaction with her infant. Specifically, this study first sought to examine how maternal risk factors, social support available to the mother, the infant's developmental status (at risk or not at risk for developmental delays), and the discrepancy between the mother's assessment of her infant's abilities and the actual abilities of her infant influenced her attributional biases. Secondly it sought to examine how the mother's socioeconomic status, the infant's developmental status, and the discrepancy between the mother's assessment of her infant's abilities and the actual abilities of her infant influenced her style of interaction with her child. It was expected that these results would identify factors which influenced parents' interpretations of their children's behavior and would suggest how these interpretations related to parents' interactions with their children. Because there is no existing literature on maternal attributions with at-risk infants, the supporting literature comes from work with older children or children not at risk for developmental delays.

Factors Related to Maternal Attributions

Maternal At-Risk Factors

Marital discord, maternal depression, and low family socioeconomic status are characteristics of mothers and families which have been hypothesized by MacKinnon and her colleagues as variables likely to affect mothers' perceptions of their children's behavior (MacKinnon, Lamb, Belsky, & Baum, 1990). Much of the research on these characteristics suggests that if these factors are present, mothers'

perceptions of their children's behavior are less likely to be accurate (Brody & Forehand, 1986; Christensen, Phillips, Glasgow, & Johnson, 1983; Cutrona, 1983; Emery & O'Leary, 1984; Forehand, Lautenschlager, Faust, & Graziano 1986b; Griest, Forehand, Wells, & McMahon, 1980; Johnson & Martin 1985; Lahey, Conger, Atkeson, & Trieber, 1984; McGillicuddy-DeLisi 1982b, Ninio, 1979).

Poor marital quality

Poor marital quality has been found to be positively related to parental misperceptions of children's behavior problems in both clinical and non-clinical populations (Bond & McMahan, 1984; Christensen et al., 1983; Emery & O'Leary, 1984; Forehand, Brody, & Smith, 1986a). Christensen and his colleagues (1983) examined parental knowledge of behavioral principles, tolerance of children's deviancy, and expectations concerning children's behavior as they relate to marital discord. They found that marital discord was associated with parental perception of children's behavior problems. In families where there was poor marital quality, parents perceived their children to have more behavior problems.

Several dimensions of the marital relationship (i.e., lack of intimacy, conflict, poor problem-solving techniques) have been found to be moderately positively correlated with each other in a number of studies (Cox, personal communication; Snyder, 1979; Snyder, Wills, & Keiser, 1981). These findings suggest that a mother who has poor quality in one aspect of her marriage also experiences distress in other aspects of the marital relationship. The effects of distress

created by disruption in the marital relationship generates considerable mental and emotional demands on mothers. Being distracted and preoccupied, these mothers are more likely to process information incorrectly concerning their children's behavior (Fisher, 1984; Glass, Holyoak, & Santa, 1979).

Maternal depression

Maternal depression also appears to be positively related to maternal attributional biases. Depression has been associated with mothers' negative perceptions of their children's behavior (Brody & Forehand, 1986; Cutrona, 1983; Forehand et al., 1986b; Griest et al., 1980). Specifically, maternal depression is positively related to mothers' perceptions that their children exhibit behavior problems (Brody & Forehand, 1986; Lahey et al., 1984). One explanation of these findings is that when depressed, parents have a lower tolerance for children's behavior due to stresses associated with depression such as distractibility and insomnia. This may cause parents to fail to process important information about their children's abilities before making judgments about their children's behavior (Brody & Forehand, 1986).

Low socioeconomic status

Low socioeconomic status of the family has been positively related to more authoritarian parental attitudes and beliefs, and punitive parental behavior (Elder, Liker, & Cross, 1984; Johnson & Martin 1985; Lahey, et al., 1984; McGillicuddy-DeLisi, 1982a, 1985; Ninio, 1979). For example, Lahey and his colleagues (1984) suggest that when parents are under greater family stress due to lack of

financial resources, they are less likely to respond positively to their children's behavior. Parents under a great deal of socioeconomic stress are preoccupied mentally and physically with the acquisition of basic needs. These parents may be unable to receive and to process information accurately concerning their children while focused on these problems (Mandler, 1979; Skinner, 1985).

Taken together, these studies suggest that poor marital quality, maternal depression, and low socioeconomic status in a family affects parents' abilities to process information and therefore their attributions about their children's behavior. These studies have been conducted with older children. Thus, in this study, one question of interest was whether these factors are related to mothers' attributional biases about children at a much younger age.

Social Support as an At-Risk Factor

During the last decade there has been substantial research on the positive effects of the provision of social support in a variety of areas including physical health (Cohen & Syme, 1985), postnatal transitions (Boukydis, 1987), and life events and depression (Lin, Dean, & Ensel, 1986). Among families with children who have a handicap or are at risk for developmental delays, the provision of social support has been found to have direct and indirect effects on maternal psychological well-being (Affleck, Allen, McGrade, & McQueeney, 1982; Affleck, Tennen, Allen, & Gershman, 1986), attitudes toward parenting (Crnic, Greenberg, & Slough, 1986), parental expectations for their children (Lazar, Darlington, Murray, Royce, &

Snipper, 1982), maternal styles of interaction (Dunst & Trivette, 1986; Crnic et al., 1986; Fox & Feiring, 1985), and child behavior and development (Crnic, Greenberg, Ragozin, Robinson, & Basham, 1983). This study attempted to see if more social support would have the same positive influence on maternal attributional biases.

Infant At-Risk Status

There are a number of factors related to both the birth of an infant at risk for poor developmental outcomes and the characteristics of such an infant which may influence parental attributional biases about the infant. It has been found that the birth of an at-risk infant is considered a negative life event by many parents who experience this situation (Bristol & Schopler, 1984; Holmes, Nagy, Slaymaker, Sosnowski, Prinz, & Pasternak, 1982; Seltzer & Krauss, 1984; Slade, Redl, & Manguten, 1977; Turnbull & Winton, 1984). The birth is often viewed as negative because of the additional time and financial demands of having an at-risk child, as well as the emotional adjustment necessary when the child does not match the parent's expectations.

The results from several studies indicate that negative life events significantly correlate with attributional biases (Bristol & Schopler, 1984; Persons & Rao, 1985; Sarason, Johnson, & Seigal, 1978; Seligman & Peterson, 1986; Seltzer & Krauss, 1984; Slade et al., 1977; Turnbull & Winton, 1984). Because stress interferes with the ability to process information accurately, it would be expected that the stress associated with a negative life event such as the birth and

parenting of an at-risk infant would be related to maternal attributional biases about the infant's behavior.

In addition to the stress of this life event itself, there are a number of characteristics of at-risk infants which may increase the likelihood of maternal attributional biases. At-risk infants are more fussy, irritable, and likely to cry (Davis & Thoman, 1987; Elmer, 1976; Goldberg, 1979), and their cries are perceived as more aversive (Frodi et al., 1978). Crockenberg and her colleagues (1981, 1982) found that at-risk infants spend less time in an alert state, are more difficult to keep alert, are less responsive to sights and sounds, and provide fewer cues to guide maternal interaction than normal infants. These characteristics make interpretation of the infants' cues very difficult (Field, Sandberg, Garcia, Vega-Lahr, Goldstein, & Guy, 1985), increasing the likelihood that mothers will misinterpret their babies' behavior.

The results from several studies also suggest that mothers' perceptions of children's abilities and behavior, both of which are significant factors in the formation of attributions, are related to the handicaps of the children (Priel & Kantor, 1988; Serbin, Steer, & Lyons, 1983; Yoder & Feagans, 1988). Yoder and Feagans (1988) found that mothers of severely delayed children interpret prelinguistic behavior differently than mothers of moderately developmentally-delayed children. Mothers of the more severely handicapped children tended to attribute communication to the children's behavior more frequently than did mothers of less handicapped children. This suggests that mothers' perceptions of their children and subsequently

the attributions they make about their children are influenced by the children's handicaps. The present study addressed whether the at-risk status of infants increased mothers' attributional biases about their babies' intentions.

Factors Related to Maternal Styles of Interaction

Socioeconomic Status

Socioeconomic status (SES) has been found to influence parent interaction styles in a number of studies (Affleck et al., 1982; Dunst & Trivette, 1988; Farren & Ramey, 1980; Skinner, 1985). Each of these studies have replicated the finding that parents from higher SES levels are more likely to exhibit supportive and responsive styles of interacting with their children than are parents from lower SES levels. This relationship has been found in studies of both families who have children at risk for developmental delays (Affleck et al., 1982; Dunst & Trivette, 1988) and families who do not have children at risk for developmental delays (Farren & Ramey, 1980; Skinner, 1985). For example, Skinner (1985) found that mothers from higher SES backgrounds were more sensitive with their children than were mothers from a lower SES background. Affleck and his colleagues (1982) reported similar results with a group of 9-month-old infants who were handicapped.

Infant At-Risk Status

The interaction styles of parents with children who are at risk for developmental delays or are handicapped and parents of children with no apparent disability have been compared in a number of studies

(Field, 1981; Levy-Shiff, 1986; Marfo & Kysela, 1988; Stoneman, Brody, & Abbott, 1983; Tannock, 1988). Though some studies report differences depending on the types of disabilities that the children have, generally it has been found that when comparisons are made between mothers based on whether their children are handicapped or not there are differences in the interaction styles of the mothers. These studies suggest that parents of children at risk for developmental delays or handicapped often use more language with their children; however, their language is less complex and more directive than that of parents of children not at risk for developmental delays.

Maternal Attributions

The link between attributions and behavior is an area that has recently received attention in the research literature. Results from a number of studies are beginning to establish the relationship between maternal attributions and maternal interactions with children (Bugental, 1987; Bugental & Lewis, in press; Grusec, Dix, & Mills, 1982; Nuttall, Stollak, Fitzgerald, & Messe, 1985). For example, studying 15-month-old infants, Nuttall and his colleagues (1985) found that the more the mothers perceived of the infants' behavior as problematic, the less the mothers touched and supported their infants in using toys during a play session. Nuttall's work, as well as others previously cited, involved normal infants or children, not children with a handicap. Vietze and Anderson (1981) hypothesized that parental attitudes and perceptions of their children's abilities are important components in understanding parent-child interactions within families with handicapped children. In a study of infants at risk for

developmental delays, Affleck, McGrade, Allen, and McQueeney (1985) found that when mothers felt responsible for their infants' problems, they experienced fewer caregiver problems and had a greater degree of maternal responsiveness and involvement with the child. The current study examined the relation between maternal attributional biases and maternal interaction styles with at-risk infants.

Maternal Discrepancy in Infant Ability

Dix and Grusec's (1985) definition of attributions involves parents' assessments of children's abilities. The underestimation or overestimation of children's abilities is an important step in the process of assigning intentionality to children's behavior. A number of researchers, however, have found discrepancies in maternal estimations of children's abilities (Cotler & Shoemaker, 1969; Crouchman, 1985; Hunt & Paraskevopoulos, 1980; Miller, 1986). These studies have shown that mothers of normal children tend to overestimate the overall abilities of their children. In families of handicapped children, parents recognize that their children have lower abilities, but also overestimate the level at which their children are functioning (Anton & Dindia, 1984; Stancin, Reuter, Dunn, & Bickett, 1984).

The data that are available from studies with normal children suggest that accurate assessments of children's abilities and developmental milestones are positively related to positive and effective styles of interaction (Epstein, 1980; Fry, 1985; Nover, Shore, Timberlake, & Greenspan 1984; Stevens, 1984). Results from these studies indicate that the less accurate the parents were in

their assessments, the less responsive, more controlling, and less verbal they behaved in interactions with their infants. The present study sought to determine whether the discrepancy between maternal assessment of infant ability and actual infant ability was related to maternal attributional biases and maternal styles of interaction.

Conceptual Framework

The conceptual framework for this research was grounded in three theoretical perspectives: attribution theory (Dix, Ruble, Grusec, & Nixon, 1986), human ecology (Bronfenbrenner, 1979), and family life cycle (Figley & McCubbin, 1983; McCubbin & Figley, 1983). The following is a brief summary of each of these perspectives.

Attribution Theory

The process of interpreting another person's behavior has been examined in the areas of children's peer interactions (Dodge, 1986) and parent-child interactions (Dix & Grusec, 1985). An information-processing model of children's peer attributions has been proposed by Dodge, Pettit, McClaskey and Brown (1986). Briefly, the model involves five steps in a dyadic interaction that occur in a temporal order beginning with a social cue. In the first step, the received social cue is encoded from the environment and integrated with past experiences in order for the intent of the cue to be interpreted. This interpretation stage, step two, requires the child to use current information about the situation as well as past experiences when making inferences concerning the intent of an action. When the meaning of the cue is interpreted, the person begins the third step,

searching for a possible behavioral response and assessing the consequences of that response. Once the response is selected, the fourth step occurs, and the person emits a behavior. In the last step, this behavior is then evaluated and acted upon by the other half of the dyad.

Dodge and his colleagues (1986) use this model to assess how children process information about their peers. He and his colleagues have tested all five steps of the model (Dodge, 1985, 1986; Dodge et al., 1986). It is at the interpretation stage, however, where they have concentrated their efforts. For the purposes of this project, the interpretation stage of the model was examined as it applies to parent-child interactions.

The model of Dix and his colleagues (1986) focuses on this interpretation step by suggesting that parenting behavior may depend on parents' inferences about the traits and motives of their children, the situational factors operating on their children, and most importantly, the parents' assessment of the intent of their children's behavior (Dix & Grusec, 1985). According to this model a parent first assesses his/her child's abilities, knowledge, and control in a situation. The parent assesses the degree to which he/she feels that his/her child has knowledge about what the appropriate behavior should be in a particular situation. The parent considers whether the child understands that certain types of behavior are or are not appropriate in a specific situation. The parent also assesses the child's abilities to act in a particular way. For example, assuming the child has the knowledge of what should be done, the parent also asks whether

he/she is able to act in the correct way. Furthermore, the parent assesses the control that the child has in the particular situation. Dix and Grusec (1985) suggest that at times a parent feels that his/her child does know what to do and is capable of performing the actions, but the child is in a situation that is beyond his or her control. For example, the parent might assess a child's behavior differently if the child is with another adult who is encouraging a behavior that the parent does not endorse.

Another component of the model developed by Dix and his colleagues (1986) is the concept of intentionality. At this step in the model, the parent assigns intentionality to the child's behavior based on the assessment of the child's knowledge, ability, and control. If the parent decides that the child knows what is appropriate behavior, has the ability to behave appropriately, and is free from outside controls, then the parent is more likely to judge the actions of the child as deliberate. This idea that a number of factors are considered to form beliefs about intentionality can also be found in the work of other attributional theorists (Bugental, 1987; Heider, 1958; Weiner, 1979).

Dix and his colleagues (1986) then assert that the parent's affective reaction to the child's behavior will depend on how the parent assigns intentionality to that behavior. If the child's behavior is perceived to be intentional, then it is predicted that the parent will have a negative emotional reaction to the behavior. These theorists suggest that this affective reaction on the part of the

parent is an important factor in determining the parent's response to the child's behavior, i.e., an intense emotional reaction is more likely to evoke a negative behavioral response from the parent.

This attribution model (Dix et al., 1986) provides a framework in which to understand the cognitive process that parents undergo before responding to children's behavior. An understanding of this cognitive process is particularly helpful when looking at the judgments parents of children at risk for developmental delays make concerning intentionality. These children vary in their abilities from normally developing children. In general, parents expect children's behavior to match their chronological age, yet for these at-risk children chronological age does not accurately reflect their ability and knowledge, and therefore their behavior may be more susceptible to misinterpretation.

Human Ecology

An ecological perspective of development emphasizes the interactions and accommodations between a developing child and his/her animate and inanimate environments. This perspective examines how events in different ecological settings directly and indirectly affect the behavior of the person (Bronfenbrenner, 1979; Cochran & Brassard, 1979). For example, Bronfenbrenner (1979) argues that "whether parents can perform effectively in their child-rearing roles within the family depends upon role demands, stresses, and supports emanating from other settings" (p. 7). In other words, parents' perceptions of and their responses to their children are influenced by larger social systems beyond the parent-child relationship. This perspective

suggests that the family environment and the mother's other relationships will influence her interactions with her child.

Family Life-Cycle Theory

Family life-cycle theory focuses on the growth and adaptations of parents and families in response to both normative life events [e.g., marriage, the birth of a normal child (McCubbin & Figley, 1983)] and non-normative life events [e.g., divorce, the birth of premature child (Figley & McCubbin, 1983)]. This theory explains the needs and tasks that are important to families in the various life stages (Carter & McGoldrick, 1980). The birth of a normal child is a normative event which requires adaptation and growth on the part of the family. The birth of an at-risk infant, however, is a non-normative life event which immediately increases the number and complexity of the tasks of the family. This theory suggests that there are a number of factors including family characteristics, resources, and social support that influence reactions to these life events and facilitate the accomplishment of important family tasks (Ehly, Conoley, & Rosenthal, 1985). Social support is described in family life-cycle theory as one important variable contributing to the adjustment of families to non-normative life events such as the birth of a child at risk for developmental delays (Gore, 1981). If social support is insufficient, there will be an increase in the negative effects resulting from a negative life event.

Collectively, these three theoretical perspectives provide a framework for examining what factors may influence mothers'

attributions about children and how these attributions may influence maternal styles of interaction. Attribution theory explains which factors affect the formation of attributional biases and how attributional biases may affect maternal styles of interaction. The human ecological perspective suggests the relevance to the present study of a number of factors in the familial and social environments which influence attributions. Variables such as poor marital quality, maternal depression, and low maternal socioeconomic status are the factors that affect maternal attributional biases. Family life-cycle theory suggests that social support be examined as a mediating variable that may buffer the negative effects of the birth of an at-risk infant on the formation of parental attributional biases as the family moves through the transition to parenthood.

CHAPTER II

REVIEW OF THE LITERATURE

The following review of related literature is organized into several sections. The first section will discuss the literature that examines a number of factors that relate to maternal attributional biases. The second section reports the findings from studies relating socioeconomic status, infant at-risk status, and attributional biases to paternal styles of interaction. The third section reviews literature concerning factors that may place infants at risk for future developmental delays.

Factors Related to Maternal Attributions

Maternal At-Risk Factors

As discussed in Chapter 1, a human ecological approach to the study of family interactions suggests the need to examine how factors in the larger social system may influence maternal attributional biases. From this perspective, it would be expected that factors such as maternal depression, the family's socioeconomic status (SES), and the parents' marital relationship may be related to maternal attributional biases (MacKinnon et al., 1990). Research has shown that high levels of social and personal distress on the part of parents are likely to lead to attributional biases (Christensen et al., 1983; Emery & O'Leary, 1984; Forehand et al., 1982; Griest et al., 1980; Kaplan, 1983). When people are under a great deal of distress, whether from poor marital quality, emotional depression, or

economic depression, they easily become overloaded and may have difficulty processing relevant information. This disruption in processing information may lead to misinterpretations of others' actions.

Poor marital quality

Because factors which create distress are likely to influence mothers' cognitive processing, the stress associated with poor marital quality becomes an important factor to examine (Kaplan, 1983; Lahey et al., 1984). The influence of the marital relationship on mothers' attributions about children's behavior has been found to be important in several studies (Bond & McMahon, 1984; Christensen, et al., 1983; Emery, 1982; Forehand et al., 1986a). Bond and McMahon (1984) in a study of 20 maritally distressed mothers and 20 maritally nondistressed mothers found difference in mothers perception of their children's behavior problems. The mothers, whose children were between the ages of 3 and 7 years old, were asked to rate their children on a number of behavioral measures. Christensen, Phillips, Glasgow, and Johnson (1983), in the study described earlier, also found a positive relationship between marital discord and mothers' perceptions of their children as having more behavior problems when the children were between 4 and 12 years of age. Mothers of the maritally distressed group perceived their children as having more adjustment problems and as more aggressive than mothers in maritally nondistressed group. In a review by Emery (1982), he noted that a positive relationship between marital turmoil and the parents'

perceptions of their children as having behavior problems has been found in both clinical and nonclinical populations, though the associations are stronger for the clinical samples. Emery (1982) suggested that mothers' attributional biases about children's behavior is a reflection of the mothers' state rather than a reflection of the children's behavior.

Studies have shown that there is a correlation among various dimensions of the marital relationship (Schaefer & Olson, 1981; Snyder, 1979; Snyder et al., 1981). For example, Cox (personal communication) found that intimacy, communication, and absence of conflict were positively correlated in her sample of 100 first-time parents. Schaefer and Olson (1981) found that emotional intimacy was positively correlated ($r = .62$) with a commonly used measure of marital quality, the Locke-Wallace Marital Adjustment Scale (Locke & Wallace, 1959). Tolstedt and Stokes (1983) in a study of 43 couples found that intimacy predicted 60% of the variance in the quality of the marriage. In this study, marital emotional intimacy was used to assess the quality of the marital relationship. It was hypothesized that the less marital intimacy, the more negatively biased these mothers would be in their attributions about their infants.

Maternal depression

A number of studies have examined the relation between parents' depression and parents' perceptions of their children's behavior (Brody & Forehand, 1986; Christensen, et al., 1983; Forehand, et al., 1986b; Forehand et al., 1982; Griest, et al., 1980; Lahey, et al., 1984). Most of these studies have been conducted with mothers and

have found that mothers who report higher levels of depression perceive their children's behavior to be more deviant. For example, Forehand and his colleagues (1986) found in a study of 55 mother-child pairs that maternal depression had a direct effect on mothers' perceptions of children's maladjustment and an indirect effect on children's noncompliant behavior. In another set of studies, depressed mothers reported more behavior problems in their children than did objective evaluators of the children's behavior (Forehand et al., 1982b; Griest, et al., 1980). Together, these findings suggest that maternal depression has an important influence on maternal perceptions and, therefore, on attributional biases. In the present study, it was hypothesized that the greater the degree of depression experienced by mothers, the more negatively biased these mothers would be in their attributions about their infants.

Low family socioeconomic status

Low socioeconomic status of the family is another factor that is likely to influence maternal attributional biases. Mothers become so emotionally and physically drained from trying to meet their basic needs that they may not accurately process information about their children's actions. A number of studies have shown that family income and SES are related to mothers' attributions about their children's behavior and to beliefs about child-rearing (Johnson & Martin, 1985; Lahey, et al., 1984; Miller, 1988; Schaefer & Edgerton, 1985). When families are under fewer environmental stresses, as are higher SES parents, they are less likely to perceive their children's misbehavior

to be deliberate and intentional (Lahey, et al., 1984; Miller, 1988). In the current study, it was hypothesized that mothers in lower SES families would be more likely to make negatively biased attributions about their infants.

Social Support as an At-Risk Factor

Many studies have found positive effects of high social support in a variety of areas including physical health (Cohen & Syme, 1985), postnatal transitions (Boukydis, 1987), and life events and depression (Lin et al., 1986). For example, Cutrona and Troutman (1986) found that social support protected new mothers against postpartum depression. Barrera (1986) explained this process as one by which perceived support helps prevent the adverse cognitive appraisal of life events. He suggests that the perception of support decreases the likelihood that life events will be appraised as negative, and therefore helps the person be more resilient to the negative effects of the life event.

Social support provided to families with children who are handicapped or at risk for developmental delays has been found to relate directly and indirectly to maternal psychological well-being (Affleck et al., 1982; Affleck et al., 1986), attitudes toward parenting (Crnic et al., 1986), parental expectations for their children (Lazar et al., 1982), maternal styles of interaction (Crockenberg & McCluskey, 1986; Dunst & Trivette, 1986) and child behavior and development (Crnic et al., 1983). For example, Crnic, Greenberg, and Slough (1986), in a study with 52 mothers and their high-risk premature infants, examined stress-buffering effects of

social support on maternal parenting patterns and maternal styles of interaction. They found significant interactions between stress and support in the areas of parenting style [$F(1,31) = 9.84, p < .01$] and satisfaction with parenting [$F(1,38) = 5.72, p < .02$]. In each case, greater degrees of support moderated the impact of high stress resulting in more supportive parenting styles and greater satisfaction with parenting. It was hypothesized in the present study that the less reported satisfaction with social support, the greater the likelihood that mothers would be negatively biased in their attributions about their infants.

Infant At-Risk Status

The transition to parenthood for parents of normally developing children has often been described as a period of great change and adjustment (Osofsky & Osofsky 1980; Osofsky & Osofsky 1983). The birth of a child who is at risk for poor developmental outcomes has been found in a number of studies to be perceived by parents as a stressful event that requires a great deal of adjustment (Bristol & Schopler, 1984; Crnic, Friedrich, & Greenberg, 1983; Seltzer & Krauss, 1984; Slade et al., 1977; Turnbull & Turnbull, 1985; Turnbull & Winton, 1984). These studies suggest that parents are faced with a variety of factors related to their children's at-risk condition which make the adjustment particularly stressful. For example, if the child is born prematurely, there is often a prolonged stay in the hospital that interrupts the normal processes of bringing a child home and making the early adjustments (Beckwith & Cohen, 1978; Klein & Stern,

1971; Lynch, 1976). Such a prolonged separation interferes with the mother's opportunities to become familiar with her infant's behavior and therefore increases the likelihood that she would inaccurately assign intent to the infant's behavior.

Studies have also revealed certain characteristics of at-risk infants which may create more stress for parents. The characteristics that seem to distinguish at-risk from not at-risk infants include a greater amount of time spent fussing or crying (Davis & Thoman, 1987; Elmer, 1976), more aversive and irritating cries (Elmer, 1976; Frodi et al., 1978), more difficulties staying alert, and less responsiveness to sights and sounds (Crawford, 1982; Davis & Thoman, 1987; Goldberg, 1979). Crawford (1982) examined the differences between premature and full-term infants at various ages and found premature infants at 6 months of age to be more fretful and more passive in their interactions with their environment and less likely to vocalize than full-term infants. Goldberg (1979) suggested that these characteristics make it difficult for parents to understand what these premature children are needing and what are appropriate responses to these infants. This difficulty in interpreting the children's behavior may increase the likelihood that attributional biases will occur.

Furthermore, at-risk infants often have complicated medical conditions which require prolonged hospitalization and this separation may interfere with the mother-infant process of adaptation. These prolonged separations increase the likelihood that mothers will misinterpret their infants' behavior because they are not as familiar

with their infants as are mothers who have not experienced separation (Klein & Stern, 1971; Lynch, 1976). All of these factors create a situation in which it may be difficult for mothers to know what their infants are wanting and why their infants are behaving in certain ways.

Results from several studies suggest a relationship between children's handicaps and mothers' attributions about children's behavior (Serbin et al., 1983; Yoder & Feagans, 1988). In a study involving 11-month-old handicapped infants, Yoder and Feagans (1988) found differences in the frequency and certainty with which mothers of severely handicapped infants attributed communicative intentions to an unknown handicapped infant. These mothers were more likely to interpret the unknown infant's actions as communication than were mothers of children with mild handicaps. In a study of at-risk infants, Priel and Kantor (1988) found that mothers who had high-risk pregnancies differed in their perceptions of their infants from those who had low-risk pregnancies. Thirty mothers in the high-risk group were asked their perceptions and expectations about normal infants and their own infant. The same number of mothers with low-risk pregnancies were asked their perception and expectations about normal infants and about their own infant. The data confirmed the hypothesis that mothers with high-risk pregnancies perceived their infants as significantly more difficult than did mothers with low-risk pregnancies, even though all of the infants appeared to be developing normally at three months of age. Considered together, the results

from these studies suggest that maternal attributional biases are related to the presence and the severity of the conditions of the infants and children who are at risk for poor developmental outcomes. In the present study it was hypothesized that mothers of at-risk infants were more likely to be negatively biased in their attributions about their infants in comparison to mothers of infants at no risk for poor developmental outcomes.

Factors Related to Maternal Styles of Interaction

Socioeconomic Status

A number of studies have found that the socioeconomic status (SES) of the mother is related to the interaction style that is exhibited between the mother and her infant (Affleck et al., 1982; Brooks-Gunn, 1985; Dunst & Trivette, 1988; Skinner, 1985). These findings have been demonstrated in studies involving families with children who are not at risk for developmental delays or handicapped (Farren & Ramey, 1980; Skinner, 1985) and families with children who are at risk for developmental delays or handicapped (Affleck, et al., 1982; Dunst & Trivette, 1988). Skinner (1985) found that mothers from higher SES backgrounds were more sensitive to their preschool children's abilities and more aware of their children's perspective during the interaction than were mothers from lower SES backgrounds. Farren and Ramey (1980) compared the influence of family SES on mother-child interaction styles, observing maternal interactions with the children at 6 months of age and again at 20 months of age. At 6 months of age, the researchers found no differences in interaction style as a function of SES. At 20 months of age, however, the

researchers found that mothers from low SES backgrounds did not interact with their children to the extent that mothers of higher SES backgrounds did interacted with their children. Farren and Ramey hypothesized that as these infants became more assertive in their interactions, mothers of the lower SES backgrounds withdrew from the interactions.

In a study of 43 mother-infant dyads, Affleck and his colleagues (1982) examined the level of emotional responsiveness and emotional warmth that was exhibited by the mother during an interaction. They found in this study of 9-month olds who were at risk for developmental delays or handicapped that higher SES mothers were more likely to respond verbally to their infants and to exhibit more emotional warmth than were mothers from lower SES backgrounds. Dunst and his colleagues (1988) were able to replicate the influence of SES on various maternal styles of interactions in four different studies involving mothers and children who are handicapped or at risk for some type of developmental delay. Regardless of the interaction variable being assessed, the directions of the findings were the same in each study: higher SES mothers were more likely to exhibit more interactive play styles and to be more responsive, elaborative and less imposing than mothers of lower SES backgrounds. In the present study, it was hypothesized that mothers from higher SES backgrounds would be more likely to display stimulating and supportive styles of interactions than mothers from lower SES backgrounds.

Infant At-Risk Status

The differences between maternal styles of interactions as a function of children's diagnoses has been investigated in a number of studies (Field, 1981; Levy-Shiff, 1986; Marfo & Kysela, 1988; Stoneman et al., 1983; Tannock, 1988). Several studies involving various diagnostic groups have found that parents of children with handicaps may talk or vocalize more with their children, but that the language patterns displayed were much less complex, less reciprocal and more directive than those of parents of children without a handicap (Buium, Rynders, & Turnure, 1974; Eheart, 1982; Jones, 1980; Hanzlik & Stevenson, 1986). For example, Stoneman and her colleagues (1983) found in a study of children with Down syndrome and children with no handicaps that the parents of children with Down syndrome emitted more instances of verbalizations but were also more directive than were the parents of children with no handicaps. Field (1981) observed twenty-four parents of premature infants and twenty-four parents of full-term infants when the infants were four months of age. During the in-home observations of the parent-infant dyads, she found that though parents were more active with their premature babies, they engaged in less game-playing and exhibited less smiling and less laughing compared to parents of full-term infants. In a study that matched subjects on family SES, child sex, parity and developmental age, Levy-Shiff (1986) found that parents of children with mental handicaps made less physical contact, paid less attention, and showed less affect than did parents of children who did not have a handicap. Tannock (1988) found that there were differences in the speech patterns of mothers of Down

syndrome children and mothers of children with no handicap during observed interactions. Mothers of children with Down syndrome engaged in faster paced interactions, switched topics more frequently and were less willing to tolerate periods of silence and lapses in the interactions than mothers of children with no handicap. In the current study, it was hypothesized that mothers of at-risk infants would exhibit more controlling and less stimulating and supportive styles of interaction than mothers of infants not at risk for developmental delays.

Maternal Attributions

Theories of social behavior are based on the idea that cognition is related to behavior (Shantz, 1983). The work of Dodge and his colleagues has shown a relationship between children's attributions about peer actions and their behavioral responses to those actions (Dodge, 1986; Dodge et al., 1986). This same relationship has been found between mothers' attributions and their interactions with their children (Bugental, 1987; Bugental & Shennum, 1984; Miller, 1988). In a study of caregiver interactions with children at risk for physical abuse, Bugental (1987) found that mothers' vocal interactions differed depending on mothers' perceptions of children's control in the situation. Specifically, mothers who attributed a greater degree of blame for the failure of the interaction to their children, displayed more negative affect in their voice patterns. Bugental and her colleagues suggested mothers' attributional biases about children's control in the interaction influence mothers' interactions with those

children (Bugental & Lewis, in press; Bugental, Caporeal, & Shennum, 1980).

Affleck and his colleagues (Affleck et al., 1985; Affleck & Tennen, 1990) have examined the ways that maternal attributions influence parent and child outcomes by looking at maternal beliefs about the behavioral causes for their infant's condition and maternal expectations about their infants development. One study (Affleck et al., 1985) that examined maternal beliefs about behavioral causes for their infants conditions involved 51 mothers of infants who had severe perinatal medical problems or genetic conditions associated with a developmental disability. During a semi-structured interview one month after the infant was diagnosed, mothers were interviewed concerning their perceptions of the causes for their infants' conditions. Their responses to what caused their infants' condition were divided into three groups: maternal behavior or activity, behavior of others, or no behavioral causes. When the infants were 9 months of age, mothers were also asked about the extent to which they were having caretaking difficulties and were also assessed using the HOME Inventory Scale. The results of this study indicated that mothers who blamed themselves or made no behavioral attributions reported fewer caretaking problems. The results from the HOME revealed that self-blame was related to greater maternal responsiveness and involvement with the child and more effective organization of the environment at 9 and 18 months. Affleck and his (1985) colleagues hypothesized that self-blaming mothers were more active in promoting their infants' developmental advance because of

their use of more active coping strategies. If mothers believed that they had the control to cause the problems, then likewise they had the control to make the situation better.

Furthermore in a study of 94 mothers whose infants were hospitalized on a neonatal intensive care unit, Affleck and Tennen (1990) found a direct link between maternal expectations concerning infant development and the developmental outcomes of the infants. The mothers were interviewed about their expectations concerning their infants' development and their coping strategies at the time their infants were discharged from the hospital. When the infants were 18 months old, their developmental status was assessed. As hypothesized by Affleck and Tennen (1990), mothers who had estimated a greater probability that their infants' developmental outcomes would be normal had infants with better developmental outcomes regardless of the severity of the infants' medical conditions. The work by Affleck and his colleagues in the area of at-risk infants suggests that maternal cognitive processes are important in understanding the interactions and developmental outcomes for these infants. Maternal perceptions appears to influence how mothers interact with their infants and how well the children do in future development.

Nuttall, Stollak, Fitzgerald, and Messe (1985) studied how mothers' attributions concerning infants' intentionality influenced the mothers' interactions with infants not at risk for developmental delays. These researchers found the relationship between attributions about infants misbehavior and mothers' behavior toward the infants to

exist (Nuttall et al., 1985). They studied 52 mother-infant pairs during both free and structured play situations to determine whether mothers' perceptions of infants' behavior problems would be associated with particular styles of interaction. Mothers were asked to rate their 15-month-old infants on 27 items that expressed positive behaviors and 25 items that expressed negative behaviors such as bullying, selfishness, and disobeying adult directions. Results from this study supported Nuttall and his colleagues' hypothesis that mothers' positive perceptions of their children's behaviors are related to maternal touch and supportive use of toys during a play interaction. Given the relationship between attributional biases and maternal styles of interactions that has been found to exist with older, normally developing children, it was hypothesized in the present study that negative maternal attributional biases would be related to more controlling and less supportive styles of interaction.

Maternal Discrepancy Concerning Infant Ability

The study of attributions involves examining one person's perceptions of another person's actions. Attributional biases occur when a person misperceives another person's intentions due perhaps to an inaccurate estimation of the subjects knowledge or ability (Dix et al., 1986). If parents do not have an accurate understanding of their children's knowledge and abilities, they may be more likely to misinterpret the intent of their children's behavior. For example, a parent may be misinterpreting the child's intent if he/she punishes a child who continues to talk in a loud voice in church when, in fact, the child does not understand the request to whisper. For parents of

at-risk children, the lack of understanding of what the children know and are able to do may present a particular problem. Because of these children's unusual developmental patterns, parents may inaccurately assess children's abilities and therefore may misinterpret the children's behavior.

The unusual nature of the at-risk child's development may also increase the likelihood that a parent and a professional may differ in their assessments of the child's abilities. Because professionals have more information about abnormal development, they may be more able to assess accurately children's abilities. In his review, Miller (1988) found evidence that parents often are inconsistent in the accuracy of their assessments of their children's abilities (Cotler & Shoemaker, 1969; Crouchman, 1985; Frankel & Roer-Bornstein, 1982; Ninio, 1979; Reis, 1988). For example, Crouchman (1985) interviewed 54 women on postnatal wards with normal infants and found that 61% of the women had not expected their newborn infants to be able to see and 47% did not think their infants could see at the time of the interview. Frankel and Roer-Bornstein (1982) and Ninio (1979) found that parents made inaccurate estimations about approximate ages of emergence of basic perceptual capacities but were more accurate in assessing when linguistic milestones were likely to occur. Miller (1988) reported that when parents were asked to estimate their child's IQ, their estimates correlated .50 to .70 with the child's actual abilities. Studies involving handicapped populations have reported generally the same findings concerning IQ estimates (Anton & Dindia,

1984; Miller, 1988). In a study of 30 mothers of handicapped infants and 30 mothers of handicapped preschoolers, congruence was measured between the mothers and the teachers in their assessments of the children's abilities (Gradel, Thompson, & Sheehan, 1981). On the Bayley Scales of Infant Development (Bayley, 1969), correlations between the diagnosticians' and the mothers' scores were $r = .69$ for the Mental Development Index and $r = .67$ for the Psychomotor Developmental Index. Results from this study, as well as others (Capobianco & Knox, 1964; Ewert & Green, 1957; Heriot & Schmickel, 1967; Matheny & Vernick, 1969; Shulman & Stern, 1959), found that mothers estimated that their children's abilities were more advanced than did professionals, but that congruence between the parent and professional ratings increased as the children got older.

The present study examined to what extent the congruence between the mothers' assessments of the infants' abilities and the behavioral assessment is related to the mothers' styles of interaction. Previous studies with normal children have found that when parents were more accurate in assessing developmental milestones or the children's abilities, they were more responsive, more verbal and less controlling in their interactions (Fry, 1985; Stevens, 1984). In a study of 105 mothers and their 18- to 19-month-old infants, Fry (1985) found that the better the mothers understood the abilities of their infants, the more reciprocal and stimulating the mothers were in their interactions with their infants. In one study of normal mothers and their infants, Nover and his colleagues (Nover et al., 1984) examined the relationship of maternal discrepancy in assessing infants' behavior to

maternal behavior. This study involved 43 white, middle-class mothers in intact families. The mothers and professionals assessed the infants' behavior during a play situation and the discrepancies between the two ratings were computed. The mother-infant interactions were assessed on four measures (contingent responsiveness to the infant's exploratory play, affective availability, interference with infant exploratory play, and social interaction) during a ten-minute play session. The researchers found that the mothers whose perceptions of the infants' behavior were distorted scored significantly lower on social interaction, affective availability, and contingent responsiveness. The current study hypothesized that the greater the congruence between maternal assessment of infant ability and actual infant ability, the more supportive and less controlling the mothers would be in their interactions with their infants.

Relationship Between Infant At-Risk Status and Developmental Delays

There are a variety of situations and events that occur early in infancy that make infants at risk for developmental delays later in life. Conditions found in the literature that place infants at risk for future developmental delays include low infant birth weight, pregnancy and birth complications, infant prematurity, poor environmental conditions, and mother's age. Each of these situations have been found to increase the likelihood of poor developmental outcomes for children.

Low-Birth-Weight Infants

Low-birth-weight infants represent one group of infants that appear to be at risk for poor developmental outcomes. Carren and her colleagues (1989) studied 239 children of normal and low birth weights. They found that low-birth-weight children had a greater risk of exhibiting mild educational handicaps (learning disabled, emotionally handicapped, and educable mentally handicapped) than did normal-birth-weight children. Children in the low-birth-weight group were 2.48 times more likely to be placed in an exceptional education program by 11-12 years of age than children in the normal-birth-weight group. Eckerman and her colleagues (1985) reported significant mental and motor delays in low-birth-weight infants. Eighty-seven low-birth-weight infants and 95 infants with normal birth weights were assessed using the Bayley Scales of Infant Development at 6, 15, and 24 months adjusted age. The low-birth-weight infants were found to have significant mental and motor delays at 6, 15 and 24 months of age. Together, these studies suggest that low-birth-weight infants are at risk for developmental problems in the future.

Pregnancy and Birth Complications

Studies have shown that pregnancy and birth complications increase the likelihood that an infant will be at risk for future developmental delays (Blackman, 1989; Field, Hallock, Ting, Dempsey, Dabiri, & Shuman, 1978; Siegel, 1985). Field and her colleagues (1978) assessed 151 infants at four, eight, and twelve months of age to determine the influence of pregnancy and birth complications on future development (Field et al., 1978). The Obstetric Complications

Scale and the Postnatal Complication Scale (Littman & Parmelee, 1978) were used in this study to assess significant events that occurred during the pregnancy and the birth process. Field and her colleagues found that pregnancy and birth complications were significant predictors of the infants' mental and motor development at four, eight and twelve months of age. Blackman (1989) examined the influence of birth complications that lead to inadequate oxygenation of the infant's brain on future developmental outcomes. Infants that suffered severe loss of oxygen were found to have mild to moderate disabilities at 27 months of age. Mildly asphyxiated infants were more likely to display delays in language development at the age of 24 months than infants that received adequate oxygen. Siegel (1985) followed 86 infants until they were five years of age and found that pregnancy and birth complications were important predictors of later performance. Low Apgar scores, maternal smoking, asphyxia, and previous spontaneous abortions were all factors that had a significant influence on WISC-R scores. These risk factors were significant predictors of verbal IQ scores, performance IQ scores and full scale IQ scores for both full-term and preterm children. All of these studies suggest that pregnancy and birth complications place infants at risk for developmental delays in the future.

Prematurity

Prematurity is another factor that has been found to place infants at risk for future developmental problems. Beckwith and Cohen (1980) followed 126 premature infants until they were 2 years of age.

At two years of age, the infants were given the Bayley Mental Scales and Gesell Development Test. These children had lower Bayley Mental scores and lower Gesell scores than did full-term infants. In a study that followed 64 infants until they were in middle childhood, Caputo, Daniel, Goldstein, & Taub (1979) found that prematurity was related to the children's functioning. The WISC-R was used to assess these children when they were between 7 and 9 years of age. None of the 38 premature infants had clear organic indicators early in life that would suggest problems in performance later, yet prematurity was negatively correlated with their performance on the WISC-R in their middle childhood. Collectively these studies suggest that premature infants are at greater risk for developmental delays in the future than are full-term infants.

Low Socioeconomic Environment

Being raised in a low socioeconomic environment is another factor that has been found to influence the future development of children. Broman (1981) studied infants born to mothers of various ages and SES levels as part of the Collaborative Perinatal Project of the National Institute of Neurological Disorder and Stroke. The children were followed for the first seven years of life. At age four the children were tested on the Stanford-Binet and at age seven on the Wechsler Intelligence Scale for Children. At both ages SES had a significant main effect, with children from higher SES backgrounds demonstrating higher IQs on both the Stanford-Binet and the WICS. Broman (1981) also found that social-emotional development varied according to SES level. Using a behavioral profile that consisted of

15 5-point ratings of various behaviors, children's behaviors were assessed at age seven. Again she found a significant SES effect, with a larger percent of upper SES children rated as exhibiting normal behaviors than children from lower SES backgrounds. In a study of cultural and SES influences on 97 preterm infants, Parmelee and Cohen (1985) found a difference in the Stanford-Binet scores of the children. At five years of age, the scores revealed that children from English-speaking, lower SES families were performing less adequately than those from higher SES English-speaking families. Both the Broman (1981) and Parmelee and Cohen (1985) studies suggest that a low socioeconomic environment influences the future development of infants raised in these conditions.

Mother's Age

Mother's age at the time of birth is another factor that places children at risk for developmental problems later. In a study involving approximately 400 subjects, Dubow and Luster (1990) found that mothers' age at the time of the children's birth predicted the children's math, reading recognition, and reading comprehension when the children were between 8 and 15 years of age. This study revealed a positive correlation between mothers' age and children's abilities (e.g. as the age of the mothers increased so did the abilities of the children). In another study (Field, Wismayer, Adler, & de Cubas, 1990), the long term effects of being raised by teenage mothers from various cultures were examined. A number of measures were taken on the children at 18 and 24 months of age including the Bayley Scales of

Infant Development. These researchers found that regardless of the culture or family constellation that the children were being raised in there were negative consequences for infant development. There was a significant decrease in the Bayley Mental scale scores from 18 to 24 months of age. Together these studies provide evidence that infants of teenage mothers are at risk for developmental delays in the future.

Research Questions

In this study the following research questions were tested:

1. To what extent do maternal at-risk status (poor marital quality, depression, and low family income), social support, infant at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability relate to maternal attributional biases about young infants?
2. To what extent do SES, maternal attributional biases, infant at-risk status and the discrepancy between maternal assessment of infant ability and actual infant ability relate to different styles of mother-infant interaction?

CHAPTER III

METHODOLOGY

Methodological Considerations

There are a number of methodological problems which have been identified in the previous research involving families of at-risk and handicapped children which should be addressed when designing a study. First, most of the information about families of children with poor developmental outcomes has been derived from retrospective studies. A major deficiency inherent in the retrospective approach is that families are identified after the life event (birth of a child with a poor developmental outcome) has occurred. This makes it very difficult to determine the directional influence of the factors. A number of studies have demonstrated that findings from retrospective studies often differ from prospective studies (Achenbach, 1978; Altemeier, O'Connor, Tucker, Sherrod, & Vietze, 1985; Lewis, 1988). Some of the findings from the former type of investigation have not been replicated in prospective, longitudinal studies. This study was a prospective, longitudinal study.

Much of the research concerning family adaptation to the birth of handicapped infants has been derived from clinical rather than representative samples. The help-seeking literature has demonstrated that clinical samples differ from nonclinical samples in that people who seek help have been unable to buffer negative reactions to life events (Gourash, 1978; Granovetter, 1973; Mitchell & Trickett, 1980).

One would therefore expect to find many nonclinical families of children with poor developmental outcomes that are functioning well and do not display the behavioral characteristics of the clinical samples (Gourash, 1978).

Furthermore, clinical samples (Footnote 1) of families with children at risk for developmental delays or mentally and physically handicapped children have often been matched with nonclinical families of nonimpaired children. The purpose of this kind of match has been to establish the fact that the former differ from the latter, and that such differences are attributable to the birth and rearing of a child with a poor developmental outcome (Cummings, 1976; Cummings, Bayley, & Rie, 1966; Cunningham, Reuler, Blackwell, & Deck, 1981; Friedrich & Friedrich, 1981; Gath, 1977; Holroyd, Brown, Winkler, & Simmons, 1975; Holroyd & Guthrie, 1979; Holroyd & McArthur, 1976; Martin, 1975). If clinical samples of families of at-risk and handicapped children differ from nonclinical samples of children without similar developmental problems, then differences between families of impaired and nonimpaired children may be more related to the characteristics of the families that prompted one group of families to seek help than to the children's impairments. In this study, the sample was not drawn from a clinical population in order to avoid the confounds that may be reflected in a clinical sample.

Another major methodological problem in studies of family reactions to the birth and rearing of a child at risk for poor developmental outcomes is the failure of the research design to

discriminate between normative changes and those changes in parent and family functioning which are particularly due to the precipitous event of having an at-risk child. The birth of any child is an event that significantly affects the family unit and the behavior of the child's parents (Busch-Rossnagel, Peters, & Daly, 1984; Dyer, 1963; Hobbs, 1965; Steffensmeier, 1982). Consequently, when examining parents' reactions to the birth of an at-risk infant, it is possible to attribute these reactions to the child's impairment, when in fact these reactions may be due to the addition of a child in the house (Farran, Metzger, & Sparling, 1986). The proposed study involved mothers both of infants at risk and infants not at risk for developmental delays.

Comparative studies (e.g., families of retarded vs. nonretarded children, families of handicapped vs. Down syndrome children) have constituted the primary sources of information about families of developmentally at-risk children (e.g., Cummings, 1976; Cummings et al., 1966; Cunningham et al., 1981; Friedrich & Friedrich, 1981; Gath, 1977; Holroyd et al., 1975; Holroyd & Guthrie, 1979; Holroyd & McArthur, 1976; Martin, 1975). Comparative studies, however, provide very little information about the factors (e.g., parental, familial, environmental) that influence adaptations to the birth and rearing of children with poor developmental outcomes. In order to understand these adaptational factors, studies must include explanatory variables other than diagnostic group. This is especially important since there is evidence to suggest that higher social support, for example, does reduce negative reactions to the birth and rearing of children with

poor developmental outcomes (Crockenberg & McCluskey, 1986; Dunst, 1985; Dunst & Trivette, 1988; Friedrich, 1979). In this study, a number of maternal and familial factors were examined to determine the influence they had on maternal attributional biases.

A particular methodological issue that must be addressed when conducting interaction research is the level of observations employed. One method of data collection that has been used in interactional research is the measurement of molecular responses. This procedure takes data that have been coded as a minute-by-minute account of behavior and are summed to yield an overall score (Towle, Farran, & Comfort, 1988). Often this type of data is collected with automated, data-recording devices. Another method is a molar observation system in which data are "defined by the meaning of the interaction for the participants or by the goal of the participants" (Raab & Pettit, in preparation). Data gathered in this manner are most often collected using observers' overall summary ratings of certain behaviors.

There is much controversy regarding the advantages and disadvantages of different observation methods. Some researchers have proposed that only by observing the moment-to-moment patterns of behavior is it possible to describe the interactions of a family in a meaningful way (Patterson & Reid, 1984). Others such as Lamb (1982) have argued that the fine-grained approach loses the meaning of the behavior for the participants. He has suggested that by not using the observers' abilities to identify and make judgments about

interactional patterns, researchers may miss information which is important in understanding parent-child interaction.

The decision about the type of observational system to be employed should be directed by the research question (Raab & Pettit, in preparation). In the current study, the question focuses on how maternal attributional biases relate to maternal styles of interaction. The maternal styles of interaction that will be examined include sensitivity of the mother to the child's needs, the quantity of the mother's control over the child's actions, and the quantity of stimulation the mother provides the child. The aims of this study suggested the usefulness of a molar observation system that allowed for the observer's judgments about the behavior being observed.

This research was designed to address these methodological issues as it examined mothers' attributional biases about infants' behavior and the influence of mothers' attributional biases on mothers' styles of interactions. In order to address the concerns stated above, the study was a longitudinal study of nonclinical families with infants at risk and not at risk for developmental delays.

Research Design

Data for this study were used to determine which factors relate to maternal attributional bias, and how maternal attributions relate to maternal styles of interaction. The research design was quasi-experimental in that it included a control group (mothers of children not at risk for developmental delays), but did not involve random assignment or the manipulation of the treatment variable (birth of a child who is handicapped or at risk for developmental delays).

Sample Selection

The 65 subjects in this investigation were identified as part of a larger study involving approximately 200 to 300 pregnant women per year. The project covers a four-county area in western North Carolina (Burke, Catawba, Caldwell, and McDowell counties). The average number of live births to mothers between 18 and 40 years of age in these four counties was about 4700 per year for 1983, 1984, and 1985. Actual incidence data (Center for Disease Control, 1985; Division of Health Services, 1985; National Information Center for Handicapped Children and Youth, 1982; Office of Policy and Planning, 1985; Region IV Network for Data Management and Utilization, 1985; State Center for Health Statistics, 1985) were used to estimate the number of subjects whose children are likely to be found in at-risk and not at-risk categories.

The 65 subjects were a cohort of women whose 1- to 6-month-old infants were identified as either at risk for developmental delays or not at risk for developmental delays. The women whose infants were identified as at risk had been exposed to one or more of the following events or situations: (1) low birth weight (less than 2500 grams), (2) complications during pregnancy or delivery, (3) prematurity (born less than 37 gestational weeks), (4) environmental deprivation (a score of 25 or less on the Hollingshead Four-Factor Index), (5) mother's age (15-18 years of age or 35 years of age or over), (6) testing one standard deviations below the mean on the Bayley Scales of Infant Development at six months of age. The group of mothers whose

children were not identified as being at risk for poor developmental outcomes had not been exposed to any of the events or situations described above.

Procedure

The subjects for the study were recruited as part of the larger, ongoing longitudinal study from private physicians, public health departments, Lamaze classes, prenatal parenting classes, posters, mailing, and newspaper announcements. A specific effort was made to use existing organizational structures (e.g., churches, community colleges, service clubs) as a basis for recruitment.

Once a mother expressed interest in the study, she was contacted by a research assistant. During this contact the study was explained in more detail, and if she was interested, a commitment to participate was obtained. The mother was asked to give one person as a contact source (to help in tracking the woman). The mothers were asked to sign an informed consent letter (Appendix A).

Confidentiality of the mothers' responses was insured by coding the data with a four-digit identification number. Raw data were maintained in a form that does not include individual identities. Previous work conducted by this researcher has demonstrated the effectiveness of this method in insuring confidentiality.

Demographic Characteristics of the Sample

Socioeconomic level (SES) was computed by using Hollingshead's (1975) Four-Factor Index of Social Status (see Appendix F). The four factors are educational level, occupation, marital status, and gender. For this study, gender was not included as a factor in the

calculations. Education and occupation were scored, weighted, and then summed to produce a single SES score. Marital status was taken into account when computing SES for dual-wage earning couples. For dual-wage earning couples, SES was calculated separately and then averaged to yield a single score. For married families with a single-wage-earner, only the wage-earner's education and occupation were used for the calculations. For families headed by a single mother, only the mother's education and occupation were used for the calculations. If the mother's were living with her parents, then SES was computed on her family. Higher scores reflected a higher SES.

Socioeconomic scores were categorized into Hollingshead's five levels of social status. Social status I included individuals employed in a major profession, social status II those in a minor profession or technical occupation, social status III those employed as skilled craftspeople, clerical or sales workers, social status IV those employed as machine operators or semiskilled workers, and social status V included unskilled laborers or menial service workers.

As can be seen in Table 1, the participants in this study were predominantly white (92.3%). As indicated by Hollingshead's Index about one-third (35.4%) of this sample fell into the top two social status groups, those involved with major or minor professions or technical occupations. About a fourth of the sample (27.7%) were employed as craftspeople, clerical or sales workers and a little less than a fourth of the sample (21.5%) were semiskilled workers. Unskilled workers made up fifteen percent of the sample. Over half of

the mothers were married (81.5%) and had at least a high school degree (83.1%). Forty-one percent of the mothers were between the ages of 25 and 29 years old. Income for two-thirds of the sample was fairly evenly distributed between the following three groups: \$10,000 - 19,999 (21.5%), \$20,000 - 29,999 (27.7%) and \$30,000 - 39,999 (26.2%). At the six-month interview, 44.6% of the mothers had returned to work, while the remainder were still home with their infants (55.4%). A little over a half of these mothers were first time mothers (52.3%), 30.8% were mothers for the second time, and 16.9% were mothers for the third time. Thirty-four of the infants were not at risk for developmental delays while thirty-one had one or more indicator of risk. The mean score on the Bayley MDI was 118.29 and a standard deviation of 17.68 and on the Bayley PDI the mean was 115.98 and a standard deviation 16.19.

Table 1

Demographic Characteristics of the Sample

Characteristics	n	Percent
Race		
white	60	92.3
other	5	7.7
Mother's age		
under 19	9	13.9
20 - 24	18	27.7
25 - 29	27	41.5
30 - 34	8	12.3
over 35	3	4.6
Social status		
I	2	3.1
II	21	32.3
III	18	27.7
IV	14	21.5
V	10	15.4
Mother's education		
less than 12th grade	11	16.9
high school graduate	21	32.3
partial college or specialized training	17	26.2
college graduate	13	20.0
graduate degree	3	4.6
Annual income		
under \$10,000	11	16.9
\$10-19,999	14	21.5
\$20-29,999	18	27.7
\$30-39,999	17	26.2
over \$40,000	5	7.7
Mother's marital status		
married	53	81.5
single	12	18.5
Mother's working when child was six months old		
working	29	44.6
not working	36	55.4

Total number of children		
1	34	52.3
2	20	30.8
3	11	16.9
Infant at-risk status		
no at-risk indicators	34	52.3
one at-risk indicator	24	36.9
two at-risk indicators	5	7.7
three at-risk indicators	2	3.1

	<u>M</u>	<u>SD</u>

Infant's developmental level		
at six months		
MDI	118.29	17.68
PDI	115.98	16.19

Description of Measures

The following information and measurement procedures/instruments were used in this investigation:

Prenatal Maternal At-Risk Status:

- o Personal Assessment of Intimacy in Relationships
- o Psychological Well-Being Index
- o Family gross monthly income

Social Support At-Risk Factor:

- o Personal Assessment of Social Support

Infant At-Risk Status:

- o Obstetric Complications Scale
- o Postnatal Complications Scale
- o Bayley Scales of Infant Development
- o Hollingshead Four-Factor Index

Socioeconomic Status:

- o Hollingshead Four Factor Index

Maternal Attributional Biases:

- o Attribution Vignettes
- o Attribution Interview

Maternal Discrepancy Score:

- o Bayley Scales of Infant Development
- o Maternal Perceptions of the Child's Abilities Scale

Maternal Styles of Interaction:

- o Maternal Behavior Rating Scale
- o Reciprocal Play Scale

Table 2 presents the time schedule for data collection.

Table 2

Assessment Schedule for Data Collection

Scale	Prenatal	Four weeks	Six months
<u>Interview</u>			
Family SES	X		
Family income	X		
Obstetric and Postnatal Complications Scales		X	
Attribution Vignettes		X	
Attribution Interview		X	
<u>Self-Report</u>			
Psychological Well-Being	X		
Maternal Perceptions of the Child's Abilities Scale			X
Personal Assessment of Social Support	X		
Personal Assessment of Intimacy in Relationships	X		
<u>Observation/Administered</u>			
Maternal Behavior Rating Scale			X
Reciprocal Play Rating			X
Bayley Scales of Infant Development			X

Following are brief descriptions of the procedures/instruments themselves.

Prenatal Maternal At-Risk Status

In this study, the prenatal maternal at-risk variables included poor marital quality, maternal depression and family's gross monthly income. These were assessed as described below. The scores from each of these measures were standardized and summed in order to compute one score for maternal at-risk status.

Personal Assessment of Intimacy in Relationships. The Personal Assessment of Intimacy in Relationships (PAIR) (Olson & Schaefer, 1981) is a 36-item, self-report measure that examines five types of intimacy: emotional (the experience of a closeness of feelings), social (the experience of having common friends and similarities in social networks), intellectual (the experience of sharing ideas), sexual (the experience of sharing general affection and/or sexual activity), and recreational (the experience of shared interests in hobbies). Individuals completing the scale respond to each statement by reporting their current perception of the relationship. A factor analysis of the original 75 items produced six factors. The six highest items in each factor were used to comprise the subscale. Split-half reliability of the subscales produced coefficients of .70 or greater.

For this study the emotional intimacy subscale was used as a measure of marital quality (Appendix B). This subscale has been found to correlate with a number of other intimacy scales and with the Locke-Wallace Marital Adjustment Scale (Schaefer & Olson, 1981). Studies suggest that this subscale is a good predictor of parenting

attitudes and parental interactions (Schaefer & Olson, 1981) and marital satisfaction (Fredman & Sherman, 1987).

Psychological Well-Being Index. The Psychological Well-Being Index (PWI) (Bradburn, 1969; Bradburn & Caplovitz, 1965) is a 14-item rating scale which measures two dimensions of emotional well-being of the respondent (Appendix C). This self-report measure asks the respondent to indicate how often a variety of emotional states were experienced over the last week. Ratings are made on a 4-point Likert scale ranging from Did Not Feel At All (1) to Often (4). Several investigators have found that the positive affect and depression items on the PWI are independent of each other (Bradburn, 1969; Diener, 1984; Dunst, Trivette, & Thompson, in press). The depression items on the PWI have been found to correlate with the Center for Epidemiologic Studies Depression Scale (CES-D Scale) at .60, .63, and .55 in three different studies (Radloff, 1977). Because of the modest correlation with the CES-D and because the literature has shown depression to be a factor related to attributional biases, the depression score on the PWI will be used in this study. The depression scale was computed by summing the following 9 items on the scale: very lonely or remote from other people, angry at something that usually wouldn't bother you, couldn't do something because you just couldn't get going, depressed or very unhappy, bored, so restless you couldn't sit long in a chair, that you had more things to do than you could get done, uneasy about something without knowing why, and upset because someone criticized you. A high score indicated more depression in the mother. The PWI has been found to relate to the following predictor variables: age

(Bradburn, 1969), income (Bradburn & Caplovitz, 1965), and social support (Dunst, 1985; Dunst & Trivette, 1986, 1988a; Friedrich & Friedrich, 1981).

Family income. Gross monthly income of the total family as reported by the mother was the measure of family socioeconomic status.

Social Support as an At-Risk Factor

Prenatal social support was measured by the mother's rating of satisfaction with her social support network.

Personal Assessment of Social Support. The Personal Assessment of Social Support (PASS) (Dunst & Trivette, 1988b) is designed to obtain the following information in a self-report format: (a) a list of the members of an individual's personal support network, (b) the respondent's relationship with each network member (spouse/partner, relative, friend, neighbor, co-worker, church), (c) the frequency of contact with each person, (d) the types and assistance that each of the network members provides for the respondent, (e) the degree of reciprocity in the relationship with each person, (f) the degree to which the respondent can depend on each network member for help and assistance, (g) the frequency of requests to each network member for help and assistance, (h) the degree of closeness the respondent feels to each of the network members, and (i) the degree of satisfaction the respondent feels about the help received from the network member (Appendix D). The PASS yields a wealth of information that can be used to gain as complete an understanding as possible of an individual's personal support network. This assessment tool combines

the major features of the Inventory of Social Support (Trivette & Dunst, 1986), Inventory of Socially Supportive Behaviors (Barrera, Sandler, & Ramsey, 1981), Psychosocial Kinship Inventory (Pattison, DeFrancisco, Wood, Frazier, & Crowder, 1975), and Support Network Inventory (Oritt, Paul, & Behrman, 1985). Internal consistency estimates for the various dimensions range from .97 to .99. The internal consistency estimate for the satisfaction rating is .97.

The satisfaction rating was used in this study. In computing satisfaction, respondents' rating (1-5) of their satisfaction with each network member were summed. A higher score indicated greater satisfaction with the help they received.

Infant At-Risk Status

The at-risk status of infants was determined based on information from the Pregnancy and Birth Complications Scale, the Bayley Scales of Infant Development, and the Hollingshead Four-Factor Index.

Pregnancy and Birth Complications Scale. A modified version of the Obstetric Complications Scale (OCS) and the Postnatal Complications Scale (PCS) (Littman & Parmelee, 1978) was used to identify the group of subjects whose infants were at risk due to pregnancy and birth-related complications (Appendix E). Both scales were standardized on a group of infants from a general well-baby clinic (Littman & Parmelee, 1978). The OCS includes items that assess aspects of the mother's past medical history, including gestational age, parity, and labor and delivery problems. The PCS includes ten items that assess complications during the first month of life. All items are scored in a yes/no fashion from information obtained from

the mothers. The subject's score on each scale was computed using the total number of "Yes" responses and the total number of items answered. Higher scores reflect fewer complications. Both scales were used to determine differences between pre-term and full-term babies (Bromwich & Parmelee, 1979; Field, Widmayer, Greenberg, & Stoller, 1985; Littman, 1979; Sigman & Parmelee, 1979). In a study of 126 children, the PCS was significantly related to poor child outcomes at 18 months (Littman, 1979). The scales were used to identify children at 1 month of age who met the at-risk criteria as described above.

Hollingshead Four-Factor Index. The Hollingshead Four-Factor Index was used to compute the socioeconomic level (SES) of each family in order to measure the environmental risk for the child (Appendix F). The scores on the index range from 8 to 85. An infant living in a family which scored 25 or below was considered at risk for poor developmental outcomes due to the environment.

Bayley Scales of Infant Development. The three sections of the Bayley Scales of Infant Development, the Mental Scale, the Motor Scale and the Infant Behavior Record, were used in this study (Bayley, 1969) (Appendix G). This norm-referenced measure is widely used to assess mental and motor abilities and temperament of children who have been diagnosed as having a handicap. The mental and motor portions of the test assess the mental and motor abilities of children functioning between 1 and 30 months. The scale was standardized on a stratified sample of 1,262 children. Split-half reliability coefficients for the

14 age groups ranged from .81 to .93 with a median value of .88 on the mental scale. For the motor scale the range was .68 to .92 with a median value of .84. The tester-observer reliability was .89. The Infant Behavior Record (IBR) assesses the child's interpersonal and affective domains, motivational variables and the child's interest in specific modes of sensory experience. The scale has been found to correlate with other measures of affect and activity (Bayley, 1968). All three of the scales yield an age equivalent score. The mental and motor scales each produce a developmental index [Mental Developmental Index (MDI) and Motor Developmental Index (PDI)] that is similar to an IQ score.

These scores were used in two ways. The MDI and PDI scores were used to identify subjects diagnosed at risk for developmental delays at 6 months of age. A score that was minus one or more standard deviations was used to place the child in this category. The ratings on the motor, mental and behavioral assessment were also used in determining the Child's Ability Discrepancy Score. The professional's assessment of the child's abilities was based on the scores on items from the Bayley. (See Child's Ability Discrepancy Score below.)

Maternal Attributional Biases

Attribution Vignettes and Attribution Interviews were used to measure maternal attributional biases.

Attribution Vignettes. The Attribution Vignettes (Trivette & MacKinnon, 1988b) consist of four stories which were read to each subject (Appendix H). Each story describes the plan or expectations the mother has in a particular situation. In each story the behavior

of her child interferes with this expected outcome. The story describes the child's behavior but is ambiguous concerning the intent of this behavior. During the semi-structured interview, the mother was asked a series of question about these stories. For this study, the interview question asking the mother why she thought her infant engaged in the behavior was used as the measure of intentionality. The mother's interpretation of the event were coded according to the following criteria: a score of 1 represented a very positive intention; a score of 2 represented a moderately positive intention; a score of 3 represented a neutral intention; a score of 4 represented a moderately negative intention; and a score of 5 represented a very negative intention. The scores for the four vignettes were summed and yielding a total score ranging from 4 to 20. Higher scores on this continuous variable represent negative maternal attributional biases.

Piloting of the scale was conducted with 12 families of handicapped and nonhandicapped children who ranged in age from 4 weeks to 12 months. The results suggest that mothers assign different intentions depending on the age of the child. This study only assessed attributions when the infants were one month old. There were also indications that mothers of handicapped children were more likely to assign purposeful negative intentions to their children's actions. The scores for the 12 mothers ranged from 5 to 16.

Assessments of internal consistency for the Attribution Interview measure are reported in Table 3. Coefficient alpha for this measure revealed an internal consistency of .29. Other assessments of

internal consistency include an average interitem correlation of .06 and an average item-to-total correlation of .51.

Table 3

Correlations among Individual Attribution Vignettes, Vignette Total and p-values (N = 65)

	Story 1	Story 2	Story 3	Story 4
Story 2 (p-value)	-.1103 (.3781)			
Story 3 (p-value)	.1890 (.1285)	-.1703 (.1715)		
Story 4 (p-value)	.4163 (.0005)	-.1370 (.2728)	.2073 (.0949)	
Total (p-value)	.7449 (.0000)	-.0582 (.6427)	.6682 (.0000)	.7142 (.0000)
	Avg. interitem r .06	Avg. item total r .51	Coefficient alpha .29	

Attribution Interview. During the Attribution Interview (Trivette & MacKinnon, 1988a) the experimenters ask the subject to think back over the last few weeks to an unpleasant or annoying interaction that has occurred between her and her child (Appendix I). Once the mother has identified the event, she is asked a series of questions concerning what occurred, why it occurred, and why the child behaved as he/she did. The next part of the interview involves a

series of questions that are based on the work of Dix and Grusec (1985). These questions address issues of blame for the behavior, appropriateness of the behavior, generalization of the behavior, and the mother's response to the behavior. Preliminary piloting of this scale was conducted with 12 families of both handicapped and nonhandicapped children who ranged in age from 6 weeks to 12 months. Mothers of handicapped children were more likely to assign negative intentionality to their child's behaviors.

For this study the only measure used was the measure of intentionality. The intentionality of the child's action was scored as described in the Attribution Vignettes. This score can range from 1 to 5.

Assessment of the correlations between the four attribution vignettes and the attribution measured in the real life situation are reported in Table 4. Coefficient alpha for these measures revealed an internal consistency of .06. Because the correlation between maternal attribution when measured in the vignettes and the maternal attribution when measured in the real life situation were very small ($r = 0.05$) the two measures were used separately in the analyses.

Table 4

Correlations Between Real-life Situation and Vignettes and p-values(N = 63)

Vignette	Story 1	Story 2	Story 3	Story 4	Total
Real-life situation (p-value)	.0572 (.6533)	-.0694 (.5859)	.0202 (.8744)	.0545 (.6687)	.0514 (.6868)
	Avg. interitem r .01			Coefficient alpha .06	

Maternal Discrepancy Score

The Maternal Discrepancy score was derived from the difference between the maternal assessment of infant ability as measured on the Maternal Perceptions of the Child's Abilities Scale and the actual assessment of infant ability as measured on the Bayley Scale of Infant Development.

The Maternal Discrepancy score was computed by comparing the maternal score and Bayley Scale score at the six-month assessment. Generally, mothers completed Maternal Perceptions of the Child's Abilities Scale one to two weeks before the Bayley Scale was administered. For computing the discrepancy score, credit was only given on the Bayley items if the examiner observed the behavior. The scoring of the items used a yes/no format on both the parent and norm referenced versions of the scale. This allowed for a discrepancy score to be computed. The maternal score on the Maternal Perceptions

of the Child's Ability Scale was subtracted from the examiner's score on the Bayley items. A constant of 100 was then added to the difference score to eliminate negative numbers and make the interpretation of the data easier for the investigator. Higher scores indicate an overestimation by the mother of the infant's ability.

Bayley Scales of Infant Development. The Bayley Scales of Infant Development will be the instrument used to assess children's abilities. For the purposes of the Child's Ability Discrepancy score, only the 24 Bayley items that were possible for mothers to assess were used as a comparison. Interrater reliability on these 24 items ranged from .84 to .97. Overall reliability was assessed on 20% of the assessments and was .92.

Maternal Perceptions of the Child's Abilities Scale. The Maternal Perceptions of the Child's Abilities Scale (MPS) (Trivette & MacKinnon, 1988c) assesses a mother's perceptions of her child's mental and physical abilities and the child's temperament at 6 months of age (Appendix J). Twenty-four items were taken from the Bayley Scales of Infant Development. Only items that are appropriate for a child between 0 and 9 months of age are included, and the items are restructured to simplify the vocabulary and to convert them to a question format easier for the mothers to complete. For example, one motor question asks, "Can your child roll over at this time?" The child's temperament subscale includes such questions as "How do you think your child adjusts to strangers?" The items are designed so that scoring is comparable to the scoring of the Bayley Scales of

Infant Development. The previously discussed Gradel, Thompson, and Sheehan (1981) study used the Bayley Scale in a similar fashion. A score of "1" was given for every item passed on the mental and motor subscales. A higher score means the mother perceives that the child is able to perform more mental and motor tasks. The scoring of the child temperament subscale will be the same for assessments by both the professional and the mother.

Maternal Styles of Interaction

The Maternal Behavior Rating Scale and a measure of reciprocal play were used to measure maternal styles of interaction.

Maternal Behavior Rating Scale. The Maternal Behavior Rating Scale (MBR) (Mahoney, Finger, & Powell, 1985) consists of 18 global maternal behavior items and four child behavior items (Appendix K). After observing a mother and child playing together, an observer scores each of the 22 items on a 5-point Likert scale. Interrater percentage agreement within one scale point ranged from 93 to 100% for all 22 items on 50 independently rated tapes (Mahoney et al., 1985). A principal components factor of the 18 maternal items analysis yielded a three factor solution that accounted for 72% of the variance: child-oriented/maternal pleasure, quantity of stimulation, and control. Previous research using the MBR has found that a mother's style of interacting with her child appears to change as the child grows older and that maternal style accounted for approximately 25% of the variance in children's developmental status (Mahoney, et al., 1985). The research has shown that child-oriented maternal behaviors are positively associated with children's development and

mothers' control is negatively associated with children's development (Mahoney et al., 1985).

For this study the three subscales developed from factor analysis described above were used to measure maternal styles of interaction. The Child Oriented/Maternal Pleasure subscale consists of the following items: mother's effectiveness, sensitivity to child's state, degree of comfort, appropriate teaching, enjoyment, responsiveness, playfulness, and approval. Scores on these eight items are summed; the subscale range is 8 to 40 with a higher score indicating a more supportive response from the mother. The second subscale, Quantity of Stimulation, consists of six items: warmth, physical stimulation, social stimulation, inventiveness, expressiveness, and patience. Scores on these six items are summed; the subscale range is 6 to 30 with a higher score indicating a more stimulating interaction. The Control subscale consists of five items: directiveness, permissiveness, sensitivity to child's interests, encouragement of achievement, and patience. Scores on these five items are summed; the subscale score range is 5 to 25 with a higher score indicating a more controlling interaction style.

The MBR was used to assess maternal-child interaction during a 15-minute observation of play in the home (Footnote 2). The mother had available a standard group of toys which she was asked to use during the interaction. She was asked to play with her child as she would if she had a few minutes during the day to spend with her child.

Reciprocal Play Rating. This scale measures the quantity of reciprocal play between parent and child, disregarding quality as long as the interaction meets the minimum standards for reciprocal play (Appendix L). These standards consist of mutual attention to a toy or game-like interaction that lasts for at least a few seconds. This item has been found to have a reliability of $r = .86$ with a Kappa = .494 (Cox, personal communication). This item is rated on a 9-point scale with the higher score indicating more reciprocal interaction occurring. For this study, reciprocal play was the fourth measure of maternal styles of interaction.

Reliability on Mother-Infant Interaction Measures. Mother-infant interactions were rated by trained coders. Observer training involved instruction and practice in coding videotapes and live sessions of mother-infant interactions. Observers began rating mother-infant interaction for this study when interobserver reliability was .95. Every third mother-infant interaction was videotaped in order to maintain interobserver reliability. Weekly practice sessions were held to reassess reliability. Those reliability scores ranged from .84 to .100. Overall reliability was assessed by coding 33% of the tapes twice and computing the interobserver agreement. The overall interobserver reliability was .95.

Data Analyses

The two research questions tested were as follows:

Question #1: To what extent do maternal at-risk status (depression, poor marital quality, and low family income), social support, infant

at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability relate to maternal attributional biases?

Question #2: To what extent do SES, maternal attributional biases, infant at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability relate to difference styles of mother interaction?

To examine question #1, a multiple regression was performed to regress maternal attributional biases (as assessed by the vignettes) on the predictor variables (maternal at-risk status, social support, infant at-risk status, and maternal discrepancy). The predictor variables were simultaneously entered into the regression equation.

To examine question #2, multiple regressions were performed on each of the four measures of mother-infant interaction. The predictor variables were (SES, infant at-risk status, maternal discrepancy, maternal attributions as measured in the real life situation, and maternal attribution as measured on the attribution vignettes). The standardized regression coefficients, p-values, and regression coefficients for the total model were examined.

CHAPTER IV

RESULTS

The overall purpose of this study was to conduct a longitudinal analysis of attributional biases in mothers of very young infants. Specifically, this study examined the factors that influenced mothers' attributions about their one-month-old infants and how these attributions influenced mother-infant interactions when infants were six months of age.

To address these research aims, sixty-five mothers were visited three times in their homes: prenatally, one month after their infants were born, and again six months after their infants were born. At the prenatal assessment, mothers completed self-report measures examining depression, marital discord, and satisfaction with support. During the visit when the children were one month old, mothers were interviewed about their obstetric and delivery histories, and their attributions about their infants. As part of the six-month assessment, mother-infant interactions were rated and mothers were asked to complete a scale rating their perceptions of their infants' current abilities.

The results of this study are presented in three sections. The first section presents preliminary findings pertaining to the factors that are related to both maternal attributional biases and maternal styles of interaction. The second section presents the results of the regression analysis which examined the relationship of maternal at-risk status, social support, infant at-risk status, the discrepancy

between maternal assessment of infant ability and actual infant ability to maternal attributional biases. The third section presents the results of four separate regression analyses used to examine the extent to which SES, maternal attributional biases, infant at-risk status, the discrepancy between maternal assessment of infant ability and actual infant ability predict the four styles of maternal interaction.

Preliminary Findings Pertaining to Maternal Attributions,
Maternal At-Risk Status, Social Support,
Infant At-Risk Status, Maternal Discrepancy, and
Maternal Styles of Interaction

One of the concerns in a longitudinal study is potential attrition. For this study, the attrition rate between the one-month assessment and the six-month assessment was 7.14% (N = 5). Two of these mothers had at-risk infants and three had infants not at-risk for developmental delays. Results of the t-tests for differences between those mothers who dropped out and those in the final sample on maternal depression, marital quality, income, and attributional ratings at one month revealed no significant differences between the two groups. Therefore, there was no reason to suspect that there were differences on these variables of interest between the mothers who remained in the study and those who did not.

Maternal attributional biases were measured two ways. The first measure was derived by presenting mothers with four hypothetical stories representing potentially conflicting situations involving a

mother and her one-month old infant. During a semi-structured interview, the mother was asked why she thought her infant had engaged in the behavior. The findings presented in Table 5 show that maternal attribution scores on the vignettes ranged from 12 to 17, with a mean of 13.40 and a standard deviation of 1.23.

A second measure of maternal attributional biases was gathered by asking the mother to think of a real-life situation that had occurred between herself and her infant that had a very negative outcome for her. Her response to why she felt the infant had behaved in such a way was used as a measure of maternal attribution. The findings presented in Table 5 show that maternal attribution scores in the real-life situation ranged from 3 to 5, with a mean of 3.17 and a standard deviation of 0.43.

The maternal at-risk status was the sum of the standardized scores of family income, maternal depression, and marital quality. The findings presented in Table 5 show that maternal at-risk scores ranged from -4.61 to 6.85, with a mean of 0.34 and a standard deviation of 2.38.

Social support was the sum of the respondent's satisfaction with the support she was receiving from her network. The findings presented in Table 5 show that satisfaction with support scores ranged from 12 to 95, with a mean of 53.24 and a standard deviation of 20.62.

The infant at-risk status score was the sum of six risk factors that might influence the development of the child. These factors were low birth weight, complications during pregnancy or delivery, prematurity, environmental deprivation, mother's age, and

developmental delays. The possible range of scores was 0 to 6. The findings presented in Table 5 show that infant at-risk status scores ranged from 0 to 3, with a mean of 0.61 and a standard deviation of 0.76.

Maternal discrepancy was measured by finding the difference between maternal assessment of infant ability on particular Bayley items and actual infant ability on the same Bayley items. The mother indicated whether her infant could perform 24 items on the Bayley scales. The infant's actual ability to perform these same 24 items was then subtracted from the mother's score and a constant was added. The findings in Table 5 show that maternal discrepancy scores ranged from 75 to 130, with a mean of 108.49 and a standard deviation of 7.92. This indicated that generally mothers overrated infants' abilities. In fact only two of the sixty-five mothers underrated their infants' abilities. When the means were compared in a t-test, there was a significant difference between the mean score of the mothers' ratings of their infants' abilities and the mean score of the infants' actual abilities ($t = -8.65$, $df = 64$, $p = .001$).

Child orientation, quantity of stimulation, amount of control, and quantity of reciprocal play were the four measures of maternal styles of interaction used in this study. Child orientation was the sum of eight items from the Maternal Behavior Rating Scale with a possible range of 8 to 40 (Footnote 3). The findings presented in Table 5 show that child orientation scores ranged from 16 to 38, with a mean of 30.43 and a standard deviation of 5.09. Quantity of

stimulation was the sum of six items from the Maternal Behavior Rating Scale with a possible range of 6 to 30. The findings presented in Table 5 show that the quantity of stimulation scores ranged from 14 to 28, with a mean of 22.69 and a standard deviation of 3.45. Amount of control was the sum of five items from the Maternal Behavior Scale with a possible range of 5 to 25. The findings presented in Table 5 show that the amount of control scores ranged from 8 to 17, with a mean of 12.87 and a standard deviation of 1.70. Quantity of reciprocal play was measured using a rating scale with a range of 1 to 9. The findings presented in Table 5 show that the quantity of reciprocal play scores ranged from 3 to 9, with a mean of 6.86 and a standard deviation of 1.26.

Table 5

Ranges, Means, and Standard Deviations of Selected Variables

	Range	<u>M</u>	<u>SD</u>
Maternal attributions in vignettes	12-17	13.40	1.23
Maternal attributions in real-life situation	3-5	3.17	0.45
Maternal at-risk status	-4.61-6.85	0.34	2.38
Social support	12-95	53.24	20.62
Infant at-risk status	0-3	0.61	0.76
Maternal discrepancy	75-130	108.49	7.92
Child orientation	16-38	30.43	5.09
Quantity of stimulation	14-28	22.69	3.45
Amount of control	8-17	12.87	1.70
Reciprocal play	3-9	6.86	1.26

Two t-tests were performed to look at the differences between the attributional measures as a function of the number of other children in the family. Both attribution measures were dichotomized so that group one contained those subjects who gave neutral responses and group two contained those subjects who gave negative responses concerning the intentionality of the infants' actions. Results of the t-test on attributions measured in the real-life situation for differences between the mean number of other children revealed that the scores did not vary by group ($t = -.560$, $df = 61$, $p = .5860$).

Results of the t-test on attributions measured by the vignettes for differences between the mean number of other children revealed that the scores did not vary by group ($t = 1.52$, $df = 63$, $p = .1324$). These findings provide no support for the idea that there is a difference in how mothers make attributions about their new infants as a function of the number of other children in the home.

Correlations Between Attributions and Selected Variables

The relations among the variables were examined by computing Pearson correlation coefficients. The results are presented in Table 6.

Table 6

Correlations with p-values among Attributions and Selected Variables

	Social support N = 65	Infant at-risk status N = 65	Maternal discrepancy N = 65	Maternal attributions vignettes N = 65	Maternal attributions real life N = 63
Maternal at-risk status (p-value)	-.27 (.02)	.33 (.01)	-.01 (.92)	.15 (.23)	.09 (.43)
Social support (p-value)		-.26 (.03)	-.04 (.70)	-.18 (.13)	-.26 (.03)
Infant at-risk status (p-value)			.23 (.05)	-.11 (.35)	.32 (.01)
Maternal discrepancy (p-value)				-.09 (.46)	.18 (.14)
Maternal attributions vignettes (p-value)					.05 (.68)

As can be seen in Table 6, the correlations between the measure of maternal attributions (measured by the vignettes) and the hypothesized related variables (maternal at-risk status, social support, infant at-risk status, and maternal discrepancy) ranged from $-.09$ to $.1469$ and were not statistically significant. The correlations between the measure of maternal attributions in the real-life situation and social support and infant at-risk status, however, were moderately statistically significant, $-.2623$ ($p = .036$) and $.3206$ ($p = .009$) respectively. The negative correlation between maternal attribution and social support provided evidence that as satisfaction with social support increased maternal attribution became more neutral. The positive correlation between mother's attribution and infant at-risk status revealed that as the infant's at-risk status increased maternal attribution concerning the infant's intent became more negative.

Examination of maternal attributions as measured by the vignettes and the real-life situation revealed that both measures had positively-skewed distributions with long right-hand tails. Because of the non-normal distribution, the p-values for the Pearson correlation coefficients should be interpreted with caution. In order to address the problem interpretation, Spearman's rank-order correlation coefficients and Kendall's tau b were computed. Spearman's rank-order correlations were the correlations between the ranks of maternal attributions and each of the selected variables and Kendall's tau b assessed the variation of maternal attributions and selected variables while correcting for tied pairs. When the relationships between maternal attributions (measured by the

vignettes) and maternal at-risk status, social support, infant at-risk status, and maternal discrepancy were examined, the results of these correlations were the same as the results of the computations Pearson's correlation coefficients. When the relationships between maternal attributions (measured in the real-life situation) and maternal at-risk status, social support, infant at-risk status, and maternal discrepancy were examined, the results of the Kendall's and Spearman's correlations revealed that social support and infant at-risk were not significantly related to this measure of attribution. This suggested that the significant findings revealed in the Pearson's correlation were an artifact of the non-normal distribution. Caution must be taken in interpreting the findings as significant.

Correlations Between Maternal Styles of Interaction
and Selected Variables

The relation between the mother-infant interaction variables (child orientation, quantity of stimulation, amount of control, and amount of reciprocal play) and the related hypothesized variables (SES, maternal attribution score on the vignettes, maternal attribution score in the real-life situation, infant at-risk status, and maternal discrepancy) were examined via Pearson's correlation coefficients and revealed differences depending on the interaction variable being examined. The results are presented in Table 7.

Table 7

Correlations and p-values Among Attributions, Parent-Infant Interactions, and Selected Variables

	Maternal attributions real-life situations *	SES	Infant at-risk status	Maternal discrepancy	Child orientation	Quantity of stimulation	Amount of control	Reciprocal policy
Maternal attributions vignettes (P-Value)	.0514 (.6868)	-.0016 (.9901)	-.1159 (.3541)	-.0907 (.4687)	.1137 (.3633)	.1135 (.3640)	.0513 (.6822)	.0161 (.8982)
Maternal attributions real-life situations (P-Value)		-.2735 (.0287)	.3206 (.0098)	.1835 (.1468)	-.2926 (.0190)	-.2601 (.0379)	.2221 (.0778)	-.0346 (.7861)
SES (P-Value)			-.3505 (.0039)	-.0304 (.8086)	.5131 (.0001)	.3751 (.0019)	-.5004 (.0001)	.2251 (.0692)
Infant at-risk status (P-Value)				.2383 (.0540)	-.5626 (.0001)	-.4538 (.0001)	.3982 (.0009)	-.4128 (.0006)
Maternal discrepancy (P-Value)					-.4486 (.0002)	-.3416 (.0050)	.1840 (.1391)	-.3686 (.0023)
Child orientation (P-Value)						.8366 (.0001)	-.7064 (.0001)	.7171 (.0001)
Quantity of stimulation (P-Value)							-.5134 (.0001)	.6967 (.0001)
Amount of control (P-Value)								-.3514 (.0038)

*Note. N = 65 for all combinations of variables except those involving maternal attributions in the real-life situation where N = 63.

The correlations between child orientation and mother's attributions on the vignettes, mother's attributions in the real-life situation, SES, infant at-risk status, and maternal discrepancy were .1137 ($p = .3633$), $-.2926$ ($p = .0190$), $.5131$ ($p = .0001$), $-.5626$ ($p = .0001$), and $-.4486$ ($p = .0002$) respectively. All represented modest statistically significant relationships except for the measure of maternal attribution on the vignettes. As the level of child orientation increased in the interactions, mothers were less likely to make negative attributions about their infants' intent in the real-life situation, mothers were more likely to be from higher SES backgrounds, infants were less likely to be at risk for developmental delays, and mothers' were less likely to overrate their infants' abilities.

The correlations between the quantity of stimulation and the hypothesized variables revealed a similar pattern. Maternal attributions (measured in the real-life situation) SES, infant at-risk status, and maternal discrepancy all had modest and significant correlations [$(r = -.2601, p = .0379)$, $(r = .3751, p = .0019)$, $(r = -.4538, p = .0001)$, and $(r = -.3416, p = .0050)$, respectively] with the quantity of stimulation observed in the interaction. These findings provide evidence that as the quantity of stimulation increased mothers were less likely to make negative attributions about their infants' intent, mothers were more likely to be from higher SES background, infants were less likely to be at risk, and mothers were less likely to overrate their infants' abilities.

Of the correlations involving the amount of control seen in mother-infant interaction, only SES and infant at-risk status was statically significant ($r = -.5004$, $p = .0001$; $r = .3982$ $p = .0009$). Mothers who exhibited more control over their infants' behavior were more likely to be from higher SES backgrounds and more likely to have infants who were at risk for developmental delays.

The correlations involving the reciprocal play seen in mother-infant interaction revealed yet another pattern. Infant at-risk status and maternal discrepancy were statically significant at $-.4128$ ($p = .0006$) and $-.3686$ ($p = .0023$), respectively. These findings provided evidence that mothers engaged in more reciprocal play when infants were not at risk for developmental delays and when mothers were more accurate in their assessments of their infants' abilities.

Maternal Attributions, Maternal At-Risk Status, Social Support, Infant At-Risk Status and Maternal Discrepancy

As previously discussed the two measures of maternal attributional bias had very low correlations with each other and represent very different strategies for measuring maternal attributions. When examining the influences of maternal at-risk status, social support, infant at-risk status, and maternal discrepancy on maternal attributional biases, the two measures of attributional biases will be presented separately.

Maternal Attributions as Measured by the Vignettes

The relation between the criterion variable maternal attributions (measured by the vignettes) and the predictor variables (maternal at-risk status, social support, infant at-risk status, and

maternal discrepancy) was examined by performing a multiple regression analysis. As discussed above, the measure of maternal attributions showed a positively-skewed distribution; therefore a log transformation was performed to make the distribution more normal. This transformation made the data look more normal and subsequently the log transformation of the sum of the vignettes was used as the criterion variable. Maternal at-risk status, infant at-risk status, social support, and maternal discrepancy were regressed on the log of maternal attributions as measured on the vignettes. The results revealed no significant relationships among maternal attributions and maternal at-risk status, infant at-risk status, social support, and maternal discrepancy. The multiple regression produced no positive evidence to support the hypothesis that maternal at-risk status, social support, infant at-risk status and maternal discrepancy would be related to maternal attributions.

Several other approaches were taken to examine these data. Maternal attributions (as measured by the vignettes) were dichotomized into neutral and negative responses as suggested by Dodge and his colleagues (1986). Group one included mothers who made only neutral attributions about their infants' behavior across all of the vignettes or those who made a negative attribution in only one vignette. Group two included mothers who made a negative attribution in two or more of the vignettes. A series of separate t-tests were performed to test for differences between the dichotomous coding of maternal

attributions and maternal at-risk status, infant at-risk status, social support, and maternal discrepancy.

Results of the t-test for differences between mean maternal at-risk status scores indicated that maternal at-risk status did not vary by group ($t = -1.21$, $df = 63$, $p = .2337$). Results of the t-test for differences between mean social support scores indicated that social support did not vary by group ($t = 0.85$, $df = 63$, $p = .3972$). Results of the t-test for differences between mean infant at-risk status scores indicated that infant at-risk status did not vary by group ($t = 0.12$, $df = 63$, $p = .9015$). Results of the t-test for differences between the maternal discrepancy scores indicated that maternal discrepancy did not vary by group ($t = 1.09$, $df = 63$, $p = .2798$).

Lastly, a principle components analysis was performed on maternal at-risk status, social support, infant at-risk status, and maternal discrepancy. This composite score was then regressed on the log of maternal attributions as measured on the vignettes. Again the results were not significant, indicating no relationship between the combination of variables and maternal attributional biases. Therefore, there was no support for the first research question which stated that maternal at-risk status, infant at-risk status, social support, or maternal discrepancy would be related to maternal attributional biases about young infants when measured in the vignettes.

Maternal Attributions as Measured in the Real-Life Situation

The relation between maternal attributions (measured in the real-life situation) and the predictor variables (maternal at-risk

status, social support, infant at-risk status, and maternal discrepancy) was to be examined through multiple regression analysis. The measure of maternal attributions in the real-life situation, however, showed a positively-skewed distribution. The log transformation of the maternal attribution scores (in the real-life situation) did not change the skewed nature of the distributions. Therefore, the p-values are suspect.

Another approach was taken to examine this data. Maternal attributions (as measured in the real-life situation) were dichotomized into neutral and negative responses as suggested by Dodge and his colleagues (1986). Group one included mothers who made neutral attributions about their infants' behavior and group two included mothers who made negative attributions about their infants' intent. A series of separate t-tests were performed to test for differences between maternal attributions and maternal at-risk status, infant at-risk status, social support, and maternal discrepancy.

Results of the t-test for differences between mean maternal at-risk status scores indicated that maternal at-risk status did not vary by group ($t = -0.84$, $df = 61$, $p = .4218$). Results of the t-test for differences between mean social support scores indicated that social support did not vary by group ($t = 1.46$, $df = 61$, $p = .1749$). Results of the t-test for differences between mean infant at-risk status scores indicated that infant at-risk status did not vary by group ($t = -1.23$, $df = 61$, $p = .2498$). Results of the t-test for differences between the maternal discrepancy scores indicated that maternal

discrepancy did not vary by group ($t = -1.45$, $df = 61$, $p = .1741$). Thus, there was no evidence to support the idea that there was a relationship between maternal attributions as measured in the real-life situation and the predictor variables (maternal at-risk status, social support, infant at-risk status, and maternal discrepancy).

Together these results provide no support for a positive answer to the first research question which stated that maternal at-risk status, infant at-risk status, social support, and maternal discrepancy would be related to maternal attributional biases about young infants.

The Relationship Between Maternal Attribution, Infant At-Risk Status, Maternal Discrepancy, and Maternal Styles of Interaction

Maternal styles of interaction were measured by observing each mother-infant pair when the infant was six months of age and rating the play interaction using the Maternal Behavior Rating Scale and the Reciprocal Play Scale. The Maternal Behavior Rating Scale is comprised of three subscales: Child Orientation, Quantity of Stimulation, and Amount of Control. Higher scores on the three subscales indicate that mothers exhibited more orientation towards the infants, a greater amount of stimulation the infants, and more control over the infants' behavior. The fourth measure of mother-infant interaction was assessed with the Reciprocal Play Scale. The scale has a possible range of 1 to 9 with a higher score representing more reciprocal interaction occurring during the session.

In order to determine the variables that combine to form the best predictor of the level of orientation the mothers exhibited during a play interaction, five variables were entered into the regression equation (SES, infant at-risk status, maternal discrepancy, maternal attribution score from the real-life situation, and maternal attribution score from the vignettes). The multiple correlation coefficient and regression coefficients are shown in Table 8. The multiple correlation coefficient between the five predictor variables and the criterion was .74 which accounted for 55.0% of the variance. SES, infant at-risk status, and maternal discrepancy were the best relative predictors of a mothers level of child orientation as exhibited in mother-infant interactions. Higher SES status was a positive predictor of the level of child orientation, while the presence of an at-risk infant and the mother's overestimation of the infant's ability were negative predictors.

Table 8

Multiple Correlation Coefficient and Regression Coefficients for the
Child Orientation Criterion Variable

Predictor variables	Standardized regression coefficients	F	p-value	R
SES	0.380	15.42	.001	
Infant at-risk status	-0.327	10.46	.002	
Maternal discrepancy	-0.347	13.91	.001	
Attribution in real- life situation	-0.023	0.06	.813	
Attribution in vignettes	0.050	0.31	.581	
Total model				0.7417

In order to determine the variables that combine to form the best predictor of the quantity of stimulation mothers exhibited during play interactions, five variables were entered into the regression equation (SES, infant at-risk status, maternal discrepancy, maternal attribution in the real-life situation, and maternal attribution in the vignettes). The multiple correlation coefficient and regression coefficients are shown in Table 9. The multiple correlation coefficient between the five predictor variables and the criterion was .57 which accounted for 32.6% of the variance. SES, infant at-risk status, and maternal discrepancy were the best relative predictors of a mother's quantity of stimulation as exhibited in the

mother-infant interaction. Higher SES status was a positive predictor of the level of stimulation, while the presence of an at-risk infant and the mother's overestimation of the infant's ability were negative predictors.

Table 9

Multiple Correlation Coefficient and Regression Coefficients for the Quantity of Stimulation Criterion Variable

Predictor variables	Standardized regression coefficients	F	p-value	R
SES	0.255	4.63	.036	
Infant at-risk status	-0.264	4.57	.037	
Maternal discrepancy	-0.257	5.11	.028	
Attribution in real-life situation	-0.062	0.27	.603	
Attribution in vignettes	0.062	0.32	.575	
Total model				0.5717

In order to determine the variables that combine to form the best predictor of the amount of control mothers exhibited during play interactions, five variables were entered into the regression equation (SES, infant at-risk status, maternal discrepancy, maternal attribution in the real-life situation, and maternal attribution in the vignettes). The multiple correlation coefficient and regression coefficients are shown in Table 10. The multiple correlation coefficient between the five predictor variables and the criterion

was .58 which accounted for 33.4% of the variance. SES was the best relative predictor of a mother's level of control as exhibited in the mother-infant interaction. Higher SES status was a negative predictor of the level of control exhibited during the mother-infant interaction.

Table 10

Multiple Correlation Coefficient and Regression Coefficients for the Level of Control Criterion Variable

Predictor variables	Standardized regression coefficients	F	p-value	R
SES	-0.426	13.12	.001	
Infant at-risk status	0.221	3.24	.077	
Maternal discrepancy	0.116	1.04	.312	
Attribution in real-life situation	0.010	0.01	.934	
Attribution in vignettes	0.071	0.42	.519	
Total model				0.5781

In order to determine the variables that combine to form the best predictor of the amount of reciprocal play mothers exhibited during play interactions, five variables were entered into the regression equation (SES, infant at-risk status, maternal discrepancy, maternal attribution in the real-life situation and maternal attribution in the vignettes). The multiple correlation coefficient

and regression coefficients are shown in Table 11. The multiple correlation coefficient between the five predictor variables and the criterion was .53 which accounted for 28.5% of the variance. Infant at-risk status and maternal discrepancy were the best relative predictors of the amount of mother's reciprocal play exhibited in the mother-infant interaction. The presence of an at-risk infant and the mother's overestimation of the infant's ability were negative predictors of the amount of reciprocal play exhibited during the mother-infant interaction.

Table 11

Multiple Correlation Coefficient and Regression Coefficients for the Amount of Reciprocal Play Criterion Variable

Predictor variables	Standardized regression coefficients	F	p-value	R
SES	0.149	1.49	.228	
Infant at-risk status	-0.336	6.94	.011	
Maternal discrepancy	-0.321	7.49	.008	
Attribution in real-life situation	0.175	2.08	.155	
Attribution in vignettes	-0.055	0.24	.629	
Total model				0.5339

CHAPTER V

DISCUSSION

This research investigated the attributional biases of mothers with one-month-old infants. First, this study examined to what extent maternal at-risk status, social support, infant at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability were related to attributional biases mothers make about their infants. Second, this study investigated the extent to which infant at-risk status, the discrepancy between maternal assessment of infant ability and actual infant ability, and maternal attributional biases influenced each of four styles of mother-infant interaction. To address these research questions, data were collected on 65 mother-infant dyads across three points in time: prenatally, when the infants were one month old, and when the infants were six months old. The majority of mothers who participated in this study can be described as white, middle class, and married with at least a high-school education. Thirty-four of the infants were not at risk for developmental delays, while thirty-one were at risk for developmental delays. The first section of this chapter discusses the outcomes of the two research questions examined in this study. The second section presents limitations of this study and the final section addresses recommendations for future research.

Discussion of Research Outcomes

Factors that Influence Attributional Biases

The first research question investigated the extent to which maternal at-risk status, social support, infant at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability affected maternal attributional biases. Maternal at-risk status was a composite score of poor marital quality, maternal depression, and low socioeconomic status. Previous research has suggested that individually these factors impact mothers' perceptions of children's behavior (Bond & McMahan, 1984; Brody & Forehand, 1986; Elder et al., 1984). These circumstances produce mental or physical demands on mothers that are likely to impede mothers' abilities to process information (Fisher, 1984; Glass et al., 1979). Satisfaction with social support has been found in previous studies to influence parents' expectations about their children (Lazar et al., 1982) and attitudes toward parenting (Crnic et al., 1986). Social support appears to buffer parents appraisal that life events are negative and therefore helps parents to display resiliency to the negative effects of the event (Barrera, 1988; Crnic et al., 1983; Rutter, 1987). Dix and Grusec (1985) suggest that parental assessment of infants' abilities is another important factor in the development of attributional biases. Assessing the abilities of at-risk infants is often difficult because of lack of behavioral cues the infants exhibit and prolonged separation between the mother and infant. This makes it difficult for parents to accurately interpret their infants' behavior

which plays a role in the development of attributional biases and influences interaction styles.

In order to assess what factors influence attributions, two measures of maternal attributional biases were collected: one based on maternal responses to four vignettes and one based on maternal responses to a real-life situation. The scores on these two measures were not normally distributed, so both were transformed using a log procedure. The log transformation modified the distribution on the vignettes to allow for its use in the regression procedure. The regression of maternal attributions measured by the vignettes on maternal at-risk status, social support, infant at-risk status, and maternal discrepancy revealed that none of these variables accounted for a statistically significant amount of variance in maternal attributional biases. These findings ran counter to the investigator's expectations in the first research question. Three possible explanations for these findings pertain to the infant's age, observations about the vignette measure, and observations about the real-life measure.

Infant age as a factor

Failure to find that maternal at-risk status, social support, infant at-risk status, and maternal discrepancy affected maternal attributional biases may be a function of the poor variability found in both of the measures of attributional biases. One explanation for this poor variability concerns the age of the infant. As the data show, mothers of very young infants are more likely to make neutral attributions about infants' behavior than to infer negative intent.

Vedeler (1987) in a discussion of infant intentionality hypothesized that it is the object-directedness of an infant's behavior which elicits the parents' perception of infant intentionality. The type of object-directed behavior that Vedeler is describing is more likely to be observed when the infants are developmentally between 6 and 12 months. Piaget (1952) suggests that between the ages of 6-8 months means and ends are differentiated in the infant's mind, making intentional behavior possible. McCall and his associates (1979a, 1979b; McCall, Eichorn, & Hogarty, 1977) have also identified this time period as one in which there is the emergence of the infant's ability to separate means from ends. Lamb (1981) proposes that this new ability of the infant has implications for social cognition since it is now possible for the infant to direct social behavior to the mother in order to get the mother to perform a particular behavior. In fact, in two studies of normal infants ranging in age from 9 to 15 months old, parents did perceive their infants as being capable of intentional misbehavior (Nover et al., 1984; Nuttall et al., 1985). Considering also the comments of many mothers in the present study which reflected the belief that one-month-old infants were not developmentally capable of cognitive assessment of the situation or of control of their movements or behavior, the use of older infants would most likely increase the variability in mothers' perceptions of intentionality.

It is important to note, however, that not all mothers felt their infants were incapable of intentional behavior. It was clear

from the data that some mothers did assign negative intent to infants' behavior in some of the vignettes. This is evidenced in comments that mothers made such as "He knew I wanted to go and he did not want me to," "He got sick so that I couldn't go," and "She knew I was under a lot of pressure. She wanted my attention." As seen here, some mothers do make negative attributions about their infants even at this very early age.

Observations concerning the vignette measure

A second possible explanation for the lack of variability in the responses to the vignettes is that all of the stories were not salient for the mothers. One of the four vignettes involved the infant's refusing to play with a new toy that the mother had bought especially for the infant. The second story involved the infant not cooing and responding to the mother's playful advances when the grandparents came to visit. The third vignette involved the infant crying while the mother was preparing supper for company who would be arriving shortly. In the fourth vignette, the mother had made a commitment to meet friends for an evening out and the infant got upset when it was time for the mother to leave. The interitem correlations suggest the possibility that not all of these vignettes are equally salient for the mothers (See Table 3). The third and fourth stories had a moderately strong significant correlation ($r = .4163$, $p = .0005$). Interestingly, these two vignettes have some similar qualities about them. In both situations the mother was trying to perform a role beyond that of mother (e.g. hostess and friend) and was under some time constraints in performing this role (e.g. company arriving any

minute and time to leave to meet her friends). These same two features are not found in the other two vignettes. This finding raises the possibility that these two features either alone or in combination are important when trying to identify situations in which negative attributional biases are most likely to occur for mothers of very young infants.

Observations concerning the real-life measure

The use of a real-life situation to assess attributional biases has been suggested by a number of researches (Dix et al., 1986; Miller, 1988). In this study, however, attributional assessment in the real-life situation was also problematic as reflected in the skewed nature of the scores. Again, one possible explanation of this problem is found in the qualitative aspects of the data. One observation made by the investigator while scoring this variable was that most of the mothers focused on a very similar situation. When asked to think of the most negative situation that had occurred between them and their one-month-old infant, the large majority of the mothers described a situation in which the infant was very upset and would not go to sleep at the appropriate time. The three most common responses were "He still had his days and nights mixed up," "She was sick and needed to see a doctor," and "He had colic and felt bad." Mothers were very likely to assign a neutral intent to their infants' behavior in this circumstance.

Though the assignment of intent was neutral, mothers had strong emotional reactions to the situation. The words mothers used to

describe how they felt about the interactions suggested that this real-life situation was a more salient experience for them than were the vignettes. Statements such as "I felt so helpless," "I just wanted to make him feel better," and "There was nothing to do but just hold and love her, no matter how tired I was" implied strong emotional reactions on the part of mothers to these types of interactions. Dix and his colleagues (1986) found that if children's behavior elicits intense emotions in parents such as frustrations or anger, then negative parental attributions about their children's intentions are more likely to occur. Again using older infants might produce more variety in the situations mothers choose because of the larger number of experiences they will have had with their infants. The real-life situation, therefore, has the potential to be a good measure of attributional biases because of the strong emotions it evoked, if by using older infants the situations mothers described were different enough to increase the variability in the assignment of intentionality.

Factors that Influence Maternal Styles of Interaction

The second research question explored the influence of SES, maternal attributional biases, infant at-risk status, and the discrepancy between maternal assessment of infant ability and actual infant ability on each of four styles of maternal interaction. The effects of the predictor variables on the criterion variables were examined using a multiple regression procedure. In all four of the analyses, some combination of the predictor variables accounted for between 28% and 55% of the variance in maternal styles of interaction. Mothers' orientation to their infants and the quantity of stimulation

mothers provided were both influenced by SES, infant at-risk status, and maternal discrepancy. Socioeconomic status was the only variable that was a significant predictor of the level of control observed during mother-infant interactions. Infant at-risk status and maternal discrepancy were the only two significant predictors of the amount of reciprocal play. Though the models were different for three out of the four styles of interaction, these data suggest that these variables make important contributions to the understanding of maternal styles of interaction.

Socioeconomic status was an important predictor for three of the styles of interaction. Higher SES mothers were found to be more orientated toward their infants, provided more stimulation, and were less controlling of their infants' behavior during the mother-infant interactions. The influence of SES on maternal styles of interaction replicates the findings of a number of other investigations (Affleck, et al., 1982; Brooks-Gunn, 1985; Dunst & Trivette, 1988; Skinner, 1985). Skinner (1985) hypothesizes that the pressures and stress of poverty affects mothers' abilities to attend and respond to their children, therefore, making them less likely to synchronize their behavior with their infants. It appears that SES decreases maternal sensitivity during interactions because of the constraining effects the environment has on the mother.

In three of the analyses, infant at-risk status was related to interaction style. The more at risk the infants were for developmental delays, the less oriented mothers were toward their

infants, the less stimulation mothers provided, and the less reciprocal play mothers engaged in during the observed interactions. These results replicate previous studies that have found mothers of infants and children who were handicapped or at risk for developmental delays to exhibit less responsive, less stimulating, less engaging, and more controlling interactions with their children (e.g., Field, 1981; Levy-Shiff, 1986; Marfo & Kysela, 1988; Tannock, 1988).

Collectively these findings suggest that some of these infants may be experiencing multiple risks for later developmental problems. Infants may be at risk because of the family's SES level, because of an event or situation prior to or immediately after their birth that places them at risk for developmental delay, and because their mothers do not appear to be providing stimulation that is generally considered facilitative for child development (Barrera, Doucet, & Kitching, 1990; Clewell, Brooks-Gunn & Benasick, 1989; Crockenberg, 1987; Roe, Roe, Drivas, & Branstein, 1990).

Issues concerning risk and protective factors for children developing in such situations deserve attention because of these findings. For example Rutter (1979) has found in predicting the likelihood of later psychiatric disorders in children that one stressor in a child's life does not place that child at any greater risk than children who have experienced no stressor. Yet when two stressors occur together, the risk of later psychiatric disorders increases no less than fourfold. With the increase of additional stressors, the risks are more than a summation of their separate effects but magnify each other. Yet not all children succumb to these

negative situations. Some children overcome these experiences and cope successfully with life. Rutter (1987) contends that the reason some individuals escape the negative effects of these risk situations is because of protective mechanisms that are operating in their lives. He argues that there is an interactive process between potentially protective factors and risks that may change the trajectory from risk to adaptation for children. He describes a number of factors such as child temperament, a strong relationship with one parent or other adult, and a good marital relationship in later life as factors through which this protective mechanism may function to protect individuals against future psychological problems. If the same phenomena exist with at-risk infants, then the combination of various variables may serve to make the infants more or less at risk for developmental delays.

The work by Sameroff and Chandler (1975) on reproductive risks addressed the relationship between risk and protective factors in discussing developmental outcomes for infants. Sameroff and Chandler feel that an interactive model does not fully explain the relationship between risks and protective factors because neither the environment nor the infant is constant over time. The idea of changes in both the environment and the infant suggest a move to the concept of progressive interactions found in a transactional model of development. This model emphasizes the plastic nature of the environment and the child where there is a progressive interplay between the infant and the environment. So a child may begin life at

risk but if the environment is supportive, this will influence the outcomes for the child. This interaction and adaptation between the infant and the environment continues over the years.

Using these concepts of risk and protection, the data from the present study suggest that effects of infant risk, poor socioeconomic environments and maternal interaction styles that are less supportive of positive child development outcomes may collectively place infants at greater risk for future developmental problems. The accumulation of these multiple risks greatly increase the probability of problems, but they do not guarantee future negative outcomes (Rutter, 1987; Sameroff & Chandler, 1975). There are a variety of other protective factors that may mediate these influences and change the developmental outcome for the infants. These factors range from the personal characteristics of the infant and caregiver to the positive involvement of people who are part of a larger social system. For example, the temperament of the child may be such that the infant is less affected by the events that are occurring around him/her, or there may be a very strong relationship with one parent or caregiver that provides the necessary support to avoid the negative consequences. Besides the parent or caregiver, the presence of another adult with whom a positive and supportive relationship is developed may change the outcome. Another system factor that may influence the outcome for infants at risk for developmental delays is families' involvement in intervention programs. Intervention has been found to minimize some of the negative effects of these negative environmental conditions (Dubow & Lester, 1990; Stark, 1989). The

concept of risk and protection makes accurate projections about developmental outcomes difficult. Future examination of a variety of factors as either risk or protection would begin to unravel their relationships and implications for infants' developmental outcomes.

Systems theory (Bronfenbrenner, 1979) can also be used to examine the influence of socioeconomic status and infant at-risk status on maternal styles of interactions. Both the families' SES and the at-risk status of the infant, go beyond the personal traits of the mother in explaining the interaction styles she may exhibit. In this research, her infant at the dyadic level and her social status at the exosystem level affected the styles of interactions that she was likely to display with her infant. These findings support the importance of examining interaction from a systems perspective in order to assess all of the factors that work to influence mother-infant interactions.

In three of the four analyses, maternal discrepancy between maternal assessment of infant ability and actual infant ability was related to maternal styles of interaction. Mothers who overestimated their infants' abilities were less oriented toward their infants, provided less stimulation, and participated less in reciprocal play during the interaction. This replicates Nover and his colleagues (1984) research that showed mothers whose perceptions of their infants' behavior were distorted scored lower on social interaction and affective availability. These findings have important implications for attributional theory because of the role that

maternal assessment of children's abilities plays in the development of attributional biases.

Mothers generally overestimate their children's abilities regardless of whether the children have developmental problems or not (Heriot & Schmickel, 1967; Matheny & Vernick, 1969; Nover et al., 1984). Therefore, the direction of the discrepancy score is not surprising. The finding that the more mothers overestimate the abilities of their children, the less oriented they are toward their infants is very interesting. Nover and his colleagues (1984) attributed the mothers' overestimation of the infants abilities to the phenomenon of "love is blind." Gradel, Thompson, and Sheehan (1981) argue that parental overestimation occurs because the clinician's sampling of children's abilities are more limited than parents. Parents are able to make repeated assessments of the children's evolving skills, information which is not available to clinicians. Neither of these explanations for maternal overestimation are particular helpful in understanding why the greater the degree of overestimation, the less responsive and supportive the mothers will be during interactions.

Though some degree of distortion is possibly a function of the closeness of the relationship, it would seem that the more severe distortions need an explanation that goes beyond this hypothesis. Perhaps the explanation lies in the types of skills that are essential both to accurately assess an infant's abilities and to provide appropriate stimulation. In order to assess an infant's abilities, mothers need to observe what their infants do, to perceive subtle

behavior in the infant, and to understand whether their infant's behavior is appropriate. It takes these same skills of observation, perception, and understanding to be oriented and responsive toward the infant and to stimulate the infant during an interaction. This may explain why mothers who greatly overestimate their infants' abilities are not as supportive during interactions with their infants.

Dix and Grusec's (1985) attribution model proposes that assessment of the child's abilities is an important step in the formation of parental attributions. They hypothesized that misinterpretations of the child's abilities would lead to negative attributional biases. Though that hypothesis was not directly supported in this research, these findings do imply an indirect connection. These data support a connection between maternal perceptions about infants' abilities and maternal behavior toward the infants, a link that other researchers have examined (MacKinnon et al., 1990; Nuttall et al., 1985). Attempts to explore the relationship between attributions and behavior in parent-child interactions have been rare (Dix & Grusec, 1985). The finding in the present study regarding the importance of maternal perceptions in relation to maternal behavior during interactions should be examined further for the purpose of replication.

The failure of either of the attribution measures to contribute significantly in explaining variance in maternal styles of interaction is not consistent with expectations. Given potential measurement problems discussed previously, however, the lack of significant

findings is not especially surprising. If there had been more variability on these measures, then the outcomes might have been different.

Limitations of the Study

There are two limitations of this study that need to be addressed both of which may have influenced the lack of predictive power of maternal at-risk status and social support on maternal attributional biases. One problem involves the characteristics of the sample on which the data were collected and the second issue concerns the stability of the measures across time.

The problem with the sample involved the restricted ranges that were found on some of the predictor variables particularly SES and income. It had been expected in this study that the sample would contain more subjects from the last social class as defined by the Hollingshead Index. The collected data showed that only 15% of the sample came from the lowest SES level. The income variable had a similar problem. Sixteen percent of the sample fell into the lowest income group (\$0 - \$10,000 annual income). This group was not as represented in this sample as expected.

These restricted ranges are a limitation in this study because it had been hypothesized that the stress created by a lower SES environment would influence the formation of maternal attributional biases. Without a better representation from this lower SES group, it is difficult to tell what the influence of a lower SES level would be on the formation of maternal attributional biases. Caution must be taken in interpreting the lack of the hypothesized relationship as

important because this may simply reflect distribution problems in the sample.

The second limitation of the study involves the stability of the predictor variables of maternal depression, marital quality, and social support across the prenatal and one-month assessments. The transition to parenthood literature suggests that marital quality, social support, and maternal depression do change during this time period (Belsky, Spanier, & Rovine, 1983; Belsky, Ward, & Rovine, 1986; Cowan et al., 1985). Belsky and his colleagues (1983) found that the addition of an infant had a negative impact on the marital relationship and on the social support system that mothers used (Belsky, et al., 1986). Osofsky and Culp (1988) found that mothers reported being more depressed three months after their infants were born than they did prenatally.

These results suggest the need to examine the stability of these measures during this transition. The fact that this study was not able to look at whether these measures remain stable is a limitation of the study. It is possible that the lack of consistency across time in these measures is the reason the hypothesized influence of maternal at-risk status and social support on maternal attributional biases was not found in this project.

The data reported in this study do not support the first research question concerning the influence of maternal at-risk status and social support on maternal attributional biases. The limitations concerning the restricted ranges found on SES and income and the

concerns about the stability of maternal depression, marital satisfaction and social support across the time periods, makes it difficult to interpret these findings.

Recommendations for Future Research

Several suggestions arise from conclusions drawn from the present research. First, because the study of the factors that influence attributional biases and the effects of attributional biases on maternal styles of interactions in very young at-risk infants is a new area of inquiry, there is a need to replicate the results of this study. In planning a study such as this, work must be done to increase the variability of the attributional measures. As previously discussed, there appear to be certain characteristics of the vignettes (e.g., attempts by a mother to fulfill obligations beyond those to her infant and time pressures in fulfilling those obligations) that create a situation that is likely to produce negative attributional biases. Therefore, employing other situations which contain these two elements might increase the variability of the measure.

Researches interested in studying maternal attributions concerning the intent of their young infants should find it interesting to use infants between 9 and 12 months. Several comments made by the mothers suggested that once infants begin to demonstrate some ability to control their physical movements, then the infants' intent might become a more salient factor. Variability on the maternal attribution measures would be greater perhaps if they were assessed on infants between 9 and 12 months of age who are likely to be crawling and walking. The physical demonstration of control over

one's environment that is evidenced when a child becomes mobile appears to be a necessary condition for attributing awareness and control, and thus intentionality to infant's actions (Lamb, 1981; Vedeler, 1987).

Finally, future research might examine whether or not maternal attributional biases and interactions vary in a handicapped population as opposed to an at-risk population. A study using this population would require access to mothers of infants with clearly presenting handicapping conditions. Neonatal intensive care units would be a primary recruitment source since it would be necessary to recruit the mothers when the infants are still very young. There would also be a need to match a sample of mothers whose infants were in the units but did not have clearly presenting handicapping conditions for comparison.

In summary, recommendations for future research include revising both of the attributional measures by identifying situations that are more salient and potentially stressful for the mothers, using infants that are older, and using a handicapped population.

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FOOTNOTES

¹Clinical in these studies refers to families who have been referred to some type of intervention program and have chosen to become involved with the program. These referrals are for the most part made by professional though there are times when parents make self-referrals.

²Towle, Farran, & Comfort (1988) reviewed interaction observation coding systems used with parents of children with a handicap. With in-home observations of free play sessions, they found session length ranged from 4 to 20 minutes with a mean of 13.5 minutes.

³In order to be sure there were no differences in the findings depending on whether factor weights were used to compute the subscales or the items were simply summed in computing the subscales, analyses were performed using both computations. When using the factor weights, items on each of the three subscales were converted to z-scores, multiplied by the factor weights that were reported by Mahoney and his colleagues (1985), and then summed. The use of the factor weighted subscales in the analysis revealed no additional significant findings, therefore are not reported.

Appendix A

Informed Consent Form

I have heard the description of the Family Support Study and have had all my questions answered to my satisfaction. I understand the purpose of the study and agree to participate in the project as explained to me. I also understand that I may withdraw my consent to participate at any time.

Signature

Date

Witness

Date

I give permission to the Family Support Study to call my hospital to find out when my baby is born.

Yes _____

No _____

Appendix B

PLEASE NOTE

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Appendices B and C**

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Appendix D

Appendix E

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Appendix F

SES Scoring Format

Level of School Completed

	Score
Less than seventh grade	1
Junior high school (8th or 9th grade)	2
Partial high school (10 or 11th grade)	3
High school graduate (whether private preparatory, parochial, trade, or public school)	4
Partial college (at least one year) or specialized training	5
Standard college or university graduation	6
Graduate professional training (graduate degree)	7

The Occupational Factor

The occupation a person ordinarily pursues during gainful employment is graded on a nine-step scale. Wherever possible, the scale has been keyed to the occupational titles used by the United States Census in 1970, and the three-digit code assigned by the census is given. However, the occupational titles assigned by the census are not precise enough to delineate several occupational categories, especially proprietors of businesses, the military, farmers, and persons dependent upon welfare. Therefore, the occupational scale has departed from the titles and codes used by the census for a number of occupations and occupational groups.

OCCUPATIONAL SCALE

Score 9 Higher Executives, Proprietors of Large Businesses, and Major Professionals

- a. Higher executives: Chairpersons, presidents, vice-presidents, assistant vice-presidents, secretaries, treasurers;
- b. Commissioned officers in the military: majors, lieutenant commanders, and above, or equivalent;
- c. Government officials, federal, state, and local: members of the United States Congress, members of the state legislature, governors, state officials, mayors, city managers;
- d. Proprietors of businesses valued at \$250,000 and more;
- e. Owners of farms valued at \$250,000 and more;
- f. Major professionals (census code list).

Occupational title	Census Code
Actuaries	034
Aeronautical engineers	006

Score 9 (continued)

Occupational title	Census Code
Architects	002
Astronautical engineers	006
Astronomers	053
Atmospheric scientists	043
Bank officers	202
Biologic scientists	044
Chemical engineers	010
Chemists	045
Civil engineers	010
Dentists	062
Economists	091
Electrical/electronic engineers	012
Engineers, not elsewhere classified	023
Financial managers	202
Geologists	051
Health administrators	212
Judges	030
Lawyers	031
Life scientists	054
Marine scientists	052
Material engineers	015
Mathematicians	035
Mechanical engineers	014
Metallurgical engineers	015
Mining engineers	020
Optometrists	063
Petroleum engineers	021
Physical scientists, n.e.c.	054
Physicians	065
Physicists	053
Political scientists	092
Psychologists	093
Social scientists, n.e.c.	096
Sociologists	094
Space scientists	043
Teachers, college/university, including coaches	102-140
Urban and regional planners	095
Veterinarians	072

Score 8 Administrators, Lesser Professionals, Proprietors of
Medium-sized Businesses

- a. Administrative officers in large concerns: district managers, executive assistants, personnel managers, production managers;

- b. Proprietors of businesses valued between \$100,000 and \$250,000;
- c. Owners and operators of farms valued between \$100,000 and \$250,000;
- d. Commissioned officers in the military; lieutenants, captains, lieutenants, s.g., and j.g., or equivalent;
- e. Lesser professional (census code list).

Occupational title	Census code
Accountants	001
Administrators, college	235
Administrators, elementary/secondary school	240
Administrators, public administration, n.e.c.	222
Archivists	033
Assessors, local public administration	201
Authors	181
Chiropractors	061
Clergymen	086
Computer specialists, n.e.c.	005
Computer systems analysts	004
Controllers, local public administration	201
Curators	033
Editors	184
Farm management advisors	024
Industrial engineers	013
Labor relations workers	056
Librarians	032
Musicians/composers	185
Nurses, registered	075
Officials, public administration, n.e.c.	222
Personnel workers	056
Pharmacists	064
Pilots, airplane	163
Podiatrists	071
Sales engineers	022
Statisticians	036
Teachers, secondary school	144
Treasurers, local public administration, n.e.c.	201

Score 7 Smaller Business Owners, Farm Owners, Managers, Minor Professionals

- a. Owners of smaller businesses valued at \$75,000 to \$100,000;
- b. Farm owners/operators with farms valued at \$75,000 to \$100,000;
- c. Managers (census code list);
- d. Minor professionals (census code list);
- e. Entertainers and artists.

Occupational title	Census Code
Actors	175
Agricultural scientists	042
Announcers, radio/television	193
Appraisers, real estate	363
Artists	194
Buyers, wholesale/retail trade	205
Computer programmers	003
Credit persons	210
Designers	183
Entertainers, n.e.c.	194
Funeral directors	211
Health practitioners, n.e.c.	073
Insurance adjusters, examiners, investigators	326
Insurance agents, brokers, underwriters	265
Managers, administration, n.e.c.	245
Managers, residential building	216
Managers, office, n.e.c.	220
Officers, lodges, societies, unions	223
Officers/pilots, pursers, shipping	221
Operations/systems researchers/analysts	055
Painters	190
Postmasters, mail supervisors	224
Public relations persons	192
Publicity writers	192
Purchasing agents, buyers, n.e.c.	225
Real estate brokers/agents	270
Reporters	184
Sales managers, except retail trade	233
Sales representatives, manufacturing industries	281
Sculptors	190
Social workers	100
Stock/bond salesmen	271
Surveyors	161
Teachers, except college/university/secondary school	141-143
Teachers except college/university, n.e.c.	145
Vocational/educational counselors	174
Writers, n.e.c.	194

Score 6 Technicians, Semiprofessionals, Small Business Owners

- a. Technicians (census code list)
- b. Semiprofessionals: army, m/sgt., navy, c.p.o., clergymen (not professionally trained) interpreters (court);
- c. Owners of businesses valued at \$50,000 to \$75,000;
- d. Farm owners/operators with farms valued at \$50,000 to \$75,000.

Occupational title	Census Code
Administrators, except farm - allocated	246
Advertising agents/sales	260
Air traffic controllers	164
Athletes/kindred workers	180
Buyers, farm products	203
Computer/peripheral equipment operators	343
Conservationists	025
Dental hygienists	081
Dental laboratory technicians	426
Department heads, retail trade	231
Dietitians	074
Draftsmen	152
Embalmers	165
Flight engineers	170
Foremen, n.e.c.	441
Foresters	025
Home management advisors	026
Inspectors, construction, public administration	213
Inspectors, except construction, public administration	215
Managers, except farm - allocated	246
Opticians, lens grinders/polishers	506
Payroll/timekeeping clerks	360
Photographers	191
Professional, technical, kindred workers - allocated	196
Religious workers, n.e.c.	090
Research workers, not specified	195
Sales managers, retail trade	231
Sales representatives, wholesale trade	282
Secretaries, legal	370
Secretaries, medical	371
Secretaries, n.e.c.	372
Sheriffs/bailiffs	965
Shippers, farm products	203
Stenographers	376
Teacher aides, except school monitors	382
Technicians	150-162
Therapists	076
Tool programmers, numerical control	172

Score 5 Clerical and Sales Workers, Small Farm and Business Owners

- a. Clerical workers (census code list);
- b. Sales workers (census code list);
- c. Owners of small business valued at \$25,000 to \$50,000;
- d. Owners of small farms valued at \$25,000 to \$50,000.

Occupational title	Census Code
Auctioneers	261
Bank tellers	301
Billing clerks	303
Bookkeepers	305
Bookkeeping/billing machine operators	341
Calculating machine operators	342
Cashiers	310
Clerical assistants, social welfare	311
Clerical workers, miscellaneous	394
Clerical/kindred workers	396
Clerical supervisors, n.e.c.	312
Clerks, statistical	375
Collectors, bill/account	313
Dental assistants	921
Estimators, n.e.c.	321
Health trainees	923
Investigators, n.e.c.	321
Key punch operators	345
Library assistants/attendants	330
Recreation workers	101
Tabulating machine operators	350
Telegraph operators	384
Telephone operators	385
Therapy assistants	084
Typists	391

Score 4 Smaller Business Owners, Skilled Manual Workers,
Craftsmen, and Tenant Farmers

- a. Owners of small businesses and farms valued at less than \$25,000;
- b. Tenant farmers owning farm machinery and livestock;
- c. Skilled manual workers and craftsmen (census code list)
- d. Noncommissioned officers in the military below the rank of master sergeant and C.P.O.

Occupational title	Census Code
Airline cabin attendants	931
Automobile accessories installers	401
Bakers	402
Blacksmiths	403
Boilermakers	404
Bookbinders	405
Brakemen, railroad	712
Brickmasons/stonemasons	410
Brickmason/stonemason apprentices	411
Cabinetmakers	413
Carpenters	415

Score 4 (continued)

Occupational title	Census Code
Carpenter apprentices	416
Carpet installers	420
Cement/concrete finishers	421
Checkers/examiners/inspectors, manufacturing	610
Clerks, shipping/receiving	374
Compositors/typesetters	422
Conductors, railroad	226
Constables	963
Counter clerks, except food	314
Decorators/window dressers	425
Demonstrators	262
Detectives	964
Dispatchers/starters, vehicles	315
Drillers, earth	614
Dry wall installers/lathers	615
Duplicating machine operators, n.e.c.	344
Electricians	430
Electrician apprentices	431
Electric power linemen/cablemen	433
Electrotypers	434
Engineers, locomotive	455
Engineers, stationary	545
Engravers, except photoengravers	435
Enumerators	320
Expeditors	323
Firemen, fore protection	961
Firemen, locomotive	456
Floor layers	440
Foremen, farm	821
Forgemen/hammermen	442
Furriers	444
Glaziers	445
Heat treaters/annealers/temperers	446
Heaters, metal	626
Housekeepers, except private household	950
Inspectors, n.e.c.	452
Inspectors/scalers/graders, log and lumber	450
Interviewers	331
Jewelers/watchmakers	453
Job and diesetters, metal	454
Lithographers	515
Loom fixers	483
Machinists	461
Machinist apprentices	462
Mail carriers, post office	331
Mail handlers, except post office	332

Score 4 (continued)

Occupational title	Census Code
Managers, bar/restaurant/cafeteria	230
Marshals, law enforcement	963
Mechanics	470-495
Meter readers	334
Millers, grain/flour/feed	501
Millwrights	355
Molders, metal	503
Molder apprentices	504
Office machine operators, n.e.c.	514
Patternmakers/modelmakers	522
Photoengravers	515
Plasterers	520
Plaster apprentices	521
Plumbers/pipefitters	522
Plumber/pipefitter apprentices	523
Power station operators	525
Postal clerks	361
Practical nurses	926
Piano/organ tuners/repairmen	516
Pressmen, plate printers, printing trade	530
Pressmen apprentices	531
Projectionists, motion picture	505
Printing trade apprentices, except pressmen	423
Proof readers	362
Radio operators	171
Receptionists	364
Repairmen	471-486
Rollers/finishers, metal	533
Sheetmetal workers	533
Sheetmetal worker apprentices	536
Stenotypers	434
Stock clerks/storekeepers	381
Stone cutters/carvers	546
Structural metal workers	550
Superintendents, building	216
Switchmen, railroad	713
Tailors	551
Telephone linemen/splicers	552
Telephone installers/repairmen	554
Ticket/station/express agents	390
Tile setters	560
Tool and diemakers	561
Tool and diemaker apprentices	562
Weighers	392
Welders/flame cutters	680

Score 3 Machine operators and Semiskilled Workers (census code list)

Occupational title	Census code
Animal caretakers	740
Asbestos/insulation workers	601
Assemblers	602
Barbers	935
Blasters/powdermen	603
Boardinghouse/lodginghouse keepers	940
Boatmen/canalmen	701
Bottling operatives	604
Bulldozer operators	412
Bus drivers	703
Canning operatives	604
Carding, lapping, combing operatives	670
Chauffeurs	714
Child care workers, except private household	942
Conductors/motormen, urban rail transit	704
Cranemen/derrickmen/hoistmen	424
Cutting operatives	612
Deliverymen	704
Dressmakers/seamstresses, except factory	613
Drill press operatives	650
Dyers	620
Excavating/grading/road machine operators, except bulldozer	436
Farm services laborers, self employed	824
File clerks	325
Filers/polishers/sanders/buffers	621
Fishermen/oystermen	752
Forklift/tow motor operatives	706
Furnacemen/smelters/pourers	622
Furniture/wood finishers	443
Graders/sorters/manufacturing	623
Grinding machine operatives	651
Guards/watchmen	962
Hairdressers/cosmetologists	944
Health aides, except nursing	922
Housekeepers, private household	982
Knitters/loopers/toppers	671
Lathe/milling machine operatives	652
Machine operatives, miscellaneous specified	690
Machine operatives, n.e.c.	692
Meat cutters/butchers, except manufacturing	631
Meat cutters, butchers, manufacturing	633
Metal platers	635
Midwives (lay)	924
Milliners	640
Mine operatives	640

Score 3 (continued)

Occupational title	Census Code
Mixing operatives	710
Motormen, mine/factory/logging camp, etc.	710
Nursing aides/attendants	925
Oilers/greasers, except auto	642
Operatives, miscellaneous	694
Operatives, not specified	695
Operatives, except transport - allocated	696
Orderlies	925
Painters, construction/maintenance	510
Painter apprentices	511
Painters, manufactured articles	644
Paperhangers	512
Photographic process workers	645
Precision machine operatives, n.e.c.	653
Pressers/ironers, clothing	611
Punch/stamping press operatives	656
Riveters/fasteners	660
Roofers/slaters	534
Routemen	705
Sailors/deckhands	661
Sawyers	662
Service workers, except private household - allocated	976
Sewers/stitchers	663
Shoe machine operatives	664
Shoe repairmen	542
Sign painters/letterers	543
Spinners/twisters/winders	672
*Solderers	665
Stationary firemen	666
Surveying, chainmen/rodmen/axmen	605
Taxicab drivers	714
Textile operatives, n.e.c.	674
Transport equipment operatives - allocated	726
Truck drivers	715
Upholsterers	563
Weavers	673
Welfare service aides	954

Score 2 Unskilled Workers (census code list)

Occupational title	Census code
Bartenders	910
Busboys	911
Carpenter's helpers	750
Child care workers, private household	980

Score 2 (continued)

Occupational title	Census code
Construction laborers, except carpenters' helpers	751
Cooks, private household	981
Cooks, except private household	912
Crossing guards/bridge tenders	960
Elevator operators	943
Food service, n.e.c., except private household	916
Freight/material handlers	753
Garage workers/gas station attendants	623
Garbage collectors	754
Gardeners/groundskeepers, except farm	755
Hucksters/peddlers	264
Laborers, except farm - allocated	796
Laborers, miscellaneous	780
Laborers, not specified	785
Laundry/drycleaning operatives, n.e.c.	630
Lumbermen/raftsmen/woodchoppers	761
Meat wrappers, retail trade	634
Messengers	333
Office boys	333
Packers/wrappers, n.e.c.	643
Parking attendants	711
School monitors	952
Waiters	915
Warehousemen, n.e.c.	770

Score 1 Farm Laborers/Manial Service Workers (census code list)

Occupational title	Census code
Attendants, personal service, n.e.c.	933
Attendants, recreation/amusement	932
Baggage porters/bellhops	934
Bootblacks	941
Chambermaids, maids, except private household	901
Cleaners/charwomen	902
Dishwashers	913
Farm laborers, wage workers	931
Farm laborers/farm foremen/kindred workers - allocated	846

Appendix G

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APPENDIX H

ID _____

Date _____

Attribution VignettesStory I.

1. It is 5:30 and you are trying to get dinner ready before company arrives at 6:30. (CHILD'S NAME) begins to cry and cannot be comforted. Dinner is burning.

A. Why is (CHILD'S NAME) crying?

B. How does it make you feel when (CHILD'S NAME) is crying?

C. (CHILD'S NAME) will not stop crying. What do you do?

D. How well do you think (BEHAVIOR IDENTIFIED IN C) will work?

2. Which of these two things is more important to you in this situation?
- That dinner gets cooked on time.
 - That (CHILD'S NAME) is happy.
3. Since you have picked that the most important thing is (WHATEVER THEY PICKED), of the following three possible responses, which are you most likely to do?

- _____ A. You would just finish cooking dinner.
- _____ B. You would turn off dinner and deal with (CHILD'S NAME) even though dinner will not be ready when your company comes.
- _____ C. You would say, "Please be quiet! I'm doing all I can do!"

4. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (MOTHER'S FIRST CHOICE IN 3) would work?

1	2	3	4	5
Not Very Well		Somewhat		Very Well

5. Let's assume that it did not work, what might your second choice be? (ALLOW MOTHER TO SUGGEST OWN POSSIBLE SECOND CHOICE IF SHE CAN'T CHOOSE FROM LISTED CHOICES). _____

6. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (ALTERNATIVE CHOICE IN 3) would work?

1	2	3	4	5
Not Very Well		Somewhat		Very Well

2. Which of these two things is more important to you in this situation?
- That (CHILD'S NAME) look at the new toy you gave him/her.
 - That (CHILD'S NAME) is playing happily.
3. Since you have picked that the most important thing is (WHATEVER THEY PICKED), of the following three possible responses, which are you most likely to do?

- _____ A. You would walk away.
- _____ B. You would take the old toy out of (CHILD'S NAME) sight and make him/her look at the new toy.
- _____ C. You wait a little while and then try again to see if (CHILD'S NAME) is interested in the new toy.

4. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (MOTHER'S FIRST CHOICE IN 3) would work?

1	2	3	4	5
Not Very Well		Somewhat		Very Well

5. Let's assume that it did not work, what might your second choice be? (ALLOW MOTHER TO SUGGEST OWN POSSIBLE SECOND CHOICE IF SHE CAN'T CHOOSE FROM LISTED CHOICES) _____

6. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (ALTERNATIVE CHOICE IN 3) would work?

1	2	3	4	5
Not Very Well		Somewhat		Very Well

Story III.

1. Suppose you are having (CHILD'S NAME)'s grandparents over to visit on Saturday morning. You have told them about all of the wonderful things (CHILD'S NAME) can do like smiling and cooing. When they come, you try to get (CHILD'S NAME) to play and laugh with you. She/he will not and begins to cry.

A. Why did (CHILD'S NAME) not smile for you?

B. How does it make you feel when (CHILD'S NAME) will not smile for you?

C. (CHILD'S NAME) will not smile and continues to cry. What do you do then?

D. How well do you think (BEHAVIOR IDENTIFIED IN C) will work?

2. Which of these two things is more important to you in this situation?
- a. That (CHILD'S NAME) will smile when you have guests.
- b. That (CHILD'S NAME) will be happy.
3. Since you have picked that the most important thing is (WHATEVER THEY PICKED), of the following three possible responses, which are you most likely to do?
- _____ A. You would move him/her into another room.
- _____ B. You would try to calm him/her down.
- _____ C. You would just ignore the fact that (CHILD'S NAME) will not smile.
4. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (MOTHER'S FIRST CHOICE IN 3) would work?
- | | | | | |
|------------------|---|----------|---|-----------|
| 1 | 2 | 3 | 4 | 5 |
| Not Very
Well | | Somewhat | | Very Well |
5. Let's assume that it did not work, what might your second choice be? (ALLOW MOTHER TO SUGGEST OWN POSSIBLE SECOND CHOICE IF SHE CAN'T CHOOSE FROM LISTED CHOICES). _____
6. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (ALTERNATIVE CHOICE IN 3)?
- | | | | | |
|------------------|---|----------|---|-----------|
| 1 | 2 | 3 | 4 | 5 |
| Not Very
Well | | Somewhat | | Very Well |

Story IV.

1. You are planning to meet some old friends for a "night out". One of the friends will only be in town one night, so the evening has been planned for several months. You could only arrange for a new babysitter for (CHILD'S NAME). That afternoon (CHILD'S NAME) wakes from a nap very fussy and crying. Even though you have fed and changed (CHILD'S NAME), he/she is still very upset and crying when the babysitter comes. The babysitter tells you that she does not want to keep (CHILD'S NAME). You do not get to go out.

A. Why is (CHILD'S NAME) so fussy?

B. How does it make you feel when (CHILD'S NAME) is so fussy?

C. (CHILD'S NAME) continues to be fussy. What do you do then?

D. How well do you think (BEHAVIOR IDENTIFIED IN C) will work?

2. Which of these two things is more important to you in this situation?

- a. That (CHILD'S NAME) becomes happy.
- b. That you get to go out.

3. Since you have picked that the most important thing is (WHATEVER THEY PICKED), of the following three possible responses, which are you most likely to do?

- _____ A. You would say, "Please be quiet! I don't know what else to do!"
- _____ B. You would try to calm him/her down.
- _____ C. You would just go change clothes?

4. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (MOTHER'S FIRST CHOICE IN 3) would work?

1	2	3	4	5
Not Very Well		Somewhat		Very Well

5. Let's assume that it did not work, what might your second choice be? (ALLOW MOTHER TO SUGGEST OWN POSSIBLE SECOND CHOICE IF SHE CAN'T CHOOSE FROM LISTED CHOICES) _____

6. Given that you would most like (MOTHER'S CHOICE IN 2), how well do you think (ALTERNATIVE CHOICE IN 3) would work?

1	2	3	4	5
Not Very Well		Somewhat		Very Well

APPENDIX I

ID _____

Date _____

Attribution Interview

I would like to talk to you a few minutes about some specific situations that have happened between you and [CHILD'S NAME] during the last week or so. We are interested in learning more about what happens between mothers and children during both pleasant and unpleasant situations. I would like you to think back over the last week or two and think of a very pleasant situation that has occurred between you and (CHILD'S NAME).

[IF THE MOTHER CANNOT COME UP WITH A SITUATION, USE THE FOLLOWING EXAMPLE: FOR EXAMPLE PERHAPS YOUR BABY SMILED FOR THE FIRST TIME AT YOU.]

1. Now that you have thought of a situation, can you tell me more about what happened between you and (CHILD'S NAME).

2. How did you feel when (CHILD'S NAME) (BEHAVIOR IDENTIFIED)?

As you know, even the best of mothers and children can have difficult times and during these times raising a child can be very trying. Even though most of your experiences with your child are probably pleasant, occasionally there are unpleasant moments. Now I would like you to think of a very unpleasant situation that has occurred between you and (CHILD'S NAME) during the last week or so.

[IF MOTHER CANNOT COME UP WITH A SITUATION, USE THE FOLLOWING EXAMPLE: FOR EXAMPLE PERHAPS YOUR BABY TANTRUMMED AND CRIED THE WHOLE TIME WHILE YOU WERE SHOPPING.]

3. Now that you have thought of a situation, tell me more about what happened between you and (CHILD'S NAME).

4. Why do you think (CONFLICT IDENTIFIED) happened?
[NEED TO PROBE-WAS IT SOMETHING ABOUT CHILD'S PERSONALITY, KIDS IN GENERAL, THE SITUATION, MOTHER, ETC.]

5. How did (CHILD'S NAME) behave during (CONFLICT IDENTIFIED)?
[PROBE UNTIL MOTHER IDENTIFIES CHILD'S BEHAVIOR.]

6. Why do you think (CHILD'S NAME) (THE CHILD'S BEHAVIOR)?
[PROBE - WAS IT SOMETHING ABOUT THE CHILD'S PERSONALITY, KIDS IN GENERAL, THE SITUATION, OR THE MOTHER, ETC.]

7. How responsible are you for (CHILD'S NAME) (CHILD'S BEHAVIOR)?

1	2	3	4	5
Totally Responsible		Somewhat Responsible		Not at All Responsible

8. To what extent do you think (BEHAVIOR IDENTIFIED) is bad?

1	2	3	4	5
Very Bad		Somewhat Bad		Not At All Bad

9. How much do you think something about (CHILD'S NAME) [E.G., HIS/HER PERSONALITY, THE KIND OF PERSON HE/SHE IS) caused him/her to (BEHAVIOR IDENTIFIED)?

1	2	3	4	5
Totally Something About Him/Her		Partly Something About Him/Her		Nothing About Him/Her

10. To what extent do you think (CHILD'S NAME) behavior was inappropriate?

1	2	3	4	5
Very Inappropriate		Somewhat Inappropriate		Not at All Inappropriate

11. To what extent do you think (CHILD'S NAME) would (CHILD'S BEHAVIOR) at another time under the same circumstances?

1	2	3	4	5
Always		Sometimes		Never

12. To what extent do you think (CHILD'S NAME) would (CHILD'S BEHAVIOR) in other situations?

1	2	3	4	5
Always		Sometimes		Never

13. To what extent do you think (CHILD'S NAME) intended to (CHILD'S BEHAVIOR)?

1	2	3	4	5
Fully Intended to Do It		Somewhat Intended to Do It		Never Intended to Do It

14. How upset did it make you when (CHILD'S NAME) (CHILD'S BEHAVIOR)?

1	2	3	4	5
Very Upset		Somewhat Upset		Not At All Upset

15. If (CONFLICT IDENTIFIED) were to happen again and (CHILD'S NAME) (CHILD'S BEHAVIOR), how upset do you think you would be?

1	2	3	4	5
Very Upset		Somewhat Upset		Not At All Upset

16. If (CHILD'S NAME) (BEHAVIOR IDENTIFIED) again, how responsible do you think he/she would be?

1	2	3	4	5
Totally Responsible		Somewhat Responsible		Not at all Responsible

17. To what extent would you show disapproval to (CHILD'S NAME) about his/her (CHILD'S BEHAVIOR) if he/she were to do it again?

1	2	3	4	5
A Lot of Disapproval		Some Disapproval		No Disapproval

18. To what extent would you discipline (CHILD'S NAME) if she/he (CHILD'S BEHAVIOR) if he/she were to do it again?

1	2	3	4	5
A Lot of Discipline		Some Discipline		No Discipline

APPENDIX J

ID _____

Date _____

Maternal Perceptions of the Child's Abilities Scale

C. M. Trivette

C. E. MacKinnon

Babies are all different. This questionnaire asks you to indicate what your baby is like and what things your baby can do. Please circle the response that best represents your thoughts. Remember--There is no right or wrong answer. Please give your honest feelings.

Please indicate what you think your baby is like and what things your baby can do.

1. How cooperative is your baby with other adults?

1	2	3	4	5
Resist All Requests	One or Two Times Does Not Cooperate	Sometimes Will Cooperate	Often Cooperates	Always Cooperates

2. How responsive is your baby to you?

1	2	3	4	5
Withdrawn	Hesitant	Accepting	Friendly	Inviting

3. How does your baby react to new people?

1	2	3	4	5
Withdrawn	Hesitant	Accepting	Friendly	Inviting

4. What kind of mood is your baby generally in?

1	2	3	4	5
Never Happy or or Content	Seldom Happy	Moderately Happy	Generally Happy	Very Happy Cheerful

5. How active is your baby in general?

1	2	3	4	5
Very Inactive	Usually Inactive	Moderately Active	Often Active	Very Active-- Cannot Be Quieted

6. How long does your baby respond to new toys?

1	2	3	4	5
Looks Away and Not Want to Play	Looks but Is Easily Distracted	Plays Moderately Long Time	Plays for Rather Long Time	Wants to Play with the Toy for a Very Long Time

7. How easily does your baby tire out when you want to do something with him/her?

1	2	3	4	5
Tires Easily	Grows Restless Fairly Soon	Adequately Patience with Your Request	Holds Up Well, Only Tiring Occasionally	Does Not Tire Easily

8. How much control do you think you have over your baby's general development?

1	2	3	4	5
No Control		Control About Half the Time		Total Control

9. How often is your baby interested in the following?

	Never Does It	Sometimes Does It	Does It All the Time
(a) Sights--Looking	1	2	3
(b) Listening to Sounds	1	2	3
(c) Making Vocal Sounds.....	1	2	3
(d) Banging Toys	1	2	3
(e) Exploring Toys with Hands	1	2	3
(f) Body Motion	1	2	3
(g) Mouthing or Sucking Fingers	1	2	3
(h) Mouthing Toys	1	2	3
(i) Mouthing Pacifier	1	2	3

10. Is your child able to hold one block in each hand?

(A) Yes _____ No _____

(B) If yes, how often does (s)he hold a block in each hand?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

11. Does your child pick up a small toy that (s)he has dropped beside him/herself?

(A) Yes _____ No _____

(B) If yes, how often does (s)he pick up a small toy that has been dropped?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

12. Does your child continue to reach for a toy that is just beyond his/her reach?

(A) Yes _____ No _____

(B) If yes, how often does (s)he continue to reach for a toy that is just out of reach?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

13. Does your child turn his/her head when a toy has dropped noisily on the floor?

(A) Yes _____ No _____

(B) If yes, how often does (s)he turn his/her head when a toy has dropped on the floor?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

14. Does your child smile at him/herself in a mirror?

(A) Yes _____ No _____

(B) If yes, how often does (s)he smile at him/herself in the mirror?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

15. Does your child bang toys in excitement?

(A) Yes _____ No _____

(B) If yes, how often does (s)he bang toys in excitement?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

14. Does (s)he playfully respond to her/his face in the mirror?

(A) Yes _____ No _____

(B) If yes, how often does (s)he playfully respond to his/her face in the mirror?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

15. At six months when your child drops something off his/her high chair or table, does (s)he look down at the floor to see where it falls?

(A) Yes _____ No _____

(B) If yes, how often does (s)he look down to see where it falls?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

16. Does your child use an object like a rattle or bell to make noise by banging or ringing it?

(A) Yes _____ No _____

(B) If yes, how often does (s)he use an object like a rattle or bell to make noise?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

17. Is your child able to roll from his/her back to stomach?

(A) Yes _____ No _____

(B) If yes, how often does (s)he be able to roll from his/her back to stomach?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

18. Does your child sit alone for about 30 seconds?

(A) Yes _____ No _____

(B) If yes, how often does (s)he sit alone for about 30 seconds?

1	2	3	4	5
Never	Rarely	Sometimes	Often	Always

APPENDIX K

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APPENDIX L

AMOUNT OF RECIPROCAL PLAY

This scale attempts to assess the quantity of reciprocal play between parent and infant, disregarding quality if the interaction meets the minimum standards for reciprocal play. The first aspect of these standards is mutual attention to the toy or game-like interaction which is the focus of the ongoing play. Ongoing means an interaction of at least a few seconds in which both the parent and child have taken some active part. Secondly, some alternation or response is necessary. This does not necessarily mean an object manipulation, since a look, a grasp, or a verbalization can each be an adequate response which will continue the play. A negative test can be applied here; that is, if the behavior (from brightening look to grabbing, etc.) had not been emitted, would the interaction have continued; if it would not have, a response sufficient to qualify as alternating has occurred. Finally, contingency must be seen; that is, the behavior emitted must be appropriate to the situation and to the immediately preceding response, and must be temporally appropriate.

1. None
2. Few brief unsuccessful attempts by one partner to engage in reciprocal play
3. A few brief, unsustained episodes of reciprocal play
4. One instance of reciprocal play which perpetuates itself
5. A few instances of reciprocal play which perpetuate themselves or alot of brief unsustained episodes
6. Less than 25% of reciprocal play
7. Quite a bit of reciprocal play (25-50%)

8. Reciprocal play predominates during the episode (50-75%)
9. Nearly constant reciprocal play (over 75%)