PREDICTING INDIVIDUAL DIFFERENCES IN FATHER-INFANT INTERACTION

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ABSTRACT

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The study investigated the relationships between (a) infant characteristics, (b) father characteristics, (c) marital characteristics, and (d) maternal behavior characteristics in predicting variations in the frequency and quality of father-infant interaction. The subjects were twenty-five families recruited from local childbirth classes and obstetricians' practices.

Four months after the birth of their infants, parents completed the Michigan Infant Temperament Survey, the Temperament Scale-Erman, the Bem Sex Role Inventory, the Locke-Wallace Scale of Marital Satisfaction and the Parent Participation Inventory, a measure designed to assess fathers' participation in caregiving activities. In addition, parents' interactions with their infants were observed in two one-hour home observations.

Fathers' participation in caregiving was predicted by positive maternal behavior ($r = -.53$). Fathers' marital satisfaction was significantly correlated with negative paternal behavior (-.58). No other relationship

between predictors and criterion variables was significant. The findings are offered as limited support for a family systems analysis of early parent-child interaction. The lack of significant findings is also discussed.

To Judy, Amanda, and Caleb or Eliza

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INTRODUCTION

The present study was undertaken in order to expand our understanding of the nature and determinants of fathers' interactions with infants. In particular, the study attempted to identify characteristics of infants, fathers, marital relationships, and mother-infant interaction which influenced the behavior of a sample of fathers in interaction with their infants.

The attempt to specify influences on fathers' behavior and involvement with their infants is based on several assumptions within the family systems approach. This is approach advocated by a number of developmental psychologists concerned with elucidating the role of the father in infant development (Belsky, 1980a, 1980b; Lewis and Feiring, 1978; Parke, Power, and Gottman, 1979; Pedersen, 1980b).

The family systems framework is based on several assumptions about the functioning of family members vis a vis each other. First, it is assumed that individual family members, including the infant, influence, and are influenced by, each other member of the family. At this level of analysis the implication is that individual family members bring characteristics to their interactions with family members which influence

the process and outcome of those interactions.

A second mode of analysis implied by a family systems framework involves delineating reciprocal influences of the various dyads within a family. Thus, in a three person family the father-infant relationship is presumed to be influenced both by the father-mother relationship and the mother-infant relationship.

In the family systems framework several determinants of differential behaviors of fathers toward infants are suggested. One expects to find the behavior of fathers varying as a function of (a) differences in the individual characteristics of the infants as well as the fathers, (b) differences in the marital relationship and, (c) differences in the mother-infant relationship.

The present investigation utilized those sources of influence in order to predict variations in the degree to which fathers participate in the care of their infants and variations in their behavior with the infants. Multiple regression analyses were used to determine which combinations of variables accounted for the greatest variance in measures of fathers' participation and behavior.

The rationale for selection of the particular variables utilized in this study is contained in the ensuing review of the literature. Variables were sought which would have a conceptual or empirical basis in the limited

literature pertaining to individual differences in father-infant interaction. Those that emerged as plausible predictors are as follows:

(1) Infant Characteristics
    A. Gender
    B. Temperamental "Difficulty"

(2) Father Characteristics
    A. Sex-role Orientation (masculinity, femininity)
    B. Temperament (activity, sociability, emotionality, impulsivity)

(3) Marital Characteristics
    A. Fathers Marital Satisfaction
    B. Mothers Marital Satisfaction
    C. Discrepancy in Parents' Perception of Infant Temperament
    D. Parents' Temperamental Similarity

(4) Mother Behaviors
    A. Positive Maternal Behaviors
    B. Negative Maternal Behaviors

In summary, the present study was undertaken to address the lack of research aimed at identifying determinants of individual differences in father-infant interaction. Fourteen predictor variables were identified on the basis of a family systems framework and available data pertaining to father-infant relationships. These predictors were utilized in an attempt to account for variations in

a) the degree to which fathers participate in the routine care of infants, b) the quality of observed father-infant interaction and c) the frequency of observed father-infant interaction.

REVIEW OF THE LITERATURE

A sustained, systematic exploration of the role of the father in infant development has only recently begun. As late as 1975, Lamb concluded that fathers were "the forgotten contributors to child development." In 1978, Clarke-Stewart observed that the number of publications devoted to fathers that have appeared since Lamb's 1975 review suggests that they are no longer forgotten. She concluded that there was, however, little solid, replicated evidence concerning the role of the father or the father's specific contributions to the behavior and development of infants.

One particular approach to the study of fathers has been concerned with identifying (a) similarities in and differences between, mothers' and fathers' behavior as caregivers and (b) similarities in, and differences between, the behaviors of children toward mothers and fathers. Such comparisons appear useful in several respects. First, by demonstrating areas in which the behavior of mothers and fathers is similar, researchers such as Belsky (1979b), Kotelchuck (1976), Parke and O'Leary (1976) and Sullivan and McDonald (1979) have been able to argue against a priori assumptions that there is something uniquely female involved in the capacity to care for

infants and toddlers.

Second, by establishing similarities in the behavior of infants toward mothers and fathers, researchers have been able to offer empirical support for arguments to the effect that fathers as well as mothers are (a) salient figures in the infant's social world, (b) capable of eliciting attachment and affiliative behaviors and attachment bonds and (c) likely to significantly influence the course of child development. This line of research, reviewed elsewhere by Parke (1979), is typified by the work of Lamb (1980).

Finally, the comparison of mothers and fathers allows researchers to identify differences in the behavior of mothers and fathers. Differences so identified may suggest the manner in which parents contribute differentially to the development of children.

There has been a great deal of inconsistency in the reporting of differences. One of the most consistent findings is that, in general, mothers spend more time with infants than do fathers and are more involved in routine caregiving activities (Clarke-Stewart, 1978; Kotelchuck, 1976; Pedersen and Robson, 1969). There have been consistent reports of differences in the reasons for which parents are likely to pick up or hold their infants; mothers are more likely to pick up their child to give care and set limits, whereas fathers tend to

do so for purposes of play (Lamb, 1980). The style of father-infant play, but not the quantity, appears to distinguish fathers and mothers (Clarke-Stewart, 1978; Earls and Yogman, 1979; Parke and Sawin, 1980; Pedersen, Anderson, and Cain, 1980). Fathers appear to engage in more active, physical, idiosyncratic, and stimulating play than mothers. Clarke-Stewart (1978) and Lamb (1979) have suggested that the context of play may be one in which fathers are likely to have particularly potent influences.

Summary and Critique: Comparing Fathers and Mothers

In general, reviewers of the father-infant literature have concluded that the similarities between father-infant and mother-infant relationships far outweigh the differences (Parke, 1979; Pedersen, 1980a). With the exception of the few areas noted previously, there has not been a consistent identification of features distinguishing mothers from fathers. In part, the lack of consistency may result from the fact that studies have used infants from eight to thirty months of age, observed in home and laboratory, using different observational approaches that involve different levels of stress for infant and family, and using different measures. Lamb (1976a) has argued that all of these factors are likely to significantly affect results and

make comparisons across studies problematic.

Another difficulty with this line of research is that it involves an underlying assumption that "maternal behavior" and "paternal behavior" each represents a unitary phenomenon (Pedersen, 1980b). Part of the inconsistency in results may stem from regarding mothers and fathers as distinct homogeneous groups in analysis of variance designs, with no further distinction made between types of mothers and fathers. The search for between group differences may obscure within-group differences that are significant and that may contribute different results in different samples. The assumption has been that elucidating differences between fathers and mothers will result in a better understanding of the father's role in infant development. Differences so identified may provide direction for theorists and researchers. However, the ideal test of fathers' contributions to infant development would be to compare infant outcome among children with similar personal characteristics whose mothers behave toward them similarly, but whose fathers behave toward them (and the mothers) in different ways. This approach, then, requires an investigation of individual differences among fathers as they influence the infant both directly and indirectly. Such an approach is more likely to identify the range of family patterns, the range of social experiences

available to infants in their families, and the significance of variations in family pattern for the behavior and development of infants.

Individual Differences in Fathers

Though little is known about individual differences in the behavior of fathers, there is evidence to suggest that fathering is not a unitary phenomenon. Differences have been noted in the extent to which fathers are present in the home (Biller, 1976; Lynn, 1974; Radin, 1976) as well as in fathers' participation in the day-to-day care of children (Clarke-Stewart, 1978; Field, 1978; Pedersen and Robson, 1969; Russell, 1978; Peshkess, 1980; Spelke, Zelazo, Kangan, and Kotelchuck, 1973). A small number of studies have identified variations in the behavior of fathers toward their infants (Belsky, 1980; Clarke-Stewart, 1978; Peshkess, 1980) and in the beliefs and expectations fathers have regarding their infants (Parke and Sawin, 1980; Peshkess, 1980).

There also is little evidence available regarding the effects of variations in paternal behavior on infant development. Clarke-Stewart (1978) reported that individual difference in the behavior of fathers predicted the infants' scores on measures of intellectual and social competence. Such individual differences also proved useful in Belsky's (1980) study as predictors

of infant exploratory competence. Differences in fathers' participation in infant caregiving have been linked with differences in the social behavior of infants (Pedersen and Robson, 1969; Spelke, et al., 1970).

Such a small number of studies is insufficient for establishing relationships between father behavior and infant outcome with any degree of certainty. Moreover, the correlational nature of those studies permits no clear statement of direction of effects. The studies do, however, suggest a working hypothesis. That hypothesis is that factors such as paternal warmth, nurturance, availability, style of play, verbalizations and expressions of affect influence the behavior and development of infants. Such a formulation reemphasizes the utility of approaches in which individual differences in fathers are specified. In addition, it is conceptually consistent with studies of later childhood linking paternal involvement, warmth, nurturance, and acceptance with positive child outcomes (cf. Lynn, 1974).

Determinants of Individual Differences in the Father-Infant Relationship

Corresponding to the lack of research reporting variations in the father-infant relationship is a lack of research into the determinants of, or influences on, variations in the father-infant relationship. There is very little information regarding factors likely to

influence the fathers' level of involvement in caregiving, or the quantity, quality, or style of father-infant interaction. There have been a small number of studies suggestive of potentially relevant sources of influences.

Infant Characteristics

In an approach assuming that infants influence their caregivers (Lerner and Spanier, 1978; Lewis and Rosenblum, 1974) individual differences in infants become significant as variables potentially influencing the organization and development of the father-infant relationship.

Sex of Infant. The gender of the infant is one characteristic likely to influence the father-infant relationship. Expectant parents have been reported to hope for boy infants more frequently than girl infants (Hoffman, 1977). Parents of newborns describe similar infants in a sexually stereotyped manner (Rubin, Provenzano, and Luria, 1974). In addition to these attitudinal and perceptual influences, behavioral differences in the parents' treatment of male and female infants have been noted (Clarke-Stewart, 1978; Kotelchuck, 1976; Lamb, 1977a). At the same time, differences in boys' and girls' behavior toward parents has been reported (Lamb, 1977a; Pedersen and Robson, 1969; Spelke et al., 1973). It appears that parents show a preference for same-sexed infants and that by the second year infants

begin to show a preference for the same-sexed parent. The differential treatment of boys and girls may be cognitively mediated, as evidenced by Fagot's (1974) finding that fathers of boys see themselves as providing a role model. In addition, although evidence is conflicting, there may be biologically linked sex differences in infants that contribute to the differential treatment of boys and girls (Fitzgerald, 1977; Korner, 1974; Maccoby and Jacklin, 1974).

Infant Temperament. Thomas, Chess, and Birch (1968) use the term "temperament" to refer to the behavioral style of infants. They have found individual differences in infants in this domain from early in infancy and have found some continuity in this characteristics over the course of development. They have found that differences in infant temperament, in interaction with differences in caregiving environments, can significantly affect the course of child development. There has been little direct research as to the effects of infant temperamental style on the father-infant relationship. Pedersen (Note 2) reported links between infant temperament and the marital relationship, but did not report links between temperament and the father-infant relationship. Rendina and Dickerscheid (1976) reported that fathers were more likely to persist in efforts to soothe temperamentally difficult boys than girls. This finding,

however, provides very little information regarding the impact of temperament per se.

In a tangentially related study, Scholom, Zucker, and Stollack (1979) used adult temperament measures and parents' retrospective reports of infant temperament to predict adjustment of four-year-olds. Among the findings reported was a correlation between father-son temperamental dissimilarity and the sons' positive adjustment and between mother-father-daughter temperamental similarity and the daughters' positive adjustment. While it is not known what sort of family interaction patterns might have evolved from the period of infancy through four years, it seems probable that differences did emerge on the basis of temperamental "fit" between family members.

Conclusions. Studies of father and infant behavior that have been interactional in design, i.e. that have focused specifically on the mutually regulated flow of father and infant behaviors rather than time sampling of behaviors, have shown that fathers' behaviors are regulated by infants (Earls and Yogman, 1979; Parke and Sawin, 1980; Vandrill, 1979). Differences in child and father behavioral style (temperament) are likely to influence how this mutual regulation occurs. So also will the different infant capacities that emerge as a function of maturation and any differences that might

be related to infant gender influence the interaction process. It appears necessary to include specification of infant differnces in attempts to understand the variations found in father-infant relationships.

Father Characteristics

Just as individual differences in infants contribute to the organization and development of father-infant relationships, individual differences brought to the relationship by fathers also are likely to be influential.

Sex-Role Orientation. A number of authors have suggested that the sex-role orientation of fathers may be a more powerful predictor of paternal behavior than biological gender (Parke, 1979; Pedersen, 1980b; Russell, 1978). It has been suggested that personality constructs such as masculinity, femininity, and androgyny (Bem, 1974) may provide useful insight into variations in caregiving behaviors. There is indirect evidence to support such a view. Bem, Martyna, and Watson (1976) found that college students who were classified as androgynous and feminine displayed more nurturant behavior toward infants than students classified as masculine, regardless of the biological gender of the students.

A more direct study of the relationship between sex-role orientation and caregiving behavior is that of Russell (1978). He found that fathers classified as androgynous and feminine were more involved in caregiving

activities and play than those fathers rated as masculine. This relationship held across socioeconomic status levels and children's age levels. There was also an interaction with mothers' sex-role orientation. Masculine fathers married to masculine mothers were more involved in caregiving than masculine fathers married to androgynous mothers and feminine mothers. The measure of caregiving used in this study was self-report, so it is not possible to determine the relationship between fathers' sex-role orientation and the specific style or quality of father-infant interaction.

Pedersen (1980b) has noted that labelling fathers on the basis of differences in their caregiving styles does not, in and of itself, contribute to understanding those differences. Whether highly involved fathers are labelled "androgynous" or "highly involved" does not seem particularly crucial, except insofar as the relationship between those dimensions contributes to the validity of the androgyny construct. From the perspective of the father-infant literature sex-role orientation instruments that predict paternal behavior may prove most useful as sorting and classifying instruments in the early stages of recruiting subjects.

Temperament. The Scholom et al. (1979) study described above suggests that the temperamental similarity of father and infant may contribute to the father-infant

relationship. Moreover, the father temperamental factor "energy" was marginally predictive of child adjustment ($p < .10$). This finding suggests that, in addition to the "fit" between father and infant, differences in the behavioral style of the father, irrespective of the infant, may contribute to the father-infant relationship.

Conclusions. There is minimal knowledge regarding the characteristics of fathers that might contribute to individual differences in the father-infant relationship. What evidence is available suggests that fathers' level of involvement and the quality and style of father-infant interaction may be a function of a range of individual differences in fathers. Those differences may be in the personality characteristics (e.g. sex-role orientation) or biobehavioral characteristics (temperament) as well as other attitudinal and affective domains.

The Father-Mother Relationship

No analysis of the family as a social system can divorce the relationship between two family members from the relationships between other dyads in the family. This point has been stressed by a number of authors (Belsky, 1979a; Feiring and Lewis, 1978; Parke, 1979; Parke et al., 1979; Pedersen, 1980a, 1980b; Pedersen, Anderson, and Cain, 1980). There has been more of an

emphasis on linking the father-mother relationship with the mother-infant relationship than with the father-infant relationship. This emphasis stems from a belief that the father's role in child development is likely to be largely indirect, i.e. to involve influences on the child through the mother (Bowlby, 1951; Clarke-Stewart, 1978; Lewis and Weintraub, 1976; Parke, Power and Gottman, 1979). This approach has been concerned with such variables as the father's emotional and economic support of the mother and the influence of that support on the mother-infant relationship. Pedersen's (Note 2) report of a significant correlation between fathers' positive evaluations of mothers and mothers' competence in feeding is an example of this approach.

However, there have been a small number of studies linking the mother-father relationship with the father-infant relationship. Pedersen et al. (1980) compared parent-infant interaction during periods when spouses were interacting with each other with periods during which spouses were not interacting with each other. They found that parental behaviors requiring greater focused attention, such as (a) smiling, (b) vocalizing, (c) eye contact, and (d) active play were inhibited during periods in which active spousal interaction was occurring. Behavior requiring less focused attention, such as holding, rocking, and

cuddling were not affected by spousal interaction. These findings help account for the reports of a number of investigators to the effect that overall level of parent-infant interaction diminishes when both parents are in the room with the infant as opposed to only one parent (Clarke-Stewart, 1978; Lamb, 1976a; Parke and O'Leary, 1976; Pedersen et al., 1980).

Using a somewhat narrower focus, Pedersen, Anderson, and Cain (Note 2) correlated specific behaviors of spouses toward each other with specific parents' behaviors toward infants. They reported a correlation between spouses' expressions of negative affect toward each other and each parent's expression of negative toward the infant. They did not find a correlation between spouses' expressions of positive affect toward each other and expresssions of positive affect toward the infant.

In the same vein, Belsky (1979a) reported relationships between a number of spouse-spouse behaviors and parent-infant behaviors in a home observation. Belsky found that spouses who engaged in conversations unrelated to their infants were less likely to show active involvement in parenting behaviors. When mothers were frequently engaged in discussion of the infant, fathers tended to be highly involved with the infants. However, fathers' discussion of the baby was not related to wives' parenting behavior. Spousal relationships marked by

a great deal of harmony (careful listening, emotional warmth, mutual agreement), active attempts to include all family members in interaction, and shared pleasure in the infant's behavior were associated with a high level of parenting activity. This was particularly true for fathers. Belsky (1979a) concluded that wives may have a greater infuence on fathering than do husbands on mothering.

The father-mother and father-child relationships have been linked less directly in three other studies. In the Scholom et al. (1979) study cited previously, correlations were reported between mother-father temperamental similarity on some dimensions and child adjustment. Johnson and Lobitz (1974) reported a negative correlation between marital satisfaction and parental negativity toward chidren. Finally, Heath (1976) found that fathers rated by themselves, their wives, and their friends as competent fathers were involved in marriages marked by a high degree of marital and sexual satisfaction. The evidence suggests that, whether behavioral observations or self-report measures are utilized, links between the father-mother and father-infant relationship emerge.

The Mother-Infant Relationship

A family systems perspective also implies that the mother-infant and father-infant relationships influence each other. As a consequence, an understanding of

differences in father-infant relationships requires an understanding of differences in the corresponding mother-infant relationships. Pedersen et al. (Note 2) are the only investigators who have reported on specific links between mother-infant and father-infant interaction. They reported a correlation between fathers' expression of negative affect toward the infant and mothers' expressions of negative affect toward the infant in an observational setting with all three family members present.

There have been reports of the "fit" between mothers and fathers, i.e. which types of mothers tend to be married to which types of fathers. Clarke-Stewart (1978) found that fathers who engaged in the most social-physical play were married to mothers who talked and played with objects with their children the most. She suggested that, given her previous findings on optimal maternal care (Clarke-Stewart, 1973), this combination of parenting styles might be optimal.

Belsky (1980) looked at combinations of maternal and paternal sytles in his study of infant exploratory competence. His analysis was concerned with which combinations predicted infant exploratory competence. It did not provide an analysis that could elucidate the links between father-infant and mother-infant relationships. However, his results suggest that certain patterns

of mother-infant and father-infant interaction are likely to be more beneficial to children than others.

Another approach to the link between mother-infant and father-infant relationships has been to assess discrepancies in a) parents' perceptions of infant temperamental characteristics, b) evaluations of their children, c) beliefs about infant abilities, and d) attitudes regarding child-rearing practices (Clarke-Stewart, 1978; Note 1). This approach utilizes differences in parents' cognitions as an index of the differences in their relationship with their infants. Clarke-Stewart found such differences to be negatively correlated with measures of infant competence. Pedersen et al. (Note 1) reported a correlation between discrepancies in parents' perceptions of infant temperament and mothers' negative affect toward their infants. Discrepancy scores may reflect differences between parents in information, attitudes, values, and sensitivities (Note 1). In addition to providing an index of concordance between the parent-infant relationships, such scores may also serve as indices harmony and agreement in the marital relationship. Feldman (cited in Parke et al., 1979) found a correlation between marital satisfaction and parents' concordance on child-rearing attitudes.

In summary, there is conceptual justification for linking the two parent-infant relationships. Whether

the link is through modelling, as suggested by Parke and Sawin (1980) is not clear. Pedersen et al. (Note 3) have suggested that those relationships may be related to one another in a complementary or, in some instances, compensatory fashion.

Summary: Individual Differences in the Father-Infant Relationship

Although the data are limited, it appears that fathers do differ from one another in the amount of time they spend with their infants, the types of activities in which they engage with their infants, their attitudes and beliefs, and the quantity and quality of their interactions with their infants. There is some correlational evidence consistent with a belief that these differences influence the cognitive and social develpment of infants.

Fathers are likely to differ from one another as a function of a number of factors. First, characteristics of the infant and characteristics of the father and the "fit" between those characteristics influence the development of the father-infant relationship. Second, the father-mother relationship and the mother-infant relationship affect the father-infant relationship. Finally, the larger context in which the family interacts, is likely to influence the organization and development of the father-infant relationship.

Limitations of Past Research

Russell (1978) remarked that there has been little study made of critical factors associated with whether and how fathers interact with their children. The range of father-infant relationships and the determinants of father-infant relationships have not been studied in a systematic or sustained manner. As a result, the conclusions reached in the present review must be regarded as working hypotheses at the present stage of research in this area. In addition to there being a paucity of studies of individual differences in the father-infant relationship, those studies that have been reported have been characterized as "long on variables and short on subjects" (Pedersen, 1980b, p. 147). As a result, what little data are available must be viewed cautiously.

Part of the problem in this area is the lack of past theory and research to guide in the formulation of research questions. Significant determinants of individual differences have not been clearly identified. As a result, a large number of exploratory questions have been asked of a very small number of fathers. Very few studies (Field, 1978; Russell, 1978; Spelke et al., 1973) have utilized *a priori* groupings of fathers. With no rationale for selecting subjects dictated by theory or research, it becomes difficult to recruit substantial numbers of subjects who vary significantly on relevant,

meaningful dimensions.

The Present Study

Significance

The present study was an exploratory attempt to identify characteristics of fathers, infants, marital relationships, and mother-infant relationships that contribute to the variance in a) the degree to which fathers are involved in infant caregiving activities, b) the quantity of observed father-infant interaction, and c) the quality of observed father-infant interaction. A range of variables were utilized in an attempt to describe fathers more thoroughly than previous studies have done. A number of these variables, which have been directly or tangentially related to father-infant interaction in previous research, were measured using self-report instruments. Another goal of this study was to identify self-report measures predictive of variations in father-infant interaction. Instruments so identified can be utilized in future research as a means of sorting and classifying potential subjects. Such sorting procedures increase the likelihood that subjects chosen for studies will vary significantly in areas relevant to the father-infant relationship. This is the type of approach Pedersen (1980a) has proposed with reference to sex-role orientation inventories.

Variables

Behavioral Measures. A time sampling procedure was utilized to measure specific parent behaviors in a home observation. Parent behaviors measured included those identified as related to infant outcome in previous studies of parent-infant interaction (Belsky, 1979a; Clarke-Stewart, 1978; Yarrow, Rubinstein, and Pedersen, 1975; Yarrow, Rubinstein, Pedersen, and Jankowski, 1972).

The quality of parent-infant interaction was also rated utilizing scales devised by Ainsworth and her colleagues (Ainsworth, Bell, and Stayton, 1971). The dimensions rated have been utilized to predict infant outcome, particularly the quality of infant-to-parent attachment.

Self-Report Measures. From the preceding review of the literature a number of self-report variables were identified that bear a relationship to the father-infant relationship. The following variables were measured through parents' reports:

1) parents' perceptions of infant temperament
2) fathers' temperament
3) fathers' sex-role orientation
4) parents' marital satisfaction
5) fathers' involvement in caregiving activities.

An additional variable, sex of infant, was also utilized.

Hypotheses

In general, it was hypothesized that a) fathers' involvement in caregiving activities, b) the quantity of observed father-infant interaction, and c) the quality of observed father-infant interaction would be significantly correlated with measures of characteristics of a) the father, b) the infant, c) the father-mother relationship, and c) the mother-infant relationship. Specific hypotheses were as follows:

Infant Characteristics.

1. Infant sex will be significantly associated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

2. Measures of infant temperamental "difficulty" will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

Father Characteristics.

3. Measures of fathers' sex-role orientation (masculinity and femininity) will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction and c) quality of father-infant interaction.

4. Measures of fathers' temperamental characteristics (activity, impulsivity, sociability, and emotionality) will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

5. Measures of fathers' level of involvement in caregiving will be significantly correlated with measures of a) quantity of father-infant interaction, and b) quality of father-infant interaction.

The Father-Mother Relationship.

6. Measures of fathers' marital satisfaction will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

7. Measures of mothers' marital satisfaction will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

8. Measures of the discrepancy between mothers' and fathers' perceptions of infant temperamental characteristics will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

9. Measures of the temperamental similarity between mothers and fathers will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction and c) quality of father-infant interaction.

Mother-Infant Interaction.

10. Measures of the quantity and quality of mother-infant interaction will be significantly correlated with measures of a) fathers' involvement in caregiving, b) quantity of father-infant interaction, and c) quality of father-infant interaction.

METHOD

Subjects

Subjects for this study were 25 intact families consisting of mothers, fathers, and first-born four-month-old infants. They were recruited by requesting obstetricians and instructors of childbirth preparation classes in the greater Lansing, Michigan area to distribute letters explaining the study and requesting participation of couples in the last trimester of the wives' first pregnancy. This study was part of a larger research project examining parental perceptual style and infant psychological development (Stollak and Messé, Note 3). Interested couples volunteered by returning a postcard included in the introductory letter.

The sample was relatively homogenous with respect to demographic variables. The mean age of fathers was 27.03 years (S.D. = 3.12); mothers' average age was 25.87 years (S.D. = 3.21). These couples had been married an average of 3.5 years at the time their first child was born (S.D. = 1.75 years). The mean years of education for fathers was 15.24 (S.D. = 2.01) while for mothers the mean was 15.14 years (S.D. = 1.96). Approximately 55 percent of the subjects identified themselves as

Protestant. Twelve percent were Catholic, 2 percent were Jewish and 15 percent ascribed to some other religion. Sixteen percent indicated no religious affiliation.

A wide range of occupations were represented among the working mothers and fathers in the sample. Over half of the working mothers held white collar and professional positions. The same held true for the employed fathers. In general, this sample was middle-class, well educated and had at least one member of the family engaged in a relatively high-status occupation.

Only seven of the twenty-five families had mothers who stayed home full time to care for the infant. In two families the father stayed home full-time. The remaining 16 families utilized some supplemental care arrangement. In those families, the mother was viewed as the primary caregiver when the child was not with the supplemental caregiver.

Instruments and Observational Data

Data were obtained from parents' completion of six instruments and from two one-hour home observations. Instruments used were as follows:

Bem Sex Role Inventory (BSRI)

The Bem Sex Role Inventory treats masculinity and femininity as two separate dimensions rather than as a

bipolar continuum (Bem, 1974). Respondents can characterize themselves as masculine and/or feminine by endorsement of masculine and feminine personality traits. The scale consists of 60 adjectives (20 masculine, 20 feminine, and 20 neutral). The scale has been found to be internally consistent (Bem, 1974) and predictive of conceptually related behaviors (Bem, 1975; Bem and Lenny, 1976; Bem et al., 1976).

Parent Participation Inventory (PPI)

The Parent Participation Inventory is a 17 item questionnaire designed by Peshkess (1980) to assess each parent's participation in housekeeping tasks and infant caregiving activities. A subset consisting of those ten items on the instrument pertaining specifically to infant caregiving was utilized. Respondents indicate whether caregiving tasks are handled by one or the other spouse completely or mostly, or shared equally. For the present study the inventory was scored such that a high score indicates a high degree of father involvement in caregiving activities. The father score was the average of each parent's independent completion of the instrument. The agreement between spouses regarding fathers participation was determined by calculating the correlation between fathers' scores and mothers' scores. That correlation was equal to .69. A copy of this instrument can

be found in Appendix A.

Temperament Scale-
Erman (TS-E)

The Temperament Scale-Erman is an 80 item forced-choice, true-false questionnaire yielding scores on four adult temperamental characteristics, activity, emotionality, sociability, and impulsivity (Erman, 1977). The individual scales have demonstrated adequate discriminant validity, criterion validity, and internal reliability (Erman, 1977). Each spouse was given a score for each of the four dimensions, with a high score indicating greater endorsement of a characteristic. In addition, the temperamental similarity between each couple was calculated. The sum of the absolute value of the differences between spouses on each scale was used as an index of dissimilarity (cf. Scholom et al., 1979).

Michigan Infant
Temperament Scale (MITS)

The Michigan Infant Temperament Scale is 136 item, forced-choice, true-false questionnaire (Bonem, 1978). It yields scores on eight dimensions, 1) activity, 2) adaptability, 3) intensity, 4) threshhold, 5) mood, 6) approach, 7) distractability, and 8) rhythmicity. All scales show adequate discriminant validity, temporal stability, inter-observer agreement, and internal consistency (Bonem, 1978). The average of parents' independent

characterizations of the infants on the adaptability, mood, and rhythmicity scales was calculated. Thomas, Chess, and Birch (1968) identified low adaptability, negative mood, and low rhythmicity as characteristics of "difficult" children. The sum of the average of the fathers and mothers scores on these three scales was utilized as an index of infant "difficulty." A low score indicates a more difficult child. The interobeseive agreement for that difficulty scale, i.e. the correlation between mothers scores and fathers was .45.

The Locke-Wallace Marital Scale (L-W)

The Short Form of the Locke-Wallace Marital Scale provides a measure of marital adjustment and satisfaction. The scale consists of 15 items descriptive of various aspects of the marital relationship. A high score indicates a higher level of satisfaction. Locke and Wallace (1959) reported a split-half reliability of .90 and adequate criterion validity for this instrument.

Demographic Questionnaire

Each participant completed a questionnaire providing information regarding age, level of education, current occupation, years in occupation, income and years married. (See Appendix B).

Observational Data

Two types of data were available from home observations of parent-infant interaction. The first consisted of ratings of each parent on three qualitative dimensions used in previous research by Ainsworth and her colleagues (Ainsworth, Bell, and Stayton, 1971). Those dimensions are 1) sensitivity--insensitivity, 2) acceptance--rejection and 3) accessibility--ignoring/neglecting. A fourth dimension used by Ainsworth, cooperation--interference, was viewed as inappropriate for use with four-month-olds due to their limited mobility and lack of clear evidence for intentionality.

The second type of data consists of time-sampling of a number of parent behaviors. Behaviors recorded at 15 second intervals were: 1) tender and careful holding, 2) playful holding, 3) inept holding, 4) instrumental holding, 5) parent within hearing distance, 6) spontaneous verbalization, 7) responsive vocalization, 8) negative verbalization, 9) positive affect, 10) negative affect, 11) social-physical play, 12) object mediated play. Descriptions of these categories and training manual are found in Appendix C.

Scores for parent behaviors to be computed were 1) number of 15 second intervals in which each parent was verbally or physically accessible to the infant, and 2) percentage of accessible segments in which each

behavior occurs.

Reliability. Observers were four advanced undergraduate women. They were trained using the manuals found in Appendix C and that developed by Ainsworth et al. for use with their rating scales. Observers then rated videotaped segments of parents' interactions with infants ranging in age from three to twelve months. Training continued until a 90 percent index of agreement was reached on rating scales and coding of behaviors. Observers were blind to the hypotheses of this study.

Procedures

Since this study is a part of a much larger project, many of the other procedures experienced by the couple are not directly relevant to the present investigation. However, the entire range of procedures will be described very briefly. (Descriptions of other parts of the project can be found in Stollak and Messé, Note 3; Peshkess, 1980; and Watts, 1980).

Couples who returned a postcard indicating a willingness to participate in the study were given an appointment time during the third trimester of pregnancy. At the time of the appointment, they came to the university, viewed a videotape, filled out a series of questionnaires and were interviewed. Each person was then given a separate packet of questionnaires to be completed

independently at home. The couple was interviewed a second time, this time at home. Questionnaire packets were collected at that time. At the second interview couples were paid $60 for their participation. They were given a stamped, addressed postcard to return when their child was born. The card indicated the name, birthdate, and sex of the child.

Approximately three and one half months following the birth of their infant, each couple was recontacted by telephone. Two one-hour observations were scheduled at that time. They were scheduled at a time when all family members were expected to be home and awake. Each spouse was mailed a packet of questionnaires to be completed independently. This packet included all of the instruments used in the present investigation. The packets were picked up at the time of the first observation session. Following the second visit, couples were paid $25 for their participation.

During each observation period, one observer was present and an audiotape recorder was operating. The same observer was present at both of the observation periods for a particular family. Parents were instructed to go about their daily routine. Observers attempted to be as unobtrusive and uninvolved as possible.

RESULTS

Preliminary Analyses

Data Reducation

A large number of variables relative to sample size were utilized in this study. Three behavioral ratings and twelve behavioral categories were coded at two different observation periods. Various data reduction strategies were utilized in order to reduce the number of variables to more manageable proportions. (Descriptive statistics for all predictor and criterion variables are contained in Appendix D.)

Ratings. Table 1 illustrates the intercorrelations among the three rating dimensions for fathers and mothers. The average intercorrelation for fathers' ratings was .94. The average for mothers was .80. It appears that parents tended to be perceived by raters as high on all dimensions if they were high on any dimension. This was particularly true for fathers. Consequently, a global rating scale was derived using the mean of the ratings on each scale.

Observation Periods. The collapsing of rating scales left twelve behaviors and one rating measure for each parent sampled at two points in time, one week apart. A *t* test for the global rating and the twelve behaviors

Table 1

Intercorrelations Among Rating Scales

	Fathers		
	Sens.	Accp.	Accs.
Sensitivity	1.00	.93	.97
Acceptance		1.00	.93
Accessibility			1.00

	Mothers		
	Sens.	Accp.	Accs.
Sensitivity	1.00	.97	.73
Acceptance		1.00	.88
Accessibility			1.00

for fathers and mothers was utilized to determine if there were significant mean differences from one observation period to the next. None of the variables, for fathers or mothers, differed significantly from one time to the next ($p < .05$). The mean of the two samplings for each of the thirteen variables for fathers and for mothers was utilized for the subsequent analyses.

Stability of behavioral measures. Table 2 shows the correlation between the variables at the first and second observation periods. These correlations are an index of the stability of the behaviors and ratings over a one week period. The average correlation between time one and time two was .42 for fathers and .45 for mothers.

Reduction of behavioral variables. Table 3 presents the intercorrelations among the father behaviors and ratings. Table 4 illustrates the same information for mothers. An attempt was made to reduce each of these matrices through principle components analysis. However, no solution was found that met the criteria of a) significant reduction in number of variables, b) simple structure and c) meaningfulness.

In lieu of reduction of variables into factors, an attempt was made to derive scales from the twelve behavioral dimensions. A preliminary inspection of the intercorrelations in the matrix of father behaviors and mother behaviors suggested that if one excludes the

Table 2

Stability of Behaviors and Ratings
Across Observations

	Father	Mother
Global rating	.76*	.51*
Tender holding	.33	.75*
Playful holding	.52*	.24
Inept holding	.06	-.05
Instrumental holding	.26	.57*
Within hearing distance	.64*	.34
Spontaneous vocalization	.54*	.77*
Responsive vocalizations	.62*	.54*
Negative vocalizations	.61*	.12
Positive affect	.53*	.74*
Negative affect	-.12	.12
Social-physical play	.14	.74*
Object-mediated play	.16	.49*

*$p < .05$

Table 3

Intercorrelations Among Father Behaviors and Rating

	Rating	Ten.	Play	Inept	Inst.	Within Hearing	Spon voc	Resp voc	Neg. Voc.	Pos. aff.	Neg. aff.	Soc. play	Obj. play
Global rating	1.00	.33	.19	-.09	.21	.73*	.37	.52*	-.03	.40*	-.30	-.03	-.07
Tender holding		1.00	.21	-.07	-.01	.10	.36	.54*	.09	.25	.15	-.06	.29
Playful holding			1.00	.16	-.04	-.03	.64*	.28	.28	.53*	.08	.72*	.35
Inept holding				1.00	-.03	-.32	.07	-.05	-.05	-.16	.07	.17	.22
Instrumental holding					1.00	.25	.01	.13	.03	.05	-.16	-.17	.04
Within hearing distance						1.00	-.01	.26	-.05	.07	-.42*	-.13	-.13
Spontaneous voc.							1.00	.39	.33	.80*	.32	.39	.42*
Responsive voc.								1.00	.05	.63*	-.08	-.02	.10
Negative voc.									1.00	.36	.75*	.02	-.26
Positive affect										1.00	.29	.20	.08
Negative affect											1.00	-.01	-.22
Soc-Phy. play												1.00	.39
Obj.Med. play													1.00

*p <.05
r >.39

Table 4

Intercorrelations Among Mother Behaviors and Rating

	Rating	Ten.	Play	Inept	Inst.	Within Hearing	Spon. voc.	Resp voc.	Neg. Voc.	Pos. aff.	Neg. aff.	Soc. play	Obj. play
Global rating	1.00	.22	.30	-.19	-.12	.29	.17	.11	-.56*	.18	-.35	-.51*	-.08
Tender holding		1.00	-.03	-.15	-.35	-.20	.18	.36	-.10	.24	-.29	-.05	-.05
Playful holding			1.00	-.09	-.22	.10	-.05	-.23	-.24	-.07	.15	.08	-.03
Inept holding				1.00	-.20	.17	-.27	-.07	.51*	-.29	.38	-.18	.11
Instrumental holding					1.00	-.12	.59*	-.06	0.02	.53*	-.06	.09	.17
Within hearing distance						1.00	-.31	-.17	-.17	-.34	.24	-.62*	.31
Spontaneous voc.							1.00	.20	-.01	.96*	-.18	.09	.04
Responsive voc.								1.00	.07	.43*	-.16	.02	.01
Negative voc.									1.00	.02	.58*	.22	.07
Positive affect										1.00	-.22	.13	.07
Negative affect											1.00	-.03	.08
Soc-Phys play												1.00	.20
Obj.-Med. play													1.00

*p <.05

categories a) inept holding, b) negative affect, c) negative vocalization and d) time within hearing distance, the remaining variables were highly intercorrelated. Two scales for each parent, Positive Behavior and Negative Behavior were formed. Table 5 lists the composition and alpha coefficients for each of these scales. Positive paternal behavior scores correlated .45 with global ratings of fathers on sensitivity, acceptance, and accessibility. Negative maternal behavior scores correlated -.49 with global ratings. Negative paternal behaviors and positive maternal behavior did not correlate significantly with global ratings.

Correlational Analyses

Zero-order correlational analyses

Subsequent to data reduction, three dependent variables remained; father participation in caregiving, positive paternal behavior and negative paternal behavior. These were to be predicted by two variables pertaining to infant characteristics, six pertaining to father characteristics, five pertaining to marital characteristics, positive maternal behavior and negative maternal behavior. The Pearson Product moment correlation between the three criterion variables and the fifteen predictor variables are listed in Table 6. That table contains 44 correlation coefficients. (Participation in caregiving is a

Table 5

Scale Composition, Alpha Coefficients, Temporal Stability

Scale Name	Scale Composition	Alpha	Stability
Positive Paternal Behavior	tender holding playful holding spontaneous vocalization responsive vocalization positive affect social-physical play object-mediated play	.78	.42
Negative Paternal Behavior	negative vocalization negative affect	.70	.63
Positive Maternal Behavior	tender holding playful holding instrumental holding spontaneous vocalization responsive vocalization positive affect social physical play object mediated play	.64	.63
Negative Maternal Behavior	inept holding negative vocalization negative affect	.72	.10

Table 6

Zero-Order Correlation Coefficients
(two-tailed)

	Father participation in caregiving	Positive paternal behavior	Negative paternal behavior
Infant characteristics			
sex	.06	-.02	.05
temperamental difficulty	.18	-.36*	-.13
Father characteristics			
masculinity	-.05	.13	.29
feminity	.05	.13	-.30
activity	-.23	.37*	-.03
impulsivity	-.35*	-.16	.13
sociability	.06	.09	-.09
emotionality	-.15	-.09	-.05
part. caregiving	1.00	.17	.09
Marital characteristics			
father satisfaction	-.32	-.35*	-.58**
mother satisfaction	.02	-.31	-.49**
temperamental dissimilarity	-.03	.24	.02
discrepancy in inf. rating	.15	.14	.01
Maternal Behavior			
positive	-.53**	.08	.31
negative	.24	-.18	.07

*p <.10

**p <.05

predictor in two sets of correlations and a criterion in the third. Only three of those reach significance with alpha set at .05. Three significant findings are about what one could expect on the basis of chance fluctuations in the data utilized in the computation of 44 correlation coefficients. Those relationships that were statistically significant are a) negative correlation between fathers' marital satisfaction and negative paternal behavior, b) a negative correlation between mothers' marital satisfaction and negative paternal behavior and c) a negative correlation between positive maternal behavior and fathers' participation in care-giving.

Multiple Regression Analyses

Preliminary. Stepwise multiple regression analyses were performed to see if any cluster of variables would account for a significantly greater degree of variance in the criterion variables than would individual predictor variables. In order to avoid the capitalization on chance that would result from entering all fifteen predictors into an equation for each of the criterion variables, a preliminary series of multiple regressions were performed. For each criterion variables four regression equations were calculated. For those regressions, the predictors were grouped into 1) infant characteristics, 2) father characteristics, 3) marital characteristics

and 4) maternal behavior. A separate forward stepwise regression analysis was done to predict each of the criterion variables from each of the four categories of predictors. Variables were entered into the equations empirically. In order to be retained for subsequent analyses, variables had to a) enter their respective equations at a significance level less than .10 and b) be preceded in their entry into the equation only by predictors entering at the .10 alpha level.

Using the above criteria, father impulsivity and positive maternal behavior were extracted as predictors of father participation in caregiving. Positive paternal behavior was predicted by a) infant temperamental difficulty, b) fathers' activity and c) fathers' marital satisfaction. Finally negative paternal behavior was predicted only by fathers' marital satisfaction.

Final regression analyses. Regression analyses for three criterion variables are illustrated in Table 7. As the table indicates, positive mother behavior and fathers' impulsivity account for 34 percent of the variance in fathers' participation in caregiving ($p < .05$). Thirty-four percent of the variance in positive father behavior is accounted for by fathers' activity, fathers' marital satisfaction and infant temperamental difficulty. Though the overall F test for this equation is significant at the .05 level, none of these variables entered

Table 7

Regression Summary Table

Dependent Variable	Step	Variable Entered	F to Enter	Signifi-cance	Multiple R	R Square	R Square Change	Simple R	Overall F	Signifi-cance
Father participation in care-giving	1	Pos. maternal beh.	8.78	.007	.53	.28	.28	-.53	8.78	.007
	2	Father impulsivity	2.23	.150	.59	.34	.06	-.35	5.74	.010
Positive paternal behavior	1	Father actuity	3.71	.066	.37	.14	.14	-.37	3.71	.066
	2	Father marital satisfaction	3.73	.066	.51	.26	.12	-.35	3.94	.034
	3	Infant temp.difficulty	2.33	.142	.58	.34	.07	-.36	3.56	.032
Negative paternal behavior	1	Fathers' marital satisfaction	11.89	.002	.58	.34	.34	-.58	11.89	.002

into the equation with a probability less than .05. Finally, fathers' marital satisfaction accounts for 34 percent of the variance in negative paternal behavior ($p < .05$). No other variable made a significant independent contribution to the prediction of scores on this dimension.

DISCUSSION

The Sample

One of the purposes of this research was to identify those characteristics of infants, fathers, father-mother relationships, and mother-infant interaction which might predict variations in the degree to which fathers participate in the day-to-day care of infants, and variations in the behavior of fathers in interaction with their infants. Unfortunately, a relatively small, homogenous sample of families participated in the study. Thus, there was a limited amount of variation in either the predictor variables or criterion measures.

The sample was well educated, white, and almost entirely middle class. Both parents were in their mid-to-late-twenties. Most had been married for over three years at the time of their infants' birth. All but one of the 50 adults in the sample had completed high school; 40 of the remaining 49 had at least two years of college education. The sample may have been atypical in the number of mothers who planned to stay home and care for the children full time (28 percent). The majority of mothers were continuing to work and using some degree of supplemental care.

The homogeneity of the sample with regard to

demographic characteristics was also reflected in responses to the predictor measures. While normative data are not available as a point of comparison with the present sample, the mean responses on the measures used can be compared to the possible range of responses. On this basis, the sample can be described as one in which both parents are quite satisfied with their marriage, parents tend to agree with each other regarding the characterization of their infants temperament and they tend to be temperamentally similar to each other. Fathers, while not generally primary caregivers, were highly involved in the care of their infants. They seem to share considerably more of the responsibility for the care of infants than do the fathers in Clarke-Stewart's (1978), Kotelchuck's (1976), or Pedersen and Robson's (1969) samples. Finally, the infants in this sample tended to be high on dimensions of adaptability, rhythmicity, and mood. In short their parents appeared to be finding them relatively easy to care for.

In summary, the small number of subjects and their homogeneity on a variety of dimensions is relevant in two ways. First, the homogeneity of the sample is likely to have decreased the variance of all variables, thereby attenuating the possible range of regression coefficients. Secondly, the homogeneity of the sample limits the degree to which results are generalizable.

Parent Behavior Scales

The pattern of intercorrelations among paternal behavior categories and among maternal behavior categories (Tables 3 and 4) suggests that there are strong relationships among the specific behaviors sampled. The fact that these relationships could not be captured through factor analytic solutions may be much more a function of sample size than of the manner in which parental behavior is organized. In the present sample it appears that when fathers held their babies frequently, they also talked to them frequently. When they talked to them frequently, they tended to play with them frequently. Mothers who held babies frequently tended to verbalize frequently. Thus, it may be that activity level, as indexed by the combined frequencies of the behaviors sampled, is an accurate means of portraying the observational data.

However, there was reason to view a subset of the behaviors in isolation from the remaining categories. Conceptually, the variables a) inept holding, b) negative vocalizations and c) expressions of negative affect differ from the remaining categories of behavior. On the basis of Ainsworth's descriptions of the sensitivity, acceptance, and accessibility rating scales, one would expect negative correlations between parents' ratings and the frequency of inept holding, negative affect and

negative vocalizations and positive correlations between the ratings and frequencies of the remaining behaviors. This expectation was supported for the relationships between ratings and verbalization categories for fathers and between ratings and negative vocalizations for mothers. However, the most striking difference between this particular subset of variables (negative affect, negative vocalization, and inept holding) and the remaining behaviors was their relative infrequency. For fathers, the mean frequency of each of these categories was less than .4 percent. Thus, fathers displayed these behaviors in less than one-half of 1 percent of the fifteen second periods in which they were within proximal or distal contact of the infant. The modal frequency was zero. For mothers, the mean frequency of negative vocalizations was 1.5 percent and the mean frequency for the remaining two behaviors was less than 1 percent. Zero was the modal frequencies for mothers in these three categories. In short, these behaviors were rarely observed in those parents who did display them; never observed in most parents.

The conceptual relationship between inept holdings, negative affect, and negative vocalization and their relatively low frequencies led to their isolation from the remaining nine behavioral categories for the purpose of scale construction. The subset of each of those

groupings within father behavior and within mother behaviors yielding the highest alpha coefficient were retained as criterion variables. Their labelling as positive behavior and negative behavior is not without justification; nor is it without qualification. One would expect negative outcome for infants exposed to a high level of the negative behaviors from mothers (Ainsworth, et al.. 1971). If similar processes operate for father-infant relationships, then one would expect the same relationship to hold. However, there are currently no data available regarding those paternal behaviors predictive of secure attachment in the Ainsworth paradigm.

With regard to the positive scales, their labelling as positive is more tentative. They reflect positive behavior in the sense of demonstrating a high involvement of parents with infants. However, there are insufficient data available regarding a) whether there is a differential impact of those behaviors on child development relative to gender of parent and infant and whether b) there may be some curvilinear relationship between child outcome and parents engaging in these behaviors designated as positive. Thus, the labels are not applied out of an empirically supported position regarding the desirability of these behaviors for optimal child development. These behaviors are not grouped together because

they are all known to be "good" for babies. However, one can hypothesize that they are "good" for babies: for fathers, they correlate significantly with ratings on accessibility, acceptance, and sensitivity, and they are behaviors that are aesthetically pleasing. Thus, they are designated positive for the present investigation.

Predicting Individual Differences in the Behavior of Fathers

Before discussing the implications of the results of this study for the hypotheses under consideration, two points merit some attention. First, only three of 44 simple correlations between predictor variables and criterion variables reached significance at the .05 level. While the significant correlations will be discussed as if they provide support for hypotheses, it is important to bear in mind that these significant correlations may simply reflect the chance fluctuations in a large number of measurements made of a small, homogeneous group of subjects.

Secondly, correlational analysis utilizing a sample size of 25 does not constitute a rigorous test of the null hypothesis. Thus, in those instances where the research hypotheses were not supported, one cannot assume that the null hypothesis has received empirical support. With a small sample, restricted range of measurements, and

resulting attenuation of correlation coefficients, the significance test for r carries an unacceptably high probability of Type II error.

With those two limitations on the interpretation of the present results in mind, the implications of the findings for the hypotheses will be presented.

Fathers' Participation in Caregiving

The best predictor of the extent to which fathers participated in caregiving tasks was the behavior of the mother in relation to the infant. A negative correlation between father participation and positive maternal behavior accounted for 27 percent of the variance in father participation. In families where fathers were the most involved in caregiving, mothers showed the lowest frequency of positive behaviors.

There are a number of possible interpretations for this relationship. First, it may be that within the observation periods, high participating fathers were actively involved with their infants, thereby leaving less opportunity or necessity for mothers to interact. However, the lack of significant correlations between fathers' behavioral frequencies and participation score suggest that this was not the case, at least within the observation period. However, a high level of participation from fathers may establish a pattern whereby mothers'

overall involvement is lessened, as a result of their expectation that fathers will share some of the responsibilities. In this case, the direction of effects is from father to mother, with fathers' level of involvement acting to decrease the frequency of mothers' interactions with infants.

The direction of effects may be the reverse; it may be the frequency of mothers' interactions influences the degree to which fathers participate in caregiving. Mothers who are less active may allow, encourage, and/or expect more participation from husbands. Fathers who perceive lower involvement on the part of their spouses may take a more active role in order to "fill in the gaps." Again, because the relationship is between overall reported participation of fathers and observed behavior of mothers, these interpretations suggest that the effects of involvement occur as a result of the pattern set up between the parents over time. It is not simply due to the fact that there is a finite number of 15 second categories in which parents could emit codable behaviors, with one parent becoming involved as the other becomes uninvolved.

A second variable, fathers' impulsivity, was negatively correlated with participation scores and accounted for an additional seven percent of the variance in the participation scores. However, the significance

level of this relationship, with the effects of positive maternal behavior partialled out, did not reach the .05 criterion.

In summary, neither of the infant characteristic (sex, temperamental difficulty), none of the father characteristics (masculinity, femininity, activity, impulsivity, sociability, or emotionality) and none of the marital characteristics (satisfaction, discrepancy scores) predicted the degree to which fathers would engage in caregiving activities. The only hypothesis to receive support was that predicting a relationship between maternal behavior and father participation.

The failure to find a relationship between participation in caregiving and scores on the Bem Sex Role Inventory is inconsistent with Russell's (1978) report of mean differences between androgynous, feminine, and masculine fathers in participation in child care activities. There are several differences between Russell's study and the present investigation that may account for the differences. First, Russell utilized a larger and more diverse sample. Secondly, the children in Russell's sample were not limited to infant age but ranged from infancy through approximately twelve years of age. Differences between fathers may emerge more strongly later in the life span of the child or father. Finally,

Russell's larger sample allowed for an analysis of group differences. The present investigation was limited to tests of the strength of association between masculinity and femininity scores and the participation index. Bem's (1974) procedure for determining the predominant sex-role orientation results in a range of androgyny scores that are classified as undifferentiated. Thus, groupings on the basis of masculine, feminine, and androgynous, exclude segments of the population who are not clearly a) high on both masculinity and femininity or b) significantly different in their masculinity and femininity scores. The sample for the present study contained ten masculine fathers, six androgynous fathers, three feminine fathers and six undifferentiated fathers. This breakdown does not permit testing of mean differences between groups.

Positive paternal behavior

None of the correlations between predictor measures and frequency of positive parental behavioral reached significance at the .05 level. Several approached the .05 level. Infant temperamental difficulty ($r = .36$), fathers' activity score ($r = .37$) and fathers' marital satisfaction ($r = -.35$) were correlated with frequency of positive paternal behavior with a probability less than .10. Whle these three variables in combination account for 34 percent of the variance in frequency of

positive paternal behavior, the fact that none enter the regression equation at a significance level less than .05 suggests that they must, for the present, be regarded as chance findings. In summary, the present study does not support hypotheses that frequency of positive paternal behavior can be predicted by a) infant characteristics, b) father characteristics, c) marital relationship characteristics or d) maternal behavior.

Belsky's (1979a) report of a significant correlation between marital harmony and frequency of parenting activities was not corroborated in the present study. Belsky observed spousal behaviors and inferred harmony from those; the present investigation used self-reports of marital satisfaction, temperamental similarity scores and differences in the perception of infant temperamental characteristics as indices of harmony. What Belsky reported, in essence, was concordance in the behavior of spouses toward one another and toward their infants within a specific observation period. The self-report measures utilized in the present study may reflect a more global view of the marriage. To the extent that global harmony is reflected in behavior, differences may not become manifest in relatively short periods of time in the presence of an observing stranger.

Negative Paternal Behavior

As mentioned previously, the frequency of negative paternal behaviors was very low ($\bar{X}$ = .272; S.D. = .56). The very low frequency of such behaviors may account for the extreme deviation from normality observed in the distribution of negative paternal behavior scores for the sample (Kurtosis = 8.79; Skewness = 2.98). The distribution of this variable was dramatically different from that of any of the predictor variables. Regression coefficients may be calculated for data that are not normally distributed. However, the possible range of coefficients is restricted to the extent that distributions of a criterion differ from distribution of predictors (Carroll, 1961). One outcome of this phenomenon is that fewer significant correlations than expected may result from analyses of such variables. Thus, statistical considerations may account for the finding of so few significant correlation between predictors and negative paternal behaviors.

Both parents' marital satisfaction scores were significantly and negatively correlated with the frequency of negative paternal behavior (fathers' r = -.58; mothers' r = -.49). Because of the correlation between mothers' and fathers' marital satisfaction (r = .42), mothers' satisfaction score did not account for a significant amount of variance in frequency of negative paternal

behavior beyond that accounted for by fathers' marital satisfaction (r^2 = .34). This finding suggests that fathers who are most satisfied with their relationship with their spouses are likely to be married to women who are in turn satisfied with their relationships with their husbands. These fathers are also least likely to express negative affect or to verbally prohibit the baby's activities. It would appear that men satisfied with their marriages are also satisfied with their infants. This finding is consistent with that of Pedersen et al. (Note 2) who reported a relationship between expressions of negative affect between parents and between each parent and the infant. Significant correlations between marital variables and parenting behaviors provide support for the type of family systems analysis advocated by Belsky (1980), Parke et al. (1979) and Pedersen (1980b).

The present study did not find a significant correlation between a) infant characteristic (sex and temperamental difficulty), b) fathers' masculinity, femininity and temperament scores, c) discrepancy in parents' ratings of infants, d) parents' temperamental similarity or e) maternal behaviors and negative paternal behavior. Thus, there was little overall support for the ten hypotheses of this study.

Limitations of the Present Study

Perhaps the greatest weakness of the present investigation has already been alluded to. The sample was small, the range on many of the measures, especially predictors, was narrow, and therefore only the most potent of relationships are likely to appear at a statistically significant level. In short, subjects were too few and too similar.

Methodological limitations

The most prominent methodological weakness of this study lies in the lack of reliability data for the observational measures. While an initially high level of reliability was obtained (.90), it is not clear how much "drift" in raters away from that level of agreement may have occurred in the year in which data collection took place. While the decision not to place two raters in homes because of the potentially inhibiting effects of two observers on parents is valid, it may have been useful to recruit a small number of families who could have been observed as checks on reliability but who were not included in the study.

In part, the reason for questioning reliabilities stems from the observation that the intercorrelation patterns between father ratings and behaviors differed from the intercorrelation pattern for mother ratings and

behavior. This occurred in spite of the fact the identical behavioral definitions of sensitivity, acceptance, and accessibility were utilized during training of raters. It appears that fathers were rated on the basis of observed, positive behaviors in accordance with the training instructions. However, for mothers, frequency of negative vocalizations and social physical play earned lower ratings. Different criteria were applied to mothers. One way of interpreting the data on mothers is that mothers were "innocent until proven guilty," i.e. mothers were rated high unless they demonstrated negative behaviors. Fathers, on the other hand, had to demonstrate positive behavior to be rated highly. This analysis does not speak directly to the reliability of behavioral measures. It does suggest that mothers' behavior may have been perceived differently from fathers'. In that case, there is reason to suspect that the coding of behaviors may have been similarly influenced. Attention to this possibility in training procedures and in subsequent reliability checks seems warranted.

Conceptual Limitations

Many of the hypotheses of the present study rely on a trait approach to parenting behavior. An underlying assumption was that infants, fathers, and mothers bring differences in stable traits to the parenting situation and that these traits directly influence behavior. Bem

and Allen (1974) have shown the utility of considering traits in interaction with situations and subjects' conceptions of the stability and relevance of traits as predictors of human behavior.

While infants' sex and temperament and fathers' masculinity, femininity and temperament may be traits that influence father-infant interaction, the influence may be less direct than the present investigation assumed. For example, sex of infant has been reported to influence the behavior of fathers (Clarke-Stewart, 1978; Kotelchuck, 1976; Lamb, 1977a). Fagot (1974) has also reported that fathers see their role as providing a model for sons, more so than for daughters. If one takes the type of cognitive-mediational perspective recommended by Parke (Parke, 1979; Parke et al., 1979) an hypothesis is suggested, namely that those fathers who perceive their role as providing a role model for sons are likely to differ from fathers who do not share such a perception. Moreover, such fathers are likely to account for more of the mean difference betweeen behavior of fathers and mothers. To further complicate matters, fathers may differ in their beliefs about where and how sex-role socialization should take place. Fathers may differ in regard to the age at which such concerns become manifest and in what types of situations in which they see socialization practices as relevant.

In summary, the kinds of traits used as predictors in this study may well influence the behavior of fathers. However, it is likely that more information is needed before the nature of these relationships become clear. How fathers see their role, how they see their own characteristics interacting with their role as fathers, and how mothers see their husbands' characteristics interacting with parenting skills are the kinds of questions that would help spell out the relationship between the traits and behavior of fathers. Obviously, such an approach generates far more information than can be appropriately analyzed with samples as small as the one used in the present study.

Implications for Future Research

The preceding discussion of the limitations of the present study suggests directions for future research aimed at identifying and predicting variations in the behavior of fathers of infants. In addition to larger samples, it is desirable to insure some heterogeneity in the sample. This is particularly important for the independent variables. As a preliminary screening device instruments could be completed by fathers. If one were interested in sex-role orientation, then groups of masculine, feminine and androgynous fathers could be identified. For other types of measures,

fathers falling in the upper and lower quartile on indices under consideration could be retained for further study.

Once a sample of sufficiently different fathers has been identified, couples might be interviewed in enough depth to determine the manner in which such differences might influence behavior. With a sufficient sample size, multivariate methods can be used to predict the manner in which traits, cognition, and situations interact to influence behavior.

The most promising type of measurement to emerge from this present investigation is the Locke-Wallace Scale. While there were few significant findings in this study, marital satisfaction of both parents was significantly correlated with negative paternal behavior ($p < .05$). Fathers' satisfaction was positively correlated with fathers' participation ($p < .15$) and positive paternal behavior ($p < .10$) at levels approaching significance. These were relationships found in a relatively satisfied sample of fathers. Assuming that the present study did not tap into a narrow band of a non-linear relationship, one could expect significant behavioral differences among fathers with divergent levels of marital satisfaction.

The other significant relationship found was between the behavior of mothers and the degree to which fathers

participated in caregiving. This type of finding, in conjunction with the marital satisfaction findings, supports the views of a number of authors (Belsky, 1980; Lewis and Feiring, 1978; Parke et al., 1979; Pedersen, 1980) suggesting that we look to the subsystem characteristics of family systems in order to account for the behavior of family members. If the interest is in predicting differences in the relationship of fathers and infants then it may behoove researchers to look for variations in family patterns in order to account for such differences. This approach is presented as an alternative to looking for traits/cognitions/situations interactions. However, it may well turn out that fathers and mothers bring differences in personality and temperamental traits to marriages. This sets off a series of mutually regulated interactions which carry over into the realm of parenting (of both parents) once an infant is born. The infant makes independent contributions to these ongoing interactions. In any case, future research will need to attend to the manner in which characteristics of individuals within families interact with various relationships in the family to account for significant portions of the variance in the behavior of fathers or any other family member.

Summary

This research attempted to investigate variables associated with variations in a) the degree to which fathers participate in caregiving activities, b) frequency of positive paternal behavior and c) frequency of negative paternal behaviors. The predictors of these variables were grouped into a) infant characteristics, b) father characteristics, c) marital relationship characteristics and d) maternal behavior.

Only three of the simple correlations between predictor and criterion variables proved significant. Given the number of correlations computed these may well be chance findings. Positive maternal behavior was significantly, negatively correlated with fathers' participation in caregiving. Mothers' marital satisfaction and fathers' marital satisfaction were both significantly negatively correlated with negative paternal behavior. These findings were offered as qualified support for a family systems analyses approach to describing and predicting variations in the behavior of fathers of infants.

The lack of significant findings was attributed to a) a small homogeneous sample, b) an oversimplified conceptualization of the relationship between traits and behavior and c) possible unreliability of observational data.

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APPENDIX A

PARENT PARTICIPATION INVENTORY

Appendix A

Parent Participation Inventory*

Now that you have lived together with your child, some of your schedules and your division of labor have become regulated. Please specify which one of you does the following jobs -- mainly yourself, mainly your spouse, or both jointly.

1. Feeding my baby is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

2. Cooking is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

3. Washing and drying the laundry is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

4. Giving water to the baby is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

5. Attending the baby when it starts to cry is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

6. Giving the baby a bath is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

7. Washing the dishes is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

8. Changing diapers is done:

   Mainly by my spouse Mainly by myself Both jointly and about equally

*Items 1, 4, 5, 6, 8, 9, 11, 14, 15 used for Fathers' Participation in Caregiving Score.

9. Playing with the baby is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

10. Emptying the garbage is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

11. Talking to the baby is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

12. Minor household repairs is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

13. Grocery shopping is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

14. Roughhousing with the baby is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

15. Putting the baby to sleep is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

16. Punishing the baby is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

17. General house cleaning is done:

Mainly by my spouse Mainly by myself Both jointly and about equally

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

Appendix B

Name_____Age_____Phone #_____

Address_____

Occupation_____Years in occupation_____

Highest level of education completed (circle one)

Elementary grade:	1	2	3	4	5	6
Junior high school:	7	8	9			
High school:	10	11	12			
College:	1	2	3	Degree Granted		
MA Degree:						
Ph.D. Degree:						

Other Degrees/ Vocational training_____

_____

What is <u>your</u> annual income (not including your spouse's)?

_____

Date of Marriage: _____

APPENDIX C

HOME OBSERVATION MANUAL

Appendix C

Home Observation Manual

The categories for observation are: holding, accessibility, verbalization, expression of affect, play, crying, feeding and variability of stimulation. These each have sub-categories which are as follows:

Holding

tender and careful; playful; inept; instrumental.

Accessibility

within sight; within hearing distance; out of contact.

Verbalization

spontaneous; response to baby's vocalization; negative verbalization.

Expression of Affect

positive; negative

Play

social and physical; via inanimate stimulation

Crying (this is timed in seconds)

time it takes to respond to cry; length of cry

Feeding (timed in seconds)

breat, bottle; solids.

The observations are done by one person who goes into the home at a time when the child is awake and can be observed in his/her normal routine for that time of day (both parents are to be present in the home). The entire observation takes two hours. Two observations are conducted at one week intervals. No assumption is made that the presence of another person in the home will not in some way distort the parent-child interaction. Furthermore, no assumption is made that the degree of distortion will be constant from one home to the next. However, it is assumed that with an increase in the time that the parents and observer are together, it will become progressively more difficult for the mother to inhibit her ordinary reaction tendencies.

Scoring will be done via checkmarks. On each page there will be room for 14 15-second segments. The scorer will score by observing 15 seconds and scoring the behaviors, again observing 15 seconds and scoring, etc. (A tape recorder will be on for the entire visit.)

Specifications for the observations will be that both parents be home and that the time of the appointment is a time when the baby is usually awake. If the baby is asleep, the interview will be rescheduled.

Sample Scoring Sheet:

H W or B. H-husband W-wife B-baby

HOLDING ACCESSIBILITY VERBALIZATION

(See Scoring Sheet attached)

Definitions of Sub-Categories

Tender and careful. This behavior is characterized both by a gentle muting down of the parents' usual speed and vigor of movement and by a pacing of the temp of the physical handling of the infant to his/her tempo of response.

Playful. This behavior is characterized by the playful aspect of holding--such as throwing the child into the air, spinning him/her around.

Inept. The parent handles the child abruptly, roughly or very inappropriately. No show of affection or of playfulness (might be a form of punishment or just thoughtlessness).

Instrumental. The parent handles the child for the sake of performing some specific duty, such as changing its diaper, or moving the child from one room to another or from the crib to the floor. This behavior is performed more for the parent's necessity than because the child indicated it wanted to be held.

Within sight. The parent can see the child and the

child can see the parent.

Within hearing distance. The parent is out of range of sight but if the child vocalizes or cries, the parent can hear the child.

Out of contact. The parent can neither see nor hear the child.

Spontaneous verbalization. Spontaneous vocalization to the child refers to any sound or words emitted by a parent. For example, she may say, "s-s-s" or "sweet baby" or any random words or sounds. In order to check this item the paretn's vocalization must have occured spontaneously as opposed to having occurred in response to some vocalization by the child. This then would be scored by H or W depending on whether the husband or wife vocalized. Spontaneous vocalization may occur by the baby vocalizing -- making any form of sound (e.g., ga, ga). This would be scored B.

Response for baby's vocalization. Responds to vocalization of child with a vocal or verbal response. The parental response may either be a complete word or words or merely clearly differentiated sounds, e.g., "ta-ta", "tsk-tsk" or "you talking to Mommy." The key factor here is that the parent is responding to the child's vocalization, not ignoring it.

Negative verbalization. Any form of negative verbalization (not necessarily negative affect), e.g. "don't touch that"; "no, no"; etc.

Positive affect. The parent praises the child's behavior verbally by saying such things as "My, wasn't that clever" when the child does some behavior. This might be phrased in the negative as well such as "you really are a terror" but said with a smile on his/her face and then followed by "you managed to pull that cup off the table all by yourself" showing obvious praise would still be checked.

Voice conveys positive feeling. The parent feels good about his/her child, sounds animated when speaking to him/her, does not use a flat or querulous tone of voice.

Negative affect. Voice conveys negative feelings, anger or annoyance. The parent displays displeasure with the child and voice conveys flat or querulous tone.

Social and/or physical play. Any form of game that is not played via inanimate objects such as pat-a-cake or rough-housing, throwing the child up in the air and catching him/her. The key is the child's obvious enjoyment of the activity.

Object-mediated play. Any form of play that makes use of a toy or inanimate instrument.

Response to cry. The length of time (timed in seconds) it takes the parent to respond to the child's cry (the response may be verbal or physical).

Length of cry. The total length of time (timed in seconds) the child cries from onset to finish.

Feeding. Simply stating the medium used: bottle, breast or solids and also timed in seconds.

Variability of stimulation. The number of toys within reach of the child.

APPENDIX D

DESCRIPTIVE STATISTICS

Appendix D

Descriptive Statistics

VARIABLE NAME	MEAN	STD. DEV.	VARIANCE	MINIMUM OBSERVED	MAXIMUM OBSERVED	KURTOSIS	SKEWNESS	POSSIBLE RANGE
Infant Sex	.48	.51	.26	0	1	-2.17	.085	0- 1
Infant Temperamental Difficulty	28.16	6.14	37.72	27.00	48.50	- .97	.012	0-54
Father Masculinity	5.15	.94	.87	3.10	6.80	- .14	-.34	1- 7
Father Femininity	4.64	.54	.29	3.15	5.75	2.09	- .65	1- 7
Father Activity	11.80	2.22	4.92	6.00	16.00	1.23	- .42	0-25
Father Impulsivity	7.64	2.25	5.07	3.00	12.00	- .58	- .06	0-25
Father Sociability	10.36	2.14	4.57	6.00	14.00	- .73	- .32	0-25
Father Emotionality	7.04	3.02	9.12	4.00	16.00	2.10	1.40	0-25
Father Participation Index	5.92	2.60	6.74	1.5	11.5	- .40	- .13	0-18
Father Marital Satisfaction	49.40	5.69	32.42	37.00	58.00	- .38	- .78	0-67
Mother Marital Satisfaction	50.92	6.41	41.07	37.00	62.00	- .19	- .35	0-67
Father-Mother Temperamental Similarity Index	12.36	4.29	18.41	5.00	22.00	.07	.52	0-100
Discrepancy-Parents' Ratings of Infant Temperament	20.92	6.89	47.49	7.00	35.00	- .11	.16	0-90

Appendix D

Descriptive Statistics

VARIABLE NAME	MEAN	STD. DEV.	VARIANCE	MINIMUM OBSERVED	MAXIMUM OBSERVED	KURTOSIS	SKEWNESS	POSSIBLE RANGE
Father Global Rating	6.47	1.98	3.93	1.73	9.00	.86	- 1.3	0- 9
Mother Global Rating	7.34	1.24	1.54	4.47	8.95	-.14	- .69	0- 9
Father tender holding	4.36	4.54	20.59	0	17.12	1.49	1.43	0-100
Father playful holding	6.01	5.63	31.66	0	20.59	1.47	1.41	0-100
Father inept holding	.17	.38	.14	0	1.3	4.11	2.24	0-100
Father instrumental holding	25.29	14.06	197.76	3.52	50.73	- .92	.38	0-100
Father within hearing distance	82.04	19.82	393.09	29.17	100.00	1.73	-1.58	0-100
Father spontaneous vocalization	18.76	11.20	125.43	0	44.38	.82	.97	0-100
Father responsive vocalization	5.87	4.00	16.03	0	16.72	.91	.93	0-100
Father negative vocalization	.39	.83	.69	0	3.08	8.07	2.95	0-100
Father positive affect	22.18	11.35	128.80	0	50.53	.472	.48	0-00
Father negative affect	.16	.35	.12	0	1.56	10.71	3.06	0-100

Appendix D

Descriptive Statistics

VARIABLE NAME	MEAN	STD. DEV.	VARIANCE	MINIMUM OBSERVED	MAXIMUM OBSERVED	KURTOSIS	SKEWNESS	POSSIBLE RANGE
Father social-physical play	5.56	5.09	25.91	0	19.56	.59	.92	0-100
Father object-mediated play	3.17	3.48	12.10	0	11.61	.91	1.35	0-100
Positive paternal behavior	9.42	4.72	22.31	.50	20.69	.52	.59	0-100
Negative paternal behavior	.27	.56	.31	0	2.32	8.79	2.98	0-100
Mother tender holding	10.08	10.55	111.39	0	38.75	1.33	1.46	0-100
Mother playful holding	2.80	2.33	5.42	0	8.25	- .12	.84	0-100
Mother inept holding	.24	.86	.74	0	4.25	22.23	4.63	0-100
Mother instru-mental holding	29.96	16.37	268.02	6.19	67.38	.12	.74	0-100
Mother within hearing distance	92.93	9.52	90.74	57.00	100.00	7.76	-2.47	0-100
Mother spontan-eous vocalization	29.27	13.52	175.53	12.69	69.23	2.13	1.25	0-100
Mother responsive vocalization	8.51	4.87	23.74	1.76	20.56	.74	1.09	0-100
Mother negative vocalization	1.49	1.70	2.86	0	5.50	.16	1.24	0-100

Appendix D

Descriptive Statistics

VARIABLE NAME	MEAN	STD. DEV.	VARIANCE	MINIMUM OBSERVED	MAXIMUM OBSERVED	KURTOSIS	SKEWNESS	POSSIBLE RANGE
Mother positive affect	35.72	15.30	234.01	14.72	75.39	.29	.74	0-100
Mother negative affect	.85	1.62	2.63	0	5.58	3.70	2.14	0-100
Mother social-physical play	4.17	4.44	19.71	0	19.90	5.96	2.20	0-100
Mother-object-mediated play	3.28	2.86	8.20	0	8.49	-1.00	.74	0-100
Positive maternal behavior	15.47	5.48	29.99	7.55	27.46	- .46	.37	0-100
Negative maternal behavior	.86	1.15	1.33	0	3.91	1.87	1.70	0-100