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*Using the Family Systems Model to Investigate the Relationship
between Parental Sensitivity and Infant Attachment**

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ABSTRACT

This study investigates the relationship between mothers' and fathers' sensitivity and infants' attachment relations within the context of the family. Family Systems models (crossover model and circular causal model) were used to assess the transaction of parental sensitivity across the family subsystems (i.e., mother-infant and father-infant) boundaries. Sixty-six families with infants participated in two home visits to test these models. When infants were six months old, their parents' sensitivity was assessed using multiple measures: standardized observation, self rating (efficacy), and rating by the spouse. At 18 months, infants' attachment security was assessed using the attachment Q-sort (Waters 1987). Parental sensitivity was found to cross the subsystem boundaries, but in a different pattern for mothers and fathers. Partial support of the crossover model was found: Higher levels of maternal sensitivity predicted a more secure infant-father attachment relationship, whereas higher levels of paternal sensitivity predicted a less secure infant-mother attachment relationship. The circular model also received partial support: A negative relationship was found between mothers' ratings of fathers' sensitivity and the infants' attachment security to mothers, whereas a positive relationship was found between fathers' ratings of the mothers' sensitivity and infants' attachment security to mothers.

KEY WORDS Maternal sensitivity; Paternal sensitivity; Attachment security;
Family Systems Model

The present study is an investigation of infant attachment relationships within the context of the family. According to Collins (2002), the dyad has historically been central to understanding

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social development; however, parent-child interactions do not occur within a vacuum, though much of the past research has treated dyads within the family as separately functioning entities (Caffery and Erdman 2003). Researchers have found evidence that the functioning of one dyad in the family influences another dyad; for example, the quality of the marital relationship has been found to influence parent-infant interactions and infants' attachment relationships (Cohn et al. 1992; Cowan et al 1996; Frosch, Mangelsdorf, and McHale 2000), research with twins has shown that the attachment security of one twin is influenced by the relation of the other twin and parent (Fearon et al. 2006), and mothers' own relationships with their mothers have been found to predict infants' attachment security (Kretchmar and Jacobvitz 2002). Although researchers have assessed both mothers' and fathers' contributions (including sensitivity) to their infants' attachment security, few researchers have assessed the contribution that parent-infant dyadic relationships have on the development of the infants' attachment security to the other parents.

To expand our understanding of the link between parental sensitivity and the infant's attachment security, the present study uses multiple methods to assess parental sensitivity. The typical sensitivity assessment consists of a structured or nonstructured observation and rating the parent on prompt and appropriate responsiveness to the infant (Ainsworth 1973; Atkinson et al. 2000; De Wolff and Van Ijzendoorn 1997; Nievar and Becker 2007). A small number of researchers have used interviews or questionnaires focusing on specific parental behavior (e.g., HOME) or the parents' descriptions of the infants' attachment behaviors. The current study goes beyond the typical observation and questionnaires of parental sensitivity by assessing parents' perceptions of their own sensitivity and the sensitivity of their spouses toward their infants. These multiple assessments of sensitivity provide greater information about the context of the relationship between parental sensitivity and infants' attachment relationships to both parents.

PARENTAL SENSITIVITY

According to Bowlby (1969), whether the attachment figure is the mother or father, sensitive responsiveness toward the infant is assumed to be a major factor in contributing to the development of a secure attachment (Ainsworth 1979). Meta-analysis of the link between parental sensitivity (measured by the Ainsworth Parental Behavior Scales; Ainsworth 1973) and infant attachment (measured by the Ainsworth Strange Situation and attachment Q-sort completed by observers) for mothers and fathers suggests a modest relationship [.24 for mothers (De Wolff and Van Ijzendoorn 1997); .13 for fathers (Van Ijzendoorn and De Wolff 1997)]. Using a wider variety of sensitivity measures in their meta-analysis, Atkinson et al. (2000) found a similar effect size, $r = .27$. The modest association between parental sensitivity and attachment leaves unexplained a large portion of the variance in infants' attachment relations (Cowan 1997) and suggests that other factors both within and outside parent-infant dyads may influence these relations (De Wolff and Van Ijzendoorn 1997; Braungart-Rieker, Courtney, and Garwood 1999; Coleman and Watson 2000; Demo and Cox 2000; Meins et al. 2001; Mills-Koonce et al. 2007). This study will focus on two possible factors influencing infants' attachment relationships: parents' perception of their own sensitivity and parents' perception of their spouses' sensitivity.

FAMILY SYSTEMS MODEL

Family Systems is a useful paradigm for understanding how members of a dyad in the family may have an influence beyond the dyad. According to Minuchin (1985), in the Family Systems Model, the family and the individuals within the family can be viewed as an ordered

system with each parent-infant dyad (mother-infant and father-infant) considered to be a subsystem within the family. The dyads are separated by boundaries, and the interactions across these boundaries are governed by implicit rules and patterns. The rules and patterns that govern the way a parent's sensitivity toward his or her infant crosses the boundaries of the subsystems and influences the infant's attachment relationship with the other parent has been hypothesized by Cowan (1997), but this is one of the first studies to attempt to assess these rules and patterns. These patterns of interactions across the subsystems are explored using the different measures of parents' sensitivity.

PATTERNS OF INTERACTION ACROSS THE SUBSYSTEMS

According to Cowan (1997), the sensitivity of one parent may act as a buffer for the insensitivity of the other parent, allowing the infant to have secure attachment relationships, just as positive marital relations act as a buffer for a parent's insecure attachment relationship and allow the child to develop secure attachment relationships (Cohn et al. 1992; Cowan et al. 1996). In this crossover model, the parent's sensitivity influences the relationship between the other parent and infant and therefore the infant's subsequent attachment security. Caldera (2004), using an observation-based maternal sensitivity measure, did not find support for the crossover model. Mothers' observed sensitivity was found to be positively related to the mothers' Q-sort security scores but was not related to the fathers' Q-sort security scores. Unfortunately, Caldera's study did not include a measure of the fathers' sensitivity.

Parents' feelings about their sensitivity and ability to provide their infants with a warm, nurturing environment is an assessment of the parents' self-efficacy and may provide this buffer in the crossover model. According to Bandura (1982), strong self-efficacy leads to optimal performance; therefore, parents who believe themselves to be sensitive and capable of responding appropriately to the infants' needs should have interactions with the infants, which leads to secure attachment relationships. Researchers have found that parental efficacy is related to both parental and infant behavior. For example, Teti and Gelfand (1991) found that mothers with high levels of efficacy showed more appropriate mothering (e.g., sensitivity and warmth), and maternal efficacy has been found to be positively related to infants' mental and psychomotor development (Levy-Shiff et al. 1998). Jones and Lenz (1985) reported that fathers of young infants who perceived themselves to be more competent were more stimulating for their infants, talking and touching the infants more than fathers who reported less competence. Using a Family Systems approach, we would hypothesize that parents' belief in their own sensitivity would not only positively influence their own interactions with their infants but also extend across the boundaries of the subsystems by positively influencing the spouses' interactions with the infants, thereby enhancing the infants' attachment relationships.

Infants' attachment behaviors and parents' responses to these behaviors occur within view of the entire family, providing parents with knowledge about their spouses' sensitivity (Marvin and Stewart 1990). The parent's sensitivity as assessed by his or her partner moves beyond the crossover model to assess a circular causal pattern of effects between the subsystems. According to the Family Systems Model (Minuchin 1985), interactions and effects within a system are circular rather than linear. A circular causal pattern of effects occurs when a parent's assessment of his or her partner's sensitivity toward the infant influences his or her own interactions with the infant and therefore the infant's attachment security to the parent. For example, a parent who considers the spouse to be insensitive to the infant may compensate by changing his or her own interaction with the infant, increasing sensitivity and responsiveness and

ultimately increasing the likelihood that the infant will have a secure attachment relation. Likewise, a parent's view of the spouse as highly sensitive to the infant may allow the parent to relax his or her own responsiveness to the infant because the parent assumes that the spouse will be responsive to the infant. Again, the parent's change in sensitivity due to his or her assessment of the spouse's sensitivity may influence the infant's attachment security.

The circular pattern of effects may continue because the parent's assessment of the spouse's sensitivity may influence not only his or her own interaction with the infant but also the spouse's interactions with the infant. A parent who perceives his or her spouse as sensitive will act accordingly, expecting the spouse to be responsive to the infant's attachment behaviors. A parent's beliefs and perceptions have been found to be related to the partner's behavior with the infant (Fagan and Barnett 2003). For example, when a mother considers the father's involvement to be important and is more satisfied with the father's involvement in child care, the father is actually more involved in child care (De Luccie 1995). Simons et al. (1990) found that the mother's belief that parenting is important is positively related with the husband's constructive parenting practices; therefore, a parent's assessment of the spouse as sensitive may lead the spouse to be more sensitive and in turn lead to secure infant attachment relations.

HYPOTHESES

Based on the patterns of interaction between the subsystems described above, the following hypotheses were developed. The first hypothesis, for the crossover model, states that a parent's sensitivity will cross the subsystem boundaries and predict the infant's attachment to the spouse. Parent's sensitivity assessed by an observer using the Ainsworth Parental Behavior Scales (Ainsworth 1973) and the parent's perception of his or her own sensitivity will be used to test the crossover effect. A positive relationship is expected between the parent's sensitivity (both observed and the rating of her or his own sensitivity) and the infant's attachment security to the spouse. If a parent has a higher rating on sensitivity, the infant will have a more secure attachment relation to the spouse.

A set of hypotheses were developed for the circular causal pattern model. First, it is hypothesized that the parent's rating of the spouse's sensitivity will predict the infant's attachment security to the parent. A negative relation is expected between a parent's rating of the spouse's sensitivity and the infant's attachment security to the parent. The negative relation is hypothesized because of the recursive nature of family systems (i.e., a parent's perception of the spouse as less sensitive will increase the parent's sensitivity and responsiveness and increase the infant's attachment security to the parent). Using this same model, a second hypothesis was developed predicting a positive relation between the parent's rating of the spouse's sensitivity and the infant's attachment security to the spouse. A parent's perception of the spouse as sensitive may lead the parent to behave on this expectation that the spouse will be responsive and may increase pressure for the spouse to actually be more sensitive and responsive.

This study will also attempt to replicate the associations found between sensitivity and attachment relations in the meta-analyses (De Wolff and Van Ijzendoorn 1997; Van Ijzendoorn and De Wolff 1997; Atkinson et al. 2000). Because of the timing of the sensitivity and attachment measures, a small but positive relationship is expected to be found between a parent's sensitivity and the infant's attachment relations to the parent.

METHOD

Participants

Seventy infants with their parents were recruited to participate in two home visits, the first occurring when the infants were six months ($M = 6.86$, $SD = .79$) and 18 months of age ($M = 18.79$, $SD = .85$ months). Two families and one father did not participate in the 18-month session, and one family was dropped from the analysis because of the infant's developmental disability. Only the 66 families that completed both visits are included in the data analyses.

All infants were European American; 35 infants were male, and 41 infants had older siblings. At the time of the six-month visits, the mothers had an average age of 29 years ($M = 29.19$, $SD = 3.46$ years), had an average of two years' ($M = 13.94$, $SD = 1.83$ years) post-high school education, and were working an average of 32 hours per week ($M = 32.06$, *Range* 0 to 60). Fathers' average age was 31 years ($M = 31.21$, $SD = 4.17$ years), and they had an average of two years' ($M = 14.41$, $SD = 2.26$ years) post-high school education, working an average of 47 hours per week ($M = 46.64$, *Range* 0 to 90). The Hollingshead Four Factor Index (Hollingshead 1978) was used to determine family socioeconomic status, which ranged from lower- to middle class ($M = 45.25$, *Range* 27 to 66).

Procedure

Families were recruited through birth announcements in local newspapers. A letter describing the study was sent to the families, who were contacted a week later by telephone and asked to participate. Forty-three percent of the families contacted in this manner agreed to participate.

The six-month home visit consisted of an interview and a two-hour observation of normal family activity. The interview included questions concerning the parents' occupations and education and the number and age of other children in the family.

Parents' sensitivity ratings. Each parent provided a self rating of sensitivity and responsiveness and a rating of his or her spouse's sensitivity and responsiveness to their infant. These ratings each consisted of two questions on a seven-point rating scale, with a score of seven being the most optimal response. Sensitivity efficacy questions were (1) How sensitive and aware do you feel you are to your infant's signals for attention (e.g., smiles, cries, and coos)? and (2) How responsive are you to your infant? Spouse sensitivity questions were (1) How sensitive and aware do you feel your spouse is to your infant's signals for attention (e.g., smiles, cries, and coos)? and (2) How responsive is your spouse to your infant? Pearson correlations revealed moderately high associations for the parents' responses on these items, ranging from .64 for mothers' ratings of the fathers' sensitivity and responsiveness to .68 for fathers' ratings of mothers' sensitivity and responsiveness. The questions were summed to provide each parent with a *sensitivity efficacy score* and *spouse's sensitivity score*.

Parents' observed sensitivity. Following the interview, the two-hour observation began and the parents were encouraged to go about their normal routine. Following this observation, the mother and father were each rated on the four nine-point Parental Behavior Scales (Ainsworth 1973). These scales were (1) acceptance versus rejection—the balance between the parent's positive and negative feelings about the infant; (2) accessibility versus ignoring and neglecting—

the parent's accessibility to the infant, with emphasis on responsiveness to the infant; (3) cooperation versus interference—the extent to which the parent's interventions and initiations of interaction break into, interrupt, or cut across the infant's ongoing activity rather than being geared to the infant's present mood and activities; and (4) sensitivity versus insensitivity—the degree of sensitivity showed in perceiving and responding promptly and appropriately to the infant's signals and communication. Each parent's scores on the four Parental Behavior Scales were summed to create an overall *observed sensitivity score*.

For 18 of these home visits, there were two observers who had been trained on the Parental Behavior Scales. Inter-rater reliability for these four scales was determined by use of Pearson correlations. Inter-rater reliability ranged from .86 for acceptance to .96 for sensitivity.

The 18-month home visit consisted of an interview and the attachment Q-sort (Waters 1987). The interview included questions concerning the parents' occupations and education, and number and age of other children in the family.

Attachment Q-sorts. To obtain the parents' description of infants' attachment, the procedure for parental attachment Q-sorts developed by Teti et al. (1991) was used in this study. Approximately two weeks before the 18-month visit, the mother and father were each mailed a copy of the 90-item attachment Q-sort and were asked to think about how like or unlike each item was regarding their infant's current behavior. The father's version of the Q-sort was created by substituting the word father and masculine pronouns for references to the mother in the original items. During the 18-month visit, the mother and father independently sorted the items according to the procedure developed by Waters. The mother and father were supervised by a trained assistant who reminded the parents to target their infant's behavior during the previous two weeks. The infant's *security score* was computed individually for the mother and father by correlating their Q-sort with a criterion sort of the same 90 items provided by Waters. Higher scores indicate that the parents' description denotes greater attachment security.

Descriptive statistics were used to determine the normal distribution of the data set. Outliers greater than three standard deviations from the variable mean were transformed by winsorization (Winer 1971).

RESULTS

Intercorrelations of Six-Month Observed Sensitivity Scores, Sensitivity Efficacy, and Spouses' Sensitivity Ratings

Pearson correlations were used to investigate the relation of the six-month observed sensitivity scores, sensitivity efficacy scores, and ratings of spouses' sensitivity (Table 1). Mothers' and fathers' sensitivity measures were concordant, with moderate positive correlations between mothers' and fathers' observed sensitivity scores, sensitivity efficacy scores, and ratings of spouses' sensitivity. The associations between the measures of mothers' sensitivity were inconsistent; mothers' observed sensitivity scores were positively related with mothers' ratings of their own sensitivity (sensitivity efficacy scores) but not related to fathers' ratings of mothers' sensitivity. Mothers' ratings of their sensitivity efficacy were positively related to fathers' ratings of mothers' sensitivity. Fathers' sensitivity measures revealed even less consistency; fathers' observed sensitivity was not related to either fathers' ratings of their own sensitivity (sensitivity

efficacy scores) or to mothers' ratings of fathers' sensitivity. However, fathers' ratings of their sensitivity efficacy were positively related to mothers' ratings of fathers' sensitivity. Parents' ratings of their sensitivity efficacy were positively related to their ratings of their spouses' sensitivity.

Table 1. Intercorrelations between Observed Sensitivity, Parents' Sensitivity Efficacy, and Spouses' Sensitivity Ratings

	Fathers'	Sensitivity Efficacy		Mothers'	Fathers'
	Observed	Mothers	Fathers	Rating of	Rating of
Mothers' observed sensitivity	.52**	.26*	.12	.27*	.18
Fathers' observed sensitivity	C	.16	.20	.13	.09
Mothers' sensitivity efficacy	C	C	.29*	.27*	.62**
Fathers' sensitivity efficacy	C	C	C	.75**	.39**
Mothers' ratings of fathers (Spouse's sensitivity rating)	C	C	C	C	.36**

* $p < .05$; ** $p < .01$.

Correlations of Six-Month Observed Sensitivity Scores, Sensitivity Efficacy, and Spouses' Sensitivity Ratings with Q-sort Security Scores

Pearson correlations were used to determine the relation between the observed sensitivity scores, sensitivity efficacy scores, and ratings of spouses' sensitivity and Q-sort security scores (Table 2). Mothers' sensitivity efficacy scores were positively related to Fathers' security scores. Fathers' ratings of mothers' sensitivity were positively related to both mothers' and fathers' security scores.

Table 2. Intercorrelations between Six-Month Observed Sensitivity, Parents' Sensitivity Efficacy, and Spouses' Sensitivity Ratings and the Infants' Attachment Security Scores

	Attachment Security Scores	
	Mothers	Fathers
Mothers' observed sensitivity	.11	.23
Fathers' observed sensitivity	-.09	-.09
Mothers' sensitivity efficacy	.23	.38**
Fathers' sensitivity efficacy	-.23	.18
Mothers' ratings of fathers	-.10	.15
Fathers' ratings of mothers	.36**	.26*

* $p < .05$; ** $p < .01$.

Hierarchical Multiple-Regression Analyses Assessing the Crossover and Circular Causal Pattern Model

Crossover model. In the crossover model, the parent's sensitivity crosses the subsystem boundaries and predicts the infant's attachment to the spouse. Hierarchical multiple-regression analyses with mothers' and fathers' observed sensitivity scores entered as the predictors and the mothers' and fathers' Q-sort security scores as the dependent variable were used in the first test of this model. In the hierarchical multiple-regression analyses, the spouse's sensitivity was entered first and then the parent's sensitivity was entered into the equation; this allows the parent's sensitivity to be assessed while controlling for the spouse's sensitivity. Fathers' observed sensitivity scores were not found to predict mothers' security scores; however, mothers' observed sensitivity scores were found to predict the fathers' security scores [F (change) = 5.97, $p < .05$, R Square change = .09, $Beta = .36$]. The greater mothers' ratings of acceptance, accessibility, cooperation, and sensitivity, the greater fathers' attachment security scores.

The second test of the crossover model consisted of hierarchical multiple-regression analyses with parents' sensitivity efficacy as the predictors and their Q-sort security scores as the dependent variable. The spouse's sensitivity was entered first into the hierarchical multiple-regression analyses, and then the parent's sensitivity was entered into the equation; this allows the parent's sensitivity to be assessed while controlling for the spouse's sensitivity. The mothers' security scores were predicted by the fathers' sensitivity efficacy [F (Change) = 7.03, $p < .01$, R Square change = .10, $Beta = -.32$]. When the father reported himself to be more sensitive to the infant, the mother reported a lower attachment security score. The fathers' security scores were predicted by the mothers' sensitivity efficacy [F (change) = 8.67, $p < .01$, R Square change = .12, $Beta = .36$]. When the mother reported herself to be more sensitive to the infant, the father reported a higher security score for the infant.

Circular causal pattern model. In the circular causal pattern model, the parent's rating of the spouse's sensitivity crosses the subsystem boundaries to predict the infant's attachment security to the parent. In the hierarchical multiple-regression analyses to test this model, the spouses' ratings of the parents' sensitivity were entered first and then the parents' ratings of the spouses' sensitivity were entered into the equation. The parents' Q-sort security scores were the dependent variable. The mothers' ratings of the fathers' sensitivity predicted the mothers' security scores [F (change) = 4.92, $p < .05$, R Square change = .06, $Beta = -.27$]. When the mother rated the father as more sensitive, the mother reported a lower security score. Fathers' ratings of mothers' sensitivity did not predict fathers' security scores.

In the second part of the circular causal pattern model, the parent's rating of the spouse's sensitivity crosses the subsystem boundaries to predict the infant's attachment security to the spouse. In the hierarchical multiple-regression analyses to test this model, the spouses' ratings of the parents' sensitivity were entered first and then the parents' ratings of the spouses' sensitivity were entered into the equation as the predictors and the spouses' Q-sort security scores were the dependent variable. The fathers' ratings of the mothers' sensitivity predicted mothers' security scores [F (change) = 14.33, $p < .01$, R Square change = .18, $Beta = .46$]. When the father rated the mother as more sensitive, the mother reported a higher security score. Mothers' ratings of fathers' sensitivity did not predict fathers' security scores.

DISCUSSION

The current study provides support for the importance of studying children's attachment relations within the context of the family and supplies partial support for the use of the Family Systems Model to explain the parental sensitivity and infant attachment relationship link. A mutual influence among the family subsystems was found with the pattern of the interaction across the subsystem boundaries (Minuchin 1985) differing dependent on whether it originated from the mother-infant subsystem or the father-infant subsystem. Mothers appear to have a different influence on father-infant relationships than fathers have on mother-infant relationships.

The first hypothesis, that parents' sensitivity will cross subsystem boundaries, was supported, but only for mothers in the predicted direction. Higher levels of observed maternal sensitivity and maternal sensitivity efficacy were related to fathers' perceptions of greater security in the infant-father attachment relationships. This supports a model in which mothers' sensitivity crosses the boundaries between the dyads and enhances the relations between fathers and their infants. This crossover between the dyads has been noted before; however, this is the first time it has been found for parental sensitivity (Caldera 2004). Mothers' attitudes and satisfaction with the fathers' involvement with their children have been found to influence the frequency of fathers' involvement (De Luccie 1995); Frosch et al. (2000) found that mothers who exhibited more warm, supportive parenting behavior had children who were more securely attached to their fathers. The efforts provided by mothers who are sensitive and perceive themselves to be sensitive could take many forms; for example, these mothers may be active in creating positive interactions between fathers and infants. Caldera and Lindsey (2006) found that mothers who were more responsive toward their infants were more likely to enhance interaction between the infants and parents. Another possibility is that highly sensitive mothers may act as positive models for the fathers to copy during their interactions with their infants.

Fathers' sensitivity efficacy was not found to have a similar association. Instead, higher levels of paternal sensitivity efficacy were related to the mother's report of lower security in the infant-mother attachment relationship. Certain paternal characteristics [e.g., fathers' support of maternal caregiving (Crnic, Greenberg, and Slough 1986)] may positively support the mother-infant relationship, whereas other characteristics may not be as supportive. For example, Clarke-Stewart (1978) found that when fathers were present, mothers talked, responded, and played with their children less.

According to the Family Systems Model, the fathers' influence on mother-infant relationships may be explained as a systemic causal relationship (Marvin and Stewart 1990). In this case, the father who views himself as more sensitive may be more active and involved with his infant and act as a co-attachment figure, which in turn may change the mother's perception of herself from a primary attachment figure to a co-attachment figure and may influence the way in which she performs the Q-sort. The validity of fathers' views of their sensitivity efficacy is not supported by observers' ratings of fathers' sensitivity. This may also explain why fathers' sensitivity efficacy is not linked to infants' attachment security to their fathers.

The circular causal pattern model (i.e., negative relationships will be found between parents' ratings of spouses' sensitivity and infants' attachment security to their parents and a positive relationship will be found between parents' rating of the spouses' sensitivity and their infants' attachment security to the spouses) was partially supported. The gender of the parent appears to moderate the effect. Mothers' perceptions of their infants' attachment was predicted by both mothers' ratings of fathers' sensitivity and fathers' ratings of mothers' sensitivity. Mothers with more positive attitudes about the father role have been found to exhibit less gatekeeping and

are more likely to promote fathers' involvement with their children (Fagan and Barnett 2003). The findings in the current study appear to be a systemic causal relationship; when the mother perceives the father as sensitive to the infant, the mother may relax her own responsiveness to the infant because she assumes that the father will be responsive, and her Q-sort description of the infant's attachment relations is also modified by treating the father as a co-attachment figure in her sort. In a similar circular pattern, a father who perceives the mother to be highly sensitive may be less responsive, assuming that the mother will be responsive, which may in turn create situations where the mother must be more responsive. The quality of co-parenting relationships has been found to predict infants' attachment relationships (Caldera and Lindsey 2006). The current research suggests that the co-parenting issues may be complex, going beyond the co-parent dyad and needing to be assessed within multiple subsystems in the family and the interactions that occur across the subsystem boundaries. Infants' attachment relationships are clearly not dyad-specific relationships but are a function of the interactions within the triadic relationship.

Further research will be necessary to fully explore the systemic causal relationships of infant attachment relations within the context of the family. The present study provides evidence that researchers will need to go beyond dyad- and behavioral-based assessments to fully understand the development of infant attachment relations. The family is a dynamic system with transactions crossing the subsystem boundaries (Cox and Paley 2003) in complex causal patterns. The present study provides evidence that the rules governing the transactions across the subsystem boundaries are moderated by the gender of the parent. Investigation into these triadic relationships or integrated family attachment will provide further insight into children's attachment relations (Bowlby 1969; Kozłowska and Hanney 2002).

This study failed to find the expected relationship between observed parental sensitivity and infant attachment, although the relationship between parental sensitivity efficacy and infant attachment security, though not significant, is similar to that found in the meta-analysis (De Wolff and Van Ijzendoorn 1997; Van Ijzendoorn and De Wolff 1997; Atkinson et al. 2000). Atkinson et al. (2000) found the relationship between sensitivity and attachment security to be moderated by the length of time between the assessments: Assessments that are separated by six months or more (as in this study) will have a small effect size. It is possible that parents' perceptions of sensitivity are more stable than their actual sensitivity, which has been found to be affected by external factors such as stress (Belsky and Fearon 2002).

Study Limitations

One limitation of this study is that the measurement of the mother's and father's observed sensitivity was rated by the same observer. The mother's and father's observed sensitivity was moderately correlated, which could be due to the lack of independence in the observation. Other researchers using independent raters for the mother's and father's sensitivity have also found a similar significant relationship (Braungart et al. 2001; Schoppe-Sullivan et al. 2006), suggesting a similarity between spouses on this measure.

Another limitation of this study is that parents provide infants' security scores by performing the sort of the Attachment Q-sort. There is debate in the literature concerning the validity of Attachment Q-sorts provided by parents. Van Ijzendoorn et al. (2004) provides a meta-analysis of the convergent, divergent, and predictive validity of the parent-sorted Q-sort. The parent-sorted Attachment Q-sort is found to be associated with the Strange Situation Procedure

(convergent validity) and sensitivity (predictive validity), but to a lesser extent than the observer-sorted Attachment Q-sort (both parent and observer Attachment Q-sort show a similar level of association with socio-emotional development, another measure of predictive validity). The parent-sorted Attachment Q-sort is also found to have a higher association with temperament than the observer-sorted Q-sort, though both have a significant association.

One factor not considered in this meta-analysis is the training of the parents on the Attachment Q-sort. This is an important factor to consider because this training may have an impact on the validity of parents' Attachment Q-sort scores. The procedure used in the current study is a standardized procedure (Teti and Gelfand 1991) that provides the parent with exposure to the Q-sort items and guidance during the Q-sort. Research has shown that with training, parents can make accurate judgments about their children's attachment. Pedersen et al. (1998) and Porter (1997) found that children classified with secure attachment relationships using the Strange Situation method had significantly higher security scores from mother-sorted Attachment Q-sorts than children with insecure attachment relationships. Research has also shown a significant, but moderate, concordance between parent-sorted and observer-sorted Q-sorts (Teti and McGourty 1996; Cassibba, Van Ijzendoorn, and D'Odorico 2000; Tarabulsky et al. 2008). Tarabulsky and colleagues (2008) report that the similar levels of association between parent-sorted and observer-sorted Q-sorts and maternal sensitivity provide evidence that both tap into similar information about the developing relationship.

It is possible that the parent-sorted Attachment Q-sort provides a description of the infant's attachment relationships that may be more useful in the Family Systems Model because this sort may be more sensitive to subsystem interaction and to effects across subsystems than observer sorts. Further research using the Family Systems Model is necessary to determine if parent- and observer-sorted Q-sorts are equally sensitive to effects across subsystems.

In future research, the effect of the infant and siblings on the development of attachment relationships will need to be investigated. Though this study goes beyond single dyads to investigate infants' social development, it is limited by focusing only on parents and their behavior. The infants and their characteristics such as emotional regulation (Braungart-Rieker et al. 2001) and the birth of a sibling (Teti et al. 1996) have been found to influence infants' attachment relationships.

In conclusion, parents' perceptions of their own and their spouses' sensitivity was found to cross the boundaries of dyadic subsystems within the family, predicting infants' attachment relationships, but differently for mothers and fathers and not always in the expected manner. According to the Family Systems Model, the family is not merely composed of dyads but is a dynamic system in which individuals influence their own relationships with the others in the family and also influence how others in the family interact with each other (Cox and Paley 2003). Mothers and fathers do not appear to be interchangeable caregivers, because the pattern of interaction across the subsystem boundaries differ depending on whether the sensitivity originates from the mother-infant subsystem or the father-infant subsystem.

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