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Examining the Relations of Infant Temperament and Couples' Marital Satisfaction to Mother and Father Involvement: A Longitudinal Study

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Abstract

The relations of infant temperament and parents' marital satisfaction to mother and father involvement in early (T1, approximately 7 months, $n = 142$) and later (T2, approximately 14 months, $n = 95$) infancy were examined. At each assessment point, mothers and fathers completed daily diaries together to measure their involvement over four days (i.e., 2 weekdays and 2 weekend days), each partner reported on marital satisfaction, and mothers reported on infants' temperament. Structural equation models indicated that when infants were more temperamentally regulated, parents were more satisfied in their marital relationships. Parents' marital satisfaction mediated the association between more regulated infant temperament and greater mother involvement at T1 (but not at T2) and father involvement at T2 (but not at T1). The findings are discussed in terms of the implications of infant temperament and family relationships for parental involvement.

Keywords

infant temperament; marital satisfaction; mother and father involvement

Although infancy is a comparatively brief period, no other stage of life demands more parental time and investment (Lamb, Bornstein, & Teti, 2002; Margolin, Gordis, & John, 2001). Consequently, father involvement during infancy and thereafter has been the focus of considerable research. In particular, researchers have highlighted the benefits of positive father involvement on children's social, emotional, and cognitive functioning (Lamb, 2004; Yogman, Kindlon, & Earls, 1995) and have emphasized the need to examine the nature and correlates of father involvement (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Tamis-LeMonda & Cabrera, 1999). Scholars also have chronicled some potential determinants of father involvement, including parental and infant characteristics and family relationships (Belsky, 1984; Doherty, Kouneski, & Erickson, 1998). The goal of the current study was to advance our knowledge about individual differences in fathering over time by examining the

relations of infant characteristics and the marital relationship to both mother and father involvement following the birth of a child, using 2-wave longitudinal data.

Defining Father Involvement

Over the past few decades, there has been increasing scholarly interest in men's evolving role in the family. Historically, mothers were viewed as the primary care-givers whereas fathers mainly provided economic support. Given the changing conceptualizations of father involvement as well as of the family, fathers are now viewed as more than just providers; rather, they are considered active participants in their children's lives and development. In fact, there are more studies that account for the effects of fathers' attitudes, behaviors, and presence on children and families than for fathers' absence from the family (Fitzgerald, Mann, & Barratt, 1999). Furthermore, fathers themselves report feeling closer to their children than their own fathers were to them (Daly, 1993), and research linking father involvement to positive developmental outcomes in children is growing (Lamb, 2004). As fathers' roles within the family continue to change, the ways in which researchers conceptualize and measure fathering qualities also continue to evolve.

In considering fathers' many roles in the lives of their children, researchers have investigated a number of aspects of father involvement. Some work has focused on quantitative measures, including the amount of time or frequency with which fathers engage in various activities directly or indirectly related to childrearing (e.g., Lamb, Pleck, Charnov, & Levine, 1987). Other researchers have sought to capture the quality of fathers' involvement with their children, using indices such as sensitivity or engagement (Feldman, 2000; National Institute of Child Health and Human Development Early Child Care Research Network, 2000). In the current study, we examined both mothers' and fathers' direct involvement in childrearing activities. Although not reflective of the quality of father-child interactions (Cabrera et al., 2000), our measure of mother and father involvement represents the extent to which parents are directly engaged with their children, which may be particularly important during the first years of life when considerable basic care is required and family responsibilities are being negotiated.

Investigators also have examined differences between men's and women's time engaging in childcare activities. Although fathers are increasing their level of involvement in childcare activities, findings have shown that mothers spend considerably more time providing childcare than do fathers (Marsiglio, Amato, Day, & Lamb, 2000). Researchers are paying close attention to the determinants of parenting in young children (Popp, Spinrad, & Smith, 2008), and theorists have suggested that these factors may differ for mothers and fathers (Corwyn & Bradley, 1999; McBride & Mills, 1993; Pleck, 1997). Some research has indicated that the kinds of childrearing activities in which mothers and fathers typically engage may differ, with mothers providing the majority of basic caregiving, and fathers becoming more involved in play (Lamb, 2004). Furthermore, fathers' level of involvement may increase as children get older (Gaertner, Spinrad, Eisenberg, & Greving, 2007; Goldscheider & Waite, 1991; Kreppner, 1988; Pleck, 1997).

In identifying the influences on fathering, Doherty and colleagues (1998) presented a model outlining how fathering is influenced by several critical factors: (1) individual parental characteristics (e.g., psychological well-being); (2) characteristics of children (e.g., temperament); (3) contextual factors (e.g., employment opportunities); and (4) parental relationships (e.g., marital relations). Moreover, it is possible that these factors may differentially predict mother versus father involvement. In the current study, both infants' temperament and the marital relationship were explored as predictors of mother and father involvement with very young children. In addition, marital satisfaction was considered as a potential mediator of the relation between infant temperament and parental involvement.

Children's Temperament and Parental Involvement

There are a variety of potential factors which may influence parenting behaviors during infancy, including employment status of both parents (Aldous, Mulligan, & Bjarnason, 1998; Beitel & Parke, 1998; Bonney, Kelley, & Levant, 1999; NICHD Early Child Care Research Network, 2000; McBride & Mills, 1993), fathers' attitudes toward parenting (Beitel & Parke, 1998; Bonney et al., 1999), fathers' perceived competence at parenting (Pleck, 1997), parents' expectations of instrumental and affective father involvement (Cook, Jones, Dick, & Singh, 2005), and the quality of the co-parental relationship (Cummings & O'Reilly, 1997; McHale et al., 2004). In addition to these factors, infant characteristics are also likely to predict parenting behaviors (Crockenberg & Leerkes, 2003; Doherty et al., 1998; Parke, 1996). For example, there is some evidence that fathers are more involved when they have more sociable daughters (McBride, Schoppe, & Rane, 2002) or temperamentally "easier" sons (Manlove & Vernon-Feagans, 2002). In addition, research has demonstrated that mothers' responsivity is diminished when their infants have difficult temperaments (Popp et al., 2008), although the relations of infant temperament to mothers' level of involvement with their infants has not been examined.

The challenges associated with caring for infants with difficult temperaments may discourage parents' active engagement with their children, whereas infants with easier or more positive temperaments may elicit greater levels of involvement. Because many men still view themselves as primary breadwinners in families and see involvement in child care as a more voluntary activity (Cabrera et al., 2000), it is possible that infant temperament is more strongly associated with fathers' more variable involvement as compared to mothers' involvement with children.

Moreover, the relations between infant temperament and father involvement may be somewhat complex. In other words, the relation of infant temperament to father involvement may be mediated by other factors, such as the marital relationship (Leve, Scaramella, & Fagot, 2001). In one of the only studies in this area, Leve and colleagues (2001) found that temperamental difficulty predicted stress on the marital relationship. In turn, lower marital satisfaction predicted fathers', but not mothers', lower pleasure in parenting. The current study extended this work by longitudinally examining the relations of infant temperament to the marital relationship, and in turn, the association between marital satisfaction and mothers' and fathers' involvement with their children. Furthermore, we investigated whether the relations were evident in early versus later infancy.

Children's Temperament and the Marital Relationship

There is consistent evidence that marital satisfaction and intimacy tend to decrease after the birth of a child (Cox, Paley, Burchinal, & Payne, 1999; Gable & Crnic, 1994; O'Brien & Peyton, 2002; Schulz, Cowan, & Cowan, 2006). Indeed, marital satisfaction is lowest among parents of infants; specifically, mothers with infants are significantly more dissatisfied in their marriages than any other group (i.e., men with infants, men with older children, and women with older children; Twenge, Campbell, & Foster, 2003). It has been theorized that, following the birth of a child, a shift in structure and organization in the marital and parental relationships occurs as parents adjust their roles to meet the needs of the child (Minuchin, 1974). Thus, the marital relationship is thought to be in competition with parenthood for limited resources (Aldous, 1978). Potentially, children's characteristics such as high negative emotionality could further stress the marital relationship (Leve et al., 2001). For instance, children who exhibit high negative emotionality may demand more parental time and energy, and almost inevitably, less attention is given to the marital relationship. Consistent with this idea, O'Brien and Peyton (2002) reported that mothers and fathers who perceived themselves as having more parenting difficulties also experienced less marital intimacy.

Progress has been quite limited in understanding the role of infant temperament on the quality of family relationships (Crockenberg & Leerkes, 2003; McHale, Kavanaugh, & Berkman, 2003). There has been some work to suggest that easier child temperament (i.e., higher levels of emotional and physiological regulation) is linked with higher levels of marital quality (Porter, Wouden-Miller, Silva, & Porter, 2003), whereas infant negativity has been related to poorer marital quality (Leve et al., 2001; McHale et al., 2004). Notably, there is some evidence that when parents have negative perceptions of their children, they hold similar evaluations of other familial relationships (McHale et al., 2004). Thus, children may play a key role in setting the tone for the overall affective climate within the family, including the marital relationship.

Marital Quality and Parental Involvement

The quality of parental relationships, and in particular, marital satisfaction, has been associated with differences in fathering behaviors (i.e., Cox et al., 1999; Grych & Clark, 1999), including fathers' involvement during infancy (Feldman, Nash, & Aschenbrenner, 1983; McBride & Mills, 1993; Volling & Belsky, 1991). There is also evidence that marital quality is a stronger predictor of fathering than mothering (Coiro & Emery, 1998; Leve et al., 2001). Thus, men are more likely to be involved in childrearing when they also are satisfied in their marital relationships. Katz and Gottman (1996) referred to this process as a “spillover” effect. Specifically, husbands who are unhappy with their marriage and withdraw from their partners may correspondingly distance themselves from their children (Coiro & Emery, 1998; Dickstein & Parke, 1988). Conversely, when fathers are actively involved in their marital relationships, there may be a general pattern in which they are actively involved with and invest more in the care of their children (Belsky, Youngblade, Rovine, & Volling, 1991).

Indeed, positive relations between marital satisfaction and fathering behaviors have been demonstrated in a number of empirical studies (Cowan & Cowan, 2000; Cox et al., 1999; Grych & Clark, 1999; Katz & Gottman, 1996; Levy-Shiff, 1994; McBride & Mills, 1993; McBride, Schoppe, Ho, & Rane, 2004; Paley et al., 2005). For example, McBride and Mills (1993) found that fathers' involvement was relatively high for men who were satisfied with their marriage and for men whose wives were high in marital satisfaction; however, the authors found no relation between marital satisfaction and mothers' involvement. Thus, the correlates of parental involvement with infants may differ for mothers and fathers. There is clearly a need to further investigate the links between marital satisfaction and mother and father involvement, particularly within the context of other aspects of the larger family system and with younger children.

Contextual Factors

Over the past few decades, more mothers are actively participating in the workforce (Rogers, 1996; U.S. Bureau of the Census, 1998; White & Rogers, 2000). In addition, there is an increasing number of mothers resuming employment while their children are infants and throughout the childrearing years (Spain & Bianchi, 1996; U.S. Bureau of Labor Statistics, 1998). Maternal employment has been linked with greater levels of father involvement in dual-earner families (Aldous et al., 1998; Beitel & Parke, 1998; Bonney et al., 1999) and lower maternal involvement (McBride & Mills, 1993). Thus, maternal employment was considered as a potential predictor of mother and father involvement.

In addition to mothers' employment status, family size may be an important factor in determining mother and father involvement. There is a plethora of research on the changes in the family associated with the birth of the first child (Cowan et al, 1985; Cox et al, 1999; Schultz et al., 2006; Shapiro, Gottman, Carrere, 2000; White & Booth, 1985); however, there is a shortage of research on differences in mother and father involvement resulting from the expansion of the family. Kreppner (1988) highlighted that the entrance of a second child into

the family increases caregiving and other activities, which places more demands on parental involvement. Furthermore, although fathers often become more involved in parenting activities as family size increases, they are also less likely to spend time with their infants and are more likely to be involved with the older children (Goldscheider & Waite, 1991; Kreppner). Therefore, the number of siblings was assessed as a potential predictor of mother and father involvement with infants.

The Current Study

The present investigation was designed to integrate the roles of both child temperament and parents' marital satisfaction in predicting direct mother and father involvement during infancy. Longitudinal work is particularly important during the first years of life, as infants' rapidly developing abilities and changing needs may influence the extent to which parents are required or enticed to become involved. For this study, parental involvement was assessed through a structured daily diary intended for both parents to fill out together at the end of each day on two weekdays and two weekend days. Specifically, using a diary methodology, parents jointly reported on the extent of their direct involvement in a variety of childrearing activities, including caregiving, playing, teaching, and soothing. This method allowed us to examine the amount and/or frequency of parents' involvement in important childrearing activities, rather than simply approximating a global perception of father involvement. Further, diary data can reduce recall error because participants report on behaviors that occurred that particular day (DeLongis, Hemphill, & Lehman, 1992; Piasecki, Hufford, Solan, & Trull, 2007; Schwarz & Oyserman, 2001). In empirical studies, diary data have demonstrated to be a valid and reliable measure of father involvement (Pleck & Masciadrelli, 2004). As noted earlier, the daily diaries provide quantitative estimates of the amount or frequency of direct parental involvement, but cannot indicate the quality of this involvement.

In developing hypotheses for this study, we expected that the link between infant temperament and father involvement would be mediated by marital satisfaction. Specifically, it was hypothesized that parents' marital satisfaction would be higher when infants have easier temperaments (i.e., low negative emotionality and well-regulated); in turn, high marital satisfaction was expected to be positively related to father involvement at both early and later infancy.

Given the lack of relations between marital satisfaction and mothers' involvement in prior work (Coiro & Emery, 1998; McBride & Mills, 1993), we did not expect marital satisfaction to mediate the relation between temperament and mothers' involvement. Finally, longitudinal mediation models were tested to examine whether the relations among infant temperament, marital satisfaction, and mother or father involvement would remain even after controlling for initial levels of the constructs.

Method

Participants

Participants were families residing in a large, southwestern metropolitan area, who were part of a larger longitudinal study of infants' social and emotional development and its correlates. The initial sample consisted of 276 families of which 252 were either married or cohabitating (only these families were eligible for the current investigation). A total of 157 families completed involvement diary data (doing so was optional) when infants were approximately seven months of age (T1; 81 boys, 61 girls) and at 14 months of age (T2; 47 boys, 49 girls). For this study, we included only those participants who completed the parental involvement diary at least one time.

The parents were Caucasian, non-Hispanic (80% of mothers and 82% of fathers), Hispanic (15% of mothers and 13% of fathers), Asian (2% of mothers and 2% of fathers), African American (1% of mothers and 1% of fathers), and an additional 2% of mothers and fathers indicated “other” as their race. Annual family income ranged from less than \$15,000 to over \$100,000, with a median income of \$45,000-60,000. Parents' formal education level ranged from 8th grade to the graduate level. The median number of years of formal education completed was a 4-year college degree for mothers and some years of college for fathers. Mothers were between the ages of 19 and 44 years ($M = 30.09$ years, $SD = 5.44$) and fathers were aged 19 to 53 years ($M = 32.08$ years, $SD = 5.70$) at the time of the infants' birth. The average length of marriage was approximately five years ($M = 5.07$ years, $SD = 3.83$). About half (49.7%) of the infants were firstborns. The total number of siblings ranged from 0 to 7 ($M = .91$, $SD = 1.22$).

Procedures

Families were recruited through three local hospitals following the birth of their child. Infants were healthy, full term, with no birth complications, and born to adult mothers and fathers (i.e., at least 18 years of age). Initial questionnaire packets were sent to both mothers and fathers when infants were approximately 6 and 12 months of age (T1 and T2) and returned by mail. Approximately one month after the initial questionnaires were sent, parents completed a daily diary together for a total of four days. Mothers provided information about their infants' temperamental emotional reactivity and regulation, and both parents separately reported their marital satisfaction.

Measures

Demographics—In addition to parental age, education, income, and length of marriage, mothers provided information regarding maternal employment status, maternal employment hours per week, and family composition (number of siblings).

Infant temperament—At T1 and T2, mothers were asked to complete the Infant Behavior Questionnaire, Revised version (IBQ-R; Gartstein & Rothbart, 2003), which assesses dimensions of infant temperament. For this study, we were interested in the constructs of negative emotionality and self-regulation, and created a composite score for each by averaging scores on five temperament scales, similar to prior work (see Gartstein & Rothbart). The negative emotionality composite included three scales: *distress to limitations* (16 items; e.g., “How often did the baby seem angry when you left him/her in the crib?”; $\alpha = .78$ and $.84$ for T1 and T2), *sadness* (14 items; e.g., “When you were busy with another activity, and your baby was not able to get your attention, how often did she become sad?”; $\alpha = .80$ and $.86$ for T1 and T2), and *falling reactivity* (reversed) (13 items; e.g., “When frustrated with something, how often did your baby calm down within 5 minutes?”; $\alpha = .82$ and $.81$ for T1 and T2). Two subscales were utilized to form a composite reflecting infant regulation: *duration of orientation* (12 items; e.g., “How often during the last week did the baby stare at a mobile, crib bumper or picture for 5 minutes or longer?”; $\alpha = .82$ and $.85$ for T1 and T2), and *soothability* (18 items; e.g., “When patting or gently rubbing some part of your baby's body, how often did she soothe immediately?”; $\alpha = .75$ and $.82$ for T1 and T2).

Marital satisfaction—Marital satisfaction was assessed at T1 and T2 using the Marital Adjustment Test (MAT; Locke & Wallace, 1959). This measure consists of 15-items that are weighted and summed to create one score representing marital satisfaction. The MAT is one of the most widely used measures in studying marital relationships (Gottman, Markmann, & Notarius, 1977; Roach, Frazier, & Bowden, 1981) and has the greatest number of reliability and validity studies of all self-report marital adjustment measures (Cohen, 1985). For mothers'

marital satisfaction, $\alpha_s = .75$ and $.80$, and for fathers' marital satisfaction, $\alpha_s = .70$ and $.74$, for T1 and T2, respectively.

Parental diaries—At T1 and T2, mothers and fathers were asked to complete a daily diary together for two weekdays (Monday-Friday) and two weekend days (Saturday-Sunday) of their choosing. Parents reported their involvement in a variety of child-related activities, including four caregiving items (e.g., “How many times today did you change your baby's diapers?”), two playing items (e.g., “How many times today did you play with your baby, such as using toys, reading to baby, playing peek-a-boo?”), three teaching items (e.g., “How many times today did you teach your baby to crawl or walk?”), and two soothing items (e.g., “How many times today did you soothe your baby when fussing or crying during the day?”). In response to each of the items, parents reported the duration and/or frequency of involvement for the mother individually (without the father; $\alpha_s = .80$ to $.91$), the father individually (without the mother; $\alpha_s = .67$ to $.89$), the mother and father jointly participating ($\alpha_s = .72$ to $.88$).

Absolute involvement scores for mothers' and fathers' individual involvement were used. Because existing literature has suggested that father involvement may differ across the week (Yeung, Sandberg, Davis-Kean, & Hofferth, 2001), and to reduce the number of variables, scores were computed for each of the four types of childrearing activities separately for weekdays and weekends. Thus, raw scores for fathers' individual involvement (not including joint involvement) were added over the two appropriate days to yield a weekday or weekend score in each category (i.e., caregiving, play, teaching, and soothing), and the same procedure was used to composite mothers' scores. Because the raw scores for father involvement were highly correlated across categories ($r_s = .44$ to $.71$, $p_s \leq .01$ and $r_s = .46$ to $.60$, $p_s \leq .01$ for T1 weekday and weekends, respectively and $r_s = .42$ to $.67$, $p_s \leq .01$ and $r_s = .23$ to $.55$, $p_s \leq .05$ for T2 weekday and weekends, respectively), and for mother involvement ($r_s = .27$ to $.58$, $p_s \leq .01$ and $r_s = .23$ to $.65$, $p_s \leq .01$ for T1 weekday and weekends, respectively and $r_s = .25$ to $.64$, $p_s \leq .01$ and $r = .11$ between teaching and caregiving, $p = ns$, and $r_s = .25$ to $.56$, $p_s \leq .05$ for T2 weekday and weekends, respectively), and to reduce the number of variables, these scores were summed to reflect total (i.e., across all four categories) weekday mother or father involvement and total weekend mother or father involvement.

Results

Attrition Analyses

Because completing the daily diaries was an optional portion of the larger study, we conducted analyses to examine potential differences between families who completed the involvement diaries ($n = 157$) and the eligible (i.e., married or cohabitating) families who were enrolled in the study but chose not to participate in the diary aspect of the project ($n = 95$). As a result of our selection criteria, parents who completed diaries were more likely to be married, $\chi^2(4) = 33.35$, $p \leq .01$, than parents who did not complete diaries. These families also had higher income levels ($M = 4.18$) than those in the larger sample ($M = 3.60$), $t(263) = 2.71$, $p \leq .01$, and mothers were more educated ($M = 4.37$) than those in the larger sample ($M = 3.93$), $t(271) = 3.35$, $p \leq .01$. Mothers and fathers who completed involvement diaries also were more likely to be Caucasian, $\chi^2(5) = 12.31$, $p \leq .05$ (mothers), and 23.11 , $p_s \leq .01$ (fathers). There were no differences between groups on infant sex, number of siblings, mothers' work hours, length of marriage, infant temperament, and parents' marital satisfaction.

We also conducted analyses to examine differences between families who completed involvement diaries at T1 but not at T2 and those who completed diaries at both time points. Mothers in families who completed involvement diaries at T2 tended to have slightly higher levels of education ($M = 4.53$) than those who did not continue in the study ($M = 4.12$), $t(154) = -2.48$, $p \leq .01$, and fathers who remained in the study were more likely to be Caucasian,

$\chi^2(4) = 12.17, p \leq .05$. There were no other significant differences in demographic characteristics, infant temperament, marital satisfaction, or parental involvement in comparison with families who did not continue in the study and complete diary data at T2.

Sex Differences

The means and standard deviations of the study variables are displayed separately for boys and girls in Table 1. Because some prior work has indicated differences in parental involvement with boys and girls (e.g., Manlove & Vernon-Feagans, 2002; McBride et al., 2002), MANOVAs were conducted to examine potential differences in the study variables for boys versus girls, and no significant sex differences were obtained.

Relations among Study Variables

The correlations of the demographic variables with mothers' and fathers' involvement were examined. The number of siblings was significantly negatively related to T1 father weekday and weekend involvement, $r_s(140) = -.23$ and $-.31, p_s \leq .01$; At T1 and T2, maternal work hours were negatively associated with mothers' involvement during the week, $r_s(139, 122) = -.31$ and $-.43, p_s \leq .01$, for T1 and T2, respectively. In addition, mothers' work hours were negatively related to mothers' marital satisfaction at T1, $r(151) = -.21, p \leq .01$.

To examine whether infant temperament and marital satisfaction were associated with mothers' and fathers' involvement at T1 and T2, correlations were computed (see Table 2). In general, the study variables were correlated in the hypothesized directions, particularly within T2. Father involvement scores during the week and on weekends were positively related, as were mother involvement scores during the week and on weekends. At both time points, fathers were more involved during the week with infants who were well regulated, and mothers were more involved on weekends when their infants were more regulated at T1 but not at T2. Mothers (but not fathers) had lower marital satisfaction when their children displayed higher levels of negative emotionality at T1 (this relation also was nearly significant at T2). When mothers were more satisfied in their marital relationship at T1, they were more involved with their infants during the week, and T2 mother marital satisfaction positively predicted father involvement during weekends at T2. Mothers' and fathers' reports of marital satisfaction were positively associated at both time points. Moreover, there was considerable stability in infant temperament, mother and father involvement, and marital satisfaction over time.

Relations of Infant Temperament and Marital Satisfaction to Father Involvement

Structural equation models were used to test the relations among infant temperament, marital satisfaction, and parental involvement (separately for mother and father involvement) both within and across time. The construct of infant temperament was indicated by mothers' reports of negative emotionality (reverse coded) and regulation. The two indicators for marital satisfaction were mothers' and fathers' marital adjustment test (MAT) scores. The constructs of parental involvement were indicated by parents' daily report of weekday and weekend mother or father involvement. In addition, mothers' employment hours (in the mother involvement model) and total number of siblings (in the father involvement model) were used as control variables based on the preliminary correlations.

Because estimates of the relations among latent variables are often positively biased when using the same reporter, corresponding error terms were correlated with each other when indicated by modification indices (i.e., error terms for mothers' report on one variable were correlated with error terms for their reports on other measures; Kenny & Kashy, 1992; Thomson & Williams, 1984). Mplus (Muthén & Muthén, 1998-2006) was used to analyze the data because it accounts for missing data by using a maximum likelihood method estimation.

Confirmatory factor analyses were conducted to ensure unidimensionality of the latent variables in the models. The measurement model included data on infant temperament, marital satisfaction, mothers' employment hours, total number of siblings, and parental involvement. For the mother involvement model, all loadings were significant and fit the data well, $\chi^2 (75) = 105.37, p = .01, AIC = 2132.40, CFI = .96, RMSEA = .05$ (90% CI = .03 to .07). Similarly, the father involvement measurement model fit the data well and all loadings were significant, $\chi^2 (72) = 92.07, p = .06, AIC = 1950.98, CFI = .97, RMSEA = .04$ (90% CI = .00 to .07).

To test the factorial invariance of the models from T1 to T2 and verify that the relations of the indicators to the latent constructs were constant across time (Cole & Maxwell, 2003), the measurement model described above (unconstrained model) was compared to a model in which the T1 loadings of the various observed variables were constrained to be equal with their analogous loadings on the T2 variables (constrained model). The comparison between the constrained and unconstrained models was not significant for either the mother involvement model, $\Delta\chi^2 (3) = 3.08, p > .10$, or the father involvement model, $\Delta\chi^2 (4) = 4.81, p > .10$, indicating that the factor loadings were equal across waves. Accordingly, for all subsequent models, the loadings were set to be equal across time. The unstandardized loadings (constrained to be equal across time) of the observed variables on the latent constructs are presented in Table 3.

Mediation within each time point—Structural equation modeling was utilized to examine whether marital satisfaction mediated the relation between infant temperament and parental involvement within each time (separately for mother and father involvement). In addition, direct paths between infant temperament and parental involvement were included at each time point. Relations among the constructs within T1 were tested, and the analogous paths at T2 were also tested simultaneously. In addition, because there was stability in the constructs from T1 to T2, we included autocorrelations in the constructs across time.

Both the mother involvement model and the father involvement models fit the data adequately, $\chi^2 (55) = 86.15, p = .01, AIC = 2153.12, CFI = .95, RMSEA = .06$ (90% CI = .03 to .08), and $\chi^2 (60) = 82.58, p = .03, AIC = 1965.49, CFI = .96, RMSEA = .05$ (90% CI = .02 to .07), for the mother and father involvement models, respectively. The path coefficients for these models are presented in Figures 1 and 2.

When predicting mother involvement, findings revealed a significant and positive path from infant temperament to parents' marital satisfaction (at both T1 and T2). Moreover, at T1 (but not at T2), marital satisfaction was positively related to mothers' involvement. The direct path between infant temperament and mothers' involvement was not significant at either time point. The mediated effect at T1 was formally tested by following the confidence interval method, PRODCLIN, recommended by Fritz and MacKinnon (2007) that accommodates the non-normal distribution of the indirect effects. The PRODCLIN asymmetric confidence-intervals test obtains a confidence interval for the indirect effect estimate over the traditional tests utilizing normal theory (see Fritz & MacKinnon; MacKinnon, Fritz, Williams, & Lockwood, 2007). The 95% confidence limits for the indirect effect did not include zero (lower confidence limit = .00653; upper confidence limit = .08408), indicating that T1 marital satisfaction significantly mediated the relation between infant temperament and mother involvement at T1.

Similar to the mother involvement model, in the father involvement model, findings showed significant paths from infant temperament to higher parental marital satisfaction at both T1 and T2. Moreover at T2, but not at T1, parents' marital satisfaction was positively related to father involvement. The 95% confidence limits for the indirect effect did not include zero (lower confidence limit = .00007; upper confidence limit = .02615), signifying that T2 marital

satisfaction significantly mediated the relation between T2 infant temperament and T2 father involvement.

Longitudinal mediation—Although mediation was found concurrently (at T1 for the mother involvement model and at T2 when predicting father involvement), a more ideal test for mediation using longitudinal two-wave data involves testing relations over time while controlling for initial levels of each construct (Cole & Maxwell, 2003). It was hypothesized that there would be a positive path from T1 infant temperament to T2 marital satisfaction, and a positive path from T1 marital satisfaction to T2 parental involvement, controlling for stability of the constructs. A direct path between T1 infant temperament and T2 parental involvement was also tested. Further, it was expected that the autoregressive paths (stability over time) from T1 to T2 constructs would be positive and significant.

For the mother involvement longitudinal model, the model fit the data adequately, $\chi^2(75) = 125.30$, $p \leq .01$, $AIC = 2152.27$, $CFI = .93$, $RMSEA = .07$ (90% CI = .05 to .09). As expected, all of the autoregressive paths were positive and significant between the T1 and T2 constructs. However, the paths from T1 infant temperament to T2 parental marital satisfaction and T2 mother involvement were not significant. Moreover, the path from T1 marital satisfaction to mother involvement was not significant. These findings indicate that relations among the variables could only be found concurrently at T1 and not across time once controlling for stability of the constructs.

When predicting father involvement over time, the model with fit the data well, $\chi^2(77) = 92.78$, $p = .11$, $AIC = 1302.14$, $CFI = .96$, $RMSEA = .04$ (90% CI = .00 to .06). The path coefficients for the model are presented in Figure 3. As expected, all of the autoregressive paths were positive and significant between the T1 and T2 constructs. The paths from T1 infant temperament to T2 parents' marital satisfaction and T2 father involvement were not significant; however, the path from T1 parents' marital satisfaction to T2 father involvement was significant and positive, indicating across-time relations between parents' marital satisfaction and father involvement, even after controlling for initial levels of the constructs.

Discussion

Although scholars have shown differences in the level of child care involvement for mothers and fathers (Craig, 2006; Gaertner et al., 2007; McBride & Mills, 1993), this study goes beyond previous research by examining the differential factors that predict mothers' and fathers' involvement over time. Theorists strongly suggest that the conceptualizations of fathering should not be based on mothering literature (Marsiglio et al., 2000). Because fathers have fewer explicit guidelines and, consequently, their involvement may be more variable (Doherty et al., 1998; Harris & Morgan, 1991; Parke 2002), it was hypothesized that fathers would be more sensitive to the influence of other factors, such as child characteristics or parental relationships, than would mothers. Overall, the results of this study suggest that infants' development may play a role in understanding the determinants of mothering versus fathering. Specifically, mothers' involvement was explained in early infancy by infant temperament and marital satisfaction; however, fathers' involvement was predicted only in later infancy by these factors.

Biological maturation occurs rapidly during the first year of life (i.e., some temperament-related developments) and infants are continually mastering age-appropriate skills (i.e., asserting autonomy). Consequently, with the acquisition of new developmental skills, the needs and opportunities for parental involvement may shift as well during this period. Indeed, fathers tend to become more involved in childrearing as children age (Gaertner et al., 2007; Pleck, 1997). Thus, as fathers begin to engage to a greater extent with their infants, factors such as marital quality may become more important in impacting the level of their involvement.

This current work builds upon the existing literature demonstrating a positive relation between marital satisfaction and fathering behaviors (Cowan & Cowan, 2000; Cox et al., 1999; Grych & Clark, 1999; Katz & Gottman, 1996; Levy-Shiff, 1994; McBride & Mills, 1993), including father involvement (Aldous et al., 1998; Crouter, Perry-Jenkins, Huston, & McHale, 1987). Results from the current study also indicate that parents' marital satisfaction at approximately seven months postpartum could either encourage or inhibit later father involvement. These findings support a “spillover” hypothesis. Fathers may differentiate less clearly between their role as father and husband (Furstenberg & Cherlin, 1991). In other words, fathers that feel disconnected or distressed in their marital relationship are more likely to withdraw and are less likely to be involved with their children (Coiro & Emery, 1998).

It is also important to note that fathers may have more discretion when it comes to caring for their infants than do mothers (Craig, 2006). For example, tasks in which fathers may be more likely to engage (i.e., playing) have been shown to be less time constrained than are tasks typically performed by mothers (i.e., feeding, diapering). Thus, fathers may be more likely to choose when and how much they are involved with their infants. Given this difference between the nature of mothers' and fathers' childrearing tasks, fathers' involvement may be more influenced by other factors such as the marital relationship than is mothers' involvement.

For mothers, parents' marital satisfaction also predicted higher maternal involvement at T1 (but not at T2). It is possible that marital satisfaction impacts mothers' involvement in early infancy because more basic caretaking is required during the early months of life, and mothers may view themselves as the primary caregiver and take on more of these responsibilities. In addition, marital satisfaction is susceptible to steeper declines in women than in men during this period (Cowan & Cowan, 2000). Thus, the greater caretaking demands and added stress from the marital relationship may carryover to mothers' parenting of their young infants.

We also investigated the role of infants' disposition on mothers' and fathers' involvement with their infants. In the structural equation models, there were no direct relations between infant temperament and parental involvement. However, examination of the correlations revealed that when infants were more regulated, their mothers reported greater involvement on weekends at T1 and their fathers reported higher levels of involvement during the week at both time-points. Thus, while no unique direct relations were found, mothering and fathering may be easier when infants are less difficult, especially during times when the other parent is likely more involved (i.e., weekends for mothers and weekdays for fathers; Yeung et al., 2001).

As expected, infant temperament was associated with the marital relationship. Specifically, infant temperament (i.e., well regulated, low negative affect) was positively related to parents' marital satisfaction at both T1 and T2. Researchers have shown that mothers report more stress with temperamentally difficult children (Engfer, 1986; Gelfand, Teti, & Radin Fox, 1992). Therefore, infants' dispositions may contribute to parents' emotional tone, and, in turn, their perception of other familial relationships. Specifically, when their child displays high negativity, parents' view of their marriage may be more negative. Correspondingly, McHale and colleagues (2004) found that when parents have negative perceptions of their children, they may hold similar evaluations of other family relationships. The fact that temperament did not predict parents' marital satisfaction over time may be due to a variety of factors associated with sample size and the strong stability of constructs across time.

In understanding mothers' and fathers' involvement with their infants, it is important to examine the processes involved. Thus, in this study, we tested whether the relations of infant temperament to parental involvement were mediated by parents' marital satisfaction. Indeed, we found that temperament did not directly predict parents' involvement when marital satisfaction was accounted for in the models. Although no other studies to date have tested

such relations with young children, Leve et al (2001) found a similar mediational relation between temperament and fathers' pleasure with parenting. The current study adds to our knowledge about these processes by examining mothers' and fathers' involvement in childcare and studying these processes over time.

In considering contextual variables that may account for variance in parental involvement, sibling size predicted T1 father involvement. Specifically, as the number of siblings increased, the less involved fathers were with their infants. Consistent with the literature, one possible explanation is that fathers are more likely to be involved with parenting older children (Goldscheider & Waite, 1991; Kreppner, 1988). In addition, mothers' work hours negatively predicted mother involvement at both T1 and T2. These findings add to the body of literature that demonstrate a link between maternal employment and parental involvement (Aldous et al., 1998; Beitel & Parke, 1998; Bonney et al., 1999; McBride & Mills, 1999).

Strengths, Limitations and Future Directions

Among the strengths of this study was the utilization of parental involvement diaries that incorporated the multidimensional aspects of father involvement. Parental involvement was documented with diaries over the course of several days, including both weekdays and weekends. This type of data can increase reliability and validity of self-report data and reduce recall error because the participant recounts behaviors on that particular day (DeLongis et al., 1992). In addition, the longitudinal design of this study allowed us to examine the predictors of father involvement across infancy, a period that may be particularly important in establishing the nature and trajectory of fathers' involvement with their children.

Although the present study provided methodological improvements over past research, it is important to note its weaknesses and limitations. One limitation is that the data gathered on infant temperament were collected only from mothers. Given that the interest was in mothers' and fathers' involvement during infancy, it would be an asset to gather information on fathers' perception of temperament as well. Despite this limitation, mothers and fathers have been found to agree moderately on children's temperament (Bates & Bayles, 1984) and mothers' reports have been correlated modestly with observed measures of temperament (Bates & Bayles; Goldsmith & Rothbart, 1991; Matheny, Wilson, & Thoben, 1987), indicating that maternal reports of temperament are a valid approach to studying individual differences in children's behaviors (Rothbart & Bates, 2006).

Caution should be used in generalizing results from the present study to other populations. Participants for this study were predominantly Caucasian, middle-class, and fairly educated. The relations between mother and father involvement, infant temperament, and spousal satisfaction may differ across other ecological and sociocultural contexts. Therefore, in order to improve the study's generalizability, future research should explore these relations with different family structures.

The findings of this present study draw attention to the construct of parental involvement, which we conceptualized as active participation in childrearing. Some researchers have asserted the need to continue to examine both mother and father involvement in a multidimensional manner (Schoppe-Sullivan, McBride, & Ho, 2004), and future research should also include other important dimensions of parental involvement (i.e., financial support, indirect parenting responsibilities, household duties) to more fully understand their predictors and how they may impact child development.

Given the traditionally lower levels of father involvement as compared to mothers and the considerable differences in patterns of father involvement across families (McBride & Mills; 1993; Pleck & Masciadrelli, 2004), this topic clearly deserves continued attention. When

studying father involvement, as well as designing programs to encourage fathers to become more involved in the parental role, it is important to more fully understand the variables that may influence such involvement, most notably child characteristics and other family processes (Tamis-LeMonda & Cabrera, 1999). It is also important to understand the factors that differentially predict mothers' and fathers' involvement in childcare. Lastly, in examining characteristics of marital relations that may promote or dissuade mother and father involvement, future studies should include multiple dimensions of the marital relationship, such as conflict and partner support.

Perhaps the most important lesson to be learned from this study is that infants' dispositions and parents' view of their marital relationship are associated with aspects of parenting. Longitudinal studies should continue to include assessments of infant temperament, mother and father involvement, and marital satisfaction during infancy and into toddlerhood. Although this was a longitudinal study, it consisted of only two assessment points, resulting in limited information about the correlates of parental involvement with a new infant in the family system. Potential patterns could be demonstrated through more assessment points over time to understand the role of fathers during infancy and thereafter. Indeed, by studying these patterns over time, researchers should examine how the emergent familial patterns during infancy contribute to later child outcomes. Only by fully understanding these familial processes will researchers and practitioners be best able to emphasize interactions that are most beneficial to the family.

Acknowledgments

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References

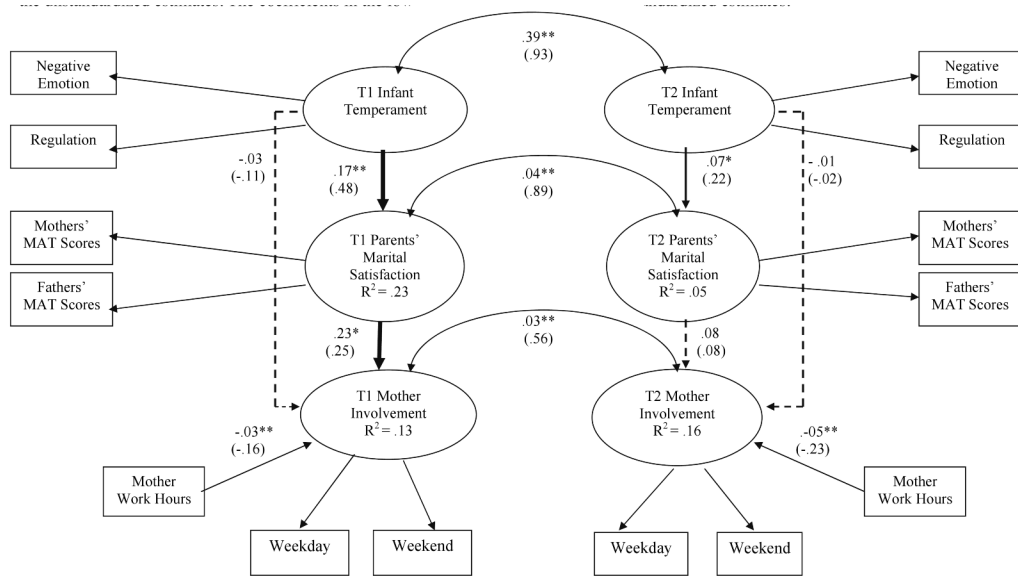
- Aldous, J. *Family careers: Developmental changes in families*. New York: Wiley; 1978.
- Aldous J, Mulligan GM, Bjarnason T. Fathering over time: What makes the difference? *Journal of Marriage and the Family* 1998;60:809–820.
- Bates JE, Bayles K. Objective and subjective components in mothers' perceptions of their children from age 6 months to 3 years. *Merrill-Palmer Quarterly* 1984;30:111–130.
- Beitel AH, Parke RD. Paternal involvement in infancy: The role of maternal and paternal attitudes. *Journal of Family Psychology* 1998;12:268–288.
- Belsky J. The determinants of parenting: A process model. *Child Development* 1984;55:83–96. [PubMed: 6705636]
- Belsky J, Youngblade L, Rovine M, Volling B. Patterns of marital change and parent-child interaction. *Journal of Marriage and the Family* 1991;53:487–498.
- Bonney JF, Kelley ML, Levant RF. A model of fathers' behavioral involvement in child care in dual-earner families. *Journal of Family Psychology* 1999;13:401–415.
- Cabrera NJ, Tamis-LeMonda CS, Bradley RH, Hofferth S, Lamb ME. Fatherhood in the twenty-first century. *Child Development* 2000;71:127–136. [PubMed: 10836566]
- Cohen PM. Locke Marital Adjustment Scale and Dyadic Adjustment Scale. *American Journal of Family Therapy* 1985;13:66–71.
- Coiro MJ, Emery RE. Do marriage problems affect fathering more than mothering? A quantitative and qualitative review. *Clinical Child and Family Psychology Review* 1998;1:23–40. [PubMed: 11324075]
- Cole DA, Maxwell SE. Testing mediational models with longitudinal data: questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology* 2003;112:558–577. [PubMed: 14674869]
- Cook JL, Jones RM, Dick AJ, Singh A. Revisiting men's role in father involvement: The importance of personal expectations. *Fathering* 2005;2:165–178.

- Corwyn RF, Bradley RH. Determinants of paternal and maternal investment in children. *Infant Mental Health Journal* 1999;20:238–256.
- Cowan, CP.; Cowan, PA. When partners become parents: The big life change for couples. Mahwah, NJ: Erlbaum; 2000.
- Cowan CP, Cowan PA, Heming G, Garrett E, Coysh WS, Curtis-Boles H, et al. Transitions to parenthood: His, hers, and theirs. *Journal of Family Issues* 1985;6:451–481. [PubMed: 12340558]
- Cox MJ, Paley B, Burchinal M, Payne CC. Marital perceptions and interactions across the transition to parenthood. *Journal of Marriage and the Family* 1999;61:611–625.
- Craig L. Does father care mean fathers share? A comparison of how mothers and fathers in intact families spend time with children. *Gender and Society* 2006;20:259–281.
- Crockenberg, S.; Leerkes, E. Infant negative emotionality, caregiving, and family relationships. In: Crouter, AC.; Booth, A., editors. *Children's influence on family dynamics: The neglected side of family relationships*. Mahwah, NJ: Lawrence Erlbaum Associates; 2003. p. 57-78.
- Crouter AC, Perry-Jenkins M, Huston T, McHale SM. Processes underlying father involvement in dual-earner and single-earner families. *Developmental Psychology* 1987;23:431–440.
- Cummings, EM.; O'Reilly, AW. Fathers in family context: Effects of marital quality on child adjustment. In: Lamb, ME., editor. *The role of the father in child development*. 3rd. New York: Wiley; 1997. p. 49-65.
- Daly K. Reshaping fatherhood: Finding the models. *Journal of Family Issues* 1993;14:510–530.
- DeLongis, A.; Hemphill, KJ.; Lehman, DR. A structured diary methodology for the study of daily events. In: Bryant, FB.; Edwards, J.; Tindale, RS.; Posavac, EJ.; Heath, L.; Henderson, E., et al., editors. *Methodological issues in applied social psychology*. New York: Plenum Press; 1992. p. 83-109.
- Dickstein S, Parke RD. Social referencing in infancy: A glance at fathers and marriages. *Child Development* 1988;59:506–511. [PubMed: 3359868]
- Doherty WJ, Kouneski EF, Erickson MF. Responsible fathering: An overview and conceptual framework. *Journal of Marriage and the Family* 1998;60:277–292.
- Engfer, A. Antecedents of perceived behavior problems in infancy. In: Kohnstamm, G., editor. *Temperament discussed*. Lisse: Swets & Zeitlinger; 1986. p. 165-180.
- Feldman R. Parents' convergence on sharing and marital satisfaction, father involvement, and parent-child relationship at the transition to parenthood. *Infant Mental Health Journal* 2000;21:176–191.
- Feldman SS, Nash SC, Aschenbrenner BG. Antecedents of fathering. *Child Development* 1983;54:1628–1636.
- Fitzgerald H, Mann T, Barratt M. Father and infants. *Infant Mental Health Journal* 1999;20:213–221.
- Fritz MS, MacKinnon DP. Required sample size to detect the mediated effect. *Psychological Science* 2007;18:233–239. [PubMed: 17444920]
- Furstenberg, FF.; Cherlin, AJ. *Divided families: What happens to children when parents part*. Cambridge: Harvard University Press; 1991.
- Gable S, Crnic K. Coparenting within the family system: Influences on children's development. *Family Relations: Interdisciplinary Journal of Applied Family Studies* 1994;43:380–386.
- Gaertner BM, Spinrad TL, Eisenberg N, Greving KA. Parental childrearing attitudes as correlates of father involvement during infancy. *Journal of Marriage and Family* 2007;69:962–976. [PubMed: 18174913]
- Gartstein MA, Rothbart MK. Studying infant temperament via the revised infant behavior questionnaire. *Infant Behavior & Development* 2003;26:64–86.
- Gelfand DM, Teti DM, Radin Fox CE. Sources of parenting stress for depressed and non-depressed mothers. *Journal of Clinical Child Psychology* 1992;21:262–272.
- Goldscheider, FK.; Waite, LJ. *New families, no families*. Berkeley: University of California Press; 1991.
- Goldsmith, HH.; Rothbart, MK. Contemporary instruments for assessing early temperament by questionnaire and in the laboratory. In: Strelau, J.; Angleitner, A., editors. *Explorations in temperament: International perspectives on theory and measurement Perspectives on individual differences*. New York: Plenum Press; 1991. p. 249-272.
- Gottman JM, Markman H, Notarius C. The topography of marital conflict: A sequential analysis of verbal and nonverbal behavior. *Journal of Marriage and the Family* 1977;9:461–477.

- Grych JH, Clarke R. Maternal employment and development of the father-infant relationship in the first year. *Developmental Psychology* 1999;35:893–903. [PubMed: 10442859]
- Harris KM, Morgan SP. Fathers, sons, and daughters: Differential paternal involvement in parenting. *Journal of Marriage and the Family* 1991;53:531–544.
- Katz, LF.; Gottman, JM. Spillover effects of marital conflict: In search of parenting and coparenting mechanisms. In: McHale, JP.; Cowan, PA., editors. *Understanding how family level dynamics affect children's development: Studies of two-parent families*. San Francisco, CA: Jossey-Bass; 1996. p. 57-76.
- Kenny DA, Kashy DA. Analysis of the multi-trait-multimethod matrix by confirmatory factor analysis. *Psychological Bulletin* 1992;112:165–172.
- Krepner, K. Changes in dyadic relationships within a family after the arrival of a second child. In: Hinde, RA.; Stevenson-Hinde, J., editors. *Relationships within families: Mutual Influences*. Oxford: Clarendon Press; 1988. p. 143-167.
- Lamb, ME., editor. *The role of the father in child development*. 4rd. Hoboken, NJ: Wiley; 2004.
- Lamb, ME.; Bornstein, MH.; Teti, DM. *Development in infancy*. New Jersey: Lawrence Erlbaum Associates; 2002.
- Lamb, ME.; Pleck, JH.; Charnov, EL.; Levine, JA. A biosocial perspective on paternal involvement. In: Lancaster, J.; Altmann, J.; Rossi, A.; Sherrod, L., editors. *Parenting across the lifespan: Biosocial dimensions*. New York: Aldine de Gruyter; 1987. p. 111-142.
- Leve LD, Scaramella LV, Fagot BI. Infant temperament, pleasure in parenting, and marital happiness in adoptive families. *Infant Mental Health Journal* 2001;22:545–558.
- Levy-Shiff R. Individual and contextual correlates of marital change across the transition to parenthood. *Developmental Psychology* 1994;30:591–601.
- Locke H, Wallace K. Short marital-adjustment and prediction tests: Their reliability and validity. *Marriage and Family Living* 1959;21:251–255.
- MacKinnon DP, Fritz MS, Williams J, Lockwood CM. Distribution of the product confidence limits for the indirect effect: Program PRODCLIN. *Behavioral Research Methods* 2007;39:384–389.
- Manlove EE, Vernon-Feagans L. Caring for infant daughters and sons in dual-earner households: Maternal reports of father involvement in weekday time and tasks. *Infant and Child Development* 2002;11:305–320.
- Margolin G, Gordis EB, John RS. Coparenting: A link between marital conflict and parenting in two-parent families. *Journal of Family Psychology* 2001;15:3–21. [PubMed: 11322083]
- Marsiglio W, Amato P, Day R, Lamb ME. Scholarship on fatherhood in the 1990's and beyond. *Journal of Marriage and the Family* 2000;62:1173–1191.
- Matheny AP, Wilson RS, Thoben AS. Home and mother: Relations with infant temperament. *Developmental Psychology* 1987;23:323–331.
- McBride BA, Mills G. A comparison of mother and father involvement with their preschool children. *Early Childhood Research Quarterly* 1993;8:457–477.
- McBride, BA.; Schoppe, SJ.; Ho, MH.; Rane, TR. Multiple determinants of father involvement: An exploratory analysis using the PSID-CDS data set. In: Day, RD.; Lamb, ME., editors. *Conceptualizing and measuring father involvement*. Mahwah, NJ: Lawrence Erlbaum Associates; 2004. p. 321-340.
- McBride BA, Schoppe SJ, Rane TR. Child characteristics, parenting stress, and parental involvement: Fathers versus mothers. *Journal of Marriage and the Family* 2002;64:998–1011.
- McHale, JP.; Kavanaugh, KC.; Berkman, JM. Sensitivity to infants' cues: As much a mandate for researchers as for parents. In: Crouter, AC.; Booth, A., editors. *Children's influence on family dynamics: The neglected side of family relationships*. Mahwah, NJ: Lawrence Erlbaum Associates; 2003. p. 91-108.
- McHale JP, Kazali C, Rotman T, Talbot J, Carleton M, Lieberman R. The transition to coparenthood: Parents' prebirth expectations and early coparental adjustment at 3 months postpartum. *Development and Psychopathology* 2004;16:711–733. [PubMed: 15605633]
- Minuchin, S. *Families and family therapy*. Cambridge, Massachusetts: Harvard University Press; 1974.
- Muthén, LK.; Muthén, BO. *Mplus User's Guide*. 4th. Los Angeles, CA: Muthén & Muthén; 19982006.

- NICHD Early Child Care Research Network. Factors associated with fathers' caregiving activities and sensitivity with young children. *Journal of Family Psychology* 2000;14:200–219. [PubMed: 10870290]
- O'Brien M, Peyton V. Parenting attitudes and marital intimacy: A longitudinal analysis. *Journal of Family Psychology* 2002;16:118–127. [PubMed: 12085726]
- Paley B, Cox MJ, Kanoy KW, Harter KSM, Burchinal M, Margand NA. Adult attachment and marital interaction as predictors of whole family interactions during the transition to parenthood. *Journal of Family Psychology* 2005;19:420–429. [PubMed: 16221022]
- Parke, RD. *Fatherhood*. Cambridge, MA: Harvard University Press; 1996.
- Parke, RD. Fathers and families. In: Bornstein, MH., editor. *Handbook of parenting: Vol 3 Being and becoming a parent*. 2nd. Hillsdale, NJ: Erlbaum; 2002. p. 27-73.
- Piasecki TM, Hufford MR, Solhan M, Trull TJ. Assessing clients in their natural environments with electronic diaries: Rationale, benefits, limitations, and barriers. *Psychological Assessment* 2007;19:25–43. [PubMed: 17371121]
- Pleck, JH. Paternal involvement: Levels, sources, and consequences. In: Lamb, ME., editor. *The role of the father in child development*. 3rd. New York: Wiley; 1997. p. 66-103.
- Pleck, JH.; Masciadrelli, BP. Paternal involvement by U.S. residential fathers: Levels, sources, and consequences. In: Lamb, ME., editor. *The role of the father in child development*. 4th. Hoboken, NJ: Wiley; 2004. p. 222-271.
- Popp TK, Spinrad TL, Smith CL. The relation of cumulative demographic risk to mothers' responsivity and control: Examining the role of toddler temperament. *Infancy* 2008;13:496–518. [PubMed: 19865607]
- Porter CL, Wouden-Miller M, Silva SS, Porter CL. Marital harmony and conflict: Links to infants' emotional regulation and cardiac vagal tone. *Infancy* 2003;4:297–307.
- Roach AR, Browden R, Frazier T. The Marital Satisfaction Scale. *Journal of Marriage and the Family* 1981;43:537–546.
- Rogers SJ. Mothers work hours and marital quality: Variations by family structure and family size. *Journal of Marriage and the Family* 1996;58:606–617.
- Rothbart, MK.; Bates, JE. Temperament. In: Eisenberg, N.; Damon, W.; Lerner, RM., editors. *Handbook of child psychology*. 6th. New York: Wiley; 2006. p. 99-166.
- Schoppe-Sullivan SJ, McBride BA, Ho MHR. Unidimensional versus multidimensional perspectives on father involvement. *Fathering* 2004;2:147–163.
- Schulz MC, Cowan CP, Cowan PA. Promoting healthy beginnings: A randomized controlled trial of a preventive intervention to preserve marital quality during the transition to parenthood. *Journal of Consulting and Clinical Psychology* 2006;74:20–31. [PubMed: 16551140]
- Schwarz N, Oyserman D. Asking questions about behavior: Cognition, communication, and questionnaire construction. *American Journal of Evaluation* 2001;22:127–160.
- Shapiro AF, Gottman JM, Carrere S. The baby and the marriage: Identifying factors that buffer against decline in marital satisfaction after the first baby arrives. *Journal of Family Psychology* 2000;14:59–70. [PubMed: 10740682]
- Spain, D.; Bianchi, SM. *Balancing act*. Russell Sage Foundation; 1996.
- Tamis-LeMonda CS, Cabrera N. Perspectives on father involvement: Research and Policy. *Social Policy Report*. 1999 Society for Research in Child Development.
- Thomson E, Williams R. A note on correlated measurement error in wife-husband data. *Journal of Marriage and the Family* 1984;46:387–390.
- Twenge JM, Campbell WK, Foster CA. Parenthood and marital satisfaction: A meta-analytic review. *Journal of Marriage and Family* 2003;65:574–583.
- United States Bureau of Labor Statistics. *Labor for statistics from the current population survey, Table A-2. Employment Status of the Civilian Population by Race, Sex, Age, and Hispanic Origin*. 1998.
- United States Bureau of the Census. *Marital status and living arrangements (Current Population Reports)*. Washington, DC: U.S. Government Printing Office; 1998. P20-514
- Volling BL, Belsky J. Multiple determinants of father involvement during infancy in dual-earner and single earner families. *Journal of Marriage and the Family* 1991;53:461–474.

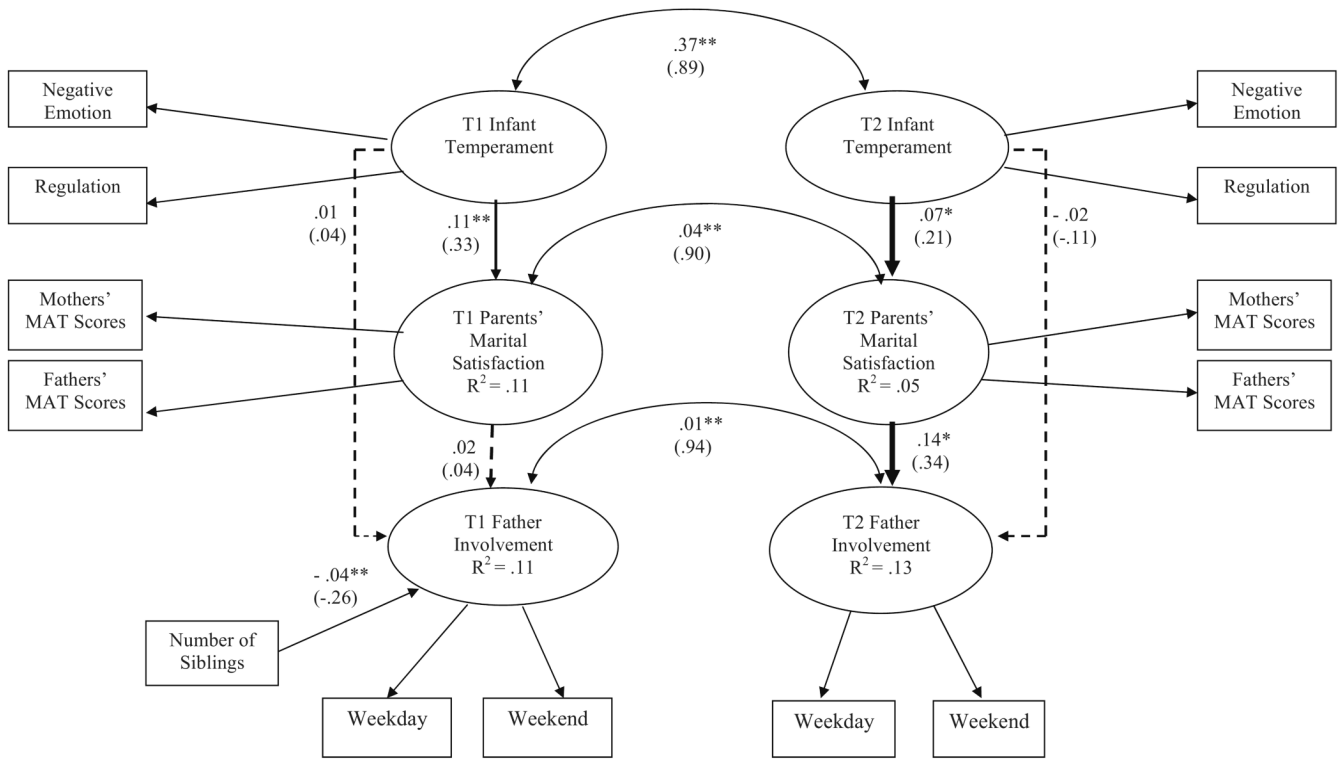
- White L, Booth A. The transition parenthood and marital quality. *Journal of Family Issues* 1985;6:435–449. [PubMed: 12340557]
- White LK, Rogers SJ. Economic circumstances and family outcomes: A Review of the 1990s. *Journal of Marriage and the Family* 2000;62:1035–1051.
- Yeung WJ, Sandberg JF, Davis-Kean PE, Hofferth SL. Children's time with fathers in intact families. *Journal of Marriage and the Family* 2001;63:136–154.
- Yogman MW, Kindlon D, Earls F. Father involvement and cognitive-behavioral outcomes of preterm infants. *Journal of the American Academy of Child and Adolescent Psychiatry* 1995;34:58–66. [PubMed: 7860458]



Note: * $p \leq .05$, ** $p \leq .01$

Figure 1.

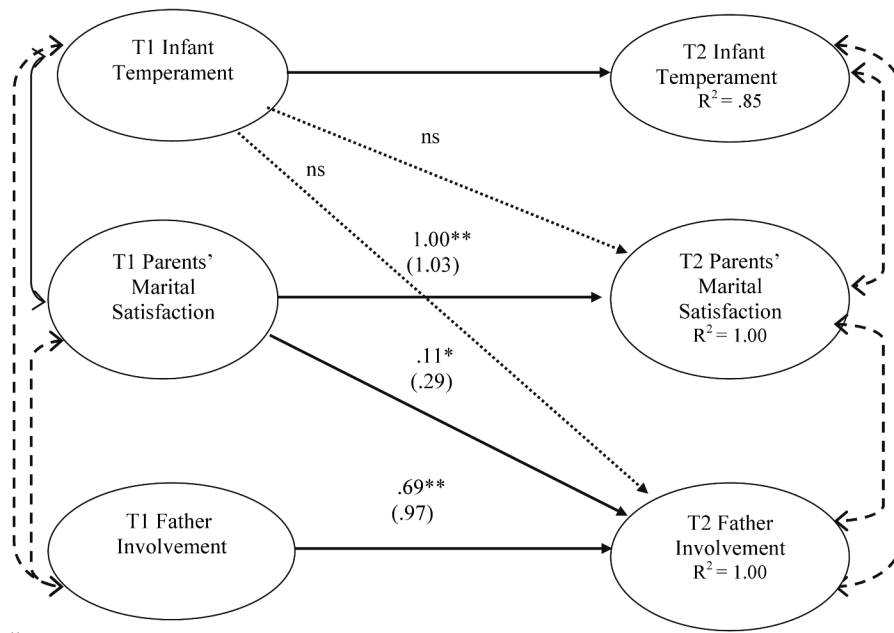
The relations of infant temperament and parents' marital satisfaction to mother involvement within time. Solid lines represent significant paths, bold lines represent mediated paths, and dashed lines represent hypothesized but non-significant paths. The coefficients in the upper row are the unstandardized estimates. The coefficients in the lower row (in parentheses) are the standardized estimates.



Note: * $p \leq .05$, ** $p \leq .01$

Figure 2.

The relations of infant temperament and parents' marital satisfaction to father involvement within time. Solid lines represent significant paths, bold lines represent mediated paths, and dashed lines represent hypothesized but non-significant paths. The coefficients in the upper row are the unstandardized estimates. The coefficients in the lower row (in parentheses) are the standardized estimates.



Note: * $p \leq .05$, ** $p \leq .01$

Figure 3. The relations of parents' marital satisfaction and infant temperament to father involvement across time controlling for initial levels. Solid lines represent significant paths, and dashed lines represent hypothesized but non-significant paths. The coefficients in the upper row are the unstandardized estimates. The coefficients in the lower row (in parentheses) are the standardized estimates.

Table 1
Means and Standard Deviations of the Study Variables

	Overall <i>M (SD)</i>	Boys <i>M (SD)</i>	Girls <i>M (SD)</i>	<i>T</i>
<i>T1 Variables^a</i>				
Negative Emotion	2.98 (.73)	3.01 (.76)	2.94 (.69)	.58
Infant Regulation	4.56 (.73)	4.57 (.76)	4.55 (.69)	.14
Mothers' MS	122.33 (23.95)	125.21 (22.98)	118.88 (24.80)	1.64
Fathers' MS	121.17 (21.31)	121.04 (21.94)	121.33 (20.73)	-.08
Father-Weekday	21.03 (15.41)	20.47 (13.94)	21.77 (17.27)	-.50
Father-Weekend	28.13 (17.78)	28.65 (17.52)	27.43 (18.25)	.41
Mother-Weekday	60.96 (20.97)	63.52 (20.70)	57.56 (21.02)	1.69 ⁺
Mother-Weekend	56.91 (21.22)	56.98 (20.28)	56.82 (22.59)	.04
<i>T2 Variables^a</i>				
Negative Emotion	3.17 (.76)	3.15 (.80)	3.19 (.70)	-.28
Infant Regulation	4.39 (.64)	4.36 (.67)	4.45 (.59)	-.83
Mothers' MS	122.22 (24.76)	124.27 (22.70)	119.55 (27.18)	1.11
Fathers' MS	121.79 (22.99)	122.67 (23.59)	120.78 (22.47)	.44
Father-Weekday	23.90 (16.04)	21.68 (16.02)	26.02 (15.93)	-1.33
Father-Weekend	26.32 (13.64)	26.09 (13.39)	26.55 (14.01)	-.17
Mother-Weekday	54.43 (21.71)	53.28 (23.13)	55.53 (20.43)	-.51
Mother-Weekend	50.58 (17.33)	49.36 (15.73)	51.76 (18.82)	-.67

^aNote: MS = Marital Satisfaction; Weekday and Weekend refers to Parents' Involvement

⁺ $p \leq .10$

Table 2

Observed Correlations Between the Study Variables

Variables ^a	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. T1 Negative Emotion	—														
2. T1 Infant Regulation	-.16*	—													
3. T1 Mothers' MS	-.23**	.13	—												
4. T1 Fathers' MS	-.11	.01	.54**	—											
5. T1 Father-Weekday	.03	.22**	.00	-.01	—										
6. T1 Father-Weekend	-.06	.13	.07	.01	.50**	—									
7. T1 Mother-Weekday	.00	.05	.23**	.14	.15+	.26**	—								
8. T1 Mother-Weekend	.08	.18*	.05	.04	.23**	.11	.56**	—							
9. T2 Negative Emotion	.69**	-.17*	-.19*	-.12	.00	-.06	.01	-.06	—						
10. T2 Infant Regulation	-.17*	.58**	.11	-.09	.27**	.24**	.08	.15+	-.21**	—					
11. T2 Mothers' MS	-.20*	-.01	.78**	.48**	-.07	.08	.15	-.05	-.16+	.00	—				
12. T2 Fathers' MS	.14	-.10	.43**	.51**	-.15	-.03	.04	-.10	.08	.03	.41**	—			
13. T2 Father-Weekday	-.05	.28**	.06	-.01	.62**	.47**	.30**	.27*	.00	.43**	.06	-.15	—		
14. T2 Father-Weekend	.02	.01	.20+	.12	.38**	.50**	.33**	.23*	.04	.06	.22*	.16	.32**	—	
15. T2 Mother-Weekday	.09	.03	.07	-.05	.01	.03	.55**	.42**	.05	.04	-.02	-.12	.10	.27*	—
16. T2 Mother-Weekend	.07	.13	-.03	-.01	.14	.15	.48**	.65**	.03	.06	-.12	-.20+	.32**	.22**	.61**

^aNote: MS = Marital Satisfaction; Weekday and Weekend refers to Parents' Involvement

+ $p \leq .10$

* $p \leq .05$

** $p \leq .01$

Table 3
Parameter Estimates for Concurrent Mediation

Variables	Unstandardized Loadings	Standard Error	Standardized Loading T1/T2
<i>Mother Involvement Model</i>			
Temperament: Negative emotion	1.00	0.00	.86/.87
Temperament: Regulation	.26**	0.08	.23/.26
Mothers' marital satisfaction	1.00	0.00	.94/.85
Fathers' marital satisfaction	.60**	0.08	.60/.53
Mother involvement: Weekdays	1.00	0.00	1.0/1.0
Mother involvement: Weekends	.51**	0.05	.52/.62
<i>Father Involvement Model</i>			
Temperament: Negative emotion	1.00	0.00	.89/.86
Temperament: Regulation	.24**	0.08	.22/.25
Mothers' marital satisfaction	1.00	0.00	.92/.89
Fathers' marital satisfaction	.59**	0.07	.60/.55
Father involvement: Weekends	1.00	0.00	.78/.67
Father involvement: Weekdays	.68**	0.17	.62/.41

**
Note: $p \leq .01$