

The Pennsylvania State University
The Graduate School
Department of Human Development & Family Studies

**COPARENTING AND MARITAL QUALITY ACROSS THE TRANSITION TO
PARENTHOOD: THE ROLE OF INFANT SLEEP QUALITY**

A Thesis in
Human Development & Family Studies

by
Brandon T. McDaniel

© 2012 Brandon T. McDaniel

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

May 2012

The thesis of Brandon T. McDaniel was reviewed and approved* by the following:

Douglas M. Teti
Associate Director, Social Science Research Institute
Professor of Human Development, Psychology, and Pediatrics
Lead Faculty, Parenting-at-Risk Faculty Research Initiative
Thesis Advisor

David J. Eggebeen
Associate Professor of Human Development and Sociology

J. Douglas Coatsworth
Associate Professor of Human Development
Professor-in-charge of Graduate Studies in HDFS

*Signatures are on file in the Graduate School

ABSTRACT

The transition to parenthood can be a stressful time for new parents, as parents must learn to take on new roles and responsibilities. Sleep disruption—which has been linked in prior research to parent distress and fatigue—is also common in the early months of the transition. The current study is the first to our knowledge to examine infant sleep quality and its potential influence on parents' perceptions of coparenting quality at 1 and 3 months of infant age. Participants included 113 families; mothers were on average 29.5 years old ($SD = 5.1$), and fathers were 32.1 years old ($SD = 5.8$). It was found that mothers reported more night waking, poorer sleep quality, more depressive symptoms, and worse perceptions of coparenting quality as compared with fathers. We tested a structural model of infant and parent night waking and sleep quality as predictors of parent distress and coparenting using maximum likelihood estimation. The frequency of infant night waking predicted father and mother night waking, which in turn predicted self-reports of parent sleep quality. Poor parent sleep quality predicted elevated depressive symptoms, and finally depressive symptoms were negatively related to perceptions of coparenting and marital quality. In summary, both mothers' and fathers' perceptions of coparenting and marital quality appear to be sensitive to the unfolding parental dynamics that take place in response to infant sleep difficulties. This held true even after controlling for parent education, family income, and infant temperament. Therefore, parenting may indirectly benefit from interventions targeting infant sleep problems.

TABLE OF CONTENTS

LIST OF FIGURES	v
LIST OF TABLES	vi
ACKNOWLEDGEMENTS	vii
Introduction.....	1
Infant Sleep Quality and Parental Functioning	2
Additional Influences on Coparenting	3
Comparing Mothers and Fathers.....	4
The Effects of Infant Sleep on Marital Quality.....	5
The Current Study.....	6
Method	7
Participants	7
Procedure	8
Questionnaire Measures.....	8
Quality of Coparenting.....	8
Infant Night Waking	9
Parent Night Waking and Sleep Quality	9
Depressive Symptoms	9
Marital Quality	10
Infant Temperament	10
Results	10
Preliminary Analyses.....	10
Aim 1: Mother and Father Comparisons	11
Aim 2: Model of Infant and Parent Sleep Quality Predicting Parent Distress and Perceptions of Marital and Coparenting Quality	11
Analysis Plan.....	12
Results.....	13
Controlling for socioeconomic factors and infant soothability	16
Aim 3: Parent Gender as a Moderator	16
Discussion	17
Aim 1: Mother and Father Comparisons	18
Aims 2 and 3: The Model for Mothers and Fathers	18
A Note on Marital Quality	20
Limitations and Future Directions	20
Conclusion and Practical Implications.....	21
References.....	23

LIST OF FIGURES

Figure 1-1: Conceptual model.	3
Figure 2-1: Model of infant and parent sleep quality predicting parent distress, perceptions of coparenting, and marital quality at 1 month.	14
Figure 3-1: Model of infant and parent sleep quality predicting parent distress and perceptions of coparenting quality at 1 and 3 months.	15

LIST OF TABLES

Table 1-1 : Means and standard deviations of main study variables.	11
Table 2-1 : Bivariate correlations for mothers between main study variables.....	12
Table 3-1 : Bivariate correlations for fathers between main study variables.....	12

ACKNOWLEDGEMENTS

This investigation is part of Project SIESTA, a NICHD-funded, ongoing, longitudinal study of parenting, infant sleep, and infant development (R01-HD052809), awarded to Douglas Teti. I would like to thank David Eggebeen and Laurie Van Egeren for their valuable feedback on earlier drafts of the manuscript. I thank Douglas Teti for the many hours spent on my behalf and in critiquing thesis drafts as well as for allowing me to use data from Project SIESTA for my thesis.

Introduction

Among normative life events, the transition to first-time parenthood is one of the most challenging (Leigh & Milgrom, 2008). After the baby is born, the family system must adapt, and parents must learn to take on new roles and responsibilities (Cowan & Cowan, 1992). For instance, the coparenting subsystem, which is conceptually distinct from the marital subsystem (Hayden et al., 1998; McHale, Kuersten-Hogan, Lauretti, & Rasmussen, 2000), is introduced at this time, and parents must learn to work together to raise their child. The stress experienced during the transition to parenthood often can have a number of negative effects on parents and families such as decreased marital satisfaction, increased conflict, and depression (Goodman, 2004; Lawrence, Rothman, Cobb, Rothman, & Bradbury, 2008; Leigh & Milgrom, 2008). These problems can exacerbate parenting stress, and if left unresolved, may lead to greater problems in parenting practices and psychological well-being, all of which may impact child well-being (Huston & Holmes, 2004; Teti, O'Connell, & Reiner, 1996). It is thus crucial to understand the processes that facilitate and impede parental well-being and coparenting quality during this time of transition. The present study examines a potentially important but heretofore uninvestigated influence on the early coparenting relationship, infant sleep quality.

Coparenting, or “the ways that parents work together in their roles as parents” (Feinberg, 2003, p. 1499), is an important theoretical mediator between family risk factors across the transition (e.g., poor relationship quality, conflict, difficult infant temperament, lack of social support, etc.) and family and child outcomes (Belsky & Hsieh, 1998; Gonzales, Pitts, Hill, & Roosa, 2000; Margolin, Gordis, & John, 2001). More specifically, supportive coparenting, such as when partners endorse and support each others' parenting behaviors and cooperate with each other in raising their children, has been linked to increased relationship quality, less depression, and less parenting stress (for a review, see Feinberg, 2003), all of which have been linked to favorable child outcomes (Belsky & Hsieh, 1998; Teti et al., 1996). Therefore, examining factors that influence

mothers' and fathers' perceptions of coparenting becomes important for creating more optimal family outcomes across the transition to parenthood.

Infant Sleep Quality and Parental Functioning

Interestingly, no research to date has examined the potential role of infant sleep quality in shaping coparenting perceptions. Parental concerns about infant sleep are one of the primary complaints heard by pediatricians across an infant's first year of life (Boyle & Cropley, 2004). Indeed, around 17% to 34% of infants have been shown to exhibit sleep problems (Bayer, Hiscock, Hampton, & Wake, 2007; Martin, Hiscock, Hardy, Davey, & Wake, 2007), and there is ample anecdotal and empirical evidence that infant sleep impacts parents' sleep quality and parent functioning across the transition to parenthood (Bayer et al., 2007; Goyal, Gay, & Lee, 2009; Lam, Hiscock, & Wake, 2003; Martin et al., 2007; Meijer & van den Wittenboer, 2007).

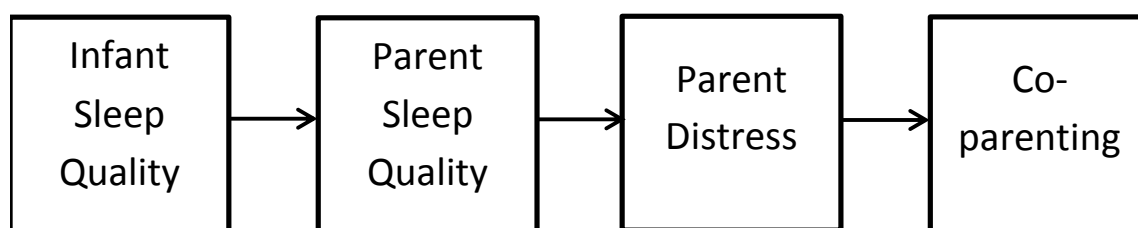
A well-established data base attests to the fact that parents find chronic infant sleep difficulties to be highly stressful. Consistently high levels of infant night waking have been associated with maternal depression (Bayer et al., 2007; Meltzer & Mindell, 2007; Teti & Crosby, in press), as well as paternal depression (Loutzenhiser & Sevigny, 2008). The direction of effects is likely bidirectional (Sadeh, Tikotzky, & Scher, 2010), with some evidence suggesting that depressive symptoms in mothers may be causally linked to infant night waking (Teti & Crosby, in press) and other evidence suggesting that prolonged infant night waking predisposes mothers to depression (Lam et al., 2003; Meltzer & Mindell, 2007).

Parent sleep quality appears to be one mechanism through which infant sleep problems may alter parent mood or depressive symptoms, and when a parent's sleep disruption is cumulative distress may result. For example, maternal sleep disturbance is associated with elevated maternal depressive symptoms and poorer adaptation to infant sleep (Counterline & Teti, 2010). Further, maternal sleep quality has been found to mediate the relationship between child sleep disruptions and maternal mood and distress (Bayer, et al., 2007; Meltzer & Mindell,

2007). Moreover, adult sleep deprivation and fatigue have been linked with compromised cognitive and physical functioning (Dahl & El-Sheikh, 2007; White, White, & Fox, 2009).

In Figure 1-1, we present a conceptual model that serves as the basis for the present study and that outlines a pathway by which infant sleep quality might influence coparenting quality. In this model, infant sleep disruption is conceptualized as an environmental stressor that impacts parent sleep quality, and the distress produced from parent sleep disruption in turn undermines the coparenting relationship. This model draws from theoretical formulations that environmentally-influenced stress tends to result in poorer coparenting, specifically less support and more conflict (Feinberg, 2002; see also Belsky, 1984). In addition, the model draws from empirical work that has linked (a) stress with compromised individual functioning, lower tolerance for frustration, and more negative interpersonal functioning (Crnic & Low, 2002; Lipscomb et al., 2011); (b) child sleep problems with parent sleep problems and fatigue and, in turn, parenting problems (Germo, Chang, Keller, & Goldberg, 2007); (c) fatigue with low parenting efficacy, involvement, warmth, and high levels of hostility (Giallo, Rose, & Vittorino, 2011); and (d) elevated depressive symptoms with poorer coparenting (Bronte-Tinkew, Moore, Matthews, & Carrano, 2007; Elliston, McHale, Talbot, Parmley, & Kuersten-Hogan, 2008).

Figure 1-1. Conceptual Model



Additional Influences on Coparenting

The coparenting relationship is only one part of the overall family system, and no single piece of the system can be completely understood or disconnected from the broader family environment (Cox & Paley, 1997). Thus, it is important to understand whether other family

environment factors are related to and/or may change the potential relationship between infant and parent sleep, distress, and coparenting quality. Indeed, conceptualizations of coparenting note that it is multiply determined (Feinberg, 2003). This study controls for the potential relations between coparenting and other ecological influences on family functioning, including parent education, family income, and infant temperament. Socioeconomic factors such as parent educational level, occupational status, and income have been found to be robust predictors of coparenting quality. For example, parents with more education tend to be better coparents (Van Egeren, 2003), as do fathers with a higher occupational status and income (Van Egeren, 2003; Lindsey, Caldera, & Colwell, 2005). Child characteristics such as temperament may also play a role in coparenting quality. Although relations between coparenting and infant temperament appear to be complex (Davis, Schoppe-Sullivan, Mangelsdorf, & Brown, 2009; Lindsey, et al., 2005; McHale, et al., 2004; Schoppe-Sullivan, Mangelsdorf, Brown, & Sokolowski, 2007; Van Egeren, 2004), we anticipate that an infant who is not easily soothed may pose a particular challenge to the coparenting subsystem, and parents may experience more failures than successes with difficult-to-sooth infants compared with parents of more easily soothed infants (Feinberg, 2003). This in turn may lead to increased negative coparenting (e.g., criticism and undermining).

Comparing Mothers and Fathers

The conceptual model presented in Figure 1 will also be tested separately for mothers and for fathers in the present study, because prior work suggests that coparenting perceptions, and determinants of coparenting perceptions, may be different for mothers and fathers (Van Egeren, 2004). For example, although mothers and fathers within families tended to be similarly satisfied (or dissatisfied) with coparenting, Van Egeren (2004) found that fathers are generally more satisfied with coparenting than mothers and that change over time in coparenting in one spouse was not related to change in coparenting in the other spouse. Reasons for these differences are unclear. Mothers may intentionally or inadvertently exclude fathers from parenting (termed

maternal gatekeeping) (Schoppe-Sullivan, Brown, Cannon, Mangelsdorf, & Sokolowski, 2008), which may be one reason for the discrepancies found in the development and determinants of mothers' and fathers' coparenting perceptions (Van Egeren, 2004). With respect to this study's conceptual model, however, we thought it reasonable to expect that linkages between infant night waking, parent night waking, and parent sleep quality would be stronger among mothers than among fathers, because mothers frequently function as the primary caregivers of their infants despite fathers' increasing involvement with children (Pleck, & Masciadrelli, 2004) and because of recent data indicating that mothers of infants are more involved in their nighttime care than fathers (Teti & Crosby, in press; Tikotzky, Sadeh, & Glickman-Gavrieli, 2011).

The Effects of Infant Sleep on Marital Quality

Although not the primary focus of this study, we lastly sought to determine if parent sleep disruption due to infant night waking was also predictive of marital quality, as the coparenting and marital system are interrelated but conceptually distinct (Hayden et al., 1998; McHale et al., 2000). Some have argued that parent sleep quality may influence the trajectory of marital quality across the transition to parenthood (e.g., Medina, Lederhos, & Lillis, 2009). To our knowledge, there has currently only been one empirical study that has focused specifically on infant sleep and marital functioning across the transition to parenthood (Meijer & van den Wittenboer, 2007). In their sample of 107 new parents, they found that parental insomnia was a risk factor for lower marital quality. Additionally, as noted earlier, sleep deprivation is known to negatively influence parental mood and cognitions (for a review, see Medina et al., 2009), and depressed mood has been linked with lower marital quality (Whisman, Davilla, & Goodman, 2011). Medina et al. (2009) state that "it is hard to imagine that the mood disturbances and information-processing deficits associated with prolonged sleep disruption do not contribute to the well-documented decline in marital satisfaction" (p. 157).

The Current Study

In sum, in the present study we examined coparenting and marital processes in relation to parent and infant sleep quality at 1 and 3 months postpartum. To our knowledge, this study represents the first examination of these relationships in regards to coparenting and the second in regards to marital quality. We focused on the early months of infancy as this time period is arguably the most difficult in terms of parents' adjustment to infant night waking. In line with the research presented above, we present the following aims and hypotheses:

Aim 1: We first examined potential differences between mothers and fathers on our main study variables. We hypothesized that mothers would report more night waking and worse sleep quality than fathers, as mothers are generally the primary caregivers in early infancy (Tikotzky et al., 2011). We also expected fathers to rate coparenting as more positive than mothers (Van Egeren, 2004), while mothers would rate more depressive symptoms than fathers.

Aim 2: We were quite interested in how infant night waking in early infancy might play a role in perceptions of coparenting and marital quality, as well as whether differences existed between mothers and fathers. Therefore, based on the conceptual model presented in Figure 1, we tested a model at 1 month of infant age in which infant night waking would predict parent night waking, which in turn would be negatively predictive of parents' reports of their sleep quality. Poor sleep quality in turn would predict parent distress (as measured by depressive symptoms), which in turn would be negatively predictive of coparenting and marital quality. Figure 2 shows this hypothesized model at 1 month.

We then tested a second model which included both month 1 and month 3 data to determine whether these same processes occurred at both time points. This model included only coparenting quality as the ultimate outcome, as we did not have a measure of marital quality at 3 months. Besides our same hypotheses above, we also hypothesized that infant night waking, parent night waking, parent sleep quality, depressive symptoms, and coparenting at 1 month

would be predictive of these same variables at 3 months. We also tested theoretically plausible cross-lagged paths between month 1 and month 3 parent sleep quality, parent depressive symptoms, and coparenting.¹ Figure 3 shows the hypothesized model for coparenting at 1 and 3 months. As coparenting and marital quality are multiply determined, we also tested both models while controlling for parent education, family income, and infant soothability.

Aim 3: Finally, we wished to determine if the strength of the paths within the model for coparenting at 1 and 3 months was moderated by parent gender (i.e., mothers vs. fathers). This aim was based on prior observations that mothers are generally more involved at night with their infants than fathers (Tikotzky et al., 2011), prompting speculation that the paths between infant night waking and parent night waking and between parent night waking and parent sleep quality would be stronger for mothers than for fathers. Less clear was whether the paths between parent sleep quality and coparenting quality would differ between mothers and fathers, and thus hypotheses were withheld about whether these paths would be stronger for mothers than fathers.

Method

Participants

Participants in the study were part of Project SIESTA, a NICHD-funded, ongoing, longitudinal study of parenting, infant sleep, and infant development (R01-HD052809). Mothers were recruited from local hospitals when their infants were born. At the time of this manuscript, data for 150 1-month-old infants (46% male) and their families was available. Their mean age was 1.21 months ($SD = .17$) at Month 1. Data for 126 of these infants are available at 3 Months. Their mean age at this time point was 3.13 months ($SD = .31$). For our analyses, we utilize the data from 113 families who completed the coparenting measures at both month 1 and month 3.

¹ We did not test other cross-lagged because we did not feel that these paths were theoretically plausible. For instance, it is much more plausible for infant night waking to affect parent night waking contemporaneously than infant night waking at 1 month to affect parent night waking at 3 months. Additionally, it is not likely that parent night waking at 1 month would affect infant night waking at 3 months. Finally, ratings of parent sleep quality are believed to derive from concurrent, but not prior parent night wakings.

When their infants were 1 month old, 82% of mothers were married and living with their infant's father. Mothers' average age was 29.5 years old ($SD = 5.1$), ranging in age from 18 to 43 years old. Fathers' average age was 32.1 years old ($SD = 5.8$), ranging in age from 21 to 49 years old. Eighty-three percent of mothers were White, 4% were Asian American, 3% were African American, 5% were Latino, and 4% identified themselves as Other. Eighty-four percent of fathers were White, 4% were Asian American, 5% were Latino, 3% were African American, and 4% identified themselves as Other. Eighty-seven percent of mothers completed some post-secondary education, and 64% were employed outside the home with 66% of those employed working full-time. Eighty-eight percent of fathers completed some post-secondary education, and 94% were employed outside the home with 94% of those employed working full-time. Average family income was \$66,587 ($SD = \$43,673$).

Procedure

When infants were 1 and 3 months old, families were visited at three time points across seven days of data collection. At the first visit, parents were given a variety of questionnaires to complete, including a sleep diary. On the 7th day project staff returned in order to collect the questionnaires. Mothers and fathers also participated in phone interviews each day for 7 days, which assessed things such as parent sleep quality and number of infant and parent night waking. This study was approved by the institutional review boards at both The Pennsylvania State University and the Mount Nittany Medical Center.

Questionnaire Measures

Quality of coparenting. Parents' ratings of the quality of their coparenting were assessed at 1 and 3 months using the Coparenting Relationship Scale (CRS; Feinberg, Brown, & Kan, 2012). The CRS consists of 35 items that tap into six dimensions, including each parent's rating of agreement, closeness, support and cooperation, competition and undermining in their relationship with their partner within the context of parenting, as well as the extent to which their

child is exposed to conflict between them and their endorsement of their partner's parenting. Parents to rate the degree to which a particular statement describes their parenting relationship with their partner on a 7-point Likert-type scale (e.g., My partner and I have different ideas about how to raise a child; 1 = Not true of us, 7 = Very true of us). For this study, we reversed scored items from the negative scales and averaged all of the items to produce an overall perception of coparenting quality score for each parent (1 month: Fathers alpha = .89, Mothers alpha = .90; 3 months: Fathers alpha = .91, Mothers alpha = .92; average Cronbach's alpha = .91).

Infant Night Waking. On each morning for seven consecutive days at both 1 and 3 months, parents were asked to complete an infant sleep diary together (adapted from Burnham, Goodlin-Jones, Gaylor, & Anders, 2002), which obtained information on the infant's sleep location, the number of times during the previous night the infant woke up, and the duration of each night waking bout. For this study we utilized the data on the frequency of infant night waking, which was summed across the seven days of data collection (1 month alpha = .87, 3 month alpha = .85; average Cronbach's alpha = .86).

Parent Night Waking and Sleep Quality. A phone interview was conducted with each mother and father once a day for the 7 days of data collection at 1 and 3 months (adapted from the 24-Hour Sleep Patterns Interview; Meltzer, Mindell, & Levandoski, 2007). Among other things, participants reported the frequency of their night wakings for the prior night and their perceived sleep quality. These items' 7 days of responses were summed to obtain the frequency of mother or father night waking (1 month: Fathers alpha = .63, Mothers alpha = .44; 3 months: Fathers alpha = .72, Mothers alpha = .83; average Cronbach's alpha = .66) and the total mother or father sleep quality for the 7 days (1 month: Fathers alpha = .71, Mothers alpha = .77; 3 months: Fathers alpha = .69, Mothers alpha = .78; average Cronbach's alpha = .74).

Depressive Symptoms. Parents completed the depression subscale of the SCL-90-R at both 1 and 3 months (Derogatis, 1994). The depression subscale contains 13 items (e.g., crying

easily, feeling lonely, feeling everything is an effort). Items were rated on a scale of 1 (*not at all*) to 5 (*extremely*). Items were summed, and higher scores indicate greater levels of depressive symptoms (1 month: Fathers alpha = .86, Mothers alpha = .91; 3 months: Fathers alpha = .88, Mothers alpha = .90; average Cronbach's alpha = .89).

Marital Quality. Both mothers and fathers rated their marital quality at 1 month on the Locke-Wallace Marital Adjustment Test (MAT; Locke & Wallace, 1959) with four items (religious matters; aims, goals, and things believed to be important; making major decisions; and household tasks) added from the Dyadic Adjustment Scale (DAS; Spanier, 1976). An overall score for each parent was obtained by summing all of the items (Fathers alpha = .67, Mothers alpha = .74; average Cronbach's alpha = .71). Higher scores indicate greater marital quality.

Infant Temperament. Mothers completed the Infant Behavior Questionnaire (IBQ; Rothbart, 1981) at 3 months. This questionnaire consists of 99 items that assess the frequency with which certain behaviors occurred during the last 2 weeks. Subscales are then derived from the items. We reasoned that the more difficult an infant is to be soothed the more unsuccessful coparenting would be (Feinberg, 2003). Also, this type of 'difficulty' has been linked with coparenting during infancy (Burney & Leerkes, 2010). Therefore, the soothability dimension, consisting of 18 items, was used to represent an important aspect of infant temperament that could affect perceptions of coparenting quality (Cronbach's alpha = .70).

Results

Preliminary Analyses

Paired sample t-tests were used to test potential changes over time in study variables within individuals. Infant night waking decreased over time, as did parent night waking; this corresponded with an increase in parent sleep quality. Mothers reported fewer depressive symptoms at 3 months, although there was no significant change for fathers. Perceptions of

coparenting quality did not significantly change from month 1 to 3, although there was a trend toward fathers reporting better coparenting quality at month 3 than at month 1 (see Table 1-1).

Aim 1: Mother and Father Comparisons

We utilized paired sample t-tests to test differences between mothers and fathers within families on our study variables. In general, mothers reported more frequent night waking, worse sleep quality, more depressive symptoms, and worse perceptions of coparenting quality than fathers (see Table 1-1).

Table 1-1
Means and Standard Deviations of Main Study Variables Over Time and Across Parents

Variable	Month 1		Month 3		n	t	p <
	M	SD	M	SD			
Infant Night Waking	15.09	6.55	9.16	6.09	111	10.04	.001
Mothers							
Marital Quality ^a	135.69	21.03	—	—	113	—	—
Coparenting Quality	6.18	0.67	6.17	0.68	113	0.97	ns
Night Waking	15.43	8.25	10.58	6.71	111	5.69	.001
Sleep Quality	25.15	4.80	26.32	5.14	111	-2.47	.05
Depressive Symptoms	7.96	7.67	6.61	6.42	113	1.95	.05
Fathers							
Marital Quality ^a	137.90	17.48	—	—	113	—	—
Coparenting Quality	6.26	0.56	6.32*	0.58	113	-1.75	.10
Night Waking	8.84*	6.30	6.75*	6.31	102	2.84	.01
Sleep Quality	26.58*	4.04	27.63*	4.36	103	-2.91	.01
Depressive Symptoms	4.89*	5.55	4.76*	6.03	113	0.30	ns

Note. A * indicates significant ($p < .01$) mean-level differences between mothers and fathers within families.

^a Marital quality was not measured at 3 months.

Aim 2: Models of Infant and Parent Sleep Quality Predicting Parent Distress and Perceptions of Marital and Coparenting Quality

Preliminary bivariate correlations were conducted in order to determine the relationship between study variables (see Tables 2-1 and 3-1). As expected for both mothers and fathers, infant night waking was positively related to parent night waking, parent night waking was positively related to parent reports of sleep quality, parent sleep quality was negatively related to

Table 2-1

Bivariate correlations for mothers between main study variables

12

	Month 1						Month 3				
	MQ	1a	2a	3a	4a	5a	1b	2b	3b	4b	5b
<i>Month 1</i>											
MQ. Marital Quality	1										
1a. Coparenting	.60***	1									
2a. Infant Night Waking	.05	-.02	1								
3a. Parent Night Waking	.06	-.05	.60***	1							
4a. Parent Sleep Quality	.12	.10	-.24*	-.21*	1						
5a. Depressive Symptoms	-.24*	-.19*	.05	-.06	-.30**	1					
<i>Month 3</i>											
1b. Coparenting	.52***	.82***	-.02	.06	.14	-.21*	1				
2b. Infant Night Waking	.06	.00	.53***	.38***	-.13	-.06	.02	1			
3b. Parent Night Waking	-.12	-.02	.39***	.38***	-.13	-.07	.03	.60***	1		
4b. Parent Sleep Quality	.17 [†]	.01	-.08	-.03	.49***	-.25**	.07	-.19*	-.45***	1	
5b. Depressive Symptoms	-.38***	-.35***	.02	-.05	-.34***	.56***	-.46***	-.02	-.03	-.37***	1

†p < .10, *p < .05, **p < .01, ***p < .001; n = 107

Table 3-1

Bivariate correlations for fathers between main study variables

	Month 1						Month 3				
	MQ	1a	2a	3a	4a	5a	1b	2b	3b	4b	5b
<i>Month 1</i>											
MQ. Marital Quality	1										
1a. Coparenting	.56***	1									
2a. Infant Night Waking	.03	.15	1								
3a. Parent Night Waking	-.01	.04	.33***	1							
4a. Parent Sleep Quality	.07	.04	.07	-.21*	1						
5a. Depressive Symptoms	-.40***	-.20*	-.14	.02	-.17 [†]	1					
<i>Month 3</i>											
1b. Coparenting	.47***	.76***	.10	.10	.05	-.20*	1				
2b. Infant Night Waking	.03	.06	.49***	.08	.10	-.14	.05	1			
3b. Parent Night Waking	-.01	.01	.08	.30**	-.26*	.16	.05	.21*	1		
4b. Parent Sleep Quality	.01	-.02	.13	-.06	.61***	-.15	.11	-.04	-.36***	1	
5b. Depressive Symptoms	-.49***	-.46***	-.09	.04	-.18 [†]	.75***	-.48***	-.07	.22*	-.22*	1

†p < .10, *p < .05, **p < .01, ***p < .001; n = 100

distress (i.e., depressive symptoms), and depressive symptoms were negatively related to perceptions of marital and coparenting quality. Direct links between infant and parenting night waking and perceptions of coparenting and marital quality were not observed however.

Analysis Plan. We utilized Structural Equation Modeling (SEM) using maximum likelihood estimation in the Analysis of Moments Structure (AMOS) software (Arbuckle & Wothke, 1999) to test the fit of our hypothesized model of infant and parent night waking and sleep quality as predictors of parent distress and marital and coparenting quality to the data. SEM is preferred over regression as SEM uses maximum likelihood estimation, which minimizes bias

(i.e., Type 1 error) in estimates, allows one to include multiple independent and dependent variables in the same analysis, and offers confidence intervals and assessments of goodness of fit for hypothesis testing (Buhi, Goodson, & Neilands, 2007; Kline, 2010). Goodness of fit indexes compare the observed covariances with the covariances predicted by the hypothesized model, and these include the chi-square (χ^2) test, the Root Mean Square Error of Approximation (RMSEA), and baseline comparison indexes such as the Comparative Fit Index (CFI). The χ^2 examines whether or not there is a statistically significant difference between the model and the sample data and degrees of freedom. A non-significant χ^2 statistic is preferable as it reflects “exact fit” between the hypothesized model and the data. The RMSEA reflects good model fit with a score of .06 or lower (the lower the better), while the CFI reflects good model fit with a score of .95 or higher (on a scale of 0 to 1) (Hu & Bentler, 1999).

Results. The hypothesized model at 1 month showed a good model fit for both fathers’ and mothers’ perceptions of marital quality and coparenting (Hu & Bentler, 1999) (χ^2 (9) = 5.90, p = .75; RMSEA = .00, lo = .00, hi = .05; CFI = .99). A good fit was also found for parents’ perceptions of coparenting at 1 and 3 months (χ^2 (28) = 33.65, p = .21; RMSEA = .03, lo = .00, hi = .06; CFI = .99). Figures 2-1 and 3-1 show the models with standardized path estimates for both mothers and fathers as a whole. In general, the frequency of infant night waking predicted father and mother night waking, which in turn predicted parent sleep quality, elevated depressive symptoms, and poorer marital and coparenting quality. In the second model, infant and parent night waking, sleep quality, depressive symptoms, and coparenting were significantly related from 1 month to 3 months. Interestingly, the cross-lagged paths demonstrated that more positive coparenting at 1 month was significantly predictive of decreased depressive symptoms at 3 months for both mothers and fathers. In general, depressive symptoms at 1 month were not

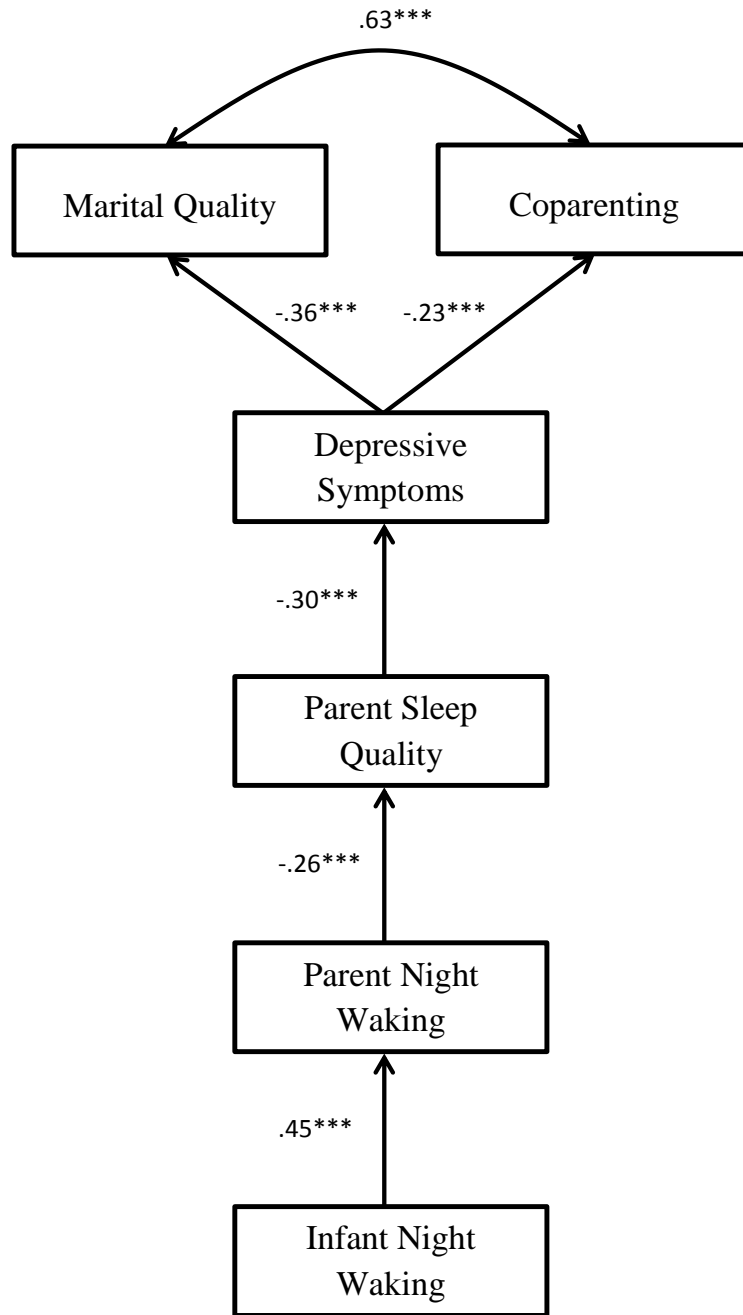


Figure 2-1. Model of infant and parent sleep quality predicting parent distress and overall coparenting and marital quality at 1 month of infant age. The figure shows the model with standardized path estimates for both mothers and fathers as a whole.

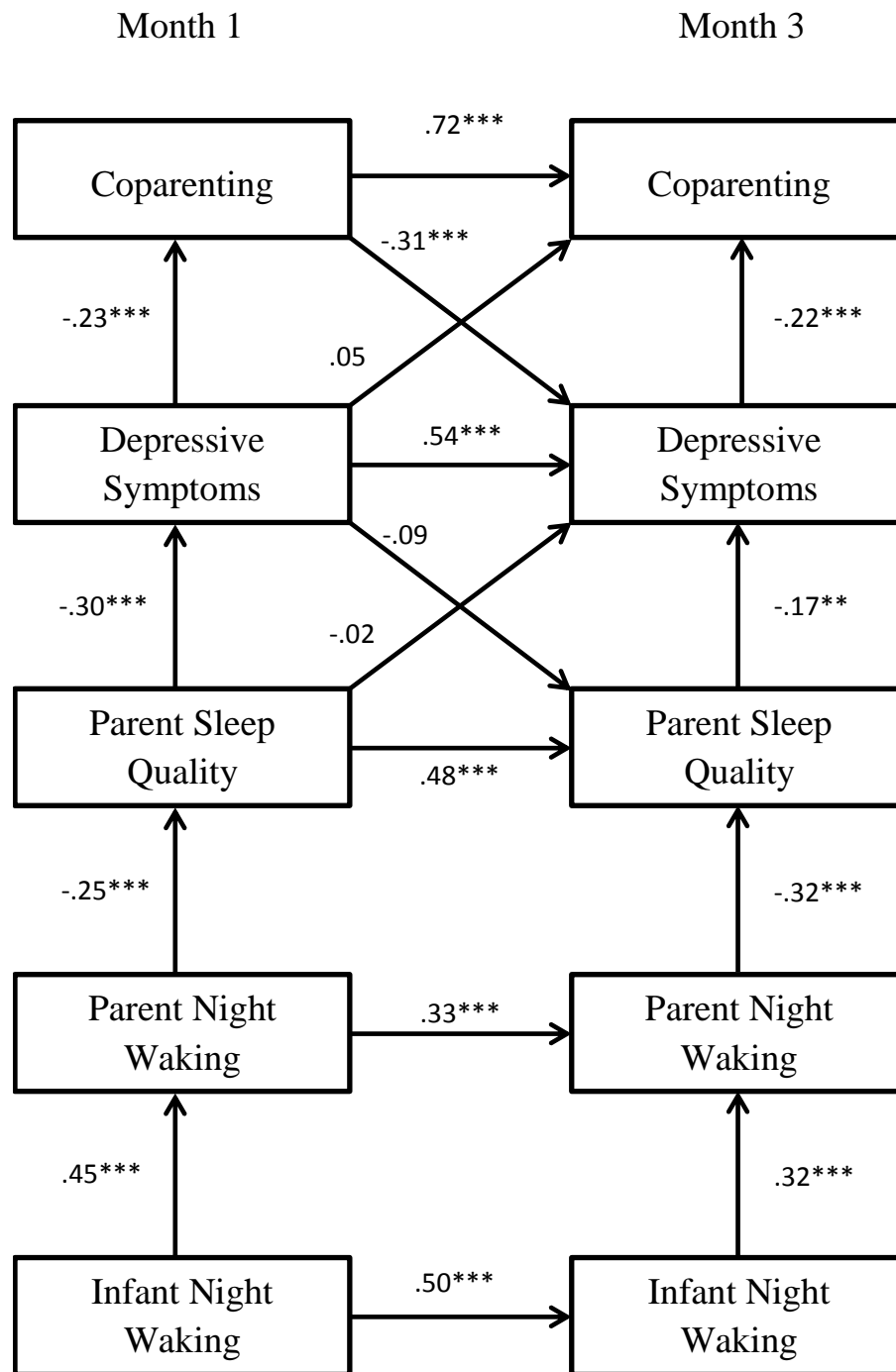


Figure 3-1. Model of infant and parent sleep quality predicting parent distress and perceptions of coparenting quality. The figure shows the model with standardized path estimates for both mothers and fathers as a whole.

predictive of coparenting or sleep quality at 3 months. Finally, sleep quality at 1 month did not predict depressive symptoms at 3 months.²

Controlling for socioeconomic factors and infant soothability. As coparenting is multiply determined, we also attempted to control for other influences, including parent education, family income, and infant soothability. With these variables entered in, the model for 1 month maintained a good fit to the data ($\chi^2(9) = 7.07, p = .63$; RMSEA = .00, lo = .00, hi = .06; CFI = .99), as did the model including only coparenting quality at both month 1 and 3 ($\chi^2(28) = 35.77, p = .15$; RMSEA = .04, lo = .00, hi = .07; CFI = .99). Importantly, the significance level of the paths did not change even after controlling for these factors. The relationships between the control variables and our study variables were similar across models; therefore, we report standardized path estimates for the model including 1 and 3 months.³ Parent education related to depressive symptoms ($\beta = .19, p < .01$) and coparenting quality at 1 month ($\beta = .15, p < .05$), but not at 3 months. Family income related to depressive symptoms at 1 month at the trend level ($\beta = -.14, p < .10$) and coparenting quality at 1 month ($\beta = .14, p < .05$), but again not at 3 months. Finally, infant soothability was related to depressive symptoms at 1 month ($\beta = -.15, p < .05$) and 3 months ($\beta = -.10, p < .05$), but only to coparenting at 3 months ($\beta = .11, p < .01$).

Aim 3: Parent Gender as a Moderator

A multi-group structural equation modeling approach was used to compare the strength of associations between model variables for mothers and fathers. To test for invariance across groups, a model for coparenting at 1 and 3 months with all parameters allowed to be unequal across groups was compared to a model with the loadings constrained to be equal across groups.

² As it can also be argued that coparenting quality may impact depression and that depression may impact sleep quality (i.e., the reverse of what we hypothesized), we tested our model with these paths reversed such that coparenting quality was theorized to predict depressive symptoms and depressive symptoms was theorized to predict parent sleep quality. This model produced an adequate fit to the data ($\chi^2(4) = 6.38, p = .17$; RMSEA = .05, lo = .00, hi = .12; CFI = .99); however, the fit was worse than the fit for our model with the paths running from parent sleep quality to depressive symptoms and then to coparenting quality ($\chi^2(4) = 2.51, p = .64$; RMSEA = .00, lo = .00, hi = .08; CFI = .99).

³ Note that in the model for 1 month, none of the control variables were significantly related to marital quality.

The model with all parameters freely estimated in the two groups fit the data well ($\chi^2 (56) = 61.86, p = .28$; RMSEA = .02, lo = .00, hi = .05; CFI = .99). The invariance model with loadings constrained to be equal across groups demonstrated a worse fit ($\chi^2 (73) = 106.13, p < .01$; RMSEA = .04, lo = .03, hi = .06; CFI = .95; $\Delta\chi^2 (17) = 44.26, p < .001$). This suggests that there were some differences between mothers and fathers in the model.

Pairwise parameter comparisons, where the path estimates for fathers and mothers were subtracted and then divided by the estimate of the standard error of the difference, revealed that there were significant differences between mothers and fathers on a few paths.⁴ The link between infant night waking and parent night waking was stronger for mothers than for fathers at 1 month ($z = -4.57$) and at 3 months ($z = -3.04$), and the link between depressive symptoms at month 1 and depressive symptoms at month 3 was stronger for fathers than mothers ($z = 3.24$).

Discussion

To our knowledge, this paper is the first to examine infant and parent sleep quality and potential effects on mothers' and fathers' perceptions of coparenting during the early months of the transition to parenthood. It is important to examine infant and parent sleep quality at this time as infant night waking can be a significant problem and parents often admit distress over these wakings (Boyle & Cropley, 2004). Indeed, in our study infants woke up during the night approximately 15 times each week at 1 month and 9 times each week at 3 months.

As expected, infant night waking decreased over time, and this coincided with a decrease in parent night waking, an increase in sleep quality, and a decrease in distress (i.e., depressive symptoms) over time. However, unlike we had expected, coparenting quality appeared to be stable from 1 to 3 months. It may be that our time frame (1-3 months) was too brief to notice significant changes in coparenting quality. For instance, Van Egeren (2004) found coparenting experiences to be stable over the first six months of parenthood. She suggests that within

⁴ In order to minimize Type I error, we report only those differences that were significant at the $p < .01$ level.

developmental periods the challenges that parents face are relatively stable; thus, perceptions of coparenting are relatively stable. Significant changes in coparenting quality may only be seen after developmental transitions (e.g., greater infant mobility, development of language, etc.) when parents must renegotiate the coparenting system.

Aim 1: Mother and Father Comparisons

In support of our hypotheses, we found that within families mothers experienced more night waking than fathers and also showed worse sleep quality and more depressive symptoms. Fathers also tended to rate better overall coparenting quality than mothers within families; this is in line with previous research (Van Egeren, 2004). These results support the idea that in general mothers are acting as the primary caregivers of their infants (Pleck, & Masciadrelli, 2004), and this is especially true at night (Tikotzky et al., 2011).

Aims 2 and 3: The Model for Mothers and Fathers

Both mothers' and fathers' perceptions of coparenting appear to be sensitive to unfolding parental dynamics that take place in response to infant sleep difficulties. We found support for our theoretically and empirically based conceptual model (see Figure 1) at both 1 month and 3 months postpartum (Aim 2), as (a) infant night waking was predictive of parent night waking, (b) parent night waking was predictive of overall sleep quality, (c) sleep quality was predictive of parent distress (i.e., depressive symptoms), and finally (d) distress predicted perceptions of coparenting quality—even after allowing for the stability in coparenting quality from month 1 to month 3 (see Figure 3). In other words, there is moderate to high stability in all of the variables from month 1 to month 3; however, infant sleep difficulties are still indirectly linked with parent distress and coparenting, and infant sleep difficulties arguably can produce modest changes in coparenting quality through the pathways that we proposed. Small differences existed between mothers and fathers (Aim 3), but the differences were only in regards to how strong the paths were between infant night waking and parent night waking, suggesting partial support for our

hypothesis. Again, this supports the conclusion that mothers are more involved with caregiving at nighttime (Tikotzky et al., 2011) and are thus more likely to get up with the infant at night. A lack of other differences indicates that mothers' and fathers' perceptions of coparenting are similarly influenced by the distress that each experiences due to night waking.

It is crucial to note that this model held up even after controlling for other family context factors, including parent education, family income, and infant soothability. This supports the idea that sleep disruption represents a significant stressor during the early months of the transition, as the strength of the paths did not change after entering the control variables. However, the control variables were not all associated with coparenting quality as would be expected. In our model, parent education, family income, and infant soothability were predictive of coparenting quality sometimes at 1 month and sometimes at 3 months. It may be that pre-birth expectations and marital quality are stronger predictors of coparenting quality (McHale, et al., 2004; McHale & Rotman, 2007; Schoppe-Sullivan, et al., 2007; Van Egeren, 2003; 2004), as our study took place during the early months of the transition. For example, it is quite possible that those whose expectations are violated will participate in more negative coparenting (e.g., undermining and less endorsement of one's partner) and also perceive less positive coparenting (e.g., less closeness to spouse). Specifically, parents may have particular ideas about how, when, and where their new infants should sleep during the first few months of the transition, and these ideas may not match their spouse's wishes (Germon et al., 2007).

It was not expected (Aim 3) that the link between depressive symptoms at month 1 and month 3 would be stronger for fathers. In general, all of our findings indicate that although fathers are influenced by infant night waking, they are not as involved at night with their infant's night waking; therefore, other factors such as marital quality may have just as strong of an influence on their distress—which in turn would feed into their perceptions of coparenting, according to our model. It may also be that mothers' depressive symptoms are more unstable across the early

months of the transition as many mothers experience transient depressed mood (Gjerdingen, Crow, McGovern, Miner, & Center, 2011). This explanation is potentially supported by our data as mothers show a slightly weaker correlation than fathers between their depressive symptoms at 1 month and 3 months ($r = .56$ vs. $r = .75$, $ps < .001$).

A Note on Marital Quality

Marital quality may also be influenced in a similar pattern by sleep disruption during the early months of parenthood. At least at 1 month, we found support for our model of infant night waking feeding up through parent waking, sleep quality, and distress, which ultimately predicted marital quality. Although we could not test whether these same processes influenced marital quality at 3 months, we believe this to be the case. We agree with Medina, Lederhos, and Lillis (2009) that it would be hard to imagine that the marital relationship would not suffer when partners were potentially experiencing mood changes and cognitive deficits due to poor sleep.

Limitations and Future Directions

This study had several limitations. First, it is crucial to note that our results are correlational and do not necessarily indicate causation. Nonetheless, we find it encouraging that the same paths emerged at both month 1 and month 3. In addition, when we reversed the paths' directions and allowed coparenting quality to predict depression, which then impacted sleep quality, the model fit was worse. As coparenting is inherently a triadic concept (i.e., consisting of mother, father, and child), it would have been beneficial to have observational measures of coparenting as well as self-report measures. Future research should examine whether these same paths that we observed in this study hold true for observed coparenting behaviors or whether differences in perceptions and actual behavior emerge—as perceptions and actual behavior have been shown to be distinct at times, at least for mothers (Van Egeren, 2004). Additionally, our study did not look at the bidirectional nature of family interactions and coparenting. It is likely that mothers' and fathers' experiences of night waking, distress, and coparenting quality are

interrelated and potentially interact to produce particular feelings about coparenting over and above individual experiences. For example, we might expect a mother and father who are both experiencing poor sleep quality to show higher distress and decreased coparenting quality as compared with families in which only one parent is experiencing sleep disruption. One might also wonder if mothers who are experiencing poor sleep would be more likely to practice maternal gatekeeping—in a sense, blocking father involvement as they may have fewer cognitive resources available to manage potential conflicts—leading to less positive and more negative coparenting. It would have been important to measure pre-birth factors, as we were examining coparenting quality across the early months of the transition and coparenting has been strongly linked with pre-birth factors, such as marital quality and expectations (McHale, et al., 2004; McHale & Rotman, 2007; Van Egeren, 2003; 2004). Our sample consisted of mostly married, White, and highly-educated parents. It may be that families of lower socioeconomic status are more at risk for spillover from sleep disruption, as multiple risk factors may already be present. Thus, it is important to examine in these other contexts as well. Finally, as there are many factors that could also lead to increased family distress, such as infant health problems, unmet pre-birth expectations, low family income, and high work stress, it may be important to examine whether infant night waking is more detrimental as other risk factors increase.

Conclusion & Practical Implications

In summary, both mothers' *and* fathers' perceptions of coparenting and marital quality appear to be sensitive to the unfolding parental dynamics that take place in response to infant sleep difficulties. Therefore, when attempting to intervene in parenting, coparenting, and/or the marital relationship, it is important to understand other stressors that may be present in the family during the transition to parenthood. Indeed, parenting may indirectly benefit from interventions targeting infant sleep problems and strategies used by parents to promote infant sleep.

Furthermore, although mothers are generally the primary caregivers of their infants at night

(Tikotzky et al., 2011), it is critical that both parents work together to find solutions to the distress caused by infant night waking. This is especially important as chronic sleep problems can develop, which can continue into the early childhood years (Lam et al., 2003), if parents do not make a conscious (and informed, we might add) effort to assist their infants in the consolidation of their sleep. Parents should seek to understand infant sleep, how it is different from adult sleep, and potential strategies for assisting with their sleep over time. Before the baby is born, it may be helpful for parents to create a plan for promoting their infant's sleep. At the very least, parents need to be in agreement on sleep arrangements and which strategies they will use with their infant. As mothers were shown in our study to have more fragmented sleep, perhaps mothers and fathers should discuss when and who will get up each night with the infant, and work out arrangements that promote, to whatever extent possible, sleep quality in both parents. If faced with an infant who does not sleep well, parents must be proactive and work together, as the resulting distress feeds into aspects of their psychological well-being as well as their parenting and marital relationship.

References

- Arbuckle, J. L., & Wothke, W. (1999). *Amos 4.0 user's guide*. Chicago: Small Waters.
- Bayer, J. K., Hiscock, H., Hampton, A., & Wake, M. (2007). Sleep problems in young infants and maternal mental and physical health. *Journal of Pediatrics and Child Health, 43*, 66-73. DOI: 10.1111/j.1440-1754.2007.01005.x
- Belsky, J. (1984). The determinants of parenting: A process model. *Child Development, 55*, 83-96. DOI: 10.2307/1129836
- Belsky, J., & Hsieh, K. H. (1998). Patterns of marital change during the early childhood years: Parent personality, coparenting, and division-of-labor correlates. *Journal of Family Psychology, 12*(4), 511–528. DOI: 10.1037/0893-3200.12.4.511
- Boyle, J. & Cropley, M. (2004). Children's sleep: Problems and solutions. *Journal of Family Health Care, 14*(3), 61-63.
- Bronte-Tinkew, J., Moore, K. A., Matthews, G., & Carrano, J. (2007). Symptoms of major depression in a sample of fathers of infants: Sociodemographic correlates and links to father involvement. *Journal of Family Issues, 28*, 61-99. DOI: 10.1177/0192513X06293609
- Buhi, E. R., Goodson, P., & Neilands, T. B. (2007). Structural equation modeling: A primer for health behavior researchers. *American Journal of Health Behavior, 31*, 74-85.
- Burney, R. V., & Leerkes, E. M. (2010). Links between mothers' and fathers' perceptions of infant temperament and coparenting. *Infant Behavior and Development, 33*, 125-135. DOI: 10.1016/j.infbeh.2009.12.002

- Burnham, M. M., Goodlin-Jones, B. L., Gaylor, E. E., & Anders, T. F. (2002). Nighttime sleep–wake patterns and self-soothing from birth to one year of age: A longitudinal intervention study. *Journal of Child Psychology and Psychiatry, 43*, 713–725. DOI: 10.1111/1469-7610.00076
- Counterline, M. S., & Teti, D. M. (2010). Sleep arrangements and maternal adaptation in infancy. *Infant Mental Health Journal, 31*, 647-663. DOI: 10.1002/imhj.20276
- Cowan, C. P., & Cowan, P. A. (1992). When partners become parents: The big life change for couples. New York: Basic Books.
- Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology, 48*, 243-267. DOI: 10.1146/annurev.psych.48.1.243
- Crnic K., & Low C. (2002). Everyday stresses and parenting. In M. Bornstein (ed.), *Handbook of parenting: Practical issues in parenting (2nd edition), vol. 5.* (pp. 243-267). Lawrence Erlbaum Associates: Mahwah, NJ.
- Dahl, R. E., & El-Sheikh, M. (2007). Considering sleep in a family context [Introduction to the Special Issue]. *Journal of Family Psychology, 21*, 1–3. DOI: 10.1037/0893-3200.21.1.1
- Davis, E. F., Schoppe-Sullivan, S. J., Mangelsdorf, S. C., & Brown, G. L. (2009). The role of infant temperament in stability and change in coparenting across the first year of life. *Parenting: Science and Practice, 9*, 143-159. DOI: 10.1080/15295190802656836
- Derogatis, L. R. (1994). *SCL-90-R Symptom Checklist-90-R: Administration, scoring, and procedures manual*. Minneapolis, MN: National Computer Systems.

- Elliston, D., McHale, J., Talbot, J., Parmley, M., & Kuersten-Hogan, R. (2008). Withdrawal from coparenting interactions during early infancy. *Family Process, 47*, 481-499. DOI: 10.1111/j.1545-5300.2008.00267.x
- Feinberg, M. E. (2002). Coparenting and the transition to parenthood: A framework for prevention. *Clinical Child and Family Psychology Review, 5*, 173-195. DOI: 10.1023/A:1019695015110
- Feinberg, M. E. (2003). The internal structure and ecological context of coparenting: A framework for research and intervention. *Parenting: Science and Practice, 3*, 95-131. DOI: 10.1207/S15327922PAR0302_01
- Feinberg, M. E., Brown, L. D., & Kan, M. L. (2012). A Multi-Domain Self-Report Measure of Coparenting. *Parenting, 12*, 1-21. DOI: 10.1080/15295192.2012.638870
- Germo, G. R., Chang, E. S., Keller, M. A., & Goldberg, W. A. (2007). Child sleep arrangements and family life: Perspectives from mothers and fathers. *Infant and Child Development, 16*, 433-456. DOI: 10.1002/icd.521
- Giallo, R., Rose, N., & Vittorino, R. (2011). Fatigue, wellbeing and parenting in mothers of infants and toddlers with sleep problems. *Journal of Reproductive and Infant Psychology, 29*, 236-249. DOI: 10.1080/02646838.2011.593030
- Gjerdingen, D., Crow, S., McGovern, P., Miner, M., & Center, B. (2011). Changes in depressive symptoms over 0-9 months postpartum. *Journal of Women's Health, 20*(3), 381-386. DOI: 10.1089/jwh.2010.2355
- Gonzales, N. A., Pitts, S. C., Hill, N. E., & Roosa, M.W. (2000). A mediational model of the impact of interparental conflict on child adjustment in a multiethnic, low-

income sample. *Journal of Family Psychology*, *14*(3), 365–379. DOI:

10.1037/0893-3200.14.3.365

Goodman, J. H. (2004). Paternal postpartum depression, its relationship to maternal postpartum depression, and implications for family health. *Journal of Advanced Nursing*, *45*, 26-35. DOI: 10.1046/j.1365-2648.2003.02857.x

Goyal, D., Gay, C., & Lee, K. (2009). Fragmented maternal sleep is more strongly correlated with depressive symptoms than infant temperament at three months postpartum. *Women's Mental Health*, *12*, 229-237. DOI: 10.1007/s00737-009-0070-9

Hayden, L. C., Schiller, M., Dickstein, S., Seifer, R., Sameroff, A. J., Miller, I., et al. (1998). Levels of family assessment: I. Family, marital, and parent–child interaction. *Journal of Family Psychology*, *12*, 7–22. DOI: 10.1037/0893-3200.12.1.7

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1-55. DOI: 10.1080/10705519909540118

Huston, T. L., & Holmes, E. K. (2004). Becoming parents. In A. L. Vangelisti (Ed.), *Handbook of family communication* (pp. 105-133). Mahwah, NJ: Erlbaum.

Kline, R. B. (2010). *Principles and practice of structural equation modeling* (3rd Edition). New York: Guilford Press.

Lam, P., Hiscock, H., & Wake, M. (2003). Outcomes of infant sleep problems: A longitudinal study of sleep behavior and maternal well-being. *Pediatrics*, *111*, e203-e207. DOI: 10.1542/peds.111.3.e203

- Lawrence, E., Rothman, A., Cobb, R., Rothman, M., & Bradbury, T. (2008). Marital satisfaction across the transition to parenthood. *Journal of Family Psychology, 22*, 41-50. DOI: 10.1037/0893-3200.22.1.41
- Leigh, B., & Milgrom, J. (2008). Risk factors for antenatal depression, postnatal depression and parenting stress. *BMC Psychiatry, 8*, 24-35. DOI: 10.1186/1471-244X-8-24
- Lindsey, E. W., Caldera, Y., & Colwell, M. (2005). Correlates of coparenting during infancy. *Family Relations, 54*, 346-359. DOI: 10.1111/j.1741-3729.2005.00322.x
- Lipscomb, S. T., Leve, L. D., Harold, G. T., Neiderhiser, J. M., Shaw, D. S., Ge, X., & Reiss, D. (2011). Trajectories of parenting and child negative emotionality during infancy and toddlerhood: A longitudinal analysis. *Child Development, 82*, 1661-1675. DOI: 10.1111/j.1467-8624.2011.01639.x
- Locke, H. J., & Wallace, K. M. (1959). Short marital adjustment and prediction tests: Their reliability and validity. *Marriage and Family Living, 21*, 251-255.
- Loutzenhiser, L., & Sevigny, P. R. (2008). Infant sleep quality of family life for first-time parents of three-month-old infants. *Fathering, 6*, 2-19. DOI: 10.3149/fth.0601.2
- Margolin, G., Gordis, E. B., & John, R. S. (2001). Coparenting: A link between marital conflict and parenting in two parent families. *Journal of Family Psychology, 15*(1), 3-21. DOI: 10.1037/0893-3200.15.1.3
- Martin, J., Hiscock, H., Hardy, P., Davey, B., & Wake, M. (2007). Adverse associations of infant and child sleep problems and parent health: An Australian population study. *Pediatrics, 119*, 947-955. DOI: 10.1542/peds.2006-2569

McHale, J. P., Kazali, C., Rotman, T., Talbot, J., Carleton, M., & Lieberson, R. (2004).

The transition to coparenthood: Parents' prebirth expectations and early coparental adjustment at 3 months postpartum. *Development and Psychopathology, 16*, 711-733. DOI: 10.1017/S0954579404004742

McHale, J. P., Kuersten-Hogan, R., Lauretti, A., Rasmussen, J. L. (2000). Parental reports of coparenting and observed coparenting behavior during the toddler period. *Journal of Family Psychology, 14*(2), 220-236. DOI: 10.1037/0893-3200.14.2.220

McHale, J. P., & Rotman, T. (2007). Is seeing believing? Expectant parents' outlooks on coparenting and later coparenting solidarity. *Infant Behavior and Development, 30*, 63-81. DOI: 10.1016/j.infbeh.2006.11.007

Medina, A. M., Lederhos, C. L., & Lillis, T. A. (2009). Sleep disruption and decline in marital satisfaction across the transition to parenthood. *Families, Systems, & Health, 27*, 153-160. DOI: 10.1037/a0015762

Meijer, A. M., & van den Wittenboer, G. L. H. (2007). Contribution of infants' sleep and crying to marital relationship of first-time parent couples in the 1st year after childbirth. *Journal of Family Psychology, 21*, 49-57. DOI: 10.1037/0893-3200.21.1.49

Meltzer, L.J., & Mindell, J.A. (2007). Relationship between child sleep disturbances and maternal sleep, mood, and parenting stress: A pilot study. *Journal of Family Psychology, 21*, 67-73. DOI: 10.1037/0893-3200.21.1.67

- Meltzer, L. J., Mindell, J. A., & Levandoski, L. J. (2007). The 24-hour sleep patterns interview: A pilot study of validity and feasibility. *Behavioral Sleep Medicine, 5*, 297-310. DOI: 10.1080/15402000701557441
- Pleck, J. H., & Masciadrelli, B. P. (2004). Parental involvement by U.S. residential fathers: Levels, sources, and consequences. In M. E. Lamb (Ed.), *The role of the father in child development* (4th ed., pp. 222–271). New York, NY: Wiley.
- Rothbart, M. K. (1981). The measurement of infant temperament. *Child Development, 52*, 569–578. DOI: 10.2307/1129176
- Sadeh, A., Tikotzky, L., & Scher, A. (2010). Parenting and infant sleep. *Sleep Medicine Reviews, 14*, 89-96. DOI: 10.1016/j.smrv.2009.05.003
- Schoppe-Sullivan, S. J., Brown, G. L., Cannon, E. A., Mangelsdorf, S. C., & Sokolowski, M. S. (2008). Maternal gatekeeping, coparenting quality, and fathering behavior in families with infants. *Journal of Family Psychology, 22*, 389-398. DOI: 10.1037/0893-3200.22.3.389
- Schoppe-Sullivan, S. J., Mangelsdorf, S. C., Brown, G. L., & Sokolowski, M. S. (2007). Goodness-of-fit in family context: Infant temperament, marital quality, and early coparenting behavior. *Infant Behavior & Development, 30*, 82-96. DOI: 10.1016/j.infbeh.2006.11.008
- Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family, 38*, 15-28. DOI: 10.2307/350547

- Teti, D. M., & Crosby, B. (in press). Maternal depression, dysfunctional cognitions, and infant night waking: The role of maternal night-time behavior. *Child Development*.
- Teti, D. M., O'Connell, M. A., & Reiner, C.D. (1996). Parenting sensitivity, parental depression and child health: The mediational role of parental self-efficacy. *Early Development & Parenting*, 5(4), 237–250. DOI: 10.1002/(SICI)1099-0917(199612)5:4<237::AID-EDP136>3.0.CO;2-5
- Tikotzky, L., Sadeh, A., & Glickman-Gavrieli, T. (2011). Infant sleep and paternal involvement in infant caregiving during the first 6 months of life. *Journal of Pediatric Psychology*, 36, 36-46. DOI: 10.1093/jpepsy/jsq036
- Van Egeren, L. A. (2004). The development of the coparenting relationship over the transition to parenthood. *Infant Mental Health Journal*, 25, 453-477. DOI: 10.1002/imhj.20019
- Van Egeren, L. A. (2003). Prebirth predictors of coparenting experiences in early infancy. *Infant Mental Health Journal*, 24, 278-295. DOI: 10.1002/imhj.10056
- Whisman, M. A., Davilla, J., Goodman, S. H. (2011). Relationship adjustment, depression, and anxiety during pregnancy and the postpartum period. *Journal of Family Psychology*, 25, 375-383. DOI: 10.1037/a0023790
- White, C. P., White, M. B., & Fox, M. A. (2009). Maternal fatigue and its relationship to the caregiving environment. *Families, Systems, & Health*, 27, 325-345. DOI: 10.1037/a0018284