

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY STUDIES

**RELATIONS BETWEEN FIRST-TIME MOTHERS' PERCEIVED PARENTING
SELF-EFFICACY, INFANT FUSSING, AND NIGHTTIME SLEEP**

BREANNE FAGAN

Fall 2009

A thesis
submitted in partial fulfillment
of the requirements for a baccalaureate degree
in Human Development and Family Studies
with honors in Human Development and Family Studies

Reviewed and approved* by the following:

Leann Birch
Distinguished Professor of Human Development and Family Studies
Thesis Supervisor

Kathryn Hynes
Assistant Professor of Human Development and Family Studies
Honors Advisor

Cynthia Stifter
Professor of Human Development and Family Studies
Faculty Reader

*Signatures are on file in the Schreyer Honors College.

Abstract

This research investigated relations of sleeping and fussing in early infancy and maternal self-efficacy during the infants' first year of life by examining how early infant fussiness may relate to changing perceptions of efficacy in the parenting role.

Participants were 75 primiparous mother-infant dyads. Most mothers were in their late 20's (27.5 ± 4.74 years), married and had high educational attainment. Infant behavior was measured using Infant/Caregiver diary cards. Maternal perceptions of self-efficacy were measured using the Parental Sense of Competence scale and the Parental Self-Efficacy Questionnaire. Data analyses were performed using t-tests, correlations and ordinary least squares regressions. The findings indicated that early infant behavior is extremely variable but despite the variability, a positive relationship emerged between early nighttime sleeping and maternal self-efficacy, while early fussing did not prove to be significant. Maternal self-efficacy increases over time, but early infant behaviors did not predict later maternal self-efficacy when controlling for early self-efficacy.

Behaviors perceived as more difficult, more fussing and less nighttime sleep, were negatively related to efficacy in mothers. One implication is that difficult behavior in early infancy may relate to negative perceptions of parenting, eliciting cycles of negative mother/infant interactions. Further investigations will be needed to confirm these findings and determine the specific mechanisms involved in the interplay between child behavior and maternal self-efficacy.

Acknowledgements

First and foremost, I would like to thank Dr. Leann Birch for giving me my first taste of her research three years ago. I am so thankful that I got to embark on this journey early and learn so much from you along the way. Leann, without your wisdom, guidance and endless coffee supply I would not have made it. Thank you!

I would also like to thank Stephanie Anzman, who met with me constantly to push me along and give me invaluable advice and feedback. I would like to thank her for so kindly dealing with my continuous emails, questions and unfinished sentences. Without her I would not have enjoyed this process as much as I did. Steph, thank you for being such an encouragement for the past year!

Additionally, I would like to thank Dr. Cynthia Stifter and Dr. Kathryn Hynes for reviewing this paper and providing valuable feedback.

Finally, I would like to thank everyone else that has supported me along the way. To my whole family, thank you for the “you’re almost there” care packages! Your support is so important to me. To my roommates and friends, thank you for pretending to listen every time I opened my mouth to talk about this paper and reminding me that I was able to do it. Last but definitely not least, William, thank you for being my biggest fan and supporter. There are no words to express my gratitude to you. I am so blessed to have such a great support system in my life; thank you all!

Table of Contents

Abstract.....	i
Acknowledgments.....	ii
Table of Contents.....	iii
List of Figures.....	iv
List of Tables	v
Introduction.....	1
Specific Aims and Hypotheses.....	11
Method.....	12
Participants.....	12
Procedure.....	13
Measures.....	14
Data Analysis	17
Results.....	19
Discussion.....	29
References.....	37
Appendix.....	40
Demographic Table.....	40
Measures.....	41
Parenting Sense of Competence.....	41
Parental Self-Efficacy Questionnaire.....	43
Diary Cards.....	45
Academic Vita.....	48

List of Figures

Figure #		Page #
1	Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes at 3 weeks showing the regression line (N=75)	22
2	Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes at 4 weeks showing the regression line (N = 75)	22
3	Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes in the Fussier group at 4 weeks showing the regression line (N=39)	24
4	Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes in the Less Fussy group at 4 weeks showing the regression line (N=36)	24
5	Change in mean PSOC and PSEQ scores	25
6	Scatter plot of the relation between PSOC and PSEQ scores at 3 weeks and mean fuss minutes at 3 weeks with the regression line (N=75)	26
7	Scatter plot of the relation between PSOC and PSEQ scores at 6 months and mean fuss minutes at 3 weeks with the regression line (N=75)	27
8	Scatter plot of the relation between PSOC and PSEQ scores at 3 weeks and mean nighttime sleep minutes at 3 weeks with the regression line (N=75)	27
9	Scatter plot of the relation between PSOC and PSEQ scores at 6 months and mean nighttime sleep minutes at 3 weeks with the regression line (N=75)	28

List of Tables

Table #		Page #
1	Timeline of Measures used in this Study	14
2	Mean Maternal PSOC and PSEQ scores (3 weeks and 6 months) and Mean Infant Fussing Minutes and Nighttime Sleep Minutes (3 and 4 weeks)	20
3	Mothers' Demographic Characteristics as Percentages of the Sample (n in parentheses)	40

Introduction

Throughout the first year of life, infants undergo rapid developmental changes; additionally, there are individual differences between infants (St. James-Roberts & Plewis, 1996). The amount of time that individual infants spend awake, asleep, feeding and fussing changes during the first year. Throughout this time, infants also differ from one another on these behaviors. It is important for parents to understand both normative developmental trajectories and patterns of behavior in their own infant to provide the best care. During early development, parenting plays an important role in child outcomes (Bronfenbrenner, 1986). Reliance on parents is higher in infancy compared to other periods, and parents have a high degree of control over the infant's environment and what the infant experiences. It is important that parents learn about their infant's development and have the knowledge and skills to tend to their infant's ever-changing needs (Feldman, Greenbaum, Mayes & Erlich, 1997). Failure to engage with the infant and be responsive to the infant's needs may negatively impact the infant's development (Landry, Smith & Swank, 2006). This may also result in negative self evaluations of feelings about parenting and a lack of satisfaction in the role (Johnston & Mash, 1989). Individual differences in infant behavior can influence and/or evoke certain parenting responses (Goldberg, 1977, as cited in Teti & Gelfand, 1991; Ohan, Leung & Johnston, 2000). Parents may respond to the same infant behavior differently as the infant matures developmentally. Parenting behaviors can elicit different child responses, as well. The aims of this paper are to explore infant behavior and perceived parenting competence during the infant's first year of life, to describe these constructs during this early

developmental period and to understand the interplay between infant behaviors and maternal self-efficacy.

Parents provide for children's basic needs, and cognitions about parenting and beliefs about oneself in the parenting role influence the type of care provided. Feelings of competence in the parental role are related to parenting behavior, with higher perceived competence being linked to more responsive parenting (Coleman & Karraker, 2003; Sanders & Wooley, 2004). Parents with more experience with their own children or other children, have been found to have higher levels of self-efficacy (Burnham, Goodlin-Jones, Gaylor & Anders, 2002; Mercer & Ferketich, 1994). Parents lacking experience may respond less effectively or fail to respond at all to infant distress, potentially leading to continuation of negative affect during child distress (Johnston, 1996; Ohan, et al., 2000). The continuation of negative infant behavior has been shown to increase parents' negative self-evaluations about parenting (Johnston, 1996; Johnston & Mash, 1989; Sanders & Woolley, 2004; Wolfson, Lack & Futterman, 1992). These negative reciprocal interactions may be more prevalent and problematic in infants with fussier temperaments (Goldberg, 1977, as cited in Teti & Gelfand, 1991). Empirical research supports the idea that infant behavior and parental perceptions of competence have a bidirectional relationship, such that parents and infants affect each other over time (Ohan et al., 2000). Due to the rapid transitions taking place during infancy, these relationships should be interpreted in the context of the infant's developmental stage. The interplay between parents and infants changes over the first year as infants develop and as parents gain more experience in the role.

Patterns of Infant Behavior

Extant research has revealed that while there are individual differences, there are some normative patterns of infant sleep, waking and crying during the first year of life. Throughout the first year, there are slight decreases in the amount of time spent sleeping during the 24-hour period along with increases in waking time (St. James-Roberts & Plewis, 1996). Sleep patterns also change. Sleep bouts become longer (from 4 to 6-8 hours), the number of sleep bouts decreases and nocturnal patterns of sleep begin to emerge. This study focuses on nighttime sleep to explore potential relationships between amount of nocturnal sleep and maternal self-efficacy. A greater concentration of sleep at night may be more positively related to self-efficacy than sporadic sleep bouts throughout the day.

The amount of time that infants spend fussing and crying increases from birth until 6-8 weeks (St. James-Roberts & Plewis, 1996; Walker & Menaham, 1994). At 6 weeks, crying time was estimated to be around 53.5 (\pm 33.9) minutes per day for American infants (Barr, Konner, Bakeman & Adamson, 1991, as cited in Walker & Menaham, 1994). Mean levels of crying and fussing are at their peak around 6 weeks, and crying and fussing occur more in the evening. The mean total crying and fussing times at 8 weeks are estimated to be between 2 and 2.5 hours a day (Walker & Menaham, 1994). The amount of time crying and fussing decreases by half after age 3 months. Some work distinguishes between crying and fussing; however, for the purpose of this research, they are combined and will be referred to as *fussing* throughout this paper.

Most of these behavior patterns data come from convenience samples. Similar patterns emerge across the samples regardless of how the data were collected, leading to

the assumption that these patterns represent infant behavior on mean in the Western World. Although these patterns of fussing and sleeping are predictable on mean, there is a considerable amount of variability across infants. Some infants are more distressed than others throughout the first year, and not all experience developmental changes at the same time. It is important to remember this variability when considering normative patterns of fussing and sleeping behavior.

In addition to variations within cultures, conceptualizations of normative infant development differ by cultures and caretaking practices, and it has been suggested that patterns of infant behavior can change with caretaking styles (Lee, 2000). For example, Soltis (2004) postulated that maternal style can affect the early infant fussing curve using the example of the differences between !Kung and Western infants. !Kung infants spent less time fussing than Western infants, a difference Soltis (2004) attributed to !Kung mothers carrying their infants for a majority of the day. Baidam, Hillier, Ward, Bannister, Bamford and Moore (1995) found that infants with longer durations of breastfeeding cried less, and that non-breastfed infants cried more. They suggested that maternal contact was the main factor in this relationship. In this study, mothers who picked up their infants in response to fussing reported the shortest durations of fussing (Baidam et al., 1995). Although less fussing may seem more favorable for parents, some researchers advocate that some fussing behavior is adaptive for infants' development of self-regulation (Rickert & Johnson, 1988). From the parents' perspective, however, minimizing fussing and distress may be perceived as a more immediate goal.

Mothers who self-identified as good soothers reported significantly less infant fussing throughout the first postnatal year. The duration of infant fussing was also found

to be related to speed of maternal response, such that mothers who responded more quickly to infant distress reported less fussing (Baildam et al., 1995). The relationship between infant/maternal contact and infant fussing remains controversial, with reports of a null relationship as well as a positive relationship (Soltis, 2004; Lee, 2000; St. James-Roberts & Plewis, 1996). This relationship may depend on the severity of the infant fussing. Also, some parents encourage the development of self-regulatory behaviors by not soothing immediately, and such behaviors could be correlated with adaptive outcomes. Clearly, infant behavior is variable, and parents' reactions to infant behaviors will qualify whether or not certain behaviors are problematic in a given context. These findings may be a result of maternal bias in self-report data. Many types of measures have been used to understand infant behavior, which may contribute to the variation in findings. The link between infant behavior and parents' perceptions of their own abilities could help clarify this issue.

Self-Efficacy

Parents play an important role during infancy, both encouraging and responding to a variety of infant behaviors. As infants are unable to care for themselves, parents' choices in this role greatly affect later child outcomes (Bor, Brennan, Williams, Najman & O'Callaghan, 2003; Coleman & Karraker, 2003). Parenting is a multi-faceted construct, with one factor being cognitions about parenting. Cognitions about parenting encompass the broad spectrum of feelings about different aspects of parenting behaviors and the parenting role in general. Researchers conceptualize these cognitions differently, as evidenced by the variety of measures used to assess this construct. Yet, there is some overlap as well. Parenting self-esteem is an important aspect of parental cognitions

(Johnston & Mash, 1989). This construct has also been termed “parental sense of competence,” which is the term that will be used herein. Parental sense of competence includes two overlapping but distinct dimensions: self-efficacy in the parenting role and the satisfaction derived from parenting (Coleman & Karraker, 2000; Johnston & Mash, 1989; Ohan et al., 2000). In some literature, these are labeled as skill-knowledge and value-comforting, respectively. In this paper, the labels of self-efficacy and satisfaction will be used, and self-efficacy specifically will be the focal aspect of parenting sense of competence. Parenting self-efficacy taps a parent’s belief in his or her ability to accomplish a particular task competently and effectively (Teti & Gelfand, 1991). Self-efficacy affects how parents view their ability to overcome parenting challenges in order to promote positive child development (Coleman & Karraker, 2000; Johnston & Mash, 1989).

Parenting self-efficacy fits into the broader psychological construct of self-efficacy, which captures individuals’ feelings of competence in all areas of development. Two different types of self-efficacy are general self-efficacy and task-specific self-efficacy. These are conceptualized similarly across studies, but a variety of measures are used to tap into the different types. General self-efficacy is an overall feeling of competence, whereas task-specific self-efficacy is how one feels about his or her performance in a specific task. Bandura (1977) explained that task-specific self-efficacy guides a person’s behavior and predicts how successfully the individual will perform in the relevant domain. Thus, understanding self-efficacy beliefs is essential to understanding how individuals interact with their environments (Sanders & Woolley,

2004; Teti & Gelfand, 1991). Self-efficacy is the core construct that mediates the relationship between knowledge and behavior (Teti & Gelfand, 1991).

Self-efficacy beliefs are increased or decreased by task success or failure, respectively. Studies have shown a difference in the actions and behaviors of individuals with low and high self-efficacy. Individuals with high levels of self-efficacy more often continue trying a task until they succeed than individuals with low levels of self-efficacy (Jain, Stifter & Fish, 2000; Teti & Gelfand, 1991). Individuals with low self-efficacy are more likely to give up on a task prematurely after failure (Teti & Gelfand, 1991). One may have the knowledge of how to handle a problem but low levels of self-efficacy discourage taking action, due to assumption of failure.

Similarly, parental self-efficacy influences parenting behaviors (Teti & Gelfand, 1991). Parents who feel more efficacious in the parenting role are more likely to put their parenting knowledge into action. For example, mothers who feel competent at soothing will react to distressed infants, confidently using soothing techniques that work for them (Coleman & Karraker, 2003). If they are successful, this perpetuates their feelings of efficacy. Efficacy and performance interact with one another in a bidirectional fashion, such that efficacy influences performance and successful or unsuccessful performance influences future feelings of efficacy (Teti & Gelfand, 1991). For example, a mother may know what to do to console her fussing infant but may fail at doing so effectively because of self-doubt, and her inability to act will perpetuate the cycle by making her feel less competent as a mother. Parents lacking self-efficacy seem to be unable to put their parenting knowledge into action (Jain et al., 2000). The cycle of negative self-efficacy beliefs is then perpetuated due to this failure. Furthermore, parents who are unable to act

on their parenting knowledge tend to become preoccupied with themselves instead of the child (Jain, et al., 2000). They also become highly aroused emotionally and do not show persistence in parenting (Jain, et al., 2000). These inefficacious individuals may impair their performance and blame their failure on other sources (Jain et al., 2000). Thus, parenting efficacy is important for competent parenting.

Parental self-efficacy is an important factor in parents responding appropriately to their infants and research shows that responsive, sensitive parenting is important for a social, affective and cognitive development (Coleman & Karraker, 2003). Parental response to the infant is dependent on parents' feelings of efficacy in understanding the infant's signal (Jain, et al., 2000). There is a proposed bi-directional relationship between parenting self-efficacy and child behavior (Johnston & Mash, 1989; Ohan, Leung & Johnston, 2000; Teti & Gelfand, 1991). We see this reciprocity working such that parenting a child with difficult behavior may have a negative effect on the parent's efficacy in the parenting role and thus on parenting behavior. Low efficacy precludes optimal responsiveness to the child's needs; perpetuating the problem as such children may then express more difficult behavior (Coleman & Karraker, 2003).

Given this cycle, it is possible that the aforementioned individual differences between infants on behaviors like sleep and fussing have implications for parenting self-efficacy. Goldberg (1977) hypothesized that maternal competence and self-efficacy are likely nurtured by infants who are predictable and manageable, who signal their needs effectively and who are easy to soothe. Conversely, we would expect to see that mothers who with chronically fussy, irritable and difficult babies would have lower maternal self-efficacy on mean (Johnston & Mash, 1989). There is also evidence that caregivers who

begin with low levels of parenting self-efficacy are more sensitive to difficult child behavior, again alluding to the likely bidirectionality of this relationship (Johnston & Mash, 1989). It has been shown that these mothers are depressed, self-blaming, less persistent and have diminished role satisfaction (Johnston & Mash, 1989).

Using diaries that track specific infant behavior can provide new insight into how maternal self-efficacy beliefs relate to infant behavior. Previous studies have focused on using measures that assess maternal perceptions of infant/child difficulty, such as the Infant Fussy-Difficult subscale of the Infant Characteristics Questionnaire and the Child Behavior Checklist (Coleman & Karraker, 2000 & 2003; Ohan, et al., 2000; Teti & Gelfand, 1991; Wolfson, et al., 1992). Although the diaries are self-report, they differ from the child temperament measures because they do not assess maternal perceptions of child difficulty. For this current research, we used fussing at 3 weeks as a proxy for the infant's temperament or initial fussiness level.

Subjective reports of global infant attributes may have different relationships with parenting compared to less perception-based measures of specific behaviors. We are examining two specific behaviors, fussing and nighttime sleep, to examine the hypothesis that infants with more difficult behavior (more fussing and less nighttime sleep) will have mothers with lower self-efficacy, consistent with research on parenting self-efficacy and maternal perceptions of overall infant difficulty (Johnston & Mash, 1989).

Previous research has shown that the first year of life is a period of rapid developmental changes, which can be difficult for parents to handle effectively. By exploring this relationship early in infancy, we are more likely to capture the ever-changing interplay between mothers and infants. With their rapid developmental

changes, infants require responsive, sensitive and competent parenting that is appropriate for their individual temperament and specific stage of development. Parents need to employ an effective strategy to parent appropriately through all stages of early development. That strategy will likely be changing frequently in early infancy as parents try to keep up with the changes of their infants. Parenting self-efficacy is an important predictor of parenting competence, which directly affects behavior. More efficacious mothers may be able to adapt their parenting as the infant develops rapidly in the first 3 – 4 weeks of life. Although some research has shown that parenting self-efficacy is fairly stable over time, an increase over time is expected because of the rapid developmental changes in the infant in this short time period (St. James-Roberts & Plewis, 1996). Because mothers cope with these rapid changes, their view of themselves in the parenting role will likely shift, corresponding with how well they adjust to such developmental changes. It is important to explore this because maternal behavior influences infant outcomes and is influenced by the infant.

This research aims to explore early infant behavior to better understand potential norms and variability in behavior during the first month of life. Early infant behavior norms across infants who differ on initial fussiness have not been explored for potential differences in early fussing and sleeping. It is also unknown how this early behavior affects parenting self-efficacy and if early behavior predicts later self-efficacy. As most work has looked at older infants and children, it is possible the cycles of parenting self-efficacy and child behavior were already well-established by these periods. This study aims to explore those relationships in the early stages as primiparous mothers are developing their initial perceptions of themselves as mothers.

Specific Aims and Hypotheses

The research will describe concurrent and longitudinal relations between infant fussing and nighttime sleep and two measures of maternal self-efficacy. The goal of this research was to describe patterns of early infant fussing and nighttime sleep and explore the relations between these variables. In addition, the research will examine relations between infant fussing and nighttime sleep and mothers' perceptions of parenting self-efficacy when the infants are 3 weeks and 6 months of age.

Specific aim 1: To describe infant fussing and nighttime (PM) sleep at 3 and 4 weeks and to explore relations between early infant fussing and sleeping.

The first aim of this study was to describe mean levels and variability of infant behavior at 3 and 4 weeks of age and also any changes that occur as infants transition into their first month.

Hypothesis 1. Mean minutes of fussing per week would be inversely related to mean weekly minutes of nighttime sleep when the infants were 3 weeks and 4 weeks old.

Hypothesis 2. The relation between minutes of fussing and nighttime sleep minutes at 4 weeks would differ on initial fussiness, such that initially fussy infants (measured at 3 weeks) will exhibit a stronger negative relationship between nighttime sleep minutes and fussing minutes at 4 weeks.

Specific aim 2: to explore changes in maternal self-efficacy over time and how these changes are related to infant fussing and nighttime sleep.

The second aim of the study was to explore how two different measures, the PSOC and PSEQ, assessed perceived maternal self-efficacy (measured at 3 weeks and 6

months) and how these measures related to infant fussing and sleeping at both concurrent and subsequent time points.

Hypothesis 1. Maternal self-efficacy would increase over time (from 3 weeks to 6 months) as experience is gained in the parenting role.

Infant fussing and nighttime sleep will more strongly predict self-efficacy at 3 weeks. By 6 months, mothers are more likely to understand their infants' individual behavior patterns and how to respond to them. Research has shown that parents with easier infants (i.e., infants who are easy to soothe, who signal their needs well and have more predictable patterns) tend to have higher self-efficacy (Teti & Gelfand, 1991). It is expected that the relationship between child behavior and self-efficacy is bi-directional.

Hypothesis 2. Mean minutes of fussing and the mean minutes of nighttime sleep at 3 weeks would be related to maternal self-efficacy, both concurrently (3 weeks) and later (6 months).

Hypothesis 3. The two measures of parental self-efficacy (PSOC and PSEQ) would be moderately correlated, illustrating that each taps into a different facet of efficacy.

Method

Participants

Participants were 160 mother-newborn dyads who were from central Pennsylvania and were part of a longitudinal study of the effects of soothing and feeding interventions on infant growth. Dyads were assessed at infant birth and when infants were, 3 weeks, 4 weeks and 6 months old. Inclusion criteria were: primiparous, English-speaking mothers who intended to breastfeed following hospital discharge, who were willing to follow-up with a University-affiliated primary care doctor and who had singleton births with a gestational age of 34 weeks or more. Dyads were excluded if

either mother or newborn stayed in the hospital for seven or more days following birth, if the newborn had diseases affecting sleeping or feeding, or if the mother had a pre-existing condition that would affect study participation and postpartum care, such as cancer or lupus. Mothers were recruited to participate in this study during their stay on the maternity floor of the Hershey Medical Center in Hershey, Pennsylvania.

One hundred and ten participants completed the larger study. The current study is limited to those with complete data on the variables of interest ($n=75$). The mean maternal age of this subsample was 27.5 ± 4.7 . At the time of enrollment, 64% of mothers reported household incomes greater than \$50,000, 11% reported incomes in the range of \$35,000 - \$50,000, and 19% reported incomes less than \$35,000. Mothers were mostly Caucasian (97%) and non-Hispanic or Latino (95%). Most mothers (79%) were married and well-educated. College completion was reported by 45% of mothers, and post graduate training/degrees were reported by 25% of the mothers. Complete demographic information can be found in Table 3. The Pennsylvania State University Institutional Review Board approved all study procedures, and mothers provided consent before the study began.

Procedure

The screening visit took place on the maternity floor of the hospital. Demographic data were collected at this time. The 3-week and 4-week visits were completed as phone calls to the mothers. During the phone calls the nurses helped the mothers complete the survey forms. For all time points, the forms were mailed to the participants and were picked up at home visits or mailed back upon completion. There were two visits around the 6-month time point: the timing of one of these visits was

relative to individual differences in infant development, and the other was conducted at age 6 months for all infants. The second visit was completed as a phone call to the mothers, where mothers were reminded to complete the necessary forms at that time point. Measures used in testing hypotheses of the study included the Parental Sense of Competence scale, the Parental Self-Efficacy Questionnaire and infant/caregiver diary cards. These are described below (Table 1).

Measures

Table 1. Timeline of Measures used in this Study

	Visit number:	2	3	7
Measure	Infant age:	3 weeks	4 weeks	6 months
Diary cards		x	x	
PSOC		x		x
PSEQ		x		x

Parental Sense of Competence (PSOC).

The PSOC is a 16-item scale developed by Gibaud-Wallston and Wandersman (1978) to measure parents' perceived competence with their infants. It contains two subscales, Skill-Knowledge and Value-Comforting, also referred to as Efficacy and Satisfaction, respectively (Johnston & Mash, 1989). Because of its relevance to the hypotheses, only the Efficacy subscale will be used for this study. The Efficacy subscale measures the degree of perceived skill and experience in the parenting role (Johnston & Mash, 1989), capturing the extent to which parents feel competent, effective in solving problems, and comfortable with the parenting role. Sample items include, "The problems of taking care of a child are easy to solve once you know how your actions affect your

child, an understanding I have acquired,” and “Considering how long I’ve been a mother, I feel thoroughly familiar with this role.” The responses are on a 6-point Likert-scale from strongly disagree (1) to strongly agree (6). Items 1, 6, 7, 10, 11, 13, 15 and 17 were all reverse-coded prior to scoring so that for all items higher scores indicated greater sense of competence. The items loading high on each factor were summed to yield Efficacy and Satisfaction scores. High scores reflect a more positive sense of competence for both subscales. Mothers completed the PSOC when infants were 3 and 6 months; scores from this measure will be referred to as *PSOC efficacy* throughout this paper. Previous work has demonstrated the reliability and validity of this measure (Gibaud-Wallston & Wandersman, 1978; Cutrona & Troutman, 1986; Ohan, Leung, Johnston, 2000). Similarly, in our sample, the PSOC efficacy subscale was reliable ($\alpha=.76$ at 3 weeks and $\alpha=.79$ at 6 months) and valid: PSOC efficacy was positively related to the PSOC satisfaction subscale at 3 weeks and 6 months ($r=.55, p<.0001$, $r=.40, p<.001$)

Parenting Self-Efficacy Questionnaire (PSEQ).

The Parenting Self-Efficacy Questionnaire is a 20-item scale developed by Fish, Stifter and Belsky (1991) to measure feelings of parental competence, specifically the ability to deal with the demands and pressures of having a child. The items tap into overall feelings of competence as parent, support in the parenting role (both sought and experienced), and perceived ability to meet the infant’s needs. Compared the PSOC, the PSEQ focuses on parental perceptions of specific demands of parenting and their perceived ability to respond to those needs. All of the items are part of one subscale that measures perceived self-efficacy in the parenting role. Sample items include, “My

baby's needs are easy to meet," and "I know best how to satisfy my baby's needs." The responses are on a 6-point Likert-scale from strongly disagree (1) to strongly agree (6). Items 1, 3, 4, 10, 12, 14, 16 and 17 are all reverse-coded prior to scoring, so that for all items, higher scores indicated positive parenting self-efficacy. Item scores were summed to yield a composite parental self-efficacy score, where a higher score indicates more positive self-efficacy. Mothers completed the PSEQ when infants were 3 and 4 weeks; scores from this measure will be referred to as *PSEQ efficacy* throughout this paper. Previous work has demonstrated the reliability and validity of this measure (Jain, Stifter & Fish, 2000). Similarly, in our sample, the PSEQ was reliable ($\alpha=.81$ at 3 weeks and $\alpha=.81$ at 6 months) and valid: PSEQ efficacy was positively related to the PSOC satisfaction subscale at 3 weeks and 6 months ($r=.70, p<.0001, r=.64, p<.0001$).

The infant/caregiver diary cards

The infant/caregiver diary cards were used to track infant behavior for 96 consecutive hours (four 24-hour periods) at two time points (3 weeks and 4 weeks). Each 24-hour period is split up into 4 sections: morning (6 am – 12 pm), afternoon (12pm – 6pm), evening (6pm – 12 am) and night (12 am – 6 am). A ruler is superimposed over each of the sections and is labeled at hourly intervals with major and minor ticks at 15 and 5 minutes, respectively. Parents were instructed to record their infant's behavior on the ruler. Color codes were assigned to four mutually exclusive behaviors, and parents used one of four crayons to indicate the behavior exhibited by the child during all time intervals: sleeping (blue), awake and content (yellow), awake and fussy (red) and feeding (green). The infant behavior was only to be recorded by the parents. Mothers were the primary provider of data in this study, but they were instructed that fathers could fill out

the diaries as well, if applicable. If someone else was caring for the baby at a certain time, parents were instructed to leave that period of the card blank and indicate a caretaker (e.g., “With grandma” or “At daycare”). Parents also indicated the normalcy of each day by answering the question, “Was this a typical day?,” (yes or no). Previous work has shown the validity of diary cards for assessing infant behavior (Barr, Kramer, Boisioly, McVey-White & Pless, 1988).

Variables created from diary data.

Composite variables were created to assess mean daily minutes of fussing and mean minutes of nighttime sleep at 3 and 4 weeks. At a given week, if infants did not have at least 3 days of diary data where each of these days included at least 12 hours of data, these individuals were excluded. It was decided that amounts of data below these cut-offs were not necessarily representative of the infant’s mean daily behavior. For the rest of the sample, both composites were calculated by summing the number of minutes of the particular behavior (fussing or sleeping) at a certain time point (ie. 3 weeks) and dividing that sum by the number of days of data available at that time point (where days = 3 - 4). When summing minutes of fussing, all time intervals were used, whereas nighttime sleep was defined as sleep occurring between 9pm and 6am. These variables will be referred to as *fussing minutes* and *Nighttime sleep minutes*.

In order to create Fussier and Less Fussy groups for subsequent analyses, a median split was conducted using data on fussing at 3 weeks. Infants with mean minutes of fussing greater than the median (≥ 76.25) were classified as “Fussier” and infants with fussing minutes less than the median (< 76.25) were classified as “Less Fussy.”

Data Analysis

All analyses were conducted using SAS Version 9.1 (SAS Institute Inc., Cary, NC).

Specific aim 1: To describe infant fussing and nighttime sleep at 3 and 4 weeks and to explore relations between early infant fussing and sleeping.

Hypothesis 1. Mean minutes of fussing per week would be inversely related to mean weekly minutes of nighttime sleep when the infants were 3 weeks and 4 weeks old.

A Pearson correlation was used to look at the relationship between fussing minutes and nighttime sleep minutes at 3 weeks. This same procedure was used to look at these same measures at 4 weeks. Descriptive statistics and dependent samples t-tests were used to describe mean minutes of sleep and fussing at each time point to examine differences and the variability across the sample.

Hypothesis 2. The relation between minutes of fussing and nighttime sleep minutes at 4 weeks would differ on initial fussiness, such that initially fussy infants (measured at 3 weeks) will exhibit a stronger negative relationship between nighttime sleep minutes and fussing minutes at 4 weeks.

A median split was used to divide infants into "Fussier" and "Less Fussy" groups using a median split of fussing minutes at 3 weeks as an index of their initial temperamental fussiness. Separate correlations were used to examine the relationships between fussiness and nighttime sleep for these two groups.

Specific aim 2: to explore changes in maternal self-efficacy over time and how these changes are related to infant behavior.

Hypothesis 1. Maternal self-efficacy would increase over time (from 3 weeks to 6 months) as experience is gained in the parenting role.

A dependent-samples t-test was used to test whether there was a significant difference between individuals' maternal self-efficacy at 3 weeks and their maternal self-efficacy at 6 months.

Hypothesis 2. Mean minutes of fussing and the mean minutes of nighttime sleep at 3 weeks would be related to maternal self-efficacy, both concurrently (3 weeks) and later (6 months).

An ordinary least squares regression was used to determine whether early child behavior predicted early and later maternal perceptions of self-efficacy. We tested to see if early fussing minutes predicted both early and later self-efficacy and if early nighttime sleep minutes predicted both early and later self-efficacy. The analyses were repeated adjusting for demographic variables to confirm that these covariates did not explain the results.

Hypothesis 3. The two measures of parental self-efficacy (PSOC and PSEQ) would be moderately correlated, illustrating that each taps into a different facet of efficacy.

A correlation was used to examine the relationship between the two measures of maternal self-efficacy. T-tests were used to test the differences between the two self-efficacy measures at concurrent time points as well.

Results

Of the 160 dyads that enrolled, 110 completed the larger one-year study. Participants were lost due to attrition throughout the study. There were some significant

demographic differences between those who completed and those who did not. Mothers who were non-completers were younger ($t(157)=2.37, p=.02$) and had lower education levels ($t(156)=3.24, p=.002$), were more likely to be a member of a minority race (chi-square=15.35, $p=.004$) and less likely to be married (chi-square=10.47, $p=.015$). The two groups did not differ on PSOC or PSEQ efficacy at 3 weeks, how long mothers planned to stay at home before returning to work, infant birth weight for gestational age, or mothers' ethnicity.

Table 2. Mean Maternal PSOC and PSEQ scores (3 weeks and 6 months) and Mean Infant Fussing Minutes and Nighttime Sleep Minutes (3 and 4 weeks)

Variable	Mean \pm SD	Range
Maternal variables		
PSOC efficacy at 3 weeks	4.46 \pm 0.70	2.86 – 5.71
PSOC efficacy at 6 months	4.96 \pm 0.64	3.29 – 6.00
PSEQ efficacy at 3 weeks	4.40 \pm 0.64	2.35 – 5.75
PSEQ efficacy at 6 months	4.52 \pm 0.57	3.20 – 5.75
Infant variables		
Fussing minutes at 3 weeks	92.77 \pm 60.56	17.50 – 296.25
Fussing minutes at 4 weeks	90.99 \pm 58.31	13.75 – 257.50
Nighttime sleep minutes at 3 weeks	382.76 \pm 56.12	206.25 – 506.25
Nighttime sleep minutes at 4 weeks	398.20 \pm 53.10	262.50 – 510.00

Note: The response scale for both efficacy measures was from 0 – 6.

Specific aim 1: To describe infant fussing and nighttime sleep at 3 and 4 weeks and to explore relations between early infant fussing and sleeping.

Mean fussing and nighttime sleeping durations for those participants with complete data ($N=75$) appear in Table 2. There is wide variability around the mean values of infant behavior (Table 2). This variability is visibly represented in the scatter plots that follow.

Hypothesis 1. Mean minutes of fussing per week would be inversely related to mean weekly minutes of nighttime sleep when the infants were 3 weeks and 4 weeks old.

From 3 weeks to 4 weeks, infants' mean nighttime sleep minutes increased, and the mean fussing minutes decreased. The increase in sleep minutes from 3 weeks to 4 weeks was statistically significant ($t(67)=2.81, p<.01$) but there was no significant difference in overall fussing minutes at 3 weeks and at 4 weeks ($t(74)=-.34, p=.73$).

Mean fussing minutes at 3 and 4 weeks was inversely related to mean nighttime sleep minutes at 3 weeks ($r=-.34, p<.01$) and 4 weeks ($r=-.43, p<.001$), respectively. These relationships are depicted in Figures 1 and 2. We can interpret this negative relationship to mean across infants that greater mean nighttime sleep minutes is related to less mean fussing minutes.

Figure 1. Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes at 3 weeks showing the regression line (N=75).

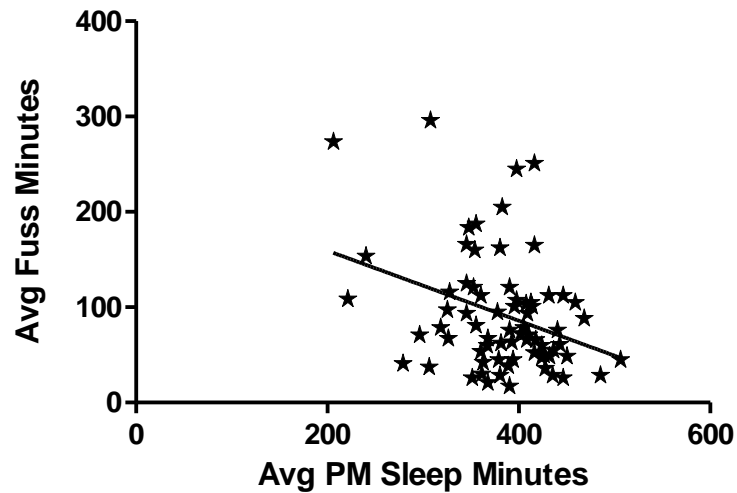
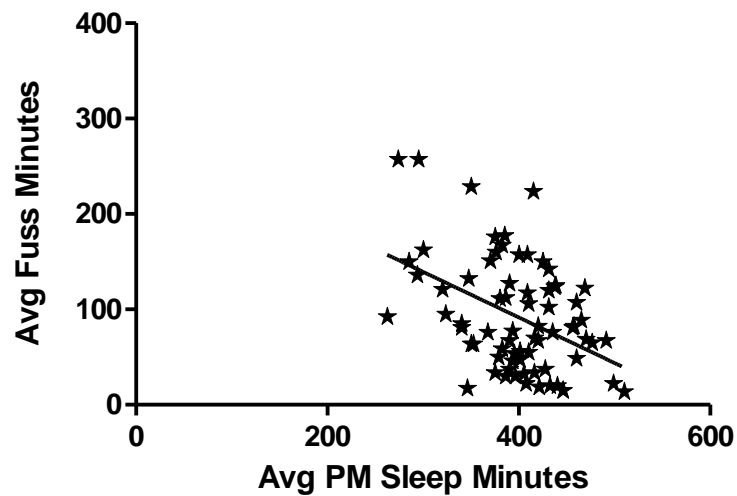


Figure 2. Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes at 4 weeks showing the regression line (N=75).



Hypothesis 2. The relation between minutes of fussing and nighttime sleep minutes at 4 weeks would differ on initial fussiness, such that initially fussy infants (measured at 3 weeks) will exhibit a stronger negative relationship between nighttime sleep minutes and fussing minutes at 4 weeks.

We used fussing at 3 weeks as a proxy for the infant's temperament or initial fussiness level. The sample was split into two groups, Fussier and Less Fussy, by a median split of fussiness at 3 weeks (median = 76.25 minutes). At 4 weeks, we see a stronger, negative relationship ($r = -.50, p = .001$) between fussing minutes and nighttime sleep minutes for the Fussier group (Figure 3). In the Less Fussy group, the relationship is non-significant ($r = -.33, p = .06$; (Figure 4). There is a stronger, negative relationship between fussing/fussing and nighttime sleep for the Fussier group as expected (although both correlations are in the same direction). An independent samples t-test comparing the Less Fussy and Fussier groups on total feed time at 3 weeks ($t(52.1) = 1.13, p = .26$) and 4 weeks ($t(56) = .93, p = .35$) showed that both groups show similar mean total feeding times. There is also no significant difference between groups for nighttime feeding time at 3 weeks ($t(55.6) = .69, p = .49$) or 4 weeks ($t(58.8) = 0.87, p = .39$).

Figure 3. Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes in the Fussier group at 4 weeks showing the regression line (N=39).

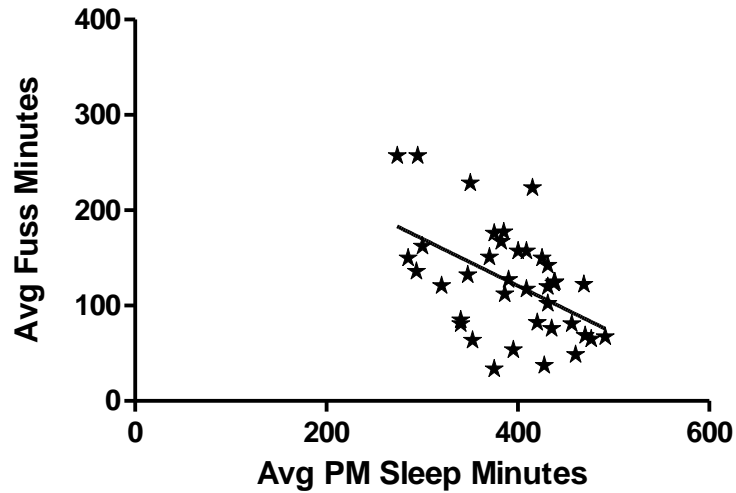
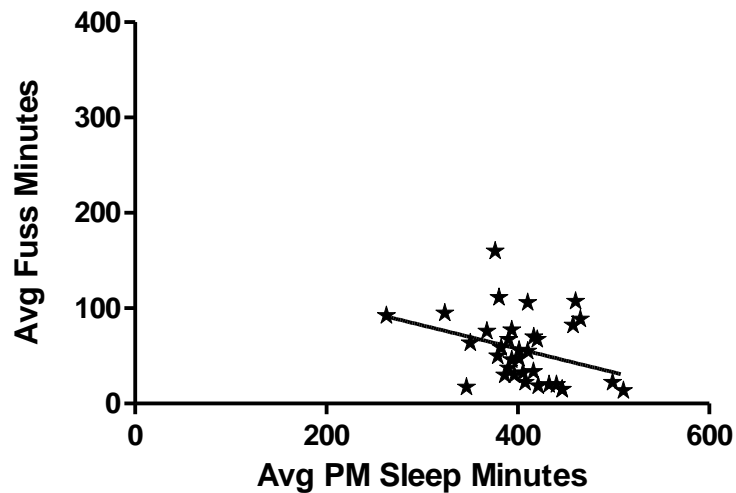


Figure 4. Scatter plot of the relation between mean fuss minutes and mean nighttime sleep minutes in the Less Fussy group at 4 weeks showing the regression line (N=36).

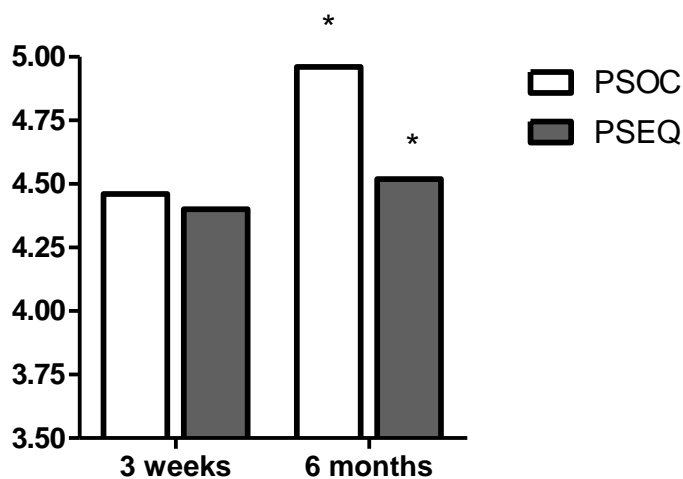


Specific aim 2: to explore changes in maternal self-efficacy over time and how these changes are related to infant fussing and nighttime sleep.

Hypothesis 1. Maternal self-efficacy would increase over time (from 3 weeks to 6 months) as experience is gained in the parenting role.

There were significant increases in PSOC efficacy ($t(74)=8.06, p<.0001$) and PSEQ efficacy ($t(74)=2.20, p=.0309$) from 3 weeks to 6 months. The mean scores of the measures are displayed in Figure 5. There is a greater increase over time in the PSOC efficacy as compared to the PSEQ efficacy.

Figure 5. Change in mean PSOC and PSEQ scores.



Note: * indicates a significant increase.

Hypothesis 2. Mean minutes of fussing and the mean minutes of nighttime sleep at 3 weeks would be related to maternal self-efficacy, both concurrently (3 weeks) and later (6 months).

Fussing: relations with PSOC and PSEQ.

Early fussing is not related to concurrent PSOC efficacy ($\beta=-.16, t(73, 1)=-1.43, p=.16$) at 3 weeks. However, early fussing is related to concurrent PSEQ efficacy ($\beta=-$

.29, $t(70, 4)=-2.50, p=.01$) adjusting for mothers' age, income and education (Figure 6). Early fussing is not related to later PSOC efficacy ($\beta=-.14, t(73, 1)=-1.25, p=.22$) or PSEQ efficacy ($\beta=-.16, t(73, 1)=-1.34, p=.18$) at 6 months (Figure 7).

Nighttime sleep: relations with PSOC and PSEQ.

Mothers whose infants showed more nighttime sleep at 3 weeks were more likely to report higher PSOC efficacy ($\beta=.28, t(69, 1)=2.45, p=.02$) and PSEQ efficacy ($\beta=.31, t(69, 1)=-2.69, p=.009$) at 3 weeks (Figure 8). Early nighttime sleep is also positively related to later PSOC efficacy ($\beta=.31, t(69, 1)=2.75, p=.0076$) and later PSEQ efficacy ($\beta=.32, t(69, 1)=2.79, p=.0068$) at 6 months (Figure 9); however, both of these longitudinal relationships disappear when controlling for initial efficacy (PSOC: $\beta=.13, t(68, 2)=1.45, p=.15$; PSEQ: $\beta=.12, t(68, 2)=1.32, p=.19$). Early sleep is no longer a significant predictor of later efficacy when earlier efficacy is in the model.

Figure 6. Scatter plot of the relation between PSOC and PSEQ scores at 3 weeks and mean fuss minutes at 3 weeks with the regression line (N=75).

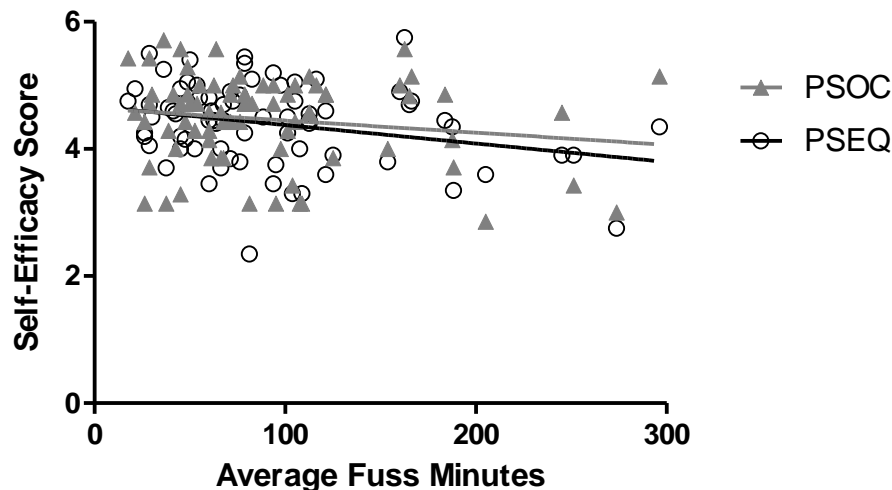


Figure 7. Scatter plot of the relation between PSOC and PSEQ scores at 6 months and mean fuss minutes at 3 weeks with the regression line (N=75).

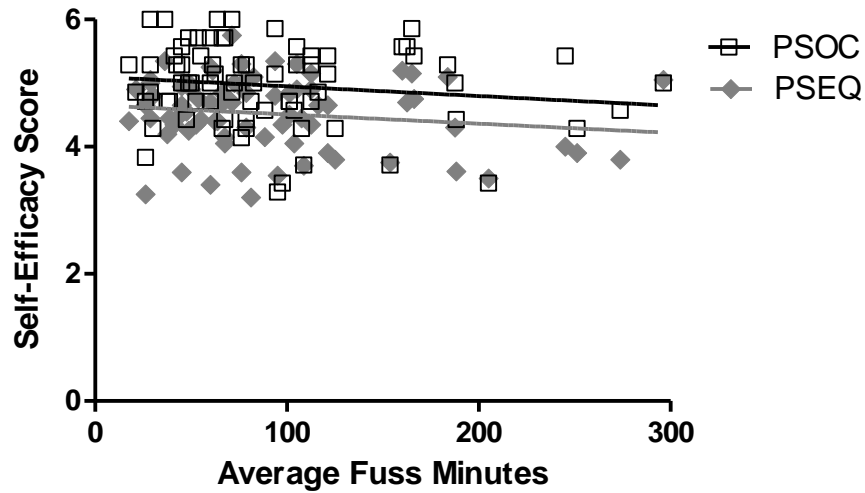


Figure 8. Scatter plot of the relation between PSOC and PSEQ scores at 3 weeks and mean nighttime sleep minutes at 3 weeks with the regression line (N=75).

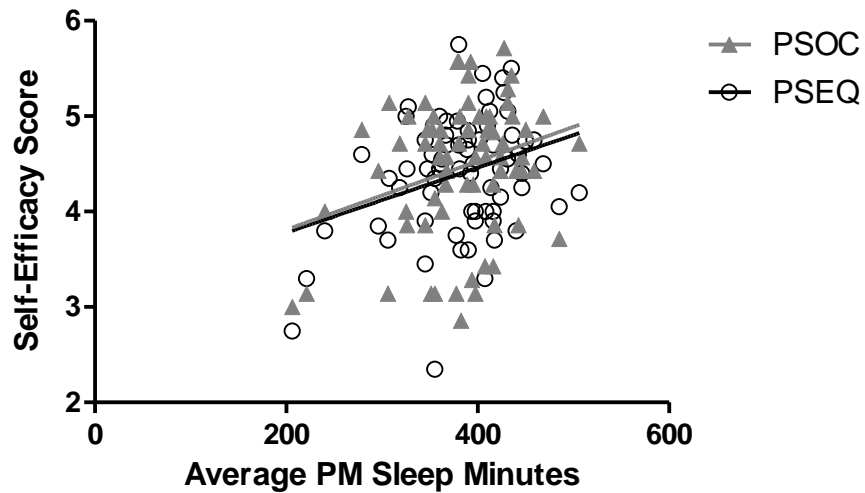
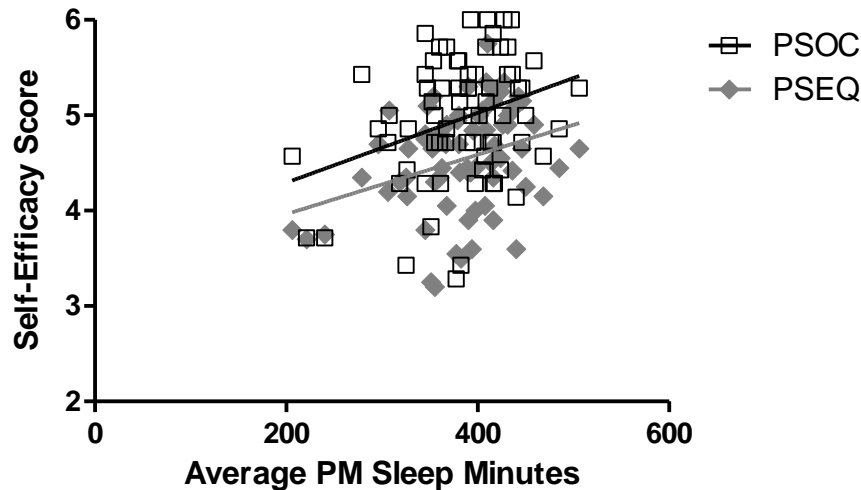


Figure 9. Scatter plot of the relation between PSOC and PSEQ scores at 6 months and mean nighttime sleep minutes at 3 weeks with the regression line (N=75).



Hypothesis 3. The two measures of parental self-efficacy (PSOC and PSEQ) would be moderately correlated, illustrating that each taps into a different facet of efficacy.

There are strong, positive correlations between the PSOC and PSEQ at both visits: 3 weeks ($r=.70, p<.0001$) and 6 months ($r=.61, p<.0001$). Both measures are also stable over time (PSOC: $r=.68, p<.0001$; PSEQ: $r=.70, p<.0001$). The strong relationship between measures implies that they overlap to some extent, and that they are both measuring similar aspects of maternal self-efficacy. A t-test comparing PSOC efficacy and PSEQ efficacy at concurrent time points resulted in a non-significant difference between the two measures at 3 weeks ($t(74) = -1.05, p=.30$) but a significant difference at 6 months ($t(74) = -7.01, p<.0001$).

Discussion

As hypothesized, the results demonstrated a reciprocal relationship between fussing and nighttime sleep at 4 weeks, which was particularly salient for initially fussier infants, and there also was an increase in maternal self-efficacy from 3 weeks to 6 months, with a strong, positive relationship between early nighttime sleep and maternal self-efficacy. The stronger, negative relationship between fussing and nighttime sleep for fussier infants is an important extension from previous research. The positive relationship between maternal self-efficacy and early nighttime sleep implies that mothers of fussier infants may have lower levels of self-efficacy because these infants are sleeping less at night. Increased fussiness is not significantly related to lower levels of maternal self-efficacy but is related to less nighttime sleep, and nighttime sleep has a strong, positive relationship with maternal self-efficacy. Given the bi-directionality of maternal self-efficacy and infant behavior, we believe that high maternal self-efficacy fosters more early nighttime sleep and that more early nighttime sleep encourages more maternal self-efficacy.

Fussing and Nighttime Sleep in This Sample

The first aim of this study was an initial investigation of the relationship between fussing and nighttime sleep behavior, with the hypothesis that fussing and sleep would be inversely related in early infancy. Given the hypothesized links between infant behavior and maternal self-efficacy, it was important to explore the means and variability of infant behavior within our sample. The findings supported all aspects of this first hypothesis. Although patterns of fussing and sleeping are emerging at this time, there is a considerable amount of variability around the means. Infants are not following identical

trajectories of fussing and sleep behavior in early infancy. Large individual differences were noted. Despite the individual variability in infants' sleeping, there remains a significant increase in nighttime sleep from 3 weeks to 4 weeks. There was not a significant change in fussing. It may also be explained in part by the time points being so close together, such that such a short time period did not allow a significant difference in behavior.

By dividing infants into two groups based on initial level of fussiness, our hypothesis was supported that initial fussiness moderates the relationship between fussing and nighttime sleep, such that infants who were fussier at 3 weeks had stronger negative relationships between fussing and nighttime sleep at 4 weeks. This is an important finding because these fussier infants are likely perceived as more difficult by parents because they are fussing throughout the day as well as sleeping less during the night. Fussing and nighttime sleep are not as strongly related for the Less Fussy group of infants, suggesting that some of the time these infants are doing something other than fussing when they are not sleeping. A non-significant relationship between group status and time spent feeding allows the conclusion that the Non-fussy infants are not being fed for significantly more time than their Fussy counterparts. We can assume that the Non-fussy infants are then spending more of their waking hours awake and calm. More time spent awake/calm in the Less Fussy infants may be viewed by parents as positive. Parents are likely to feel more confident in their abilities to parent with a frequently calm baby because it appears that their needs are met.

There was considerable variability between infants in nighttime sleep and fussing. However, the group difference may imply that patterns of more nighttime sleep and less

fussing may emerge earlier in infants with less fussy temperaments than their counterparts. Previous work has demonstrated that on average fussing increases from birth to 6 weeks postpartum (Barr, 1990; Bloom & McDowell, 1972, as cited in Walker & Menaham, 1994). The Less Fussy infants are spending less time fussing throughout the 24-hour period, and may specifically be spending less time fussing at night. Compared to the Fussier group, the Less Fussy group may show an earlier developmental increase in nighttime sleep, by exhibiting more minutes of sleep. Presumably, the behavioral characteristics of infants in the Less Fussy group are promoting higher efficacy in mothers.

Changes in Maternal Self-Efficacy Over Time

The second aim of this study was to investigate the changes in maternal self-efficacy over time and how those changes may relate to specific infant behavior. We saw an increase in maternal self-efficacy over time, which supported our hypothesis. The mean increase in maternal self-efficacy scores over time was not extreme, but a fraction of a point difference on a scale of 0 – 6 was significant. This increase illustrates that mothers' positive feelings about themselves in their parenting role are increasing as they spend more time with their infant. Consistent with the literature, we saw that when mothers gained more experience parenting infants and learned more about their infant specifically, they also had more positive feelings about motherhood (Coleman & Karraker, 2000; Mercer & Ferketich, 1994; Sanders & Woolley, 2004). As mothers spend more time with their infants, there are more opportunities to succeed in mothering tasks that boost self-efficacy. By six months, many mothers have figured out certain techniques that work well to soothe their infant and can employ these techniques

effectively. Developing a pattern of behavior makes it easier for mothers to understand and address their infants' needs. It is likely that less rapid changes in behavior and less difficult behavior (i.e. fussing, crying, waking at night, etc.) likely contribute to increased maternal self-efficacy.

We predicted less self-efficacy in mothers of infants who spent more time fussing. The findings supported this hypothesis, such that maternal self-efficacy was related to early fussing at 3 weeks. This relationship faded by the time the infant was 6 months old, so that maternal self-efficacy measured at 6 months was no longer related to early fussing. We expected to see a more lasting effect of early fussing on self-efficacy later in infancy, which we did not find. Early sleep, however, shows more lasting effects on self-efficacy. As hypothesized, we found that infants who slept more at night had more self-efficacious mothers. This finding was consistent with the literature that showed that improved infant sleep in infants (6 – 20 weeks postpartum) increasing maternal self-efficacy (Wolfson, et al., 1992). Infants who sleep more at night early on may set the stage for feelings of maternal self-efficacy in their mothers. Early nighttime sleep was related to later maternal self-efficacy, but the relationship was moderated by early self-efficacy. Stronger, positive relationships between early sleep and self-efficacy seem to establish the cycle of continued positive self-efficacy. Early behavior might not have a long lasting impact on self-efficacy because behavior changes so rapidly, whereas efficacy might be more stable because mothers either could or could not adapt to this changing behavior early on. It may also be the case that mothers who start with higher levels of self-efficacy are more successful at getting their infants to sleep more at night. Our findings are consistent with both the hypotheses and the literature, implying that

infants who are more prone to more fussing and less nighttime sleep are likely encouraging less self-efficacy in mothers.

With this longitudinal study, we saw that early behaviors predicted later efficacy. However, when testing the longitudinal relationship controlling for earlier efficacy, the relationship between early behavior and later efficacy became non-significant. Although it is likely that the relationship between infant behavior and maternal self-efficacy is bi-directional, more work needs to be done with a more precise approach to capture these processes. An initial level of maternal self-efficacy may be influenced by certain infant behaviors, as we saw that a fussier initial temperament was linked to more self-efficacy early on. Infant behavior may also be a response to maternal self-efficacy, as the literature has demonstrated that mothers with less self-efficacy are less responsive to their fussy infants (Ohan, et al., 2000; Wolfson, et al., 1992). An infant of a mother with low self-efficacy may spend more time fussing because she is not sure how to soothe the infant, whereas an infant of a highly self-efficacious mother may spend less time fussing because the mother responds to the infants' needs effectively.

In addition to exploring the aforementioned relationships, this study sought to explore the implications of using different self-efficacy measures. Findings related to self-efficacy were not markedly different by parenting self-efficacy measure. The PSOC and PSEQ have a strong, positive relationship. However, this relationship was not a perfect correlation; thus, these measures, although tapping into a similar construct, may be assessing different aspects of self-efficacy, which is evidenced by the t-test results. The PSOC seems to be related to more general self-efficacy, which is less related to skill at accomplishing specific parenting tasks. This is illustrated by the null relationship

between early fussing and early PSOC efficacy. Early fussing was, however, related to early PSEQ efficacy. The PSOC does not capture efficacy in terms of specific tasks at the PSEQ does. The greater increase in mean PSOC efficacy over time may imply that overall feelings of parenting become more positive as parenting becomes less focused on handling constantly changing specific tasks of infancy. For this reason, the PSEQ may be more successful at measuring efficacy when development is rapidly changing and parents must keep up with specific tasks to tend to their infants, as demonstrated by the strong, positive relationship between early fussing and PSEQ efficacy. When there is less change in infant patterns, parents can focus more on the overall sense of competence in the parenting role, so efficacy may be captured well by the PSOC later. This explains the frequent use of the PSOC in previous work where the infants/children were older.

Strengths and Limitations

This study has both strengths and limitations. The strengths of the study include its longitudinal nature. Change between time periods could be observed from tracking the infant-mother dyads over time. Using reliable and valid measures added to the strength of the data. Collecting infant behavioral data with the diary cards was a more specific and objective way to categorize infant behavior than global measures of maternal perceptions of infants. The homogeneity of the sample likely prevented confounding by demographic variables. However, the homogeneity of the sample may also be seen as a limitation because the results cannot be generalized beyond samples of White, well-educated, middle-to-upper SES primiparous mothers and their infants.

Another limitation of the study is the use of self-report data. Mothers may have misrepresented themselves or their infants for a variety of reasons while completing both

the diary cards and the self-efficacy measures. The nurses' assistance in completing these measures eliminated confusion in how to fill out the forms. The diaries were time consuming and potentially difficult for mothers of infants to complete accurately. They required that either the mother remember specifically the infant's behavior all the time or that they be filling the diary out throughout the entire day. Also, the smallest increment of time on the time rulers on the diary cards was 5 minutes. This encouraged a potential overestimation of time spent doing a behavior, particularly fussing.

Conclusions

The results are fairly consistent with the literature on infant developmental norms, the relationship between maternal self-efficacy and child behavior, and increase in maternal self-efficacy over time. Some differences between our sample and the literature may come from examining behavior during a smaller window of time with younger infants and the large amount of variation between infants. Maternal self-efficacy beliefs drive maternal behavior toward the infant, so understanding the interplay between these constructs is important for parenting that supports positive infant development. The current study responds to the need for information about maternal self-efficacy during a period of rapid infant development. As hypothesized, aspects of infant behavior that are viewed as more difficult (more fussing and less nighttime sleep) are related to less efficacy in mothers, particularly early on. Assessing infant behavior with the diaries extends the findings of previous research (that used parental perceptions of infant difficulty), which showed perceptions of difficulty were related to self-efficacy. With this current research, we were able to demonstrate that early infant behavior (fussing and nighttime sleep), related to early self-efficacy.

Given the strong relationship between maternal experience and self-efficacy, there is a need for intervention strategies to encourage building mothers' knowledge bases and experiences before having their first child. This research demonstrated that early infant behavior was related to level of maternal self-efficacy. Starting mothers with a higher level of maternal self-efficacy may positively affect their interactions with their infants, which may increase more positive infant behavior. Higher levels of self-esteem make one feel more competent and confident in her environment.

References

- Baildam, E.M., Hillier, V.F., Ward, B.S., Bannister, R.P., Bamford, F.N., & Moore, W.M.O. (1995). Duration and pattern of crying in the first year of life. *Developmental Medicine and Child Neurology*, 37, 345 – 353.
- Barr, R.G., Kramer, M.S., Boisioly, C., McVey-White, L., & Pless, L.B. (1988). Parental diary of infant cry and fuss behavior. *Archives in Disease in Childhood*, 63, 380 – 387.
- Bor, W., Brennan, P.A., Williams, G.M., Najman, J.M., O'Callaghan, M. (2003). A mother's attitude towards her infant and child behaviour five years later. *Australian and New Zealand Journal of Psychiatry*, 37, 748 – 755.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology*, 22, 723 – 742.
- 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.
- Coleman, P.K., & Karraker, K.H. (2000). Parenting self-efficacy among mothers of school-age children: Conceptualization, Measurement, and Correlates. *Family Relations*, 49, 13 – 24.
- Coleman, P.K., & Karraker, K.H. (2003). Maternal self-efficacy beliefs, competence in parenting, and toddlers' behavior and developmental status. *Infant Mental Health Journal*, 24, 126 – 148.
- Feldman, R., Greenbaum, C.W., Mayes, L.C., & Erlich, S.H. (1997) Change in mother-

- infant interactive behavior: Relations to change in the mother, the infant, and the social context. *Infant Behavior and Development*, 20, 151 – 163.
- Gelfand, D.M., & Teti, D.M. (1990). The effects of maternal depression on children. *Clinical Psychology Review*, 10, 329 – 353.
- Jain, A., Stifter, C.A., & Fish, M. (2000). *The Parenting Self-Efficacy Scale: A Psychometric Analysis*. Unpublished manuscript.
- Johnston, C. (1996). Parent characteristics and parent-child interactions in families of nonproblem children and ADHD children with higher and lower levels of oppositional-defiant behavior. *Journal of Abnormal Child Psychology*, 24, 85 – 104.
- Johnston, C., & Mash, E.J. (1989). A measure of parenting satisfaction and efficacy. *Journal of Clinical Child Psychology*, 18, 167 – 175.
- Landry, S.H., Smith, K.E., & Swank, P.R. (2006). Responsive parenting: Establishing early foundations for social, communication, and independent problem-solving skills. *Developmental Psychology*, 42, 627 – 642.
- Lee, K. (2000). Crying and behavior pattern in breast- and formula-fed infants. *Early Human Development*, 58, 133 – 140.
- Mercer, R.T., & Ferketich, S.L. (1994). Maternal-Infant attachment of experienced and inexperienced mothers during infancy. *Nursing Research*, 43, 344 – 351.
- Ohan, J.L., Leung, D.W., & Johnston, C. (2000). The parenting sense of competence scale: Evidence of a stable factor structure and validity. *Canadian Journal of Behavioural Science*, 32, 251 – 261.

- Rickert, V.I. & Johnson, C.M. (1988). Reducing nocturnal awakening and crying episodes in infants and young children: A comparison between scheduled awakenings and systematic ignoring. *Pediatrics*, 81, 203 – 212.
- Sanders, M.R., & Woolley, M.L. (2004). The relationship between maternal self-efficacy and parenting practices: Implications for parenting training. *Child: Care, Health & Development*, 31, 65 – 73.
- Soltis, J. (2004). The signal functions of early infant crying. *Behavioral and Brain Sciences*, 27, 443 – 490.
- St. James-Roberts, I., & Plewis, I. (1996). Individual differences, daily fluctuations, and developmental changes in amounts of infant waking, fussing, crying, feeding, and sleeping. *Child Development*, 67, 2527 – 2540.
- Teti, D.M., & Gelfand, D.M. (1991). Behavioral competence among mothers of infants in the first year: The meditational role of maternal self-efficacy. *Child Development*, 62, 918 – 929.
- Walker, A.M. & Menaham, S. (1994). Normal early infant behaviour patterns. *Journal of Pediatric Child Health*, 30, 260 – 262.
- Wolfson, A., Lacks, P., & Futterman, A. (1992). Effects of parent training on infant sleeping patterns, parents' stress, and perceived parental competence. *Journal of Consulting and Clinical Psychology*, 1, 41 – 48.

APPENDIX

Table 3. Mothers' Demographic Characteristics as Percentages of the Sample (n in parentheses)

Characteristic	Mother (n = 75)
Total household income (before taxes)	
< \$5,000	1.33 (1)
\$5,000-\$9,999	1.33 (1)
\$10,000-\$14,999	1.33 (1)
\$15,000-\$24,999	6.67 (5)
\$25,000-\$34,999	8.00 (6)
\$35,000-\$49,999	10.67 (8)
\$50,000-\$74,999	22.67 (17)
\$75,000-\$99,999	18.67 (14)
\$≥\$100,000	22.67 (17)
Refused	1.33 (1)
Don't know	5.33 (4)
Ethnicity	
Hispanic or Latino	5.33 (4)
Not Hispanic or Latino	94.67 (71)
Race	
Black or African American	2.67 (2)
White or Caucasian	97.33 (70)
Marital status	
Married	78.67 (59)
Not married, but living with partner	13.33 (10)
Single	8.00 (6)
Education level completed	
Some high school (9 – 11)	1.33 (1)
High school graduate (12)	8.00 (6)
Some college or technical school (13 – 15)	20.00 (15)
Completed college (16)	45.33 (34)
Post graduate training/degree (17+)	25.33 (19)

Note: Sample inclusion criteria for this study included: completed diaries at 3 and 4 weeks and both parenting measures (PSOC and PSEQ) at 3 weeks and 6 months. Diaries were considered complete with 3 or more days filled out, where a day was ≥ 12 hours of data. The sample size decreased from 160 to 110 mainly due to attrition throughout the study. The decrease from 110 to 75 is explained by a high amount of missing data from the diaries.

Parenting Sense of Competence Scale (PSOC)

SLIMTIME Subject ID: _____

PSOC

NITTANY Subject ID: _____

Subject Initials: _____ Visit Number: _____ Visit Date: ____ / ____ / 20____

(Mother completed)

Listed below are a number of statements. Please respond to each item indicating your agreement or disagreement with each statement by placing an 'X' in the corresponding box. Please choose only one response for each statement.

	Strongly Agree	Agree	Mildly Agree	Mildly Disagree	Disagree	Strongly Disagree
1. The problems of taking care of a child are easy to solve once you know how your actions affect your child, an understanding I have acquired.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
2. Even though being a parent could be rewarding, I am frustrated now while my child is at his/her present age.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
3. I go to bed the same way I wake up in the morning - feeling I have not accomplished a whole lot.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
4. I do not know what it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
5. My mother was better prepared to be a good mother than I am.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
6. I would make a fine model for a new mother to follow in order to learn what she would need to know in order to be a good parent.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
7. Being a parent is manageable, and any problems are easily solved.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
8. A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
9. Sometimes I feel like I'm not getting anything done.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
10. I meet my own personal expectations for expertise in caring for my child.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
11. If anyone can find the answer to what is troubling my child, I am the one.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
12. My talents and interests are in other areas, not in being a parent.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
13. Considering how long I've been a mother, I feel thoroughly familiar with this role.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
14. If being a mother of a child were only more interesting, I would be motivated to do a better job as a parent.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆

06/28/2006 Version 1.0
PSOC



Form Page 1 of 2

PSOC

SLIMTIME Subject ID: _____ NITTANY Subject ID: _____ Visit Number: _____

	Strongly Agree	Agree	Mildly Agree	Mildly Disagree	Disagree	Strongly Disagree
15. I honestly believe I have all the skills necessary to be a good mother to my child.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6
16. Being a parent makes me tense and anxious.	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6

06/28/2006 Version 1.0
PSOC



Form Page 2 of 2

Parental Self-Efficacy Questionnaire (PSEQ)

Subject ID: _____

PSEQ

Visit Number: _____

Subject Initials: _____

Visit Date: ____ / ____ / 20____

(Mother completed)

The statements below describe some feelings about being a mother. Please indicate to what extent you agree or disagree with each statement on the basis of your experience with this baby. Please respond to each item by placing an 'X' in the corresponding box. Please choose only one response for each statement.

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
1. Before I had this baby, I didn't really appreciate how difficult it is to be a mother.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
2. I think I am handling being a mother pretty well.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
3. Dealing with a baby would be easier if I had more help from my husband/partner.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
4. Some days being a mother gets me down.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
5. There are relatives or friends I can call on when I am unsure of how to handle a problem with my baby.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
6. Most of the time I feel as though I can deal with the demands of a baby very well.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
7. I knew how to take care of a baby before my baby was born.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
8. This baby's needs are easy to meet.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
9. I was able to feel comfortable about taking care of this baby soon after bringing him/her home from the hospital.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
10. I think I have more difficulty being a mother than some women do.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
11. I just seem to deal with parenting problems as they arise and never get very upset about them.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
12. I frequently call a parent, sibling, or close friend to discuss caring for my baby.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
13. I really enjoy taking care of and being with my baby.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
14. I wish that someone had taught me more about taking care of babies.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
15. I know best how to satisfy my baby's needs.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆

06/28/2006 Version 1.0
PSEQ



Form Page 1 of 2

PSEQ

Subject ID: _____

Visit Number: _____

	Strongly Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree
16. Some women are temperamentally better suited to be mothers than I am.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
17. This baby is quite demanding to care for.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
18. My spouse/partner is as involved in day-to-day child care as I am.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
19. I look forward to the time when my child is no longer an infant and will be easier to care for.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆
20. I don't feel the need to ask anyone for help regarding child care questions.	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	<input type="checkbox"/> ₅	<input type="checkbox"/> ₆

Fish, Stifter, Belsky (1990)

06/28/2006 Version 1.0
PSEQ



Form Page 2 of 2

Infant/Caregiver Diary Card

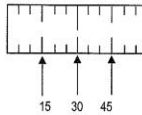
Diary Card Instructions

INSTRUCTIONS FOR COMPLETING THE INFANT/CAREGIVER DIARY

This diary is designed to permit you to record your baby's behavior over a period of four days. Turn the page and look at the record. As you can see, one whole day is split into four bars that are each made up of ruler-like parts.

Each line on the ruler represents a 5-minute interval.

The ruler-like bar is for recording your baby's behavior. Each behavior is represented by a different color: Blue = Sleeping, Yellow = Awake and Content, Red = Crying and Fussy, and Green = Feeding. Note that only one behavior may be shaded for each 5-minute interval.



When recording feeding, also note how your baby was fed: B = Breast, and F = Formula.

Once you have recorded your baby's behavior for the day, note whether it was a typical or a non-typical day. If it was not a typical day, please explain in a few words why not.

If your child was not in your (mom or dad's) care during the daytime hours (daycare/babysitter), please do not complete daytime portion of the diary and write in "babysitter" or "daycare".

Example:



In this example of a 90-minute period, the baby was feeding (green) for 15 minutes. The B tells us that she was Breast fed. If she had been fed Formula, an F would have been recorded. The feeding was followed by 30 minutes of awake and content behavior (yellow), 20 minutes of sleeping (blue) and another 25 minutes of awake and content.

Mom interacted with the baby for 35 minutes. After that, the baby contented herself for 10 minutes before falling asleep. When she awoke, dad interacted with her for 25 minutes.

Please enter an **S** for 'solid food' when you give your baby food with a spoon. The **S** should be written in the green shaded area. 21HDFS.ERFORMS
If you also feed breast milk or formula at that feeding, please write a "**BS**" or "**FS**".

Incomplete Diary Card

INFANT ACTIVITY DIARY: DAY 1

8 PM 8:30 9 PM 9:30

Example

INFANT'S BEHAVIOR *

sleeping

awake and content

awake and fussy/crying

feeding Breast / Formula

DATE: _____
 ID: _____

* LEAVE BLANK IF CANNOT REMEMBER or if someone other than Mom or Dad watched the child during the daytime

MORNING

6 AM	6:30	7 AM	7:30	8 AM	8:30	9 AM	9:30	10 AM	10:30	11 AM	11:30	12

AFTERNOON

12 PM	12:30	1 PM	1:30	2 PM	2:30	3 PM	3:30	4 PM	4:30	5 PM	5:30	6

EVENING

6 PM	6:30	7 PM	7:30	8 PM	8:30	9 PM	9:30	10 PM	10:30	11 PM	11:30	12

NIGHT

12 AM	12:30	1 AM	1:30	2 AM	2:30	3 AM	3:30	4 AM	4:30	5 AM	5:30	6

Was this a typical day? ☐ Yes ☐ No

Completed Diary Card

INFANT ACTIVITY DIARY: DAY 4

DATE: 11/11/06
ID: 150

8 PM 8:30 9 PM 9:30

Example **INFANT'S BEHAVIOR *** sleeping awake and content awake and fussy/crying feeding Breast / Formula

* LEAVE BLANK IF CANNOT REMEMBER or if someone other than Mom or Dad watched the child during the daytime

MORNING

6 AM 6:30 7 AM 7:30 8 AM 8:30 9 AM 9:30 10 AM 10:30 11 AM 11:30 12

AFTERNOON

12 PM 12:30 1 PM 1:30 2 PM 2:30 3 PM 3:30 4 PM 4:30 5 PM 5:30 6

EVENING

6 PM 6:30 7 PM 7:30 8 PM 8:30 9 PM 9:30 10 PM 10:30 11 PM 11:30 12

NIGHT

12 AM 12:30 1 AM 1:30 2 AM 2:30 3 AM 3:30 4 AM 4:30 5 AM 5:30 6

Handwritten notes on the timeline:
 Morning: 9 AM - 10 AM (gb), 11:30 - 12 (gb)
 Afternoon: 12 PM - 12:30 (gb), 1 PM - 1:30 (b), 4:30 - 5 PM (B), 5:30 - 6 (gb)
 Evening: 7 PM - 7:30 (gb), 8 PM - 8:30 (B), 9 PM - 9:30 (y)
 Night: 12 AM - 12:30 (b), 1 AM - 1:30 (b), 2 AM - 2:30 (gb), 3 AM - 3:30 (S)

Was this a typical day? ☒ Yes ☐ No

Feed at 4:45pm was split as we were out and on our way home! Started at grocery store! Finished at home.

ACADEMIC VITA of Breanne Fagan

Breanne Fagan
249 South Barnard Street
State College PA 16801
bkf5008@gmail.com

Education: Bachelor of Science Degree in Human Development and Family Studies,
The Pennsylvania State University, Fall 2009
Honors in Human Development and Family Studies
Thesis Title: RELATIONS BETWEEN FIRST-TIME MOTHERS'
PERCEIVED PARENTING SELF-EFFICACY, INFANT FUSSING,
AND NIGHTTIME SLEEP

Thesis Supervisor: Dr. Leann Birch

Related Experience:

Research Assistant
Center for Childhood Obesity Research, The Pennsylvania State University
Supervisor: Dr. Leann Birch
October 2007 – Present

Teaching Assistant
Professor: Dr. Sarah Kollat, HDFS 429
Professor: Dr. Eva Lefkowitz, HDFS 433

Awards:

Dean's List: December 2006 – December 2009
National Honors Society

Activities:

Women's Leadership Initiative class of 2008 – 2009
Mission work in Rwanda, Tennessee, Florida and Louisiana
HDFS Undergraduate Student Organization

International Education:

HDFS Study Abroad in Rome Program, Summer 2008