MATERNAL COGNITIONS AND DEPRESSIVE SYMPTOMS DURING THE PERINATAL PERIOD

by

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DEDICATION

To Peter, Helena, and Julia.

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TABLE OF CONTENTS

LIST OF TABLES

TABLE

LIST OF FIGURES

FIGURE

LIST OF APPENDICES

APPENDIX

ABSTRACT

This dissertation consists of three separate longitudinal studies that examined the relations between maternal cognitions and maternal depressive symptoms during the perinatal period.

The goal of the first study was to develop and validate a new measure, the Rigidity of Maternal Beliefs Scale (RMBS), which explored maternal self-efficacy, child vulnerability, and perceptions of societal expectations of mothers. A community sample of 134 women completed the measure once during pregnancy and once during the first 3 months postpartum. Exploratory factor analysis identified a four-factor solution best fit the data, with two of the three hypothesized factors emerging. Analyses revealed that the measure was reliable, valid, and that the prenatal RMBS predicted postpartum depressive symptoms.

The purpose of the second study was to test bidirectional and unidirectional models of depressive symptoms and parenting stress in a sample of 105 women over the first 14 months postpartum. Three specific domains of parenting stress were also examined: difficult child stress, parental distress, and parent-child dysfunctional interaction (PCDI) stress. Structural equation modeling revealed different patterns, depending on the type of stress. For total parenting stress, the hypothesized unidirectional model of stress predicting depressive symptoms fit best, whereas for difficult child stress, the alternative unidirectional model of depressive symptoms predicting stress fit best. Neither the unidirectional or bidirectional models were a good fit for parental distress. The hypothesized bidirectional model of PCDI and depressive symptoms was a good fit.

The objective of the third study was to investigate the associations of depressive symptoms, maternal self-efficacy, and rumination for 231 second-time mothers during the perinatal period. Bidirectional effects of depressive symptoms and maternal self-efficacy were also examined and rumination tested as a moderating factor. Despite significant correlations between the study variables, structural equation modeling revealed no significant paths between depressive symptoms and maternal self-efficacy. Additionally, rumination level was not found to be a moderating factor.

Findings from these three studies suggest that maternal cognitions and depressive symptoms are related. Future research should explore the specific nature of the associations, which may help researchers and clinicians to design more effective interventions for women struggling with perinatal depression.

CHAPTER I

INTRODUCTION

Depression is a world-wide public health concern and a leading cause of disability (WHO, 2010). Women are twice as likely as men to experience an episode of depression at some point in their lives (Nolen-Hoeksema, 2001) and the perinatal period is a particularly vulnerable time for women (Le, Muñoz, Ippen, & Stoddard, 2003). Prenatal and postpartum depression can have adverse short- and long-term physical and mental health effects on women and their children, and is related to impairments in parent-child and partner relationships. Women who are depressed during pregnancy are at risk for experiencing depression in the postpartum period, which places these women at even higher risk for future episodes of depression (Wisner et al., 2001). Children with depressed mothers are more likely to exhibit behavior problems and delayed developmental growth during childhood and have more mental health problems as adults (Aber, Jones, & Cohen, 2000; C. T. Beck, 1998; Cummings et al., 2000; Downey & Coyne, 1990; Teti et al., 1995). Mother-child relationships are also negatively impacted by postpartum depression and may have ramifications for how children will parent their own children (Bretherton & Munholland, 1999; Lieberman & Zeanah, 1999; Teti et al., 1995). Depression during pregnancy and the postpartum, if left untreated, clearly has multiple and long-ranging effects on women and their children.

Although much research has examined predictors and correlates of perinatal depression, and the effects on child development and parenting behavior, there has recently been a call for research that explores processes that place parenting at risk (Teti & Cole, 2011). One such area

1

is the role and importance of parental cognitions[1] and beliefs, which are purported to organize

parental behavior and emotion and the development of maternal depression (Teti & Cole, 2011).

This research is particularly relevant for psychologists and social workers because the findings

have implications for developing interventions for those working with families and pregnant

women.

Negative cognitions are a hallmark of depression. Cognitive theories of depression

suggest that a negative way of thinking about one's self, others, and the future places individuals

at risk for developing depression, particularly when a stressor occurs (Abramson et al., 1989;

Beck, 1967). Although general dysfunctional cognitions and attitudes are associated with

depressive symptoms (Coyne & Gotlib, 1986), most research that has explored cognition and

depression has been correlational in nature. Even less is known regarding cognition during the

perinatal period.

Milgrom & Beatrice (2003) examined general cognitions in depressed women at 3 and 24

months postpartum and found that depressed women had lower levels of rational beliefs and

higher levels of irrational beliefs than non-depressed women at 3 months. At 24 months,

depressed women still had significantly higher irrational beliefs than non-depressed women,

even after controlling for concurrent depression level. These findings corroborate that cognitions

may represent vulnerability in the development of depression. Yet, much less is known regarding

maternal-specific cognitions over the perinatal period and their association with the development

of depressive symptoms.

The correlational findings from Church, Brechman-Toussaint, and Hine (2005) build

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[1] A cognition is defined as the result of the mental process of knowing or understanding something. A belief is defined as something one believes to be true. The two terms may be used interchangeably throughout this dissertation.

upon those of Milgrom & Beatrice (2003) by examining if maternal-specific dysfunctional cognitions and general dysfunctional cognitions were associated in different ways with the development of depressive symptoms during the postpartum period. They studied maternal cognitions related to the transition to motherhood and general cognitions in 406 women during the first 3 months postpartum in conjunction with 5 risk factors. The results indicated there were different associations depending on the risk factor and type of cognition. Maternal cognitions mediated the relationship between postpartum depressive symptoms and having a difficult baby, whereas general cognitions mediated the relationship between previous depression history and postpartum depressive symptoms. These findings illustrate the complexity of depression during the perinatal period and suggest that it is an area of research that deserves further consideration and study with a particular focus on maternal cognitions. Examining causal pathways using longitudinal studies, in particular, has been expressed as imperative for understanding the relations between cognitions and depressive symptoms and to decipher the chicken and the egg conundrum: "it is as easy to imagine that depression affects the way people think as it is to imagine that the way people think affects how depressed they are" (Girgus & Nolen-Hoeksema, 2006, p. 147). This is especially important given the developmental context of the transition to motherhood, whether it is for the first time or with additional children.

This dissertation aimed to fill these gaps by examining the relations between different types of maternal cognitions and perinatal depression in three longitudinal studies with distinct samples. Understudied areas of cognitions, such as societal expectations of mothers and perceptions of child vulnerability were examined as potential predictors of perinatal depression. Perceptions of parenting stress and maternal self-efficacy, already known to be correlates of perinatal depression, were investigated longitudinally. Rumination, a response style

3

characterized by an excessive focus on one's negative mood and negative past events, was examined as a possible moderator of postpartum depression in mothers.

Chapter 2 focuses on the development of a new measure of maternal beliefs about anticipated maternal self-efficacy, perceptions of child vulnerability, and perceptions of societal expectations of mothers during pregnancy and the early postpartum period with a community sample of 134 primiparous and multiparous women. Becoming a mother, whether it is for the first time or not, is a time of transition in a woman's life and one that occurs in the public eye. Mid to late pregnancy is typically the point when it is clear to the world that this particular individual is in the process of becoming a mother. But what does it mean in society to become a mother? Are there societal norms and expectations with which women believe they are expected to comply? What beliefs do women hold about how vulnerable infants are? What are their anticipated feelings of maternal self-efficacy during pregnancy? A review of the literature revealed that there were no measures of maternal beliefs that explored these areas. Therefore, the purpose of the study in Chapter 2 was to develop a new measure of maternal beliefs, the Rigidity of Maternal Beliefs Scale (RMBS), that specifically investigated women's beliefs about infant vulnerability, anticipated maternal self-efficacy, and perceived societal expectations about motherhood. A series of items was designed to assess these beliefs and examine the factor structure and psychometric properties of the measure. The reliability and validity of the measure was tested, and I also hypothesized that the measure would have predictive validity, with prenatal beliefs predicting postpartum depressive symptoms.

In Chapter 3, relations between maternal depressive symptoms and cognitions of parenting stress were investigated with a sample of 105 women at 3, 7, and 14 months postpartum. Few studies have explored causal pathways between parenting stress and

postpartum depressive symptoms longitudinally. This study tested whether a bidirectional or unidirectional model best explained the association between maternal depressive symptoms and total parenting stress during the first postpartum year. Additionally, bidirectional and unidirectional models of maternal depressive symptoms and three specific subtypes of parenting stress (parental distress, difficult child stress, and stress related to dysfunctional parent-child interactions) were explored. I hypothesized that a unidirectional model would best explain the relations between most types of parenting stress and postpartum depressive symptoms, based on cognitive theory (Beck, 1967). I also hypothesized that a bidirectional model would explain the association between stress related to mother-child interaction and depressive symptoms, recognizing the possibility of a transactional process or influence. I wanted to examine if different types of parenting stress had different associations with maternal depressive symptoms over time.

In Chapter 4, the bidirectional effects of depressive symptoms and maternal self-efficacy for 230 second-time mothers were explored longitudinally, beginning in pregnancy and at 4, 8, and 12 months postpartum. Additionally, rumination was examined as a moderating factor of the relations between depressive symptoms and maternal self-efficacy. The purpose of Chapter 4 was to add to the limited literature on rumination during the perinatal period and to explore relations between rumination, maternal self-efficacy, and depressive symptoms for second-time mothers. The few studies that have included multiparous women have either been cross-sectional or with very few longitudinal timepoints. By having 4 timepoints over the perinatal period, this study provided a more complete picture of maternal depressive symptoms and maternal self-efficacy for women going through the transition of having their second child. This study was also unique because maternal self-efficacy measured the mother's feelings of efficacy in

controlling the firstborn's behavior while examining maternal depressive symptoms during the perinatal period for the second-born child. Past studies have focused on prenatal maternal self-efficacy with primiparous women expecting their first child (Leerkes & Burney, 2007; Porter & Hsu, 2003). No studies to date have examined women's maternal self-efficacy after the birth of their second child, even though these women's concerns are unique to their developmental stage (e.g., balancing the care of two children, change in family relationships, stress of taking care of a newborn). I hypothesized that rumination, depressive symptoms, and lack of maternal self-efficacy would be associated, and that there would be bidirectional effects over time between depressive symptoms and self-efficacy. Furthermore, I hypothesized that bidirectional pathways would be significant for high ruminators only.

The main purpose of this dissertation was to add to the literature regarding maternal depressive symptoms during the perinatal period and the relations with maternal cognitions. By exploring different types of maternal cognitions and their relations with maternal depressive symptoms over the course of the perinatal period, we can better understand how depression develops. This research will inform social workers and psychologists on how to best design prevention programs and intervene and support women who struggle with depression during this time.

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CHAPTER II

DEVELOPMENT OF THE RIGIDITY OF MATERNAL BELIEFS SCALE

The majority of research on perinatal depression examines its effects on parenting behavior and children's development. Studies looking at prenatal depression focus on biophysical effects of maternal depression on the developing fetus (Bansil et al., 2010; Davis & Sandman, 2010; Field, Diego, & Hernandez-Reif, 2006), whereas research on postpartum depression typically explores the relations between maternal depression, parenting behavior, and children's social, emotional, and cognitive development (Fearon, Bakermans-Kranenburg, van IJzendoorn, Lapsley, & Roisman, 2010; Lanzi, Bert, & Jacobs, 2009). Although the effects of perinatal depression are widely known, there has been little examination of cognitive factors, or maternal beliefs, that contribute to the development of perinatal depression. Recently, there has been interest in parental emotions and cognitions and how those may be associated with a host of parenting behaviors (Teti & Cole, 2011). Parental beliefs, such as low perceived control over children's behavior, are thought to provide the underlying framework for a variety of parenting behaviors that place children at risk, including substance abuse and depression, and it is suggested that these beliefs are the filter through which parenting-related emotions are experienced and regulated (Bugental & Happaney, 2004; Teti & Cole, 2011). This study will look specifically at maternal beliefs about anticipated maternal self-efficacy, perceptions of child vulnerability, and perceptions of societal expectations of mothers and examine if the rigidity of these beliefs is associated with women's depressive symptoms in the perinatal period.

Maternal self-efficacy has been one of the most studied parental beliefs. Strong relations between maternal feelings of self-efficacy, children's development, and depression have been established, with low levels of maternal self-efficacy associated with maternal depression and negative child outcomes (Gondoli & Silverberg, 1997; Teti & Gelfand, 1991), and high maternal self-efficacy related to improved child development, and reduced levels of maternal depression (Coleman & Karraker, 1998; Coleman & Karraker, 2003; Haslam, Pakenham, & Smith, 2006). Although maternal self-efficacy has been extensively studied during the postpartum period, little is known about anticipated maternal self-efficacy during pregnancy. Additionally, few studies have explored other maternal beliefs during the prenatal period, such as maternal perceptions of child vulnerability and societal expectations of mothers.

Maternal beliefs about child vulnerability have been studied in medically fragile and premature infants (Dogan, Ertem, Karaaslan, & Forsyth, 2009; Kerruish, Settle, Campbell-Stokes, & Taylor, 2005), but there has been little research exploring maternal perceptions of vulnerability in healthy infants, and none that has considered these perceptions during pregnancy. There has been virtually no psychological research that has empirically examined how women's beliefs about societal expectations of mothers may be related to women's mental health during the perinatal period. Societal expectations can be defined as the beliefs that society holds about what "good" mothers should do. They are formed by a variety of sources, such as the media and medical professionals (Marshall, 1991; Woodward, 1997). An example of a societal expectation is that mothers should always be positive and happy to be mothers and that to express any negativity about this role is not acceptable. These areas of maternal beliefs bear further investigation—if women believe themselves to be less efficacious and consider their children to be more vulnerable, the result could be a cycle of negative thoughts and less

confidence in one's own competence as a parent. Similarly, women who perceive there to be high societal expectations may feel a great deal of pressure in being a mother; typical experiences, such as a crying baby, may encourage feelings of inadequacy and low efficacy. Both of these cognitive belief systems may contribute to perinatal depression. Therefore, the first goal of this study was to expand previous research by developing a new measure that assesses three separate, but related, areas of maternal beliefs during the prenatal and postpartum period: anticipated maternal self-efficacy, perceptions of child vulnerability, and perceptions of societal expectations of mothers. The second goal of the study was to explore the factor structure of the measure and test its reliability and validity.

Maternal Beliefs as Potential Risk Factor for Perinatal Depression

      Beliefs about anticipated maternal self-efficacy. Maternal self-efficacy refers to a woman's belief in her ability to be an effective or competent parent (Teti & Gelfand, 1991) and stems from self-efficacy theory (Bandura, 1977), which suggests that individuals make behavioral decisions based on the extent to which they believe they can carry them out successfully. Theoretically, if mothers believe they are able to positively influence their children, they are more likely to behave in a way that will produce the outcomes they desire, compared to mothers low in self-efficacy who may believe that what they do will not produce the desired effects in their children. Mothers who feel insecure about the thought of soothing an infant may try less effectively or less often to soothe their own infants than mothers who feel capable of soothing their infants. Empirically, maternal self-efficacy is important because of the potential relations with a number of outcomes, including maternal and child behaviors and mother-child and mother-partner relationships (de Montigny & Lacharité, 2005; Jones & Prinz, 2005; Leerkes & Burney, 2007; Teti & Gelfand, 1991). Prenatally, women with higher levels of anticipated

11

maternal self-efficacy experience a lower level of depressive symptoms and more relationship satisfaction (Biehle & Mickelson, 2011). Anticipated prenatal maternal self-efficacy has also been found to predict adaptation to the transition to motherhood over the infant and toddler years (Williams, Joy, Travis, & Gotowiec, 1987), as well as postpartum maternal self-efficacy (Leerkes & Burney, 2007). With regard to parenting behavior, higher maternal self-efficacy is associated with more competent and sensitive parenting for infants and toddlers and continues into later childhood and adolescence. Mothers of children with high maternal self-efficacy are likely to be more involved and responsive, and they use more positive discipline techniques with their children (Bogenschneider, Small, & Tsay, 1997; Gondoli & Silverberg, 1997; Shumow & Lomax, 2002).

Beliefs about child vulnerability. Women likely have preconceived notions of how vulnerable infants are. Children whose mothers believe they are vulnerable are more likely to have behavioral problems and utilize medical care more frequently (Allen et al., 2004; Forsyth, Horwitz, Leventhal, Burger, & Leaf, 1996). Additionally, believing children are vulnerable or fragile is associated with delayed cognitive and exploratory development (Field et al., 1996). Although most of the literature revolves around medically fragile or pre-term infants, some research has investigated maternal perceptions of child vulnerability in healthy, full-term infants (Dogan et al., 2009; Kerruish et al., 2005). Kerruish et al. (2005) found that mothers whose babies were medically fragile or jaundiced viewed their children as significantly more vulnerable than mothers of healthy babies, and also determined that there was a significant association between depressive symptoms and the perception of one's baby as vulnerable. Another sample of middle-class mothers of healthy children (Dogan et al., 2009) found higher levels of belief in child vulnerability (6%) than previously reported by Kerruish and colleagues (3%). Women's

perceptions of child vulnerability prior to birth have not been studied, and it is unknown if these beliefs may change after the birth of the child or if the extent of their association with depression. Furthermore, because there is a relationship between maternal self-efficacy and infant temperament, with mothers feeling less efficacious when the infant is perceived to be difficult (Leerkes & Burney, 2007; Troutman, Moran, Arndt, Johnson, & Chmielewski, 2012), it is important to understand the role of a mother's perception of infant characteristics, such as vulnerability.

Beliefs about societal expectations of being a mother. There are cultural and societal core norms and expectations associated with being a mother (Lee, 1997; Lewis & Nicolson, 1998; Knudson-Martin & Silverstein, 2009; Raeff, 1996). For adult women, these expectations are fairly homogenous and may include ideas such as women's self-identity cannot be separated from being a mother and that there are positive and negative aspects associated with being a mother (Lewis & Nicolson, 1998; Raeff, 1996). Negative expectations include giving up individual freedom and being primary caretakers for children (Lewis & Nicolson, 1998; Raeff, 1996). Some of these societal expectations, such as the belief that women should the primary caretakers for children, appear in mothers' thoughts during pregnancy (Biehle & Mickelson, 2011), but these beliefs have not been explored during the entire perinatal period.

Relations between Depression and Maternal Beliefs

Traditional psychological theories and research suggest that there is a relationship between mental well-being and a sense of control or efficacy, "specifically cognitions, beliefs, thoughts, and emotions" (Beck, 2001; Keeton, Perry-Jenkins, & Sayer, 2008, p. 213). One study of 153 women reported that women with a higher sense of control over life events during the transition to parenthood had lower levels of depressive symptoms and anxiety in the postpartum

period and concluded that an increase in sense of control actually predicted decreases in anxiety and depressive symptoms (Keeton, Perry-Jenkins, & Sayer, 2008). This suggests that expected or anticipated maternal self-efficacy may serve as a protective factor during after the birth of a child for women at-risk for depression and anxiety. Low maternal self-efficacy may also be related to how difficult mothers perceive their infants to be (Teti & Gelfand, 1991). If mothers always view their children as difficult, they may attribute a decrease in infant fussiness over the course of a day to "easier" temperament, rather than an increase in their own competence at soothing the infant.

Although a substantial amount of research has examined maternal self-efficacy during the postpartum period, only a handful of studies have investigated maternal self-efficacy and mental health during the prenatal period, with mixed findings regarding the associations between depression and maternal self-efficacy. Porter & Hsu, (2003) found a negative correlation between depression and positive feelings of self-efficacy in 61 third-trimester primiparous women, but Leerkes & Burney (2007) did not find an association in their sample of 115 women. Both studies did report that prenatal self-efficacy predicted postpartum self-efficacy, suggesting that it is a stable construct that does not change significantly from pregnancy to postpartum (Leerkes & Burney, 2007; Porter & Hsu, 2003). A third study reported a relationship between depression and prenatal self-efficacy, but self-efficacy was not specific to mothering (Sayil, Gure, & Zehra, 2006). Finally, Zayas, Jankowski, and McKee (2005) explored how maternal self-efficacy and depression may be related in low-income, minority populations across pregnancy and postpartum. Although they found that depression decreased and self-efficacy increased from the third trimester of pregnancy to three months postpartum, they focused on depression as the predictor and maternal self-efficacy as the outcome. This study will examine

14

the predictive validity of prenatal maternal beliefs, including anticipated maternal self-efficacy, with postpartum depressive symptoms.

Less is known regarding mothers' perceptions about societal expectations of motherhood, child vulnerability, and perinatal depression. Societal messages may suggest that if women do not feel happy and fulfilled in motherhood, then they must be depressed (Lee, 1997). Examination of these beliefs during pregnancy may provide insight into the development of postpartum depression. A review of nine qualitative studies of postpartum depression revealed that across cultures and ethnicities, societal expectations about motherhood permeate the media and culture and affect women's mental health (Knudson-Martin & Silverstein, 2009). Specifically, depressed women believed that as mothers they were always supposed to be competent at taking care of their infants and were "bad" mothers if they did not comply with these societal expectations (Knudson-Martin & Silverstein, 2009). African American women, for example, believed that they were supposed to be strong and not need help with their infants— feeling depressed after the birth meant they were weak (Knudson-Martin & Silverstein, 2009). Comparatively, American and British women believed that they were supposed to be perfect and to follow often unattainable or unrealistic child-rearing ideals in order to be a good mother. For some women this meant that they should always be the primary caregiver and remain at home (Knudson-Martin & Silverstein, 2009). For others, it meant that they should not verbalize parenting difficulties they were experiencing to others; this was a common theme across cultures (Knudson-Martin & Silverstein, 2009). Conflict between societal expectations and the reality of daily activities resulted in feelings of depression (Knudson-Martin & Silverstein, 2009). Although these studies do not examine perceptions of child vulnerability, other studies have found that depressed mothers are more likely to view their healthy infants as medically fragile or

vulnerable (Field et al., 1996; Kerruish et al., 2005) and have more negative perceptions of their infants (Cornish et al., 2006; Milgrom & McCloud, 1996). It is unclear, however, if these beliefs are formed prior to the birth of the child, or if they develop concurrently with depression during the postpartum period.

The Current Study

The purpose of this study was to develop a new measure of maternal beliefs, the Rigidity of Maternal Beliefs Scale (RMBS), that specifically targeted women's beliefs about child vulnerability, anticipated maternal self-efficacy, and perceived societal expectations about motherhood, which have not been adequately addressed to date. First a series of items were created to assess maternal beliefs about infant vulnerability, societal expectations about motherhood, and anticipated maternal self-efficacy. Second, I analyzed the factor structure of this measure and examined the validity and reliability of the measure during pregnancy and the postpartum. I hypothesized that three factors would emerge from the measure: perceptions of societal expectations of mothers, anticipated maternal self-efficacy, and perceptions of child vulnerability. I also hypothesized that these constructs would be reliable and stable over the transition to parenthood. Finally, I hypothesized that the measure would demonstrate construct validity and predict postpartum depressive symptoms.

Method

Materials

After consulting with expert researchers and clinicians in the field of women's mental health and conducting a review of the existing literature, the author created 30 items (See Appendix A for original items) to reflect the 3 proposed dimensions of maternal beliefs: perceptions of infant vulnerability, anticipated maternal self-efficacy, and perceptions of societal expectations about motherhood. A 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree* was used to indicate rigidity of beliefs. High scores suggested more rigidity, while lower scores connoted more flexibility. These items were piloted with a small group of depressed women ($n = 39$) participating in an on-going intervention study. Initial analyses examined the distribution and skewness of the responses and established that ten of the items had restricted range. Six of the items were then revised and four were omitted, resulting in the 26 final items (See Appendix B) that were used in this study, with two items being reverse scored.

Procedure

A new sample was recruited through the perinatal mental health registry affiliated with a large Midwestern university. Women were eligible to participate in the registry if they were pregnant, over the age of 18, were fluent in English, and planned to keep their child. Women were initially contacted by mail if they were in their second or third trimester of pregnancy and provided a brief description stating that the study was examining maternal beliefs, an informed consent letter, and a set of prenatal questionnaires to return if they wanted to participate in the study. Women who returned the prenatal questionnaires were also sent a follow-up questionnaire packet at 6 to 8 weeks postpartum, on average, and asked to mail them back to the investigator. Women received a $5 gift card upon receipt of each set of questionnaires.

17

Prenatal questionnaires were mailed out to 273 women who met the criteria. One hundred and thirty four women returned prenatal questionnaires, for a response rate of 49%. Of those, 113 women also returned postpartum questionnaires. Eighty-four percent of the women completed both timepoints during their participation in the study, with all data collected by mail.

Participants

The mean maternal age at time of recruitment was 30.69 years ($SD = 4.87$). Women were, on average, 31.14 weeks pregnant ($SD = 4.13$), and had infants who were 7.84 weeks of age ($SD = 3.35$) at the postpartum timepoint. Fifty-eight percent ($n = 76$) of the sample was first-time mothers and 91% ($n = 122$) lived with their husband or partner. The sample was 85% white ($n = 114$), 4% African American ($n = 5$), 8% Asian ($n = 10$), and 4% other ($n = 5$). Sixty percent ($n = 80$) of the households had an income of at least \$60,000 and 81% ($n = 109$) of the women had a bachelor's degree or above.

Analyses explored if women who remained in the study differed in any way from those who did not return questionnaires postnatally. Women who dropped had significantly higher prenatal levels of depressive symptoms ($M = 7.10$, $SD = 4.86$) than those who remained ($M = 4.64$, $SD = 3.96$), $t(132) = 2.52$. There were no differences between those who dropped with regard to demographic variables or any of the other study variables.

Measures

Maternal depressive symptoms. The Edinburgh Postpartum Depression Scale (EPDS, Cox, Holden, & Sagovsky, 1987) was used to assess depressive symptoms prenatally and postpartum. The EPDS is a 10-item self-report that was created for use with postpartum women and has been established as a valid and reliable measure with pregnant women as well (Murray & Cox, 1990). Participants were asked statements such as "I have been so unhappy that I have

been crying" and to rate the intensity on a scale from 0 = *No, never*, to 3 = *Yes, most of the time*, by choosing the response that best described their feelings over the past week. Scores were summed for the 10 items with a higher score indicating more depressive symptoms.

Parental sense of competence. The Parenting Sense of Competence scale (PSOC; Johnston & Mash, 1989) is a 16-item self-report questionnaire that assesses how competent and satisfied parents feel in their role as parents. There are two subscales (*efficacy* and *satisfaction)* but only the 8 items of the *Efficacy* subscale were utilized in the current study. *Efficacy* examined women's beliefs regarding how efficacious they felt as a mother (e.g. Being a parent is manageable, and any problems are easily solved) and was completed by women at both timepoints, using a 6-point Likert scale ranging from 1 = *strongly agree* to 6 = *strongly disagree.* Responses were averaged across items, with a higher score indicating higher self-efficacy.

Data Analysis Plan

Exploratory factor analysis (EFA) was used to examine the factor structure of the Rigidity of Maternal Beliefs Scale. Once the individual factors were identified, Cronbach's alpha tested the internal consistency and bivariate correlations explored the measure's stability, discriminant validity, and convergent validity. Finally, regression analyses tested the predictive validity of the RMBS for postpartum depressive symptoms. All analyses were completed using SPSS 20 and AMOS 20.

Results

Exploratory Factor Analysis

Exploratory factor analysis (EFA) of the prenatal data was conducted to determine how many factors were present and the nature of those factors. EFA allows one to examine the factor structure by identifying what variables are associated with one another and explaining the variance associated with each underlying factor. Principal axis factoring was utilized for the extraction method as well as Promax rotation with Kaiser normalization, and initial factors were determined by those with an eigenvalue greater than one. Two items, "Whether or not I breastfeed will affect my baby," and "I'm uncomfortable sharing my parenting worries with others" did not load onto any of the factors in the factor matrix and had communalities below .3, therefore, they were deleted and the EFA was run again, leaving 24 remaining items. Seven factors had an eigenvalue greater than one and this solution explained 54.99% of the variance. Three of the factors consisted of just two items each; therefore, upon examination of the scree plot, a four-factor solution was explored. The four-factor solution was more interpretable, with few items cross-loading and explaining 44.10% of the variance. There were common themes that unified the items in each factor. See Table 1.2 for the descriptive statistics and EFA loadings for each factor.

The first factor included nine items that reflected, as expected, women's perceptions of societal expectations of mothers and will subsequently be called the Perceptions of Societal Expectations of Mothers subscale (PSEM). Items included "I should do everything for my baby myself" and "Having negative thoughts about my baby means something is wrong with me." These items typically focused on mother-specific actions or feelings in relation to the child. A second factor seemed to be specific to perceptions of expectations of either the mother or child

20

and included seven items, such as "Babies get hurt or sick easily" and "Being a mother should be positive." This factor was referred to as the Role Identity subscale (RI) because each item revolved around the specific role of mother or child. The four items in the third factor were related to confidence or efficacy, such as "I feel confident that I can manage the responsibilities of motherhood," and was labeled the Maternal Confidence subscale (MC). The final, fourth, factor suggested the concept of what is a good or bad mother, particularly with regard to the mother's parenting skills and the baby's resulting behavior. This factor consisted of four items and included "If I can't calm my baby when s/he cries, then I am not a good parent" and was labeled the Maternal Dichotomy (MD) subscale because the items focused on the duality of being a good or bad parent.

Internal Consistency and Cross-Time Stability of the RMBS

Based on the factor analysis findings, subscales were created by averaging across items resulting in four subscales representing Perceptions of Societal Expectations of Mothers, Role Identity, Maternal Confidence, and Maternal Dichotomy. A total score was created by averaging across the 24 items of the RMBS.

Cronbach's alpha assessed the internal consistency of each of the RMBS subscales and the total RMBS scale at the prenatal and postpartum timepoints. Results are reported in Table 1.1, along with the means and standard deviations. All prenatal alphas were .73 or above, suggesting that the full scale and the subscales are internally consistent. Confirmation of these alphas was conducted using the same factors within the postpartum data, with postpartum alphas above .72, with the exception of the Role Identity subscale (See Table 1.1). Bivariate correlations explored the stability in individual differences in women's beliefs from prenatal to

21

postpartum. The scores were significantly and positively correlated, indicating the RMBS and all subscales were stable over time with all correlations between .51 and .79 (See Table 1.1).

Construct Validity of the RMBS

In order to evaluate the construct validity of the RMBS, both convergent and discriminant validity were examined using bivariate correlations. Convergent validity would be established if there was a significant correlation between two measures, indicating that they were related concepts. Discriminant validity would be established if there was no significant correlation, indicating that the two constructs were not related.

A self-efficacy subscale, Maternal Confidence, did emerge from the EFA, therefore, bivariate correlations examined convergent validity of this subscale with an established self-efficacy measure, the Parenting Sense of Competence. Convergent validity between the Maternal Confidence factor and the PSOC was demonstrated prenatally, $r(134) = .25$, $p = .004$, and postpartum, $r(113) = .50$, $p = .000$.

To establish discriminant validity, bivariate correlations were conducted between the Rigidity of Maternal Beliefs Scale and the Parenting Sense of Competence. No significant correlation between the RMBS and the PSOC was found at either timepoint, prenatal: $r(134) = .060$, $p = .492$, postpartum: $r(113) = .067$, $p = .484$, indicating that the RMBS had good discriminant validity from the PSOC. Discriminant validity between the PSOC and the RMBS subscales of Maternal Dichotomy, Role Identity, and Perceptions of Societal Expectations of Mothers subscale was also found, with no significant prenatal or postpartum correlations (see Table 1.3).

Predictive Validity of the RMBS with Postpartum Depressive Symptoms

The second goal of the study was to explore the predictive validity of the Rigidity of Maternal Beliefs Scale and compare it with the Parenting Sense of Competence as a predictor of postpartum depressive symptoms. I hypothesized that the prenatal RMBS would be a better predictor of postpartum depressive symptoms than the prenatal PSOC because the RMBS examines multiple aspects of maternal beliefs, not just self-efficacy.

Hierarchical multiple regression was conducted to determine whether the RMBS or the PSOC better predicted postpartum depressive symptoms, after controlling for initial levels of depressive symptoms prenatally (See Table 1.4). The prenatal EPDS was entered at Step 1, explaining 21.5% of the variance in postpartum depressive symptoms. The prenatal RMBS and prenatal PSOC mean scores were entered in Step 2, explaining an additional 6.7% of the variance, R squared change = .07, F change $(2, 109) = 5.10$, $p = .008$. In the final model, both the PSOC and RMBS were statistically significant, with the prenatal RMBS recording a higher beta value ($\beta = .21$, $p = .016$) than the prenatal PSOC ($\beta = .17$, $p = .047$). The final model explained total variance of 28.2%, $F(3, 109) = 14.30$, $p = .016$.

A second hierarchical multiple regression examined if specific RMBS subscales or the PSOC better predicted postpartum depressive symptoms. Prenatal EPDS was entered into Step 1 to control for initial level of depressive symptoms. The four prenatal RMBS subscales and the PSOC mean scores were entered into Step 2 to examine the unique contribution of each in predicting postpartum depressive symptoms. The results of the regression (see Table 1.5) indicated that one of the RMBS subscales, Maternal Dichotomy, significantly predicted postpartum depressive symptoms. The Parenting Sense of Competence scale did not

significantly predict postpartum depressive symptoms when all RMBS subscales were in the regression model.

Discussion

The overall objective of this study was to examine previously understudied areas of maternal beliefs: anticipated maternal self-efficacy, perceptions of child vulnerability, and perceptions of societal expectations of mothers for women in the perinatal period. The first goal was to develop and test the psychometric properties of the Rigidity of Maternal Beliefs Scale, a new measure designed to explore women's perceptions of these areas during the perinatal period and the strength of the rigidity of these beliefs. First, 26 face-valid items were created and data collected. Next, I used exploratory factor analysis to identify the structure and number of subscales. Finally, the reliability, construct validity, and predictive validity of the MBS and its subscales were examined.

Three factors were anticipated through the EFA: anticipated maternal self-efficacy, perceptions of child vulnerability, and perceptions of societal expectations of mothers. Results of the exploratory factor analysis suggested a four-factor solution best fit the data, resulting in subscales of Maternal Confidence, Role Identity, Perceptions of Societal Expectations of Mothers, and Maternal Dichotomy.   Two of the three hypothesized factors did emerge. The items in the Maternal Confidence subscale corresponded with feelings of anticipated self-efficacy, and items in the Perceptions of Societal Expectations of Mothers factor included ideas such as "I would feel guilty if I did not enjoy being a mother," which reflected the pressure and expectations that society and culture place on women as mothers (Knudson-Martin & Silverstein, 2009; Lee, 1997; Lewis & Nicolson, 1998; Raeff, 1996). Child vulnerability was not supported as a single factor. Items related to child vulnerability were grouped in the Role Identity factor,

which also included role identity ideals for the mother. It may be that there were not enough items related specifically to the child to form a stand-alone factor, as only two items were infant-specific and did not include the mother ("Babies get hurt or sick easily" and "Babies should not experience discomfort (such as crying, hardship, or emotional pain"). If more infant-only items had been included, perhaps a child vulnerability factor would have emerged. A fourth, unanticipated, factor emerged: Maternal Dichotomy. The items in this factor suggest mothers are categorized into "good" and "bad" based on how the child behaves or reacts to the mother. This categorization may be a societal expectation as well, but appeared to be separate from general thoughts and feelings about motherhood found in the Perceptions of Societal Expectations of Mothers factor.

The second goal of this study was to test the internal reliability and construct validity of the RMBS. Cronbach's alpha confirmed internal consistency prenatally and postpartum for all RMBS subscales, with the exception of the postpartum Role Identity subscale and bivariate correlations supported that the constructs were stable over time. The Role Identity factor may not have had good internal consistency during the postpartum period because of its focus on two different roles. Previous qualitative research (Lewis & Nicolson, 1998) found that women experienced a loss of identity over the transition to motherhood; it is difficult to determine if the poor postpartum consistency reflects a change in the mother's role, the child's role, or both. Aspects of role identity for mother and/or child may change throughout the perinatal period and further research should separate the two and investigate the specific nature of these beliefs.

Construct validity was established in two ways. First, the Maternal Confidence subscale was significantly correlated with an established measure of parenting self-efficacy, the Parenting Sense of Competence scale, suggesting convergent validity, while the other subscales and the

RMBS as a whole were not significantly correlated with the PSOC, providing support for discriminant validity. These relations were consistent and significant at both timepoints. Significant correlations between the prenatal and postpartum timepoints established the measure's stability.

Regression analyses supported the predictive validity of the RMBS with regard to postpartum depressive symptoms. Although both the RMBS and the PSOC were significant predictors, the coefficient for the RMBS was larger, indicating that it is a better predictor of postpartum depressive symptoms than the PSOC. When the regression analysis was conducted with the RMBS subscales, only Maternal Dichotomy was a significant predictor of postpartum depressive symptoms and the PSOC was no longer significant. Pregnant women who were more rigid in thinking about being a "good" or "bad" mother experienced higher levels of postpartum depressive symptoms, whereas how efficacious women felt about their parenting was not significant.

Limitations of this study are the small sample size and homogeneous nature of the sample. The women were, as a whole, highly educated, had high levels of income, and most had partners. Additionally, there was a not a set timepoint at which data were collected. Although women were sent the postpartum survey approximately one month after giving birth, the age of the baby upon survey completion ranged from 3 to 21 weeks. Some women made comments on the surveys indicating that their answers would have been quite different during the immediate postpartum period or that they had encountered a stressful life event such as moving that adversely affected their mental health. There was no measure of social or partner support. Examining support would be an important next step because of the considerable association between social support and postpartum depression (Beck, 2001).

All hypotheses regarding validity and reliability were supported, indicating that the Rigidity of Maternal Beliefs Scale is a valid and reliable measure. Future research should test the scale with a larger, more diverse sample. It would also be interesting to determine if these beliefs change throughout pregnancy and the beliefs women hold prior to becoming pregnant. The validation of the RMBS provides researchers with the opportunity to explore a cluster of specific maternal cognitions related to anticipated maternal self-efficacy and societal expectations of mothers. This scale could be used in conjunction with observational measures to investigate the relations of these beliefs with aspects of the parent-child relationship, the romantic partner relationship, and parenting behaviors. The RMBS should be validated with a clinically depressed sample and tested as a discriminating measure between depressed and non-depressed women. The measure may be useful with clinical populations to identify maladaptive or rigid thoughts, which could then be a focus of intervention. Specifically, the RMBS may be used with Cognitive Behavioral Therapy (CBT) to identify particular beliefs that may be associated directly with maintaining and / or improving depressive symptoms. These specific beliefs may be a direct focus of the CBT. This tool may also be used to guide conversation about motherhood expectations within any context where pregnant women present (e.g. prenatal care, social services). For example, this tool can efficiently elicit beliefs that may be overly rigid or lead to future distress or other problems. Additionally, the RMBS may identify women who are at risk for postpartum depression in clinical contexts. For example, obstetrics patients who endorse problematic beliefs may be monitored, or referred for psychotherapy if they are deemed at risk for depression based on depression history or other risk factors.

This study explores a previously unexamined area of related maternal beliefs. Over the last century, women have felt an increasing pressure to "do it all," do it well, and to be happy

about it—these tenets have been reflected in the media, childcare manuals, and by medical professionals. This study represents a first step towards closer examination of how women's internalization of societal expectations about motherhood and their anticipated maternal self-efficacy may be associated with women's mental health during the perinatal period by providing a valid and reliable measure with which to investigate these beliefs in future research. Epidemiological, clinical, or health services research may utilize this measure to better hone risk factors, determine predictors of response to various treatments, and streamline implementation of screening, referral, and personalized intervention programs in prenatal care or other community settings.

Table 1.1

Means, Standard Deviations, Alphas, and Correlations for Depressive Symptoms, PSOC, & RMBS

	Prenatal ($n = 134$)			Postpartum ($n = 113$)			
	M	*SD*	α	*M*	*SD*	α	*r*
Depression	5.02	4.19	.87	4.95	3.72	.82	.46***
Parenting Sense of Competence	2.96	1.08	.91	2.34	.96	.92	.30**
Rigidity of Maternal Beliefs Scale	3.85	.72	.85	3.96	.70	.85	.79***
PSEM	3.80	1.09	.85	4.02	1.04	.81	.73***
RI	4.94	.88	.75	5.05	.68	.51	.67***
MC	2.51	.97	.74	2.37	.89	.73	.51***
MD	3.37	1.04	.77	3.54	1.05	.72	.75***

Note. PSEM = Perceptions of Societal Expectations of Mothers; RI = Role Identity; MC = Maternal Confidence; MD = Maternal Dichotomy.

* $p < .05$, ** $p < .01$, *** $p < .000$

Table 1.2

Rigidity of Maternal Beliefs Scale Factors and Loadings from Principal Axis Factoring (Promax Rotation)

Factor (Percent Variance Accounted for)	1	2	3	4
Item				
Factor 1: Perceptions of Societal Expectations of Mothers (22.42%)				
1. I should do everything for my baby myself	.81			
2. I feel guilty if I leave my baby with someone else in order to do something for myself	.68			
3. I should be able to figure out and fix parenting difficulties myself	.58			
14. Having negative thoughts about my baby means something is wrong with me	.61			
17. If I am doing well as a parent, then my baby will not have difficulties	.61			
19. I have to interact with my baby all the time when I am with him or her	.45			
18. I should not feel frustrated with my baby when my baby is difficult	.40			
4. Being a parent means I should not do anything that is morally wrong	.40			
23. I feel guilty when I put my needs before the needs of my baby	.34			
Factor 2: Role Identity (11.33%)				
12. Being a mother should be positive		.76		
11. I would feel guilty if I did not enjoy being a mother		.66		
26. Being a parent means worrying about my baby		.49		
15. As a parent, I must be flexible all the time		.40		
16. I feel guilty when I am not patient with my baby		.38		
24. Babies get hurt or sick easily		.36		
25. Babies should not experience discomfort (such as crying), hardship, or emotional pain		.33		
Factor 3: Maternal Confidence (5.80%)				
6. I feel confident in my ability to raise a happy and healthy baby			.77	
10. Other mothers are better able to comfort their baby			.76	
13. I feel confident that I can manage the responsibilities of motherhood			.66	
9. Other mothers have fewer parenting difficulties than I do			.49	
Factor 4: Maternal Dichotomy (4.55%)				
21. If my baby misbehaves, then others will think I am a bad parent				.73
22. If my baby does not sleep well, it is a sign that I am not doing a good job as a mother				.67
7. It is important to me that others think I'm a good parent				.67
20. If I can't calm my baby when s/he cries, then I am not a good parent				.60

Table 1.3
Correlation Coefficients of Prenatal and Postpartum Scores between Depressive Symptoms, PSOC, & RMBS

	1	2	3	4	5	6	7
1. Depressive Symptoms	--	.09	.25**	.18*	.06	.33**	.22**
2. Parenting Sense of Competence--Efficacy	.34**	--	.06	-.00	-.10	.25**	.16
3. Rigidity of Maternal Beliefs Scale	.47**	.07	--	.91**	.75**	.35**	.60**
4. Perceptions of Societal Expectations of Mothers	.39**	-.08	.89**	--	.59**	.17	.40**
5. Role Identity	.15	-.13	.71**	.53**	--	-.01	.26**
6. Maternal Confidence	.54**	.50**	.52**	.25**	.14	--	.19*
7. Maternal Dichotomy	.30**	.17	.76**	.52**	.39**	.48**	--

Note. Prenatal correlations are above the diagonal; postpartum correlations are below the diagonal.

* $p < .05$, ** $p < .01$, ***$p < .001$

31

Table 1.4

Summary of Hierarchical Multiple Regression Analysis for PSOC and RMBS Predicting Postpartum Depressive Symptoms (n =113)

	Model 1			Model 2		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Initial Depressive Symptoms	.44	.08	.46***	.34	.08	.36***
Parenting Sense of Competence				.59	.29	.17*
Rigidity of Maternal Beliefs				1.09	.45	.21*
R^2		.22			.28	
F for change in R^2		30.45***			5.10**	

* $p < .05$, ** $p < .01$, ***p $ < .001$

Table 1.5

Summary of Hierarchical Multiple Regression Analysis for PSOC and RMBS Subscales Predicting Postpartum Depressive Symptoms (n =113)

Variable	Model 1			Model 2		
	B	*SE B*	*β*	*B*	*SE B*	*β*
Initial Depressive Symptoms	.44	.08	.46***	.30	.09	.32***
Parenting Sense of Competence				.42	.30	.12
Perceptions of Societal Expectations of Mothers				.11	.37	.03
Maternal Confidence				-.02	.47	-.01
Role Identity				.55	.34	.15
Maternal Dichotomy				.73	.33	.21*
R^2		.22			.31	
F for change in R^2		30.45***			.10*	

* $p < .05$, ** $p < .01$, *** $p < .00$

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PARENTING STRESS AND DEPRESSIVE SYMPTOMS IN POSTPARTUM MOTHERS: BIDIRECTIONAL OR

UNIDIRECTIONAL RELATIONS?

Postpartum depression is an important risk factor that negatively impacts children's development, as well as maternal health and well-being (Aber, Jones, & Cohen, 2000; C. T. Beck, 1998; Cummings, Davies, & Campbell, 2000; Downey & Coyne, 1990; Wu, Selig, Roberts, & Steele, 2011). Even mild levels of depression that do not meet criteria for a major depressive episode may result in adverse effects for women and children (Ashman, Dawson, & Panagiotides, 2008). A consistent link between maternal depressive symptoms and parenting stress has been established (Cornish et al., 2006; Forman et al., 2008; Gelfand, Teti, & Fox, 1992; Gerdes et al., 2007; Pritchard, Colditz, Gray, Tudehope, & Beller, 2012; Sidor, Kunz, Schweyer, Eickhorst, & Cierpka, 2011). Yet, there is still much we don't know regarding the relations between depression and parental stress, which is necessary for informing intervention efforts. Thus, we need to explore causal pathways and reciprocal relations between these factors that put children's development at risk (Dodge, 1990; Cummings & Davies, 1994; Goodman & Gotlib, 1999).

Few studies have explored relations between parenting stress and maternal depressive symptoms longitudinally over the postpartum period, which is important for predicting maternal depressive symptoms across the perinatal period. Does a bidirectional model or a unidirectional model best explain the development of maternal depressive symptoms? A bidirectional model

(see Figure 2.1) would suggest that depressive symptoms and parenting stress mutually influence one another over time. On the other hand, a unidirectional model would demonstrate that either earlier parenting stress predicts later depressive symptoms (see Figure 2.2) or that earlier depressive symptoms predict later parenting stress (see Figure 2.3). This study will test whether a bidirectional or unidirectional model best explains the association between maternal depressive symptoms and parenting stress during the first postpartum year. Additionally, bidirectional and unidirectional models of maternal depressive symptoms and three specific subtypes of parenting stress (parental distress, difficult child stress, and stress related to dysfunctional mother-child interactions) will be explored. It may be that different types of parenting stress have different relations with maternal depressive symptoms. Understanding how different domains of parenting stress are related to depression over the first year can help inform future research and intervention efforts. I first present research about the consequences of maternal depression for children and mothers, followed by a brief review of what we know about parenting stress. I then review studies of maternal depressive symptoms and parenting stress during the postpartum period. Finally, I present cognitive theory and the importance of testing bidirectional and unidirectional models so we maybe better understand the causal direction of, and reciprocal relations between, postpartum depressive symptoms and parenting stress for women.

Maternal Depression and Relations with Children's Development

Women are at the highest risk for depression during their child-bearing years and between 5 and 25 percent of women suffer from postpartum depression (Gaynes et al., 2005). The effects of postpartum depression on women and children have been well-documented (C. T. Beck, 1998) and include impaired attachment relationships between mother and child, child behavior problems, child abuse, delayed developmental growth, and poor social skills (Aber et

al., 2000; C. T. Beck, 1998; Teti, Gelfand, Messinger, & Isabella, 1995; Wu et al., 2011). For instance, depressed mothers are more likely to have infants with insecure attachment relationships to their mothers, most likely because these mothers are less sensitive than non-depressed mothers (Campbell et al., 2004; Campbell, Matestic, von Stauffenberg, Mohan, & Kirchner, 2007; Teti et al., 1995). It is important to note that maternal depression is not time-limited to the postpartum period. Many women who are depressed during the postpartum period remain depressed for extended periods of time, making postpartum depression a serious and salient risk factor for children's development (Campbell et al., 2007). Beyond infancy, Carter, Garrity-Rokous, Chazan-Cohen, Little, and Briggs-Gowan (2001) found that postpartum depression was associated with behavior problems for toddlers. A meta-analysis by Downey and Coyne (1990) affirmed that school-age and adolescent children of depressed mothers are more likely to experience depression themselves, and are also more likely to present with academic and behavioral difficulties.

The effects of maternal depression can also extend into children's adult years (Cummings et al., 2000; Downey & Coyne, 1990). If children of depressed mothers are unable to come to terms with their past experiences or have limited coping mechanisms, they may repeat the same pattern of parenting they experienced growing up with their own children, and be more likely to experience depression after children are born (Bretherton & Munholland, 1999; Lieberman & Zeanah, 1999; Sejourné, Alba, Onorrus, Goutaudier, & Chabrol, 2011). In addition to the effects on the child and coping with the symptoms of depression, experiencing an episode of postpartum depression puts women at increased risk for additional episodes in future pregnancies (Wisner et al., 2001). As a result, this is a far-reaching problem that has a greater impact than one might expect at first glance. Postpartum depression can affect individuals, families, and communities

39

(Cohen, Onunaku, Clothier, & Poppe, 2005). Identifying precursors to postpartum depression

provides opportunities for researchers, clinicians, and policymakers to target areas for improved

maternal and child health outcomes and to halt the intergenerational transmission of depression.

Predictors of postpartum depression include a previous history of depression, prenatal

depression, low self-esteem, lack of social support, a poor marital history and high levels of

stress (C. T. Beck, 2001).

Parenting Stress and Its Consequences

Although stress has often been associated with depression and has been examined during

pregnancy and the postpartum, it has frequently been conceptualized in terms of general life

stress (life events) as opposed to parenting-specific stress (Dipietro, Costigan, & Sipsma, 2008),

despite research that has indicated distinct differences between global and parenting-specific

stress (Creasey & Reese, 1996). Becoming a parent is often a time of great joy and fulfillment,

but it can also be stressful, in a way that is distinct from general life stress. Whether it is the first

child or a subsequent child, the addition of a new infant to the family contributes to changes in a

variety of areas, from the physical demands of having a child (i.e., decreased sleep and energy)

to the emotional toll that having a child may take (i.e., soothing a colicky baby). Additionally,

the knowledge that another person's well-being and survival is completely dependent on the

parents' care can be stressful to women. All of these factors may contribute to parenting stress,

which can be defined as how well or poorly an individual handles the demands of being a parent,

including the resources available to the parent to handle such demands (Abidin, 1995;

Alexander, Feeney, Hohaus, & Noller, 2001). Furthermore, the parenting stress of the

postpartum period with a newborn baby may not be comparable or related to general life stress,

and may function differently in the postpartum period and change as the child develops

40

(Pridham, Egan, Chang, & Hansen, 1986). Colicky newborns with sleeping or feeding

difficulties, for example, may have quite a different effect on mothers' parenting stress than

toddlers who have begun to walk and eagerly explores their environment. These distinct

stressors may tap into different resources or arouse different insecurities in mothers, resulting in

varying types and levels of stress.

All parents experience some level of stress associated with the demands of parenting, but

excessive parental stress has been related negatively to parental behavior. Mothers with higher

levels of parenting stress are less responsive and sensitive with their children, have children who

are more likely to be insecurely attached, and have more negative perceptions of their children

and their children's behavior (Cornish et al., 2006; Emery, Paquette, & Bigras, 2008; Scher &

Mayseless, 2000). Additionally, children of highly stressed mothers display more externalizing

and internalizing behaviors (Blader, 2006; Cornish et al., 2006; Eyberg, Boggs, & Rodriguez,

1992; Rodriguez, 2011).

Relations between Postpartum Depressive Symptoms and Parenting Stress

Types of parenting stress include stress related to the parental domain, such as women's

perceived stress of the parental role, and stress related to the child domain, such as perceptions of

how difficult the infant is, as well as stress related to mother –child interaction. Stress associated

with the parental role has consistently been related to depressive symptoms (Cornish et al., 2006;

Horowitz & Goodman, 2004; Misri et al., 2006; Sidor et al., 2011). The findings regarding

perceptions of stress associated with a difficult child are mixed, with some researchers finding

that depressed mothers report their children are more difficult (Britton, 2011; Cornish et al.,

2006; McGrath, Records, & Rice, 2008; Milgrom & McCloud, 1996), whereas others find no

connection between depressive symptoms and perceptions of a difficult child (Misri et al., 2006;

41

Pritchard et al., 2012). Parenting stress specific to the parent-child interaction has also been

examined to a lesser extent. Some studies suggest mothers' stress with regard to the parent-child

interaction is related to depressive symptoms (Mason, Briggs, & Silver, 2011; Sidor et al., 2011),

but others have not found the same association (Horowitz & Goodman, 2004; Pritchard et al.,

2012). The inconsistent findings regarding specific types of parenting stress, and the importance

of parenting stress for maternal behavior and child outcomes, make parenting stress an area

worthy of further exploration. A longitudinal approach may illuminate the specific nature of the

relations between parenting stress and maternal depressive symptoms during the postpartum

period.

Research has clearly established that parenting stress and depression are associated

(Cornish et al., 2006; Gelfand, Teti, & Fox, 1992; Gerdes et al., 2007; Mason, Briggs, & Silver,

2011; Pritchard et al., 2012; Sidor et al., 2011), but we know very little about the longitudinal

relations between parenting stress and maternal depressive symptoms over the perinatal period.

Many of these studies were cross-sectional or assessed stress at only one postpartum timepoint

(Britton, 2011; Gelfand et al., 1992; Grazioli & Terry, 2000; Honey, Morgan, & Bennett, 2003;

Horowitz & Goodman, 2004; Mason et al., 2011; Sidor et al., 2011). Other studies focused on

differences between depressed and non-depressed groups of women, with parenting stress as the

outcome (Gelfand et al., 1992; Mason, Briggs, & Silver, 2011; McGrath et al., 2008; Milgrom &

McCloud, 1996; Pritchard et al., 2012), but none of these studies allowed for an examination of

longitudinal relations.

One longitudinal study has been conducted with parenting stress at multiple timepoints.

Cornish and colleagues (2006) followed 112 first-time mothers at 4, 12, and 15 months

postpartum and categorized them as never, briefly (4 months only), or chronically (12 months or

longer) depressed, and examined parenting stress over time. They found that briefly and chronically depressed women had higher levels of parenting stress than the never depressed women. They only examined group differences, however, and did not explore if maternal depressive symptoms and parenting stress influenced one another over time. The current study will enrich the literature by examining the pathways between parenting stress and maternal depressive symptoms over the first postpartum year. The results may help inform interventions for women who are at-risk for developing depression during pregnancy and the postpartum period.

Cognitive Theory of Depression

Beck's model of depression (A. T. Beck, 1976) suggests that even though an individual may have a predisposition toward negative cognitions associated with depression, these cognitions (and subsequent depressive episode) are not activated until the individual experiences some sort of stressor, suggesting a unidirectional approach toward the onset of depressive symptoms, one in which stress leads to depression. Beck's theory is considered a diathesis-stress model of depression, because the negative cognitions are pre-existing but dormant until stress activates the diathesis. Once activated, the negative cognitions maintain depressive symptoms and lead an individual to choose more negative interpretations of future events as true, regardless of the reality. Events, such as having a temperamentally challenging infant, may reinforce and accentuate negative cognitions resulting in a reciprocal relationship between depressive mood and cognitions. Once the stressor has been activated, a bidirectional model may explain the continuation of depressive symptoms. Both models of depression may provide an explanation of why some women develop postpartum depression as a result of caring for an infant whereas

others do not. I wanted to test both unidirectional and bidirectional models in this study to explore relations between depressive symptoms and parenting stress over time.

Limited research has investigated postpartum depression from a cognitive framework. Hipwell and colleagues (2004) examined cognitive vulnerability and the development of postpartum depression, yet, they considered childbirth itself as the stressor, rather than investigating the stress of caring for an infant. They found that cognitive vulnerability predicted depressive symptoms at 8 weeks postpartum, but not at 2 weeks postpartum, suggesting that the stressful event may have been incorrectly identified. Childbirth may be immediately stressful for women, but postpartum depression can develop anytime throughout the first year. The task of taking care of a child is 24 hours a day, 7 days a week, whereas childbirth is a time-limited, anticipated stressor that is also associated with the joy of a child entering the world. If childbirth truly was the activating agent, depressive symptoms would be present shortly after birth. I suggest that parenting stress, rather than childbirth, is the activating agent. Women often have family and other social support immediately following the birth of a child and may have more time to rest in the immediate postpartum period than two months later, when the realities of day-to-day infant care are on-going.

One other study has explored postpartum depression from a cognitive perspective. Grazioli & Terry (2000) examined prenatal dysfunctional attitudes and prenatal attributional style as cognitive markers of vulnerability and examined if these, in combination with postpartum parenting stress, predicted depressive symptoms at 6 weeks. They found there was an interaction between dysfunctional attitudes and parenting stress, as well as main effects of parenting stress on concurrent depressive symptoms. In addition to only measuring parenting stress once, a limitation of the study was that parenting stress was measured in a more global

manner, such as stress associated with not spending enough time with adults and problems sharing childcare tasks with one's partner. They recommended that future research examine specific types of parenting stress.

The current study will clarify the association between depression and parental stress by investigating both unidirectional and bidirectional models of the relations between parenting stress and maternal depressive symptoms. A bidirectional model underscores the reciprocal relations of parenting stress and maternal depressive symptoms, whereas a unidirectional model underscores the single path whereby either parenting stress contributes to maternal depressive symptoms, or maternal depressive symptoms contribute to parenting stress. Cognitive theory suggests a diathesis stress model of the activation of depression, but few studies have tested this theory specifically with stress and depressive symptoms. Additionally, cognitive theory supports that there are likely to be bidirectional effects once negative cognitions and depression have been activated.

The Current Study

The purpose of the current study was to explore bidirectional and unidirectional models of the relations between parenting stress and maternal depressive symptoms over the first 14 months postpartum by testing bidirectional and unidirectional models. Three specific domains of perceived parenting stress were examined: (a) parental distress related to parental competence and the parenting role, (b) perceptions of the infant's difficulty and temperament, (c) perceptions of dysfunction in the parent-child relationship. No studies have examined the bidirectional effects between maternal postpartum depression and parenting stress over time and compared a bidirectional model with a unidirectional one. The current study used a longitudinal research design to explore these models. Depression and parenting stress were measured at 3, 7, and 14

months postpartum, and structural equation modeling was used to test alternate pathways of influence over time.

The primary aim was to test a bidirectional model of the relations between parenting stress and maternal depressive symptoms (See Figure 2.1) and compare this to a unidirectional model in which parenting stress predicts later maternal depressive symptoms (See Figure 2.2). In order to rule out alternative explanations, the reverse unidirectional model was also tested (See Figure 2.3), with earlier depressive symptoms predicting later parenting stress.

Cognitive theory (A. T. Beck, 1967) suggests that stress activates negative cognitions in individuals with a genetic vulnerability, resulting in depression. Therefore, the hypothesis was that a unidirectional model, with significant paths from earlier parenting stress predicting later depressive symptoms, will result in a better fit with the data than a bidirectional model of depressive symptoms and parenting stress. I hypothesized that a unidirectional model will fit better than a bidirectional model for *Parental Distress* also based on cognitive theory, with significant cross-lagged paths from parenting distress to maternal depressive symptoms. Research findings have consistently reported that parental distress is significantly associated with maternal depressive symptoms (Cornish et al., 2006; Milgrom & McCloud, 1996; Misri et al., 2006; Sidor et al., 2011) and I hypothesized that women's perceived stress of their own role as a parent would serve as the activating agent for women to develop depressive symptoms.

I hypothesized that a unidirectional model with *Difficult Child* stress predicting maternal depressive symptoms would fit best, with significant cross-lagged paths from earlier stress to later depressive symptoms. Infants require a lot of care and although these tasks are considered normal, mothers who perceive their child as more negative as a result of the increased burden and responsibility may be more likely to develop depressive symptoms. The majority of

research does show an association between maternal depressive symptoms and perceptions of a more difficult or challenging child (Britton, 2011; Cornish et al., 2006; McGrath, Records, & Rice, 2008; Milgrom & McCloud, 1996).

I hypothesized that a bidirectional model would be a better fit for *Parent-Child Dysfunctional Interaction* stress and maternal depressive symptoms based on cognitive theory and developmental perspectives (Beck, 1976; Cummings & Davies, 1994). If a woman is depressed she is more likely to be less sensitive and less responsive to her child, which would result in less optimal parent-child interactions. The child may respond in such ways that would be less reinforcing for the mother, which in turn would exacerbate her low mood. I expected that all cross-lagged paths would be significant in the bidirectional model.

Method

Participants

Subjects were 154 women, participating in a longitudinal study starting at 28 weeks of pregnancy and followed at 3, 7, and 14 months postpartum. By 3 months, 48 women had dropped from the study. These women were less educated, $\chi^2(2, n = 152) = 30.33, p < .001$, had less income, $\chi^2(1, n = 149) = 12.58, p < .001$, and were less likely to live with a partner/spouse, $\chi^2(1, n = 153) = 15.80, p < .001$, than those who remained in the study. One infant was developmentally delayed by the time of the 14-month assessment; data for this mother were excluded from all analyses, resulting in data for 105 mothers. Twenty-four mothers attrited by the 14-month timepoint, leaving 81 mothers (77% of 3-month sample) with data at the 3, 7, and 14-month timepoints. There were significant differences between women who remained in the study until 14 months and women who dropped after the 3-month visit with regard to age, parity, and education. Women who remained in the study were more likely to be primiparous, $\chi^2(1, n =$

105) = 10.76, p = .001, and more educated, $\chi^2(2, n = 104) = 8.26$, p = .016 than those who

dropped. Women who remained in the study were also older ($M = 31.30$, $SD = 4.34$), $t(103) =$

2.08, $p = .04$, than those who dropped ($M = 29.08$, $SD = 5.33$). There were no differences by

partner status, child gender, level of depressive symptoms, or parental stress for women

remaining in the study and those who attrited.

The mean maternal age for the 105 participants was 30.79 years ($SD = 4.65$). Forty-six

percent ($n = 48$) of the sample was first-time mothers and 96% ($n = 101$) lived with their

husband or partner. Seventy-seven percent ($n = 79$) of the households had an income of $50,000

or more, and 81% ($n = 84$) of the mothers had a bachelor's degree or above. Fifty-one percent (n

$= 54$) of the babies were male. The sample was 75% white ($n = 79$), 6% African American ($N =$

6), 10% Asian ($n = 10$), 6% Hispanic ($n = 6$), and 4% other ($n = 4$).

Procedure

Pregnant women were recruited through obstetric offices affiliated with a large university

health care system in the Midwestern United States, as part of an 18-month longitudinal study

that examined women at-risk for postpartum depression. Women were eligible to participate if

they were over the age of 20, were fluent in English, planned to stay in the area for two years,

planned to keep their child, and had no substance abuse, eating disorders, bipolar illness, or

current depression. Women were recruited and interviewed for the first time during the 28th

week of pregnancy; they were screened using the *Structured Clinical Interview for DSM IV*

performed by trained clinical personnel who administered and achieved scoring reliability of at

least 85%. Women were classified as low-risk (no previous history of depression) or high-risk

(at least one previous depressive episode) for developing postpartum depression. There were no

significant differences in attrition rates between high and low-risk women. Data were also

collected at 32 and 37 weeks prenatal, and 3, 7, and 14 months postpartum through home and lab visits. Data for the current study are from the 3 (T1), 7 (T2), and 14-month (T3) postpartum timepoints and include self-report measures that assessed depressive symptoms and parenting stress.

Measures

Maternal depressive symptoms. The Beck Depression Inventory-II (BDI-II, Beck, Steer, & Brown, 1996) was used to assess depressive symptoms at 3, 7, and 14 months postpartum (3-month α = .90, 7-month α = .89, 14-month α = .89). The BDI-II is a 21-item self-report that has been established as a valid and reliable measure with postpartum women (Ji et al., 2010). Participants were asked to rate the intensity of their symptoms, on a scale from 0 to 3, by choosing the statement that best described their feelings over the past two weeks for items such as Sadness: *0 = I do not feel sad; 1 = I feel sad much of the time; 2 = I am sad all of the time; 3 = I am so sad or unhappy that I can't stand it*. Scores were summed for the 21 items.

Maternal stress. The Parenting Stress Index – Short Form (PSI-SF) (Abidin, 1995), a 36-item self-report questionnaire, was used to assess perceived stress from the mother's point of view at 3, 7, and 14 months postpartum (3-month α = .91, 7-month α = .92, 14-month α = .92). The questionnaire is also separated into three domains of parenting-related stress, with each subscale consisting of twelve items: (a) *Parental Distress* measured the mother's feelings of competence about being a parent and the associated responsibilities (e.g., "I feel trapped by my responsibilities as a parent"); (b) *Difficult Child* focused on perceptions of how challenging the child was (e.g., "My child generally wakes up in a bad mood"); (c) *Parent-Child Dysfunctional Interaction* measured the mother's feelings about her interactions with her child (e.g., "When I do things for my child, I get the feeling that my efforts are not appreciated very much").

Mothers used a 5-point Likert scale ranging from *1 = strongly agree* to *5 = strongly disagree* to rate items with higher scores indicating less parenting stress. Mean scores were derived for the total parenting stress score and all three subscales. For ease of interpretation, each score was multiplied by -1 so that a higher score represented more parenting stress.

Data Analysis Plan

Preliminary analyses consisted of descriptive statistics and examined relations between demographics, parenting stress, and maternal depressive symptoms. Four structural equation models were conducted to test bidirectional and unidirectional models of maternal depressive symptoms and parenting stress. As illustrated in Figure 2.1, the bidirectional model (Model 1) consisted of stability across timepoints (A), the cross-lagged effect or prediction of change by maternal depressive symptoms to parenting stress (B), the cross-lagged effect or prediction of change by parenting stress to maternal depressive symptoms (C), and their within-time covariances (D) to account for similar times of measurement. The unconstrained model, which allowed all paths to be freely estimated, was tested and examined for fit with the data. Next, each construct was set to be equal across time for all timepoints in order to establish measurement invariance and to test a more parsimonious model (Model 2). Two unidirectional models were also conducted for comparison with the bidirectional model. The first unidirectional model (Model 3) tested the pathway from stress to depression (See Figure 2.2). The second unidirectional model (Model 4) tested the pathway from depression to stress (See Figure 2.3). After finding the best-fitting model for parenting stress and maternal depressive symptoms by examining the fit statistics and the chi-square difference test, additional analyses were conducted for each subtype of parenting stress (*Parental Distress*, *Difficult Child,* and

Parent-Child Dysfunctional Interaction). All analyses were completed using SPSS 20 and

AMOS 20.

Results

Descriptive Analyses

Relations between demographic variables and maternal depressive symptoms and

parenting stress were examined. T-tests revealed that, at 14 months, non-white mothers (*PCDI M*

= -4.42, *SD* = .48; *PD M* = -3.59, *SD* = .50) had significantly less *Parent-Child Dysfunctional*

Interaction stress, $t(71) = 2.44$, $p = .017$, and *Parental Distress,* $t(70) = 2.65$, $p = .010$, than white

mothers (*PCDI M* = -4.70, *SD* = .35; *PD M* = -4.06, *SD* = .59).

An analysis of variance indicated that, at 3 and 7 months, women with a bachelor's

degree (3-month *M* = 8.41, *SD* = 6.90; 7-month *M* = 7.56, *SD* = 5.93) had significantly higher

levels of depressive symptoms than women with more than a bachelor's degree (3-month *M* =

4.96, *SD* = 4.29; 7-month *M* = 4.19, *SD* = 4.34), 3-month $F(2, 101) = 3.56$, $p = .032$; 7-month

$F(2, 90) = 4.27$, $p = .017$. At 14 months, women with some college or less (*M* = 8.18, *SD* =

5.83) had significantly higher levels of depressive symptoms than women with more than a

bachelor's degree (*M* = 4.02, *SD* = 4.64), $F(2, 77) = 3.20$, $p = .046$.

T-tests revealed significant differences in depressive symptoms by parity (multipara vs.

primapara) and infant gender (male vs. female). Multiparous women (*M* = 7.79, *SD* = 7.19) had

significantly higher levels of depressive symptoms than primiparous women (*M* = 5.29, *SD* =

4.50), $t(96) = 2.17$, $p = .033$, at 3 months postpartum, but not at 7 and 14 months. At 3 months,

primiparous mothers reported higher levels of stress related to *Difficult Child* (*M* = -4.25, *SD* =

.53) than multiparous mothers (*M* = -4.54, *SD* = .49), $t(95) = 1.95$, $p = .051$. Mothers of boys

(*M* = 6.49, *SD* = 6.13) reported higher levels of depressive symptoms than girls at 14 months

only ($M = 3.71$, $SD = 4.61$), $t(78) = 2.23$, $p = .029$. Mothers of boys reported significantly higher levels of stress related to *Parent-Child Dysfunctional Interaction* at 3 and 14 months postpartum (3 month: $M = -4.50$, $SD = .48$; 14 month: $M = -4.56$, $SD = .43$) than mothers of girls (3 month: $M = -4.73$, $SD = .30$; 14 month: $M = -4.76$, $SD = .29$), 3 month: $t(87) = 2.96$, $p = .005$, 14 month: $t(69) = 2.41$, $p = .019$.

T-tests examined the differences between low and high-risk mothers, with high-risk mothers reporting significantly higher levels of depressive symptoms at all timepoints than low-risk mothers (see Table 2.1). High-risk mothers also reported higher levels of overall parenting stress, and had higher scores on two of the subscales, *Parental Distress* and *Parent-Child Dysfunctional Interaction* (see Table 2.1).

Table 2.2 shows the means and standard deviations of maternal depressive symptoms and parenting stress. Bivariate correlations (see Table 2.2) revealed that parenting stress and all parenting stress subtypes were positively associated with maternal depressive symptoms at all timepoints, with the exception of 3-month *Difficult Child* stress, which was not significantly associated with maternal depressive symptoms at 14 months.

Structural Equation Modeling

The bidirectional and unidirectional models of maternal depressive symptoms and parenting stress over the first 14 months postpartum for the sample, after controlling for depression risk, were examined using structural equation modeling. Depression risk was controlled for because there were consistent, significant differences between low and high-risk women in level of depressive symptoms and parenting stress at all timepoints. Although other factors were significant, such as income, at particular timepoints, these factors were not consistent over time and were not controlled for due to the lack of power and small sample size.

The following fit indices were used to evaluate model fit: 1) the Comparative Fit Index (CFI), which should be above .90 for an acceptable fit and above .95 for a good fit; 2) Root Mean Square Error of Approximation (RMSEA), where less than .05 is a good fit, between .05 and .08 is an acceptable fit, and below .10 is a poor fit (Brown & Cudek, 1995; Kline, 2005). The chi-square should be as small as possible; it would ideally not be significant, but it is highly dependent on sample size and a significant chi-square alone does not disqualify the model fit (Schumacker & Lomax, 2010).

Four SEM models were conducted to test the bidirectional and unidirectional relations for each type of parenting stress and maternal depressive symptoms. Model 1 was the unconstrained bidirectional model, in which all paths were freely estimated (see Figure 2.1). Model 2 was the constrained bidirectional model with stability and cross-lagged paths set equal across time to establish measurement invariance. Model 3 was the unidirectional model with parenting stress predicting maternal depressive symptoms (see Figure 2.2). Model 4 was the unidirectional model with maternal depressive symptoms predicting parenting stress (see Figure 2.3). All models allowed with-in time error correlations to vary to account for similar time of measurement. The same modeling strategy was used for overall parenting stress and then with each type of parenting stress: *Parental Distress*, *Parent-child Dysfunctional Interaction*, and *Difficult Child*.

Parenting stress. Evaluation of multiple fit indices indicated that the first bidirectional unconstrained model was a poor fit for the data, χ^2 (8) = 19.24, p = .014, RMSEA = .12 [.05, .18], CFI = .97. The second bidirectional constrained model resulted in a reasonable model fit and established measurement invariance, χ^2 (12) = 19.92, p = .069, RMSEA = .08 [.00, .14], CFI = .98. A chi square difference test revealed that constraining the paths did not worsen the fit of

the model, $\Delta\chi^2(4) = .68$, $p > .05$. The third model deleted the cross-lagged paths from maternal depressive symptoms to parenting stress to test if this unidirectional model was a better fit than the bidirectional model, $\chi^2(13) = 21.78$, $p = .059$, RMSEA = .08 [.00, .14], CFI = .97. A chi square difference test revealed that eliminating the paths did not worsen the fit of the model, $\Delta\chi^2(1) = 1.86$, $p > .05$. Finally, the fourth model deleted the cross-lagged paths from parenting stress to maternal depressive symptoms to test if this unidirectional model was a better fit than the bidirectional model, $\chi^2(13) = 24.41$, $p = .028$, RMSEA = .09 [.03, .15], CFI = .97. A chi square difference test revealed that eliminating the path worsened the fit of the model, $\Delta\chi^2(1) = 4.49$, $p < .05$.

The third model fit the data well and was the most parsimonious (See Figure 2.4). All stability coefficients were significant, indicating that maternal depressive symptoms and parenting stress were dependent on the previous time point of measurement. T1 parenting stress significantly predicted an increase in T2 maternal depressive symptoms and T2 parenting stress predicted the increase in T3 maternal depressive symptoms. The hypothesis that the unidirectional model of earlier parenting stress would predict later maternal depressive symptoms and fit the data better than the bidirectional model was supported.

Parental distress. Evaluation of multiple fit indices indicated that the first bidirectional unconstrained model was a poor fit for the data, $\chi^2(8) = 25.01$, $p = .002$, RMSEA = .14 [.08, .21], CFI = .95. The second bidirectional constrained model resulted in a poor model fit as well, $\chi^2(12) = 28.69$, $p = .004$, RMSEA = .12 [.06, .17], CFI = .95, A chi square difference test revealed that constraining the paths did not worsen the fit of the model and that measurement invariance could be established, $\Delta\chi^2(4) = 3.68$, $p > .05$.

The third model deleted the cross-lagged paths from maternal depressive symptoms to parental distress to explore if the model fit was significantly worsened and to test if this unidirectional model was a better fit than the bidirectional model, χ^2 (13) = 28.74, p = .007, RMSEA = .11 [.05, .16], CFI = .95. A chi square difference test revealed that eliminating the path did not worsen the fit of the model, $\Delta\chi^2(1)$ = .05, p > .05. Finally, the fourth model deleted the cross-lagged paths from parental distress to maternal depressive symptoms to test if this unidirectional model was a better fit than the bidirectional model, χ^2 (13) = 30.51, p = .004, RMSEA = .11 [.06, .17], CFI = .97. A chi square difference test revealed that eliminating the paths did not worsen the fit of the model, $\Delta\chi^2(1)$ = 1.82, p > .05. For all models the stability coefficients were significant and none of the cross-lagged paths were significant. The hypothesis that the unidirectional model would be the best model was not supported. Although the unidirectional models were a better fit than the bidirectional model, no model was an acceptable fit. The hypothesis that cross-lagged paths from parental distress to maternal depressive symptoms would be significant was not supported, with earlier parental distress predicting later depressive symptoms and earlier depressive symptoms predicting later parental distress.

Difficult child. Evaluation of multiple fit indices indicated that the first bidirectional unconstrained model was a reasonable fit for the data, χ^2 (8) = 13.36, p = .10, RMSEA = .08 [.00, .15], CFI = .98. The second bidirectional constrained model resulted in a good model fit and established measurement invariance, χ^2 (12) = 15.99, p = .192, RMSEA = .06 [.00, .12], CFI = .98. A chi square difference test revealed that constraining the paths did not worsen the fit of the model, $\Delta\chi^2(4)$ = 2.63, p > .05. All stability coefficients were significant and the cross-lagged paths from maternal depressive symptoms to difficult child stress were significant, while the cross-lagged paths from difficult child stress to maternal depressive symptoms were not

significant. The third model deleted the cross-lagged paths from maternal depressive symptoms to parenting stress to test if a unidirectional model was a better fit than a bidirectional model, χ^2 (13) = 21.76, p = .059, RMSEA = .08 [.0, .14], CFI = .96. A chi square difference test revealed that eliminating the paths worsened the fit of the model, $\Delta\chi^2(1)$ = 5.77, $p < .05$. Finally, the fourth model deleted the cross-lagged paths from parent-child dysfunctional interaction stress to maternal depressive symptoms to test if this unidirectional model was a better fit than the bidirectional model, χ^2 (13) = 18.58, p = .137, RMSEA = .06 [.00, .13], CFI = .98 (See Figure 2.5). A chi square difference test revealed that eliminating the paths did not worsen the fit of the model, $\Delta\chi^2(1)$ = 2.59, $p > .05$. Although both the bidirectional model and the unidirectional model of depression predicting difficult child stress fit equally well, the unidirectional model is more parsimonious, so can be considered the best-fitting model, with significant cross-lagged paths from maternal depressive symptoms to difficult child stress. The hypothesis that the unidirectional model of difficult child stress predicting depressive symptoms was not supported and there were no significant paths from difficult child stress to depressive symptoms.

Parent-child dysfunctional interaction. Evaluation of multiple fit indices indicated that the first bidirectional unconstrained model was a poor fit for the data, χ^2 (8) = 20.84, p = .008, RMSEA = .12 [.06, .19], CFI = .94. The second bidirectional constrained model resulted in an acceptable model fit and established measurement invariance, χ^2 (12) = 22.94, p = .028, RMSEA = .09 [.03, .15], CFI = .95. A chi square difference test revealed that constraining the paths did not worsen the fit of the model, $\Delta\chi^2(4)$ = 2.10, $p > .05$. All stability coefficients were significant and all cross-lagged paths from parent-child dysfunctional interaction stress to maternal depressive symptoms were significant (See Figure 2.6). The third model deleted the cross-lagged paths from maternal depressive symptoms to parent-child dysfunctional interaction stress

to test if a unidirectional model was a better fit than the bidirectional model, χ^2 (13) = 29.18, p = .006, RMSEA = .08 [.06, .16], CFI = .97. A chi square difference test revealed that eliminating the paths worsened the fit of the model, $\Delta\chi^2(1) = 6.24$, $p < .05$. Finally, the fourth model deleted the cross-lagged paths from parent-child dysfunctional interaction stress to maternal depressive symptoms to test if this unidirectional model was a better fit than the bidirectional model, χ^2 (13) = 26.81, p = .013, RMSEA = .10 [.05, .16], CFI = .94. A chi square difference test revealed that eliminating the paths worsened the fit of the model, $\Delta\chi^2(1) = 3.87$, $p < .05$. The second, bidirectional model was the best-fitting model, supporting the hypothesis. Additionally, the hypothesis that all cross-lagged paths between parent-child dysfunctional interaction stress and maternal depressive symptoms would be significant was supported.

Discussion

The purpose of this study was to test bidirectional and unidirectional models of maternal depressive symptoms and parenting stress over the first 14 months postpartum, looking at both overall parenting stress and different domains of parenting stress. This was done by first examining the preliminary relations between maternal depressive symptoms and parenting stress. Next, structural equation modeling was used to compare bidirectional and unidirectional models of the relations between maternal depressive symptoms and parenting stress over time. I hypothesized that unidirectional models of stress predicting depressive symptoms would fit the data best for overall parenting stress, parental distress, and difficult child stress and that the paths from stress to depressive symptoms would be significant. I hypothesized that a bidirectional model would fit the data best for maternal depressive symptoms and parent-child dysfunctional interaction stress and that all cross-lagged paths would be significant.

Preliminary correlations revealed that maternal depressive symptoms and overall parenting stress were significantly and positively associated in the full sample within and across all time points. Further examination revealed that this held true for specific subtypes of parenting stress and maternal depressive symptoms, with the exception of 3-month difficult child stress with 14-month maternal depressive symptoms. These findings support previous research that has found associations between maternal depressive symptoms and parental distress (Cornish et al., 2006; Horowitz & Goodman, 2004; Misri et al., 2006; Sidor et al., 2011), and maternal depressive symptoms and dysfunctional parent-child interaction (Mason, Briggs, & Silver, 2011; Sidor et al., 2011). There have been conflicting findings with regard to difficult child stress and maternal depressive symptoms. Some studies have reported a connection (Britton, 2011; Cornish et al., 2006; McGrath, Records, & Rice, 2008; Milgrom & McCloud, 1996), whereas other studies have not found such an association (Misri et al., 2006; Pritchard et al., 2012). The two studies that did not find relations between maternal depressive symptoms and a more difficult child were unusual in that one had a sample of preterm infants (Pritchard et al., 2012) and the other used the full Parenting Stress Index, rather than the PSI-Short Form, which may account for some differences. The child domain of the full PSI measures things such as distractibility, and the ability to reinforce the parent, which are likely to be in the *Parent-Child Dysfunctional Interaction* subscale of the PSI-SF. In any event, the preliminary findings indicate that perceptions of a difficult child and maternal depressive symptoms were related.

The primary goal of this study was to test bidirectional and unidirectional models between maternal depressive symptoms and parenting stress over the first 14 months postpartum, and to explore specific subtypes of parenting stress. Four separate SEM models were conducted, one for overall parenting stress and three for each domain of parenting stress. All tested

bidirectional and unidirectional models. For overall parenting stress and maternal depressive

symptoms, the unidirectional model, with parenting stress predicting depressive symptoms, fit

the data best. There were significant cross-lagged effects of earlier parenting stress predicting

later maternal depressive symptoms, supporting the hypothesis. These findings support

cognitive theory, which suggests that stress activates depressive symptoms (Beck, 1976), and is

consistent with the few studies finding that concurrent parenting stress predicted maternal

depressive symptoms (Honey et al., 2003; Horowitz & Goodman, 2004).

Despite significant correlations between parental distress and maternal depressive

symptoms across time, the hypothesis that there would be significant cross-lagged effects of

parental distress to maternal depressive symptoms in the SEM model were not supported, nor

was there an acceptable model fit. This was surprising given the strength of the correlations.

Other research has examined parental distress and postpartum depressive symptoms and found a

strong association between the two, but because parental distress was only measured at one

timepoint in those studies, no conclusions could be made regarding directionality (Horowitz &

Goodman, 2004; Sidor et al., 2011). There are likely other important factors, such as social

support, that may mediate the relations between parental distress and maternal depressive

symptoms. If a woman is experiencing significant distress but has a good support system,

perhaps this buffers the development of depressive symptoms. Additionally, the majority of

women in this sample lived with their husband or partner, suggesting that they have a certain

level of support others may not have. It would also be interesting to explore if cognitive

vulnerabilities such as a ruminative response style may interact with parental distress.

Furthermore, there were low levels of depressive symptoms in this sample, even for the high-risk

59

women. More heterogeneity in depressive symptoms may be required to understand how parental distress and depressive symptoms are related over time.

For maternal depressive symptoms and difficult child stress, a unidirectional model fit the data best, however, it was not the hypothesized stress predicting depressive symptoms model, but the alternative depressive symptoms predicting stress model. There was a cross-lagged effect for earlier depressive symptoms predicting later difficult child stress, indicating that depressed mothers are more likely to perceive their child as difficult.   I hypothesized that a unidirectional model would fit best with significant cross-lagged effects of difficult child stress to maternal depressive symptoms, believing that having a difficult child would precede the increase in depressive symptoms. The results, however, indicate that earlier maternal depressive symptoms increase the likelihood that mothers will view their child as difficult, which is supported by some previous research. Gartstein and colleagues (2010), using latent growth curve modeling, found that 4-month maternal depressive symptoms were associated with significant increases in mother-reported infant fearfulness over the first year postpartum. Although they did not explore the bidirectional effects over time of depressive symptoms and infant temperament, the results correspond with the results of this study, indicating that women with higher levels of maternal depressive symptoms are more likely to perceive their child as difficult. A next step in the examination of this relationship would be to explore independent ratings of infant temperament along with maternal depressive symptoms over time, and to investigate biological mechanisms that may be associated with infant fussiness, such as cortisol reactivity and the prenatal environment.

The hypothesis that there would be significant cross-lagged effects of maternal depressive symptoms and parent-child dysfunctional interaction stress was supported. The

bidirectional model was a better fit than either unidirectional model. This is in line with cognitive theory and developmental transactional models of relationships, in that mothers who were feeling stress related to their interactions with their child would also feel more depressed and feeling more depressed in turn would make them feel more stress regarding their interactions with their child (Beck, 1976; Cummings & Davies, 1994).

Limitations of this study were that the women in the sample were primarily white, highly educated, and had relatively high levels of household income. The small sample size is limiting, in that it is difficult to conduct structural equation modeling with small samples when there is also a need to control for potentially confounding variables. There were differences in maternal depressive symptoms and parenting stress between primiparous and multiparous women, as well as differences by infant gender. These findings were not consistent over time, but warrant future investigation. Additionally, analyses examining maternal depressive symptoms and parenting stress by low-risk (no history of depression) and high-risk status (previous history of depression) indicated that there were significant differences in depressive symptoms and parenting stress between low and high-risk women. Risk status was not the focus of this particular study and the sample size limited the ability to examine high- and low-risk women in separate analyses, but it would be interesting to explore models of maternal depressive symptoms and parenting stress in samples of high- and low-risk women to determine if the results can be replicated or if there are different patterns by risk status. Because of the small sample size and unequal group size, I was not able to conduct multiple-group analyses to examine risk status as a moderator, so I controlled for risk status in the SEM analyses.

Clinical implications of this research include the need to focus on women's specific needs and understand that different types of stress have distinctive associations with depressive

symptoms. For example, knowing that women who are higher in depressive symptoms are more likely to experience stress because they view their infants as difficult and are less likely to have a positive outlook, clinicians could focus on the positive, reinforcing aspects of infants' behavior, such as when the infant smiles at the mother. This may also alleviate stress related to the parent-child interaction, since this particular type of stress appears to have a reciprocal relationship with depressive symptoms. Clinicians could normalize mothers' feelings and reassure mothers that their infants' behavior is typical and appropriate, as well as suggest and problem-solve with mothers to develop coping strategies when their infants are particularly difficult for them. Emphasizing the time-limited nature of infancy may also be of benefit for women. As infants mature and develop into toddlers and beyond, they become much more autonomous and need less care, which may alleviate mothers' stress. The aforementioned strategies could be used in home-based interventions, whether the clinician is a paraprofessional home visitor, infant mental health specialist, or visiting nurse. Pediatricians' offices consistently see mothers and infants over the first year and it would be important to incorporate questions into pediatric visits to ask about day-to-day stressors and acknowledge that the mother's wellbeing is important, not just the physical health of the infant. This would provide women with an opportunity to be heard and may open up a dialogue that women may be embarrassed or ashamed to broach on their own. This study provides a first step for examining parenting stress longitudinally, something that has been overlooked in prior research. Despite the call for transactional research that examines risk factors for children's development (Cummings & Davies, 1994), very few studies have examined parenting stress in conjunction with maternal depressive symptoms in longitudinal studies. More research is needed with larger, more diverse samples. It may also be useful to examine the development of parenting stress and depressive symptoms with women's depression risk as a

moderator, as well as including other variables, such as social support and treatment status. I found that there were clearly different patterns with regard to maternal depressive symptoms and specific types of parenting stress. No one model fit best across the different domains of parenting stress and it is vital that researchers and clinicians continue to consider that parenting stress consists of several unique factors that may relate differently with maternal depressive symptoms. Having a better understanding of how these different aspects of parenting stress and depressive symptoms may interact will provide clinicians and researchers with opportunities to develop better and more targeted interventions for depressed mothers.

Table 2.1
T-tests for Low- and High-Risk Women for Depressive Symptoms and Parenting Stress

	Risk		*t*	df
	Low	High		
3 Month Depressive Symptoms	3.89 (3.12)	7.56 (6.70)	3.79***	83
7 Month Depressive Symptoms	3.12 (3.32)	7.29 (6.22)	4.17***	79
14 Month Depressive Symptoms	3.14 (3.95)	6.12 (5.98)	2.12*	79
3 Month Parenting Stress	-4.49 (.30)	-4.20 (.46)	3.72***	68
7 Month Parenting Stress	-4.54 (.34)	-4.25 (.44)	2.89**	83
14 Month Parenting Stress	-4.55 (.34)	-4.20 (.42)	3.34***	71
3 Month Parental Distress	-4.15 (.45)	-3.74 (.69)	3.36**	69
7 Month Parental Distress	-4.24 (.63)	-3.80 (.67)	2.83**	83
14 Month Parental Distress	-4.40 (.49)	-3.81 (.56)	4.13***	70
3 Month Parent-Child Dysfunctional Interaction	-4.81 (.24)	-4.54 (.45)	3.74***	82
7 Month Parent-Child Dysfunctional Interaction	-4.84 (.23)	-4.60 (.47)	3.18**	79
14 Month Parent-Child Dysfunctional Interaction	-4.85 (.28)	-4.57 (.40)	3.32**	49
3 Month Difficult Child	-4.52 (.44)	-4.30 (.53)	1.84	95
7 Month Difficult Child	-4.53 (.47)	-4.35 (.51)	1.46	83
14 Month Difficult Child	-4.41 (.59)	-4.20 (.56)	1.41	71

Note. * $p < .05$, ** $p < .01$, ***$p < .001$

Table 2.2
Correlation Coefficients, Means, and Standard Deviations of Depressive Symptoms and Parenting Stress at all Timepoints

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. 3 Month DS	--														
2. 7 Month DS	.68***	--													
3. 14 Month DS	.62***	.63***	--												
4. 3 Month PSI	.62***	.53***	.42***	--											
5. 7 Month PSI	.54***	.59***	.47***	.82***	--										
6. 14 Month PSI	.52***	.52***	.50***	.78***	.78***	--									
7. 3 Month PD	.70***	.58***	.44***	.86***	.76***	.67***	--								
8. 7 Month PD	.51***	.67***	.49***	.66***	.84***	.63***	.76***	--							
9. 14 Month PD	.53***	.52***	.59***	.74***	.72***	.81***	.72***	.75***	--						
10. 3 Month PCDI	.43***	.42***	.36***	.82***	.64***	.61***	.57***	.50***	.57***	--					
11. 7 Month PCDI	.42***	.33**	.24*	.68***	.80***	.57***	.54***	.48***	.45***	.69***	--				
12. 14 Month PCDI	.33**	.34**	.25*	.63***	.59***	.80***	.45***	.39***	.44***	.67***	.61***	--			
13. 3 Month DC	.35***	.30**	.21	.80***	.63***	.67***	.47***	.34**	.54***	.56***	.51***	.50***	--		
14. 7 Month DC	.35***	.35***	.34**	.65***	.78***	.69***	.48***	.40***	.47***	.42***	.57***	.48***	.73***	--	
15. 14 Month DC	.37***	.39***	.33**	.58***	.60***	.85***	.45***	.36**	.45***	.37**	.38***	.64***	.62***	.73***	--
Mean	6.65	6.18	5.35	-4.28	-4.33	-4.30	-3.85	-3.92	-3.97	-4.61	-4.66	-4.65	-4.35	-4.40	-4.25
Standard Deviation	6.21	5.88	5.66	.44	.44	.43	.66	.69	.60	.42	.43	.39	.52	.50	.57

Notes. DS = Depressive Symptoms, PSI = Parenting Stress Index, PD = Parental Distress, PCDI = Parent-Child Dysfunctional Interaction, DC = Difficult Child.

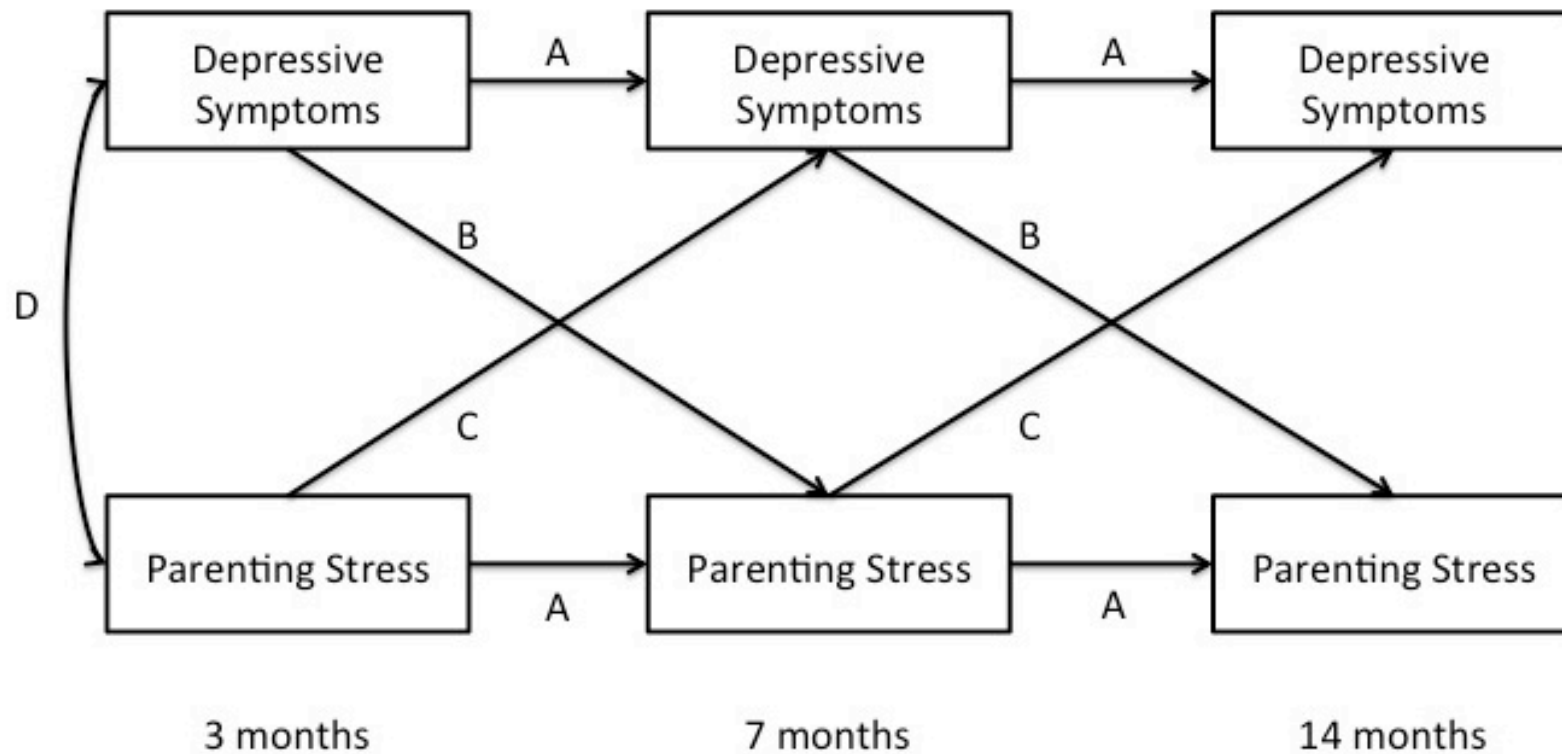* *p* < .05, ** *p* < .01, ***p < .001

Figure 2.1. Bidirectional model (Models 1 & 2) examining the stability (A) and bidirectional effects (B & C) of maternal depressive symptoms and maternal parenting stress from 3-months postpartum, 7-months postpartum, 14-months postpartum. D represents the covariance between the error terms at each timepoint. Error terms are not shown.
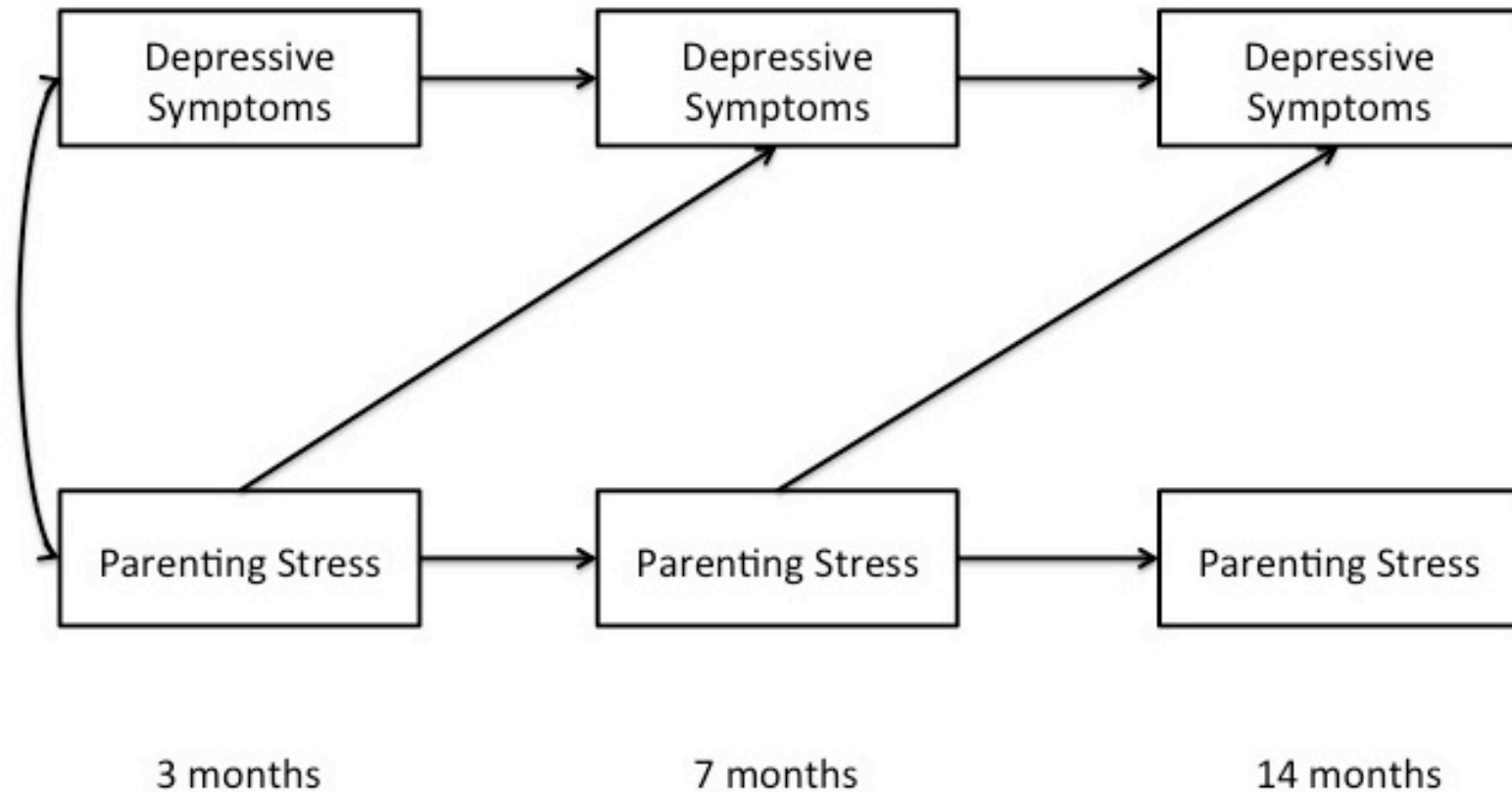
66

Figure 2.2. Unidirectional model of parenting stress predicting maternal depressive symptoms (Model 3).
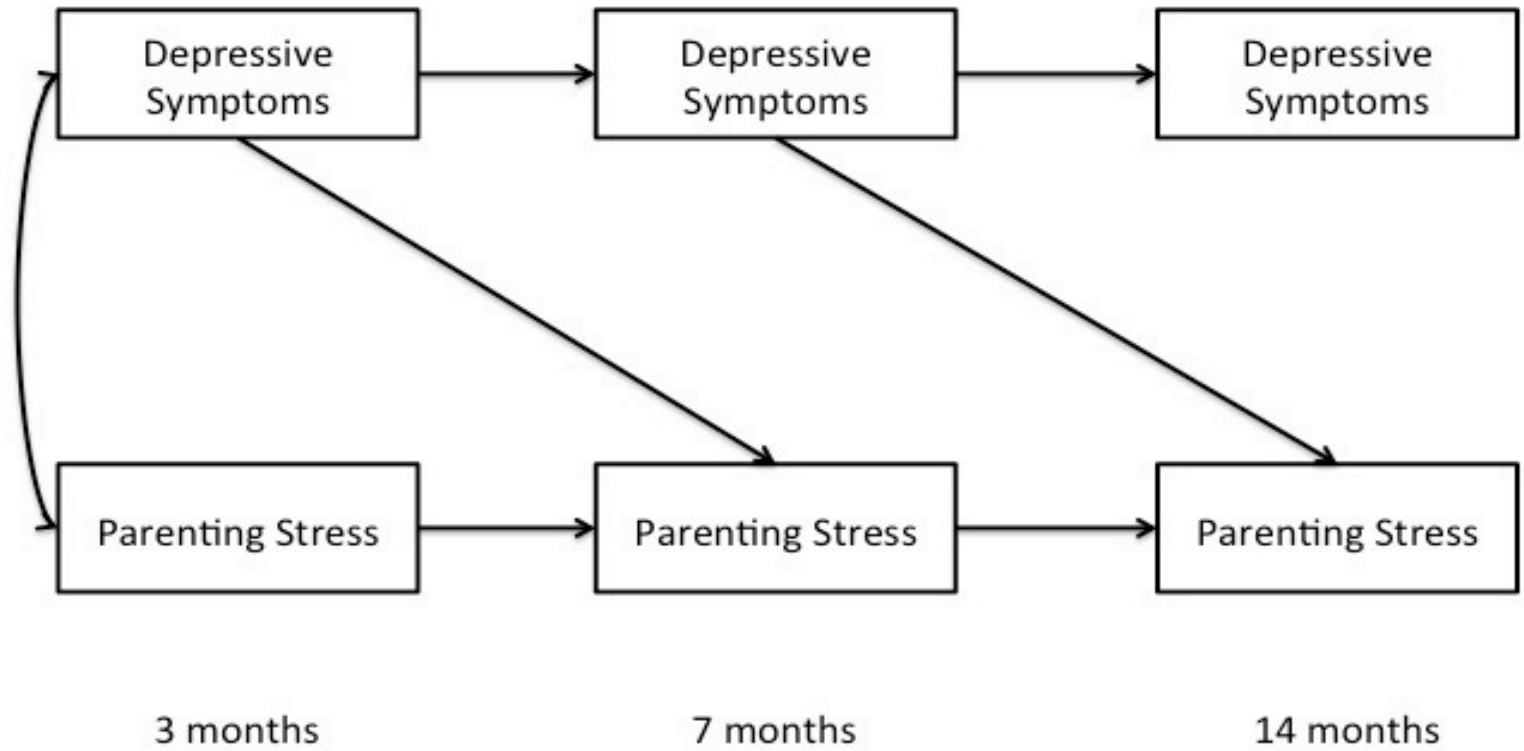
Figure 2.3. Unidirectional model of maternal depressive symptoms predicting parenting stress (Model 4).

Figure 2.4. Unidirectional model of total parenting stress predicting maternal depressive symptoms across 3, 7, and 14 months with standardized estimates, resulting in acceptable fit. χ^2 (13) = 21.78, *p* = .059, RMSEA = .08 [.00, .14], CFI = .97. Covariance estimates are not shown.

* *p* < .05, ** *p* < .01, ***p ≤ .001
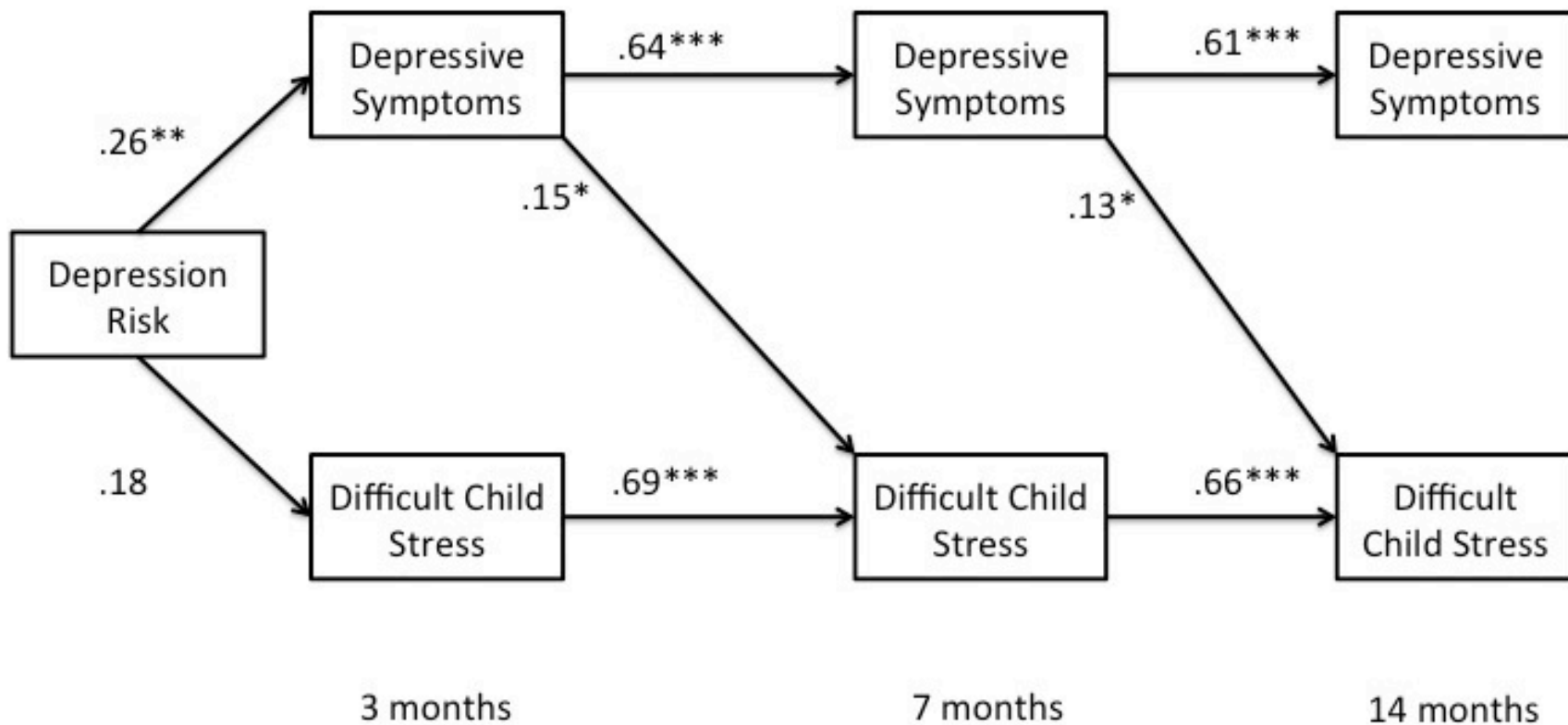
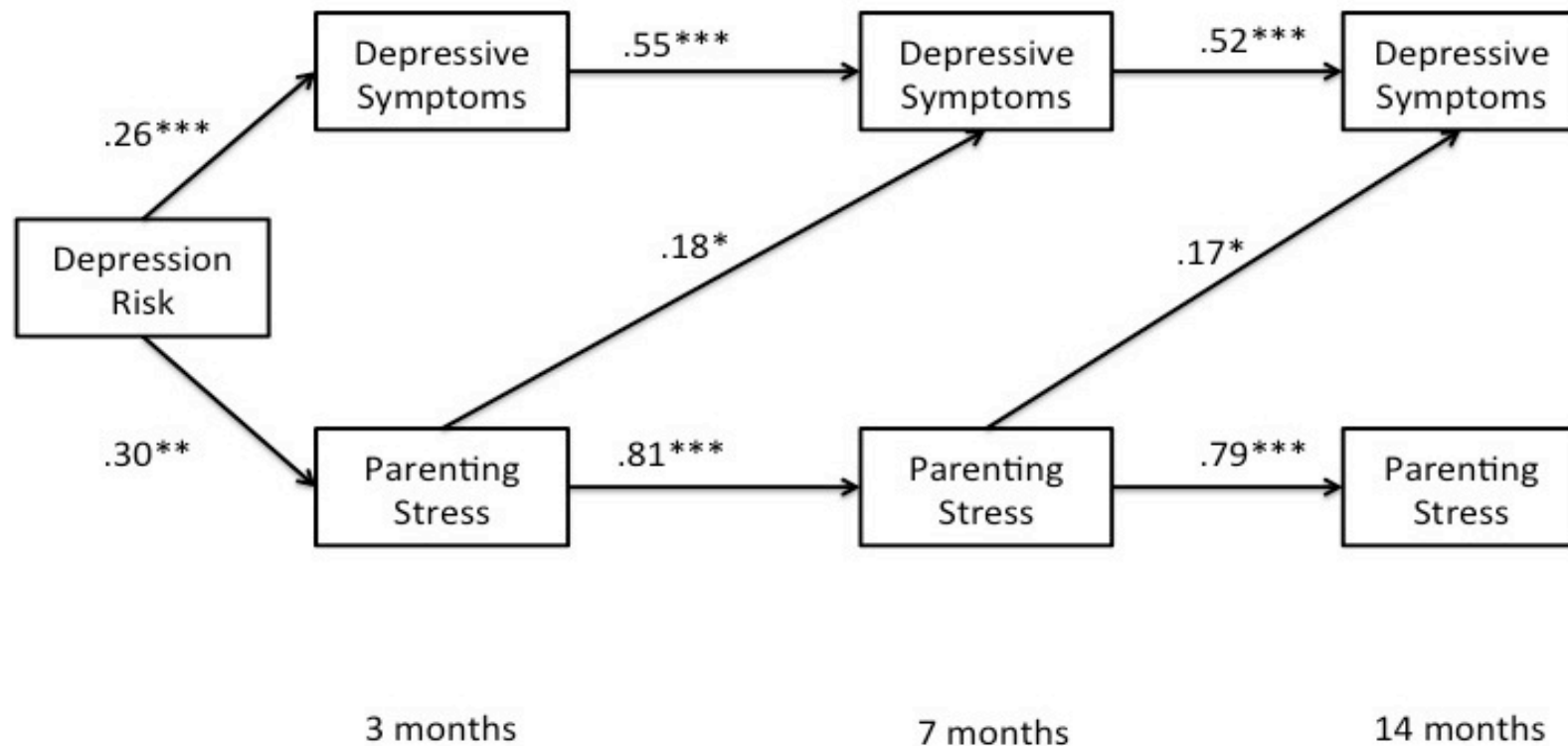*Figure 2.5.* Bidirectional model of *difficult child* stress and maternal depressive symptoms across 3, 7, and 14 months with standardized estimates, resulting in good model fit. $\chi^2 (12) = 15.99$, $p = .192$, RMSEA = .06 [.00, .12], CFI = .98. Covariance estimates are not shown.

* $p < .05$, ** $p < .01$, ***$p \leq .001$

Figure 2.6. Bidirectional model of *parent-child dysfunctional interaction (PCDI)* stress and maternal depressive symptoms across 3, 7, and 14 months with standardized estimates, resulting in acceptable model fit. χ^2 (12) = 22.94, p = .028, RMSEA = .09 [.03, .15], CFI = .95. Covariance estimates are not shown.
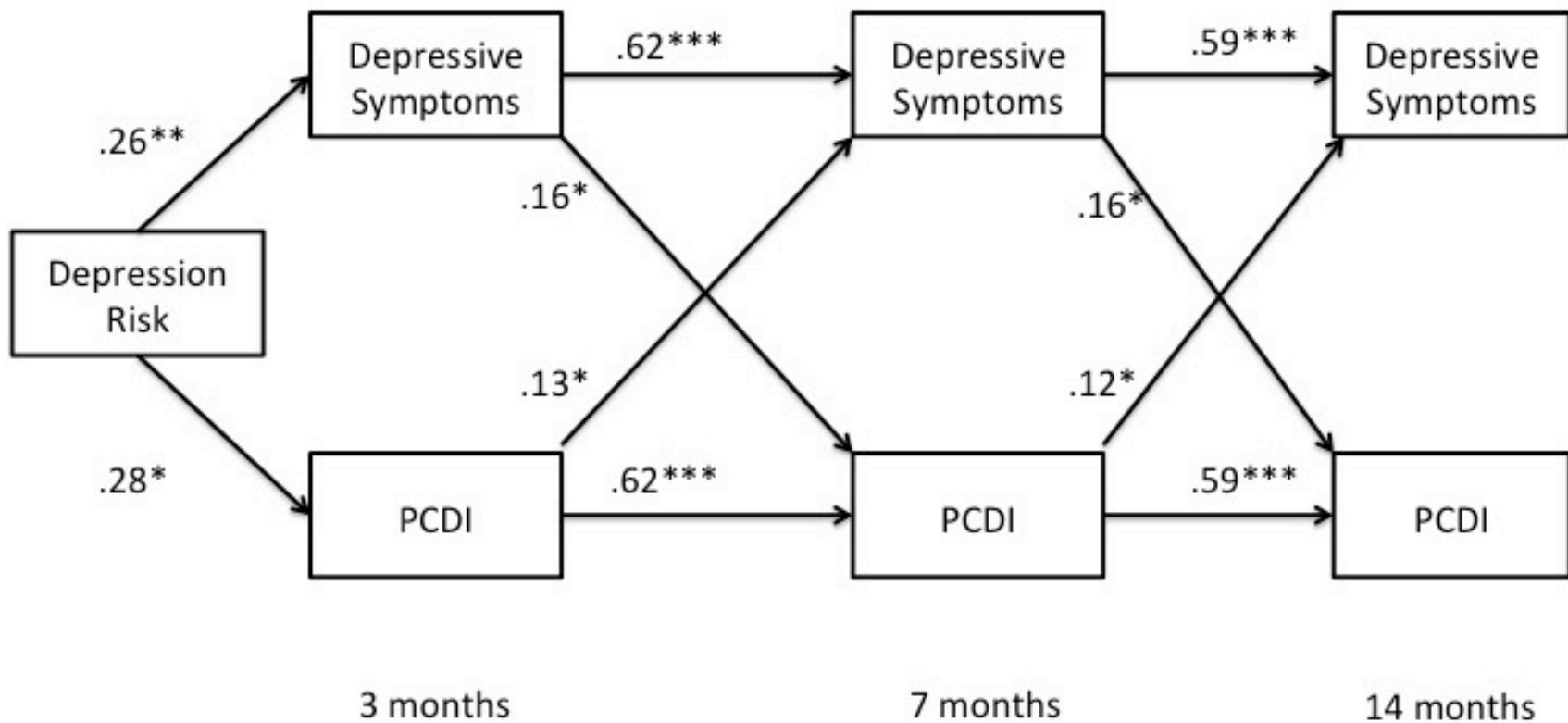
* $p < .05$, ** $p < .01$, *** $p \leq .001$

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CHAPTER IV

MATERNAL DEPRESSIVE SYMPTOMS, MATERNAL SELF-EFFICACY, AND MATERNAL RUMINATION

FOR SECOND-TIME MOTHERS

The transition to parenthood (TTP) has been a heavily-studied topic in psychological research, with a particular focus on the development of maternal depression during this time. The perinatal period is associated with an increased risk for maternal depression (Gaynes et al., 2005; Matthey, Barnett, Ungerer, & Waters, 2000; O'Hara & Swain, 1996). Mothers with higher levels of depressive symptoms are more likely to have less partner support, more marital difficulties, less optimal parenting, and are more likely to experience future depressive episodes (C. T. Beck, 2001; O'Hara & Swain, 1996; Paulson & Bazemore, 2010). Maternal depressive symptoms are associated with decreased maternal self-efficacy and both are related to less sensitive parenting (Leerkes & Crockenberg, 2002; Jones & Prinz, 2005; Teti & Gelfand, 1991). Higher levels of maternal self-efficacy are beneficial for mothers and children because maternal self-efficacy is related to greater parenting satisfaction, well-being, and more optimal parenting behavior, which, in turn, positively affects children's development (Coleman & Karraker, 1998; Elek, Hudson, & Bouffard, 2003; Jones & Prinz, 2005).

Although much is known about maternal depression and maternal self-efficacy during the transition to parenthood, much less is known about the experience of women going through the transition for a second time with the birth of another infant. What limited research there is indicates that the risk of maternal depression may be even greater for second-time mothers

(Mayberry, Horowitz, & Declercq, 2007). All of the issues that appear during the TTP may be exacerbated for second-time mothers, with second-time parents reporting less positive marital relationships and marital satisfaction, less enjoyment of their newborn, and less time spent as a couple than first-time parents (Belsky, Spanier & Rovine, 1983; Krieg, 2007). Additionally, second-time mothers are less responsive and less attentive to their first-born children once the new baby arrives (Dunn & Kendrick, 1980; Kendrick & Dunn, 1980). Mothers who are pregnant with their second child have the new stress of wondering how the entrance of a new family member will impact the first child, as well as how they will handle the needs of two children (Richardson, 1983). This unique situation warrants study of the associations between maternal depressive symptoms and maternal self-efficacy because of the potential ramification for children's development and maternal mental health.

The transition may be even more difficult for women who ruminate. Rumination, or passively and repetitively focusing on the sources and consequences of one's distress, has been suggested as a possible mechanism through which depression is intensified and it is associated with more depressive symptoms, lower levels of self-efficacy, and reduced problem-solving skills (Lyubomirsky & Nolen-Hoeksema, 1995; Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Nolen-Hoeksema, 2000; Treynor, Gonzalez, & Nolen-Hoeksema, 2003). The goal of this study was to investigate the associations of maternal depressive symptoms, maternal self-efficacy, and rumination for mothers after the birth of their second child. In addition, the bidirectional effects of maternal depressive symptoms and maternal self-efficacy were examined and rumination tested as a moderating factor. I first present research about the transition experience for second-

time mothers, followed by what we know about depression for multiparous women[2]. I then review studies of maternal depressive symptoms and maternal self-efficacy[3] during the toddler and preschool years. Finally, I present the response style theory and elaborate on rumination as a possible moderator of the relations between maternal depressive symptoms and maternal self-efficacy for women having their second child.

The Transition to Parenthood for Second-Time Mothers

Reports from women suggest that parenthood the second time around is quite different from the transition with the first child. Primiparous women are preoccupied with thoughts of what their infants will be like, labor and delivery, what the women themselves will be like as mothers, the change in the marital relationship, and the immediate concerns of taking care of an infant (Brazelton, 1981; Rubin, 1967). Multiparous women are concerned mostly with family dynamics and family relationships (Moss, 1981). Second-time mothers, in particular, have more family relationship concerns, including worrying about how their older child will react to the baby, in the first postpartum week than primiparous women or multiparous women who already have two or more children at home (Moss, 1981).

Second-time mothers have already experienced pregnancy, labor and delivery, and taking care of a newborn, but there is a multitude of firsts for second-time mothers. Will they love the second child as much? Will the first child be jealous and accept the baby? How will the mother deal with two children at once? But because these women have already had a child, they are

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[2] Multiparous, or having given birth two or more times, will be used throughout this paper and includes second-time mothers as well as mothers of more than two children. The term "second-time mothers" will be used to identify the specific sub-group of mothers going through the transition from one child to two. Primiparous, or having given birth one time, will be used interchangeably with first-time mothers.
[3] Maternal self-efficacy in this paper is focused on mothers' feelings of efficacy in caring for their first-born child, not their second-born infant.

considered experienced and not seen as needing help (Jordan, 1990; Mercer, 1979). Despite

their experience, second-time parents noted it was helpful during pregnancy to hear reassuring

comments regarding their parenting competence and to receive information about parenting two

children (Jordan, 1990). This may indicate that, although they have raised one child, second-

time parents feel unsure about their competence in parenting two children.

In addition to concerns regarding the balance of parenting two children, multiparous

women are also worried about changes in their relationships with their existing children. A

qualitative study of primiparous ($n = 5$) and multiparous ($n = 9$) women focused on women's

perceptions of changes in their relationships during pregnancy (Richardson, 1983). Without

exception, primiparous women did not identify any important relationships with children,

whereas all of the 9 multiparous women identified important relationships with their own

children as areas of concern regarding change. The multiparous women described their oldest

children as becoming more needy and dependent, and expressed concern that their children

began behaving differently during pregnancy. A retrospective study (Knox & Wilson, 1978) of

mothers of two children suggested that women experienced differences between the births of

their first child and second child. Women reported greater personal adjustment and a loss of

freedom with the birth of the first child, and an increased workload with the birth of the second

(Knox & Wilson). Maternal self-efficacy could be seriously undermined if women do not feel

that they are able to control their oldest child's behavior, to parent effectively, or to cope with the

increased demands of raising two children. Second-time mothers have concerns during

pregnancy about their older children that are a central component of their thoughts during the

perinatal period.

A few studies have examined the differences in psychological well-being between

primiparous and multiparous women. Wilkinson (1995) found that multiparous women reported significantly less wellbeing and more distress than primiparous women. Krieg (2007) explored parenting stress in first- and second-time mothers and found that parenting stress increased from pregnancy to postpartum for all women, not just primiparous women. Primiparous women may be feeling more stress in the postpartum period from the new experience of labor and delivery, or from caring for a newborn and the overall change in life, whereas for second-time mothers the increase in stress may result from the additional work of caring for another child and the shift in relationship dynamics. We cannot extrapolate research findings with primiparous women and generalize them to multiparous women. Research needs to explore the concerns, needs, and issues that are unique to second-time mothers. This will enable medical and mental health professionals to be more informed and work more effectively with mothers and families as they transition from the mother of one child to the mother of two children.

Depression during the Perinatal Period for Multiparous Mothers

Few studies have examined parity and maternal depressive symptoms specifically, but extant research does suggest that multiparous mothers have higher rates of depressive symptoms than primiparous mothers. Mayberry and colleagues (2007) found that women with two children had the highest rate of moderate to severe depressive symptoms compared with women with one child or women with more than two children in a cross-sectional sample of 1,359 women who reported their depressive symptoms within the first two years postpartum. Wilkinson (1995) reported that multiparous women experienced significantly lower mental well-being and higher psychological distress, which encompassed symptoms of anxiety and depression, than primiparous women. Dipietro, Costigan & Sipsma (2007) found that multiparous women reported higher levels of depressive symptoms than primiparous women prenatally and at 6

weeks postpartum. These studies contribute to the literature examining differences between primiparous and multiparous women, but in all cases second-time mothers were included within the larger group of multiparous mothers.

Maternal Self-efficacy and Maternal Depressive Symptoms during the Toddler and Preschool Years

Maternal self-efficacy is the belief in one's ability to be an effective or competent mother (Teti & Gelfand, 1991). It originates from Bandura's (1977) self-efficacy theory and influences how individuals approach tasks and challenges. Theoretically, if mothers believe they are able to positively influence their children, they are more likely to behave in a way that will produce the desired outcome (e.g., children's compliance), compared to women with low maternal self-efficacy, who may believe that nothing they do will produce the desired child behavior. For example, whether a mother feels confident or insecure about disciplining her toddler may influence how effective she actually is in setting limits with her child.

Although we know that maternal self-efficacy is important for infant development and parenting behavior for first-time mothers, we know very little about maternal self-efficacy in multiparous women. The two studies that have examined differences in maternal competence between primiparous and multiparous women focused on competence with regard to the new (second or later-born) infant, not the oldest child (Fish & Stifter, 1993; Mercer & Ferketich, 1995). The demands and needs of firstborn toddlers and preschoolers are different than those of infants and present new challenges for parents. Toddlers are mobile, often defiant, prone to temper tantrums, and beginning to assert their independence, often to the chagrin of their parents. Preschoolers are learning to share with others and to understand the emotions of other people. These can be trying times for parents, who may have mastered how to soothe an infant, but who

now must adjust their own parenting to accommodate these new challenges, such as setting limits and potty-training.

Despite these changes, there is very little information available regarding maternal self-efficacy during the toddler and preschool years, and even less that looks at parity. Gross and colleagues (1994) examined if maternal-self efficacy predicted concurrent depressive symptoms and if earlier maternal depressive symptoms predicted later low maternal self-efficacy across three timepoints over one year in two separate cohorts, one of 126 1-year-olds, and one of 126 2year-olds. Although they found that, within each time point, the lack of maternal self-efficacy significantly predicted maternal depressive symptoms, they did not find the hypothesized significant paths from earlier depressive symptoms to later lack of maternal self-efficacy.

La Roche, Turner, and Kalick (1994) investigated depressive symptoms and maternal self-efficacy in a sample of 26 mothers of 2- to 4- year-olds. Regressions with Time 1 maternal self-efficacy predicting Time 2 depressive symptoms, and Time 1 depressive symptoms predicting Time 2 maternal self-efficacy, did not reveal any significant predictors. The researchers did not examine relations within time or potential moderators and although they noted that all but one of the toddlers had siblings, they did not report if toddlers were first-born.

Sevigny and Loutzenhiser (2009) explored predictors of parenting self-efficacy in parents with first-born toddlers, but only one third of the families had a second child as well. The children were between 18 and 36 months for this cross-sectional study, which found that maternal self-efficacy was inversely associated with maternal depressive symptoms. Despite the significant correlations, further analyses revealed that depressive symptoms did not predict maternal self-efficacy.

One last study examined maternal self-efficacy and depressive symptoms in a sample of

652 mothers when the children were 2, 3, and 4 years of age (Weaver, Shaw, Dishion, & Wilson, 2008). No information regarding parity or number of siblings was given. There were significant inverse correlations between maternal depressive symptoms and maternal self-efficacy within and across time. Although they did find that maternal depressive symptoms at 2 and 3 years mediated the relations between maternal self-efficacy and children's behavior problems at 4 years, the bidirectional influence of maternal self efficacy and maternal depressive symptoms was not explored. The authors recommended that such bidirectional models should further investigate this process (Weaver et al., 2008).

Theoretical Framework: Response Style Theory & Rumination

One theory that may explain the development of depression for mothers during the perinatal period is the response style theory (Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema, 1987), which suggests that the way in which a person responds to distress may contribute to an escalation in depressive symptoms. A more passive, ruminative response style is associated with an increase in depressive symptoms, severity, and length of depressive episodes (Nolen-Hoeksema, 2000; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). When one responds in a more active, or problem-solving manner, the response style serves as a distraction, providing a reprieve from the recurring thoughts that may elicit depression. Rumination keeps one pre-occupied with the cause of negative thoughts and the accompanying stress without actively pursuing a solution to the situation. The central component of rumination is the thought process rather than the content (Nolen-Hoeksema et al., 2008). Treynor, Gonzalez, and Nolen-Hoeksema (2003) further clarified that brooding was a very specific maladaptive component of rumination that consisted of "a passive comparison of one's current situation with some unachieved standard" (p. 256).

Response style theory proposes that there are three primary mechanisms by which rumination contributes to depression (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008). First, ruminating allows for depressed mood to affect and enhance one's negative thoughts. Second, ruminating interferes with instrumental behavior, with individuals prone to high levels of rumination feeling less motivated to engage in beneficial behaviors. Third, ruminating interferes with and discourages effective problem-solving. Ruminators repetitively think about past events, whereas problem-solving requires moving forward and figuring out what must be done to resolve an issue. Individuals who ruminate are less likely to receive social support, as they are more likely to engage in pessimistic, depressive thoughts that may isolate themselves from others, further compounding the negative effects of a ruminative response style (Nolen-Hoeksema, 1991; Nolen-Hoeksema et al., 2008).

Although it has been established that rumination is a fairly stable construct and research has investigated rumination in children, adolescents, and adults, as well as in a variety of circumstances, such as bereavement and test-taking, only two studies have examined rumination during the perinatal period. In the first, O'Mahen, Flynn, and Nolen-Hoeksema (2010) found that rumination was associated with an increase in depressed mood for pregnant women. Even though the number of children was positively associated with maternal depressive symptoms, differences in rumination between first- and second-time mothers were not explored. In a second study, Stein and colleagues (2012) looked at women (diagnosed as anxious, depressed, or non-disordered control) 6 months postpartum and reported that inducing rumination in an experimental paradigm (i.e., primed with either a rumination, neutral, or positive stimulus prior to mother-infant interaction) interfered with mother-infant interaction, regardless of diagnosis. The study did not examine parity. Both studies contribute to the rumination literature for

mothers, but the unique circumstances surrounding the birth of a second child should be further considered because we know that second-time mothers are preoccupied with a variety of concerns during this time.

Some research has suggested that higher self-efficacy may be associated with more positive and active coping skills (Jex, Bliese, Buzzelll, & Primeau, 2001), but that a negative coping style, such as rumination, may negate the positive effects of high self-efficacy and result in more feelings of depression (Penland, Masten, Selhard, Fournet, & Callahan, 2000). Therefore, examining rumination as a moderator may help us to understand how depression develops and why some women experience depression while others do not. Perhaps lack of maternal self-efficacy is related to depression only when women are high ruminators and spend a great deal of time thinking about the demands of caring for two children.

A moderator is a variable that alters the strength or direction of the relationship between two other variables (Baron & Kenney, 1986). Few studies have examined rumination as a moderator between stress and depression, but there is some research suggesting that rumination may moderate the effects of stress on depressive symptoms (Cox, Funasaki, Smith, & Mezulis, 2012; Mezo & Baker, 2011). We know that there are associations between lack of maternal self-efficacy and parenting stress (Gerdes et al., 2007; Sevigny & Loutzenhiser, 2008). Dix & Meunier, in a meta-analysis of processes related to maternal depressive symptoms and parenting competence, specifically suggested that research should examine how "distraction, rumination, self-focus and attention-related factors affect the ability of mothers with depressive symptoms to respond sensitively to children's changing needs and interests" (p. 61, 2009). Dix & Meunier highlighted that not all children of women with depressive symptoms have poor outcomes and that it is necessary to examine what factors may moderate the effects of depressive symptoms on

child outcomes. They also emphasized that contextual factors may exacerbate depressive symptoms and the importance of examining moderators, such as rumination. The birth of a second child is definitely a time during which mothers are concerned with responding to their oldest child, who is going through age-related developmental changes, as well as the transition to having a sibling.

The Current Study

The purpose of the current study was to add to the limited literature on rumination during the perinatal period and to explore relations between rumination, maternal self-efficacy, and maternal depressive symptoms for second-time mothers. The few studies that have included multiparous women have either been cross-sectional or with very few longitudinal timepoints. This study investigated multiparous women at 4 timepoints starting in pregnancy and throughout the first postpartum year, providing a more complete picture of maternal depressive symptoms and maternal self-efficacy for women having their second child. This study is unique because maternal self-efficacy measured the mother's feelings of efficacy in controlling the firstborn's behavior while examining maternal depressive symptoms during the perinatal period. Past studies have focused mainly on maternal self-efficacy with primiparous women expecting their first child (Leerkes & Burney, 2007; Porter & Hsu, 2003). No studies to date have examined women's maternal self-efficacy after the birth of their second child, even though these women's concerns are unique to their developmental stage (e.g., balancing the care of two children change in family relationships, stress of taking care of a newborn).

The first aim was to investigate associations between rumination style, maternal depressive symptoms, and maternal self-efficacy. Response style theory (Morrow & Nolen-Hoekesma, 1990; Nolen-Hoekesma, 1991; Nolen-Hoeksema et al., 2008) would suggest that

having a ruminative response style, or repetitively and passively focusing on negative events in one's life, makes one vulnerable to depression. Rumination has also been associated with low feelings of self-efficacy (Lyubomirsky et al., 1999). Therefore, I hypothesized that rumination would be positively associated with depressive symptoms and inversely associated with maternal self-efficacy. In addition, I expected, that once the sample was split into *low* and *high* rumination groups, rumination would only be inversely associated with maternal self-efficacy for the *high* rumination group. Regardless of rumination level, I expected maternal self-efficacy and maternal depressive symptoms to be inversely correlated, in line with previous research (Sevigny & Loutzenhiser, 2009; Weaver et al., 2008).

The second aim of the study was to examine the stability and bidirectional effects of maternal depressive symptoms and maternal self-efficacy over the perinatal period and to explore rumination as a moderator (See Figure 3.1). In general, I expected that maternal depressive symptoms and maternal self-efficacy would be stable over time and that there would be significant bidirectional pathways between maternal depressive symptoms and maternal self-efficacy, in support of a cyclical negative process. I hypothesized that rumination level (*low* or *high*) would moderate the bidirectional effects of maternal self-efficacy and maternal depressive symptoms resulting in significant pathways for *high* ruminators only.

Method

Procedure

Women and their families were recruited through obstetric offices affiliated with midwestern university health care system, as well as through advertisements in local parenting publications, as part of the Family Transitions Study, a longitudinal study that examined the family's transition after the birth of a second child. Families were eligible to participate if: (a) the mothers were pregnant with their second child, (b) parents were fluent in English, (c) firstborns were between the ages of 1 and 5 when the infant was born, (d) infants were full-term, and both children were free from physical and developmental delays; and (e) both parents resided in the household.

Families were interviewed for the first time during the third trimester of pregnancy, when women were approximately 8 months pregnant. Data were also collected at 1, 4, 8, and 12 months postpartum through home visits, for a total of 5 timepoints of data collection. Parents were asked to complete a number of self-report measures to assess depressive symptoms, parenting self-efficacy, and rumination at each timepoint.

Data for the current study are from the prenatal (T1), 4 (T2), 8 (T3), and 12-month (T4) postpartum timepoints. Data from the 1-month timepoint were not used because mothers were not asked about their fatigue, which prior research has found to be associated with depressive symptoms during the early postpartum period (Dennis & Ross, 2005; Runquist, 2007), and may be confounded with depressive symptoms.

Participants

Initially 241 families were recruited for the study, however only 230 completed questionnaires at the prenatal visit. Of the 230 women who completed measures at the prenatal timepoint, 31 dropped from the study by 12 months, leaving 199 women (87%) in the study at the final timepoint. Women who dropped had significantly less education than women who remained in the study χ^2 (2) = 7.52, p = .023, with those who had some college or less more likely to drop than mothers with a bachelor's degree or higher. There were no significant differences in any of the other demographic or study variables between those who dropped and those who remained.

The mean maternal age at time of recruitment was 31.63 years (SD = 4.15). All women were expecting their second child and lived with their husband or partner. The average length of marriage was 5.78 years (SD = 2.66). Two-thirds (n = 153) of the households had an income of at least $60,000 and 84% ($n$ = 194) of the mothers had a bachelor's degree or above. Fifty-five percent (n = 123) of the second-born babies were male. The average age of the older child was 29.60 months (SD = 10.06) at the time of recruitment and 45% (n = 103) were male. The sample was 86% white (n = 198), 5% African American (n = 12), 3% Asian (n = 7), 4% Hispanic (n = 9), and 2% other (n = 4).

Measures

Depressive symptoms. The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, Erbaugh, 1961; Beck, Steer, Garbin, 1988) was used to assess *depressive symptoms* at all timepoints. The BDI is a 21-item self-report that has been established as a valid and reliable measure with postpartum women (Ji et al., 2010). Mothers were asked to rate the intensity of their symptoms, on a scale from 0 to 3, by choosing the statement that best described their

feelings over the past two weeks for items such as Sadness: 0 = *I do not feel sad*; 1 = *I feel sad much of the time*; 2 = *I am sad all of the time*; 3 = *I am so sad or unhappy that I can't stand it*. Scores were summed across the 21 items.

       Rumination. At each timepoint women completed the *brooding* subscale from the Ruminative Responses Scale (Treynor, Gonzalez, Nolen-Hoeksma, 2003) which was used to assess to what extent parents passively compared their life to some standard. This 5-item scale asked participants to rate how often they experienced particular thoughts when they were feeling down, such as "How often do you think 'Why can't I handle things better?'" The responses ranged from 1 = *almost never* to 4 = *almost always*. Scores were summed for the 5 items. Using a median split (*Mdn* = 8.00) for prenatal level of rumination, I created two groups: *low ruminators* (*n* = 119) had scores of 8 or less and *high* ruminators (*n* = 110) had scores of 9 or more.

       Maternal self-efficacy. The Parental Locus of Control Scale (Campis, Lyman, & Prentice-Dunn, 1986) consisted of 47 items that explored various facets of parental feelings of control. Previous research identified 5 valid and reliable subscales (Campis, Lyman, &Prentice-Dunn, 1986). For this study, two subscales were composited and used to assess parental feelings of self-efficacy and control related to parenting the oldest child at all timepoints. The first subscale, *parental efficacy*, consisted of 10 items about the parent's self-efficacy and contained items such as "When something goes wrong between me and my child, there is little I can do to correct it. " The second subscale, *parental control over child behavior*, asked the parent 10 questions about how much control she had over her child's behavior, with questions such as "I always feel control when it comes to my older child". Agreement was rated on a scale of 1 = *strongly agree* to 5 = *strongly disagree.* A composite mean score of *maternal self-efficacy* was

created across the 20 items. A high score indicated a low sense of maternal self-efficacy; for ease of interpretation, scores were multiplied by -1 so that a high score corresponded with high feelings of maternal self-efficacy.

Data Analysis Plan

Preliminary analyses consisted of descriptive statistics and correlations between the study variables. Structural equation modeling was then used to test bidirectional relations between maternal depressive symptoms and maternal self-efficacy in the full sample. As illustrated in Figure 3.1, the model consisted of the stability effects from one time point to the next for maternal depressive symptoms and maternal self-efficacy (A), the cross-lagged effects or prediction of change in maternal self-efficacy by maternal depressive symptoms (B), the cross-lagged effects or prediction of change in maternal depressive symptoms by maternal self-efficacy (C), and their within-time error correlations (D) to account for correlated measurement error (Schumacker & Lomax, 2010). The unconstrained model was tested and examined for fit with the data. Next, each construct was set to be equal across time for the postpartum timepoints in order to establish measurement invariance and to test a more parsimonious model. A third model set the constraints to be equal at all timepoints, including prenatal, to test measurement invariance. After finding the best-fitting model for the full sample by examining the fit statistics and the chi square difference test, multiple-group analyses compared the fit of the model for *low* and *high*-ruminating mothers, thereby testing rumination level as a moderator. All analyses were completed using SPSS 20 and AMOS 20.

Results

Descriptive Analyses

Relations between demographic variables and maternal depressive symptoms, maternal self-efficacy, and rumination were examined. No relations were found between maternal depressive symptoms, maternal self-efficacy, and rumination and the older child's age or gender, household income, or the mother's race. Bivariate correlations revealed an inverse association between maternal age and rumination at 8 months postpartum, $r(202) = -.15$, $p = .034$. An analysis of variance indicated that at eight months, women with high school or some college ($M = 10.90$, $SD = 3.65$) had higher levels of rumination than women with a bachelor's degree ($M = 9.59$, $SD = 2.43$) or more than a bachelor's degree ($M = 9.32$, $SD = 2.74$), $F(2, 203) = 3.66$, $p = .028$. An analysis of variance indicated that at the prenatal timepoint, women with high school or some college ($M = 11.64$, $SD = 7.58$) had higher levels of depressive symptoms than women with a bachelors degree ($M = 8.54$, $SD = 5.14$) or more than a bachelor's degree. ($M = 8.85$, $SD = 5.38$), $F(2, 227) = 4.09$, $p = .018$. Because none of these results were consistent across timepoints they were not controlled for in further analyses.

Table 3.1 shows the correlations, means, and standard deviations for levels of maternal depressive symptoms, rumination, and maternal self-efficacy for the full sample at each timepoint. Additional descriptive statistics were calculated for low and high ruminating mothers (see Table 3.2). Within the full sample, depressive symptoms were positively associated with rumination and inversely associated with maternal self-efficacy at all timepoints (See Table 3.1). Rumination was also inversely associated with maternal self-efficacy for the full sample at all timepoints. The hypothesis that depression would be positively associated with rumination and

inversely associated with maternal self-efficacy was supported, as was the hypothesis that

rumination would be inversely associated with maternal self-efficacy.

Table 3.2 shows correlations for *high* and *low* ruminators. Regardless of group

classification, depressive symptoms were positively associated with rumination within each

timepoint. Within the *high* ruminator group, rumination was inversely associated with maternal

self-efficacy at each timepoint. Contrary to the hypothesis, maternal depressive symptoms were

not significantly related to maternal self-efficacy for the *high* ruminator group, with the

exception of Time 2. Within the *low* ruminator group, there were inconsistent associations

between rumination and maternal self-efficacy, with significant correlations at T2 and T4, but

not T1 or T3. The hypothesis that rumination and maternal self-efficacy would be inversely

associated only for *high* ruminators was partially supported.

Structural Equation Modeling

The bidirectional effects of maternal self-efficacy and maternal depressive symptoms

from pregnancy to 12 months postpartum for the full sample were examined using structural

equation modeling. The following fit indices were used to evaluate model fit: 1) the

Comparative Fit Index (CFI), which should be above .90 for an acceptable fit and above .95 for a

good fit; 2) Root Mean Square Error of Approximation (RMSEA), which should be less than .05

for a good fit and between .05 and .08 for an acceptable fit (Kline, 2005). The chi-square should

be as small as possible; it would ideally be non-significant, but it is highly dependent on sample

size and a significant chi-square alone does not disqualify the model fit (Schumacker & Lomax,

2010).

The first model was an unconstrained model in which all stability paths, cross-lagged

paths, and within-time error correlations were allowed to vary. Fit indices indicated the model

was not a close approximate fit of the data, χ^2 (12) = 77.11, p = .000, RMSEA = .15 [.12, .19], CFI = .94. The next model constrained the postpartum stability paths and postpartum cross-lagged paths to be equal across time to establish measurement invariance during the postpartum period, but allowed the prenatal stability paths, prenatal cross-lagged paths, and all within-time error correlations to vary, χ^2 (16) = 79.81, p = .000, RMSEA = .13 [.11, .16], CFI = .94. A chi square difference test revealed that constraining the postpartum paths did not worsen the fit of the model, $\Delta\chi^2(4)$ = 2.70, p > .05. Finally, a third model constrained all stability paths and cross-lagged paths across the perinatal period and allowed the within-time error correlations to vary. This model tested whether measurement invariance could be established across the entire perinatal period, χ^2 (20) = 91.13, p = .000, RMSEA = .13 [.10, .15], CFI = .93. A chi square difference test revealed that constraining the prenatal paths to be equal with the postpartum paths worsened the fit of the model, $\Delta\chi^2(4)$ = 11.32, p < .05, indicating that there was measurement variance between the prenatal and postpartum period.

The second model was the best-fitting and the most parsimonious (See Figure 3.2). All stability coefficients were significant, indicating that maternal depressive symptoms and maternal self-efficacy were dependent on the previous timepoint of measurement. T1 maternal depressive symptoms significantly predicted a decrease in maternal self-efficacy at T2. The hypothesis that there would be significant cross-lagged effects between maternal depressive symptoms and maternal self-efficacy for the full sample was not supported, with the exception of the path from T1 depressive symptoms to T2 maternal self-efficacy.

After exploring the bidirectional model with the full sample, a multiple-group comparison was conducted to test rumination level as a moderator to see if there were stronger relations between maternal depressive symptoms and maternal self-efficacy depending on

whether women were *low* or *high* ruminators. The first model used the structure that best fit the

data from the full-sample analysis. The model constrained the postpartum stability paths and

postpartum cross-lagged paths to be equal across time, but allowed the prenatal stability paths,

prenatal cross-lagged paths, and all within-time error correlations to vary. The *low* and *high*

rumination groups were allowed to vary from one another. This model was an acceptable fit for

the data, χ^2 (32) = 91.87, *p* = .000, RMSEA = .09 [.7, .11], CFI = .94. All stability coefficients

were significant, indicating that maternal depressive symptoms and maternal self-efficacy were

dependent on the previous timepoint of measurement. There were no significant cross-lagged

effects. Maternal depressive symptoms did not predict maternal self-efficacy at any timepoint,

nor did maternal self-efficacy predict maternal depressive symptoms. The second model

retained the postpartum stability path constraints and the postpartum cross-lagged constraints.

The parameters for the *low* and *high* rumination groups were set to be equal to one another to

examine a more parsimonious fit and to see if the constraint significantly worsened the fit of the

data. If the fit was significantly worse, this would indicate a moderating effect of rumination

level. The second model was also an acceptable fit for the data, χ^2 (40) = 95.63, *p* = .000,

RMSEA = .08 [.06, .10], CFI = .94. All stability coefficients were significant, indicating that

maternal depressive symptoms and maternal self-efficacy were dependent on the previous

timepoint of measurement. There were no significant cross-lagged effects. Maternal depressive

symptoms did not predict maternal self-efficacy at any timepoint, nor did maternal self-efficacy

predict maternal depressive symptoms. The chi-square difference test between the first and

second model indicated that constraining the groups to be equal did not worsen the fit and that

there was not a significant difference between the two models, $\Delta\chi^2(8)$ = 3.76, *p* > .05. The non-

significant chi-square difference test suggested that there was effect invariance across the groups

and that the data for the *low* and *high* rumination groups fit the path model. Therefore, rumination level was not a moderator of the relations between maternal self-efficacy and maternal depressive symptoms. The hypothesis that there would be significant bidirectional effects of maternal self-efficacy and maternal depressive symptoms for the *high* rumination group was also not supported. Although there was no difference between the two models, the second model was a more parsimonious model and considered a better model fit.

Discussion

The overall objective of this study was to investigate the relationship between maternal depressive symptoms, rumination, and maternal self-efficacy for second-time mothers. This was done by first examining the relations between maternal depressive symptoms, maternal self-efficacy, and rumination for the full sample. Additionally, relations between these variables for *low* and *high* ruminators were examined. I hypothesized that maternal depressive symptoms and maternal self-efficacy would be positively correlated regardless of rumination group but that maternal self-efficacy and rumination would be inversely associated for only *high* ruminators. Next, structural equation modeling was used to test the bidirectional effects of maternal depressive symptoms and maternal self-efficacy for the full sample. Finally, multiple-group SEM was conducted to test if rumination level was a moderator of these bidirectional effects. I hypothesized that maternal depressive symptoms and maternal self-efficacy would be stable over time and that there would be significant pathways between them for the full sample, but that when rumination was entered as a moderator that there would be significant pathways for *high* ruminators only.

Maternal depressive symptoms, maternal self-efficacy, and rumination were all associated in the full sample as hypothesized. Depressive symptoms were positively correlated

with rumination and inversely correlated with maternal self-efficacy. Rumination was inversely correlated with maternal self-efficacy as well. These findings were consistent at every time point and replicate previous research that has found a link between depressive symptoms and rumination (Nolen-Hoeksema, 2000; Nolen-Hoeksema et al., 2008), and depressive symptoms and lack of maternal self-efficacy (Sevigny & Loutzenhiser, 2009; Weaver et al., 2008).

After mothers were split into groups of *low* and *high* ruminators, significant inverse associations were found consistently for maternal self-efficacy and rumination for *high* ruminators, as hypothesized, however, there were also significant correlations for the *low* ruminators, albeit inconsistent. Significant associations were found between depressive symptoms and rumination, as anticipated. Depressive symptoms and maternal self-efficacy were inversely related for *low* ruminators, but there was no such association for *high* ruminators at eight months prenatal, eight months, and twelve months postpartum. This was an unexpected finding, as previous research indicated an association within time for maternal self-efficacy and maternal depressive symptoms (Sevigny & Loutzenhiser, 2009; Weaver et al., 2008). A possible explanation for this can be found in experimental research that studied dysphoric and non-dysphoric college students assigned to a rumination or distraction prime and asked to list solutions for particular problems (Lyubomirsky et al., 1999). Although there was no difference in quality of solutions, dysphoric students in the rumination condition said they would be less likely to implement these solutions than dysphoric students in the distraction condition and non-dysphoric students in either condition. The researchers suggested this was due to the amount of energy and motivation required to implement the solutions. It is possible that *high* ruminating mothers felt that they have higher maternal self-efficacy, but do not put forth the effort required in parenting their older child. For example, one of the items that mothers responded to was

97

"When something goes wrong between me and my older child, there is little I can do to correct it." Although the mother may know what she *could* do to correct "something," if she is depressed she may not actually be implementing the solution. This may be particularly salient for second-time mothers who have the immediate needs of an infant to attend to as well as those of their older child. There may also be heterogeneity in responses among high ruminators, with some high ruminators reporting low levels of self-efficacy. This might explain why there was no significant relation in either direction between depressive symptoms and maternal self-efficacy in the *high* ruminators. Observations of mother-child interaction may provide further insight to this finding in future research.

The second goal of this study was to explore bidirectional effects over time between maternal depressive symptoms and maternal self-efficacy in the full sample, and to explore rumination as a moderator of these effects. Despite significant correlations between self-efficacy and maternal depressive symptoms across time, there were no significant cross-lagged effects of either maternal depressive symptoms or maternal self-efficacy in the SEM model for the full sample, with the exception of prenatal depressive symptoms predicting 4-month lack of maternal self-efficacy. The lack of predictors is consistent with previous research that did not find that earlier maternal depressive symptoms predicted later maternal self-efficacy in a sample of mothers of toddlers (Gross, 1994; LaRoche et al., 1994) or that earlier maternal self-efficacy predicted later depressive symptoms (LaRoche et al., 1994). I had hoped that a more sophisticated, bidirectional approach would reveal complex relations that simpler analyses might not detect.

I found an acceptable model fit when *low* and *high* rumination groups were analyzed in a multiple-group SEM model, but there were not a significant difference between the *low* and *high*

rumination group models, indicating that prenatal level of rumination was not a moderating factor. There were also no significant pathways between maternal depressive symptoms and maternal self-efficacy for either group. There are a few reasons why I may not have found support for my hypotheses. One may be that including the 1-month timepoint would provide more information with regard to the bidirectional effects for the full sample. It originally was not included because the one-month timepoint has been shown to a peak time of stress and fatigue, which may be confounded with depressive symptoms (Dennis & Ross, 2005; Mercer, 1986; Runquist, 2007; Wallace & Gotlib, 1990). Another possibility is that findings might be stronger in a sample of higher-risk women, either because they were already depressed or because of environmental stressors. The level of depressive symptoms in the current sample was quite low and may account for the lack of significant cross-lagged pathways. The prenatal mean score for the full sample, and even for the *high* ruminators, was under 13, which is in the minimal depressive symptoms range (Beck et al., 1996). Additionally, depressive symptoms actually decreased over time in this community-based sample of second-time mothers. Perhaps a sample of clinically depressed mothers or mothers with depressive symptoms in the moderate range would reveal different results. There may also be a difference by rumination level in a more depressed sample. Furthermore, I used a median split to delineate low and high ruminators, whereas some studies have used one standard deviation above and below the mean to define *low* and *high* rumination groups (Mezo & Baker, 2012; Vanhalst, Luyckx, Raes, & Goossens, 2012). I may have found different results, but greatly reduced the sample size, had I used this method. Co-rumination, or ruminative conversations between two people in a close relationship about a problem that one of them is having, is another possible explanation for the lack of significant results in the multiple-group analysis. The current report focused only on the

mothers but there is similar information for all the fathers. Recent research has suggested that co-rumination may moderate the development of depression (White & Shih, 2012). In the future, it would be interesting to examine if there are differences in depressive symptoms for high-ruminating mothers married to high-ruminating fathers and high-ruminating mothers married to low-ruminating fathers. Lastly, it may be that rumination functions as a mediator between maternal self-efficacy and depressive symptom rather than a moderator. Future analyses could explore this possibility using a developmental cascades model that takes into consideration the meditational paths over time in longitudinal data (Cox, Mills-Koonce, Gariépy, 2010).

Limitations of this study included the homogeneous nature of the sample. The women were, as a whole, white, highly educated, and mostly middle-class. Because the sample was recruited from the local community with the intent to examine a normative developmental transition, the sample was fairly well-functioning and there were very few mothers with high levels of depressive symptoms. Further, depressive symptoms were assessed with a self-report measure, rather than a clinical diagnosis. Because the study was designed to examine the role of fathers for children's adjustment after the birth of a sibling, all women had male partners living in the home. Thus, these findings cannot be generalized to other populations. The transition after a second child may be a very different experience for single mothers or families under considerable stress. Despite the mixed findings of the study, there are some notable strengths, such as the relatively low attrition rate and multiple timepoints throughout the perinatal period. Most noteworthy, however, is that this was one of the first studies to explore maternal depressive symptoms and maternal self-efficacy in experienced mothers going through the transition from one child to two.

Professionals who work with pregnant women and families should be aware that the transition to parenthood the second-time around has its own unique challenges. Although women have gone through pregnancy and caring for a newborn once, they have concerns about their ability to effectively parent and balance the needs of a newborn and older child at the same time. Acknowledging the differences of parenting one child and two is an important first step in providing effective treatment and support to families during this transition. Additionally, women may have different pregnancy and labor experiences and the new infant is bound to have a different temperament than their older sibling. Women may not experience the same level of social support as they did the first time, as family and friends will often view the second-time mother as an experienced parent who does not need the support, resources, and attention of a first-time mother. Those who see mothers during pregnancy, such as obstetricians and mental health clinicians, have an opportunity to discuss these potential issues with women and assess their need for additional support and resources before the infant arrives and help them prepare for the increased responsibilities of the postpartum period. The findings from this study suggest that there is an association between rumination, parenting self-efficacy, and depressive symptoms, even for low ruminators. Mental health clinicians should explore if ruminative thoughts are related specifically to these additional concerns regarding balancing two children, or if there are other areas that mothers are ruminating about, such as how the marital relationship might be affected by a new family member, or financial stresses. Whatever the focus, clinicians can use the emerging themes to guide treatment.

A plethora of research has studied the transition to parenthood and the changes associated with the birth of a first child for parents. In comparison, women who have already had one child are considered experienced mothers and not in need of help (Jordan, 1990; Mercer, 1979). As

101

such, these women have been an understudied population. There is a difference between the transition to parenthood that first-time mothers undergo and the state of parenthood in which second-time mothers are ensconced. Parenthood is a process, not a time-limited event (Wilkinson, 1995). Research has focused on the change from non-parent to parent, but there is a need for research that recognizes and considers parenthood as part of an individual's life-cycle where second-time mothers differ from first-time mothers in how the transition after the birth of a second child impacts the existing family unit, their relationships, and parental mental health. This study is the first to explore mothers' feelings of self-efficacy with their oldest child while going through the transition and contributes to the growing rumination literature. Future research in this field can build on the findings from this study and inform researchers and practitioners working with families and children.

Table 3.1

Correlations, Means, and Standard Deviations of Depressive Symptoms, Maternal Self-Efficacy, and Rumination for the Full Sample

	1	2	3	4	5	6	7	8	9	10	11	12
1. T1 DEP	--											
2. T1 RUM	.45***	--										
3. T1 MSE	-.24***	-.23***	--									
4. T2 DEP	.54***	.28***	-.17*	--								
5. T2 RUM	.37***	.47***	-.14*	.53***	--							
6. T2 MSE	-.26***	-.27***	.73***	-.32***	-.28***	--						
7. T3 DEP	.49***	.27***	-.17*	.63***	.48***	-.20**	--					
8. T3 RUM	.37***	.43***	-.22**	.35***	.60***	-.26***	.54***	--				
9. T3 MSE	-.26***	-.23***	.73***	-.26***	-.23***	.82***	-.21**	-.25***	--			
10. T4 DEP	.43***	.25***	-.13	.56***	.41***	-.14	.69***	.43***	-.11	--		
11. T4 RUM	.31***	.44***	-.18**	.39***	.60***	-.26***	.41***	.59***	-.21**	.45***	--	
12. T4 MSE	-.23***	-.21**	.71***	-.26***	-.24***	.78***	-.21**	-.22**	.83***	-.22**	-.26***	--
Mean	9.17	9.68	-2.15	7.69	9.59	-2.22	7.08	9.65	-2.17	6.73	9.58	-2.18
SD	5.77	2.56	.44	5.31	2.69	.47	5.58	2.81	.46	5.02	2.69	.47

Notes. DEP = Maternal Depressive Symptoms, RUM = Rumination, MSE = Maternal Self-efficacy. T1 = Prenatal, T2 = 4 months, T3 = 8 months, T4 = 12 months

* $p < .05$, ** $p \leq .01$, *** $p \leq .001$.

Table 3.2
Correlations, Means, and Standard Deviations of Depressive Symptoms, Maternal Self-Efficacy, and Rumination for Low and High Ruminators

	1	2	3	4	5	6	7	8	9	10	11	12	M (SD)
1. T1 DEP	--	.28**	-.25**	.52***	.33***	-.30**	.42***	.30**	-.27**	.46***	.22*	-.30**	7.07 (4.23)
2. T1 RUM	.26***	--	-.10	.27**	.21*	-.22*	.12	.21*	-.20*	.16	.21*	-.13	7.71 (1.16)
3. T1 MSE	-.14	-.20*	--	-.13	-.17	.77***	-.23*	-.22*	.73***	-.12	-.19	.71***	-2.08 (.41)
4. T2 DEP	.48***	.10	-.15	--	.42***	-.20*	.57***	.32***	-.14	.55**	.26**	-.21*	6.42 (4.13)
5. T2 RUM	.20*	.34***	-.04	.53***	--	-.22*	.36***	.57***	-.21*	.33***	.59***	-.22*	8.57 (2.19)
6. T2 MSE	-.12	-.12	.69***	-.33***	-.20*	--	-.21*	-.15	.80***	-.18	-.19	.74***	-2.11 (.43)
7. T3 DEP	.46***	.14	-.07	.63***	.47***	-.12	--	.56***	-.24*	.60***	.40***	-.21*	5.82 (4.78)
8. T3 RUM	.25*	.30**	-.13	.27**	.51***	-.23*	.46***	--	-.18	.37***	.54***	-.22*	8.70 (2.55)
9. T3 MSE	-.16	-.11	.71***	.29**	-.15	.83***	-.12	-.21*	--	-.11	-.14	.83***	-2.09 (.44)
10. T4 DEP	.35***	.13	-.10	.54***	.39***	-.04	.73***	.42***	-.04	--	.42***	-.23*	5.76 (4.39)
11. T4 RUM	.21*	.41***	-.11	.39***	.50***	-.20*	.34***	.53***	-.19	.41***	--	-.19*	8.77 (2.52)
12. T4 MSE	-.13	-.18	.70***	-.26*	-.19	.80***	-.15	-.13	.82***	-.17	-.27**	--	-2.11 (.45)
M	11.31	11.82	-2.22	8.99	10.62	-2.33	8.44	10.67	-2.26	7.80	10.46	-2.24	
SD	6.19	1.84	.45	6.04	2.76	.49	6.07	2.73	.46	5.45	2.61	.47	

Notes. Low ruminators are above the diagonal; high ruminators are below. DEP = Maternal Depressive Symptoms, RUM = Rumination, MSE = Maternal Self-efficacy. T1 = Prenatal, T2 = 4 months, T3 = 8 months, T4 = 12 months
* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$.
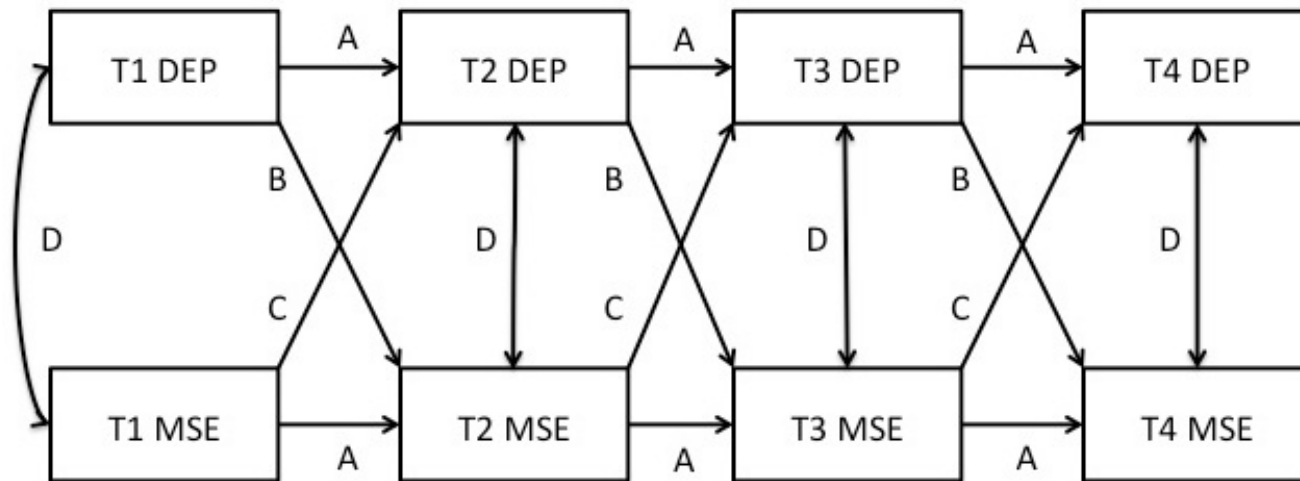
Figure 3.1. Structural equation model examining the stability (A) and bidirectional effects (B & C) of maternal depressive symptoms (DEP) and maternal self-efficacy (MSE) from 8 months pregnant (T1), 4 months postpartum (T2), 8 months postpartum (T3), and 12 12 months postpartum (T4). D represents the covariance between the error terms at each timepoint. Error terms are not shown.
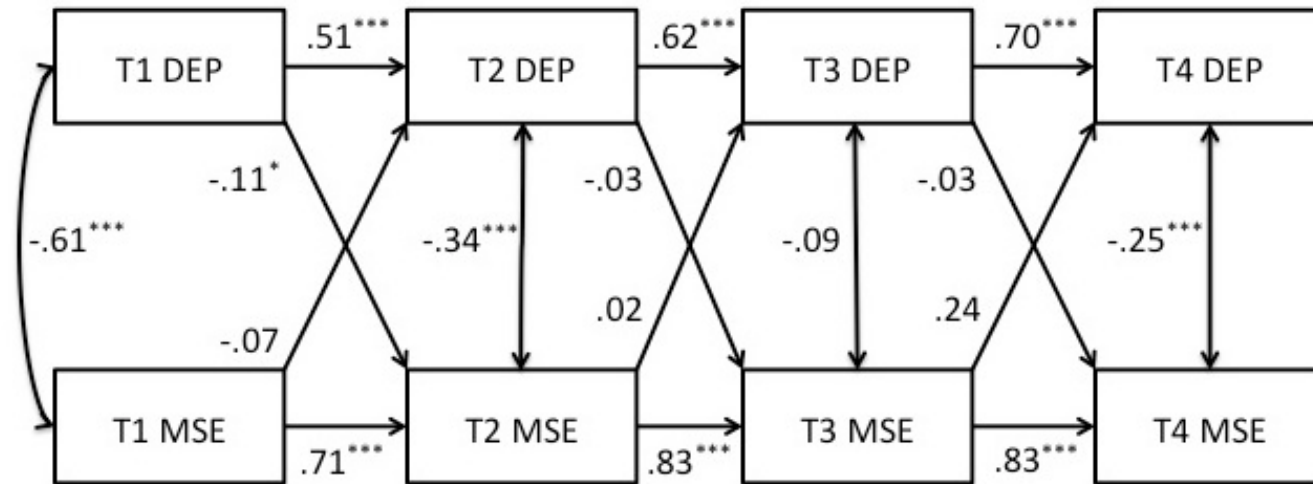
Figure 3.2. Structural equation model results indicate an unacceptable fit for the full sample for bidirectional effects between maternal depressive symptoms and maternal self-efficacy with standardized path coefficients. Error terms are not shown. χ^2 (16) = 79.81, *p* = .000, RMSEA = .13 [.11, .16], CFI = .94.
* *p* < .05, ** *p* ≤ .01, *** *p* ≤ .001.

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CHAPTER V

DISCUSSION

The overarching purpose of this dissertation was to investigate the associations between depressive symptoms and maternal cognitions in women over the perinatal period. Despite knowledge that there are relations between depressive symptoms and cognitions, very little is known about these over time or with specific regard to the perinatal period. The three studies in this dissertation examined different aspects of maternal cognitions in three different samples that were all followed longitudinally. A main focus of the dissertation, in addition to examining cognitions and depressive symptoms, was to explore previously understudied maternal cognitions. Chapter 2 described the creation of a new measure of women's perceptions of societal expectations of mothers, anticipated maternal self-efficacy, and perceptions of child vulnerability and tested the predictive validity of the measure with postpartum depressive symptoms. Chapter 3 explored the longitudinal association of parenting stress and maternal depressive symptoms, and compared bidirectional and unidirectional models of this association, as well as three specific types of parenting stress: parental distress, stress related to having a difficult child, and stress related to the parent-child interaction. Chapter 4 investigated bidirectional effects of maternal self-efficacy depressive symptoms in second-time mothers with regard to their older, first-born child and tested if rumination level moderated the association between maternal self-efficacy and depressive symptoms.

The results from Chapter 2 indicated that the Rigidity of Maternal Beliefs Scale (RMBS) was a valid and reliable measure for use with pregnant and postpartum women to assess maternal perceptions of societal expectations, beliefs about what a good and bad mother is, and anticipated maternal competence. Predictive validity of the measure was established, with the prenatal RMBS predicting postpartum depressive symptoms. More longitudinal research should investigate pathways between these two constructs. Additionally, the concept of sociotropy (Beck, 1983), or being more concerned about what others think of you and their approval, would be a useful in the future to examine perinatal depression and the maternal cognitions assessed by the RMBS. Women may be more likely than men to have a sociotropic orientation, which also encompasses the feeling to put others' needs before their own (Girgus & Nolen-Hoeksema, 2006). This could be particularly relevant during the perinatal period, a time in which women may feel the increased pressure of putting an infant's needs before all else. Theoretically and empirically, we know that there are significant associations between sociotropy, depressive symptoms, and depression diagnosis (see review in Girgus & Nolen-Hoeksema, 2006), but there are very few longitudinal investigations of the connection and it is a completely unexplored area within the perinatal literature. It may be that the RMBS may also provide a way to measure motherhood-specific sociotropy. Associations between the RMBS and a sociotropic orientation should be investigated in future research.

The objective of Chapter 3 was to explore if a unidirectional or bidirectional model best explained the influence of maternal perceptions of parenting stress on the development of postpartum depressive symptoms. I hypothesized, based on cognitive theory, that a unidirectional model would fit best for total parenting stress, parental distress, and difficult child stress, with stress significantly predicting postpartum depressive symptoms in each of the

models. I found support for this unidirectional model for total parenting stress only. Earlier total

parenting stress significantly predicted later depressive symptoms. Contrary to my hypothesis,

the alternative unidirectional model fit best for difficult child stress: postpartum depressive

symptoms significantly predicted difficult child stress over time. For parental distress and

postpartum depressive symptoms, neither the unidirectional or bidirectional model fit well, nor

were there any significant pathways. I also hypothesized, based on cognitive theory and

transactional models of relationships, that a bidirectional model fit best for stress related to

parent-child interaction and postpartum depressive symptoms. This hypothesis was supported,

indicating a reciprocal process. Mothers who were feeling stress related to their interactions with

their child also had higher levels of depressive symptoms, which in turn created more feelings of

stress regarding their interactions with their child. No one model fit best across the different

domains of parenting stress, suggesting that parenting stress consists of several unique factors

that are associated in different ways with maternal depressive symptoms.

The goal of Chapter 4 was to explore bidirectional effects between depressive symptoms

and maternal self-efficacy across the perinatal period for second-time mothers, and to explore

rumination as a moderator of those effects. I found that, despite significant associations between

the variables, there were no significant pathways from depressive symptoms and maternal self-

efficacy and no moderating effect of rumination. The lack of anticipated findings may indicate

other moderating or mediating variables involved in the complex relationship between

depressive symptoms and maternal self-efficacy. As mentioned previously, the women in the

sample were high-functioning, with low levels of depressive symptoms. It would be beneficial

to examine factors such as marital support and infant temperament in such high-functioning

samples in the future.

The first major limitation of this dissertation is that all of the samples consist of primarily married, highly educated white women with higher levels of income, resulting in an inability to generalize the findings. It would be very interesting to conduct similar studies with more economically and racially diverse samples, as well as considering how cognitions and depressive symptoms are related for adolescents or single mothers. The second major limitation of this dissertation is the low level of depressive symptoms in the samples. The average depression score fell well within the none to mild depressive symptoms range. Exploring maternal cognitions and depression in a clinical sample, or comparing maternal cognitions and pathways of influence in depressed and non-depressed mothers would strengthen future research on this subject and provide important information that psychologists and social workers could apply to interventions and their work with depressed women.

There are three substantial strengths of this dissertation. First, all of the studies were longitudinal, with at least 2 timepoints, and all but one had prenatal and postpartum timepoints. Second, I controlled for initial level of depressive symptoms in all of my analyses, which allowed me to examine if maternal cognitions led to increases in depressive symptoms above and beyond initial depressive symptomatology. Third, the focus on parenting-specific cognitions within the context of the perinatal period provides valuable information for researchers and clinicians about what the mothering experience is like for women. Two areas of cognition, self-efficacy and stress, have been examined with regard to depression, and we know they are related in the general literature. But what about for mothers? How might that relationship look different? What information do we need so that treatment might be more effective and so that we have a better understanding of the unique challenges that pregnant and postpartum women face? These are some of the questions the study findings in this dissertation begin to answer.

These studies suggest that maternal cognitions and depressive symptoms during the perinatal period are related. Moreover, the findings suggest specific areas needing future research. Parity differences were found in Chapter 3. Multiparous women experienced higher levels of depressive symptoms and primiparous women felt more stress related to perceptions of having a difficult child. Chapter 4 focused exclusively on second-time mothers, and emphasized that multiparous mothers have different concerns and experiences than primiparous mothers. Future research must recognize and examine that mothers are a heterogenous population, particularly with regard to parity. The stresses and challenges facing a first-time mother are simply not the same as those of a mother going through pregnancy and the postpartum period with a second or subsequent child. Studies have typically examined parity as a demographic variable, but there must be more research that focuses on parity as a main variable of interest. We know there are differences. How can we develop interventions based on primiparous mothers or with a one-size-fits-all mindset? Recent findings suggest that not only are there different mean levels in psychological distress between primiparous and multiparous mothers, but that trajectories also look different (Dipietro, Costigan, & Sipsma, 2008). Understanding these differences may provide psychologists and social workers with valuable information for working with mothers.

Multiple psychological interventions, including cognitive behavioral therapy (CBT) have been used for the alleviation or prevention of depressive symptoms in perinatal women. Although it is clear that CBT is an effective treatment for depression, recent reviews of therapeutic interventions have not provided strong support for the efficacy of CBT in treating perinatal depression, specifically (Cuijpers, Brännmark, & van Straten, 2008; Sockol et al., 2011). A recent meta-analysis of treatment for perinatal depression found that all interventions,

115

regardless of method, significantly reduced depressive symptoms from pre to post-treatment (Sockol et al., 2011). Many of the studies, however, only examined the difference between pre and post-treatment and did not have a control group, which means that it was not possible to determine if the effects were due to the passage of time or as a result of the intervention. A closer examination of controlled effect sizes for studies with control and treatment groups revealed that there was no difference by treatment site or type of administration (individual versus group), but that interpersonal therapy (IPT) interventions had a larger effect size than CBT interventions. The authors acknowledged that the IPT interventions may have had a more standardized and manualized approach and suggested that more rigorous research design be implemented in testing the effectiveness of a CBT approach.

In addition to more rigorous CBT intervention studies, future CBT interventions should also be developed to target uniquely maternal beliefs. O'Mahen and colleagues (2012) interviewed 23 women who ranged in depression severity during the perinatal period to uncover common themes and cognitions. Women's cognitions revolved specifically around concerns about their maternal self-efficacy and expectations that being a mother was supposed to be a joyous occasion. The women reported that they did feel they could ask others for help or indicate that they were stressed or could not handle the responsibilities of motherhood. They also experienced high levels of rumination, which interfered with approach-oriented behavior, such as problem solving. These themes are consistent with the cognitions studied in this dissertation and suggest that this may be an area on which social workers and psychologists should focus when working with depressed mothers.

Taken together, the findings from these studies have application for those who work with the perinatal population. The familial and social context is of vital importance when working

with women during pregnancy and postpartum but, increasingly, emphasis has been placed on

the importance of the parental belief system and its association with mental health, parenting

behavior, and resulting child outcomes (Teti & Cole, 2011). It may be that parental belief

systems, focusing on the specific cognitions that may be aggravating or influencing maternal

depression, could be a more beneficial target for interventions with women during the perinatal

period.

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Rigidity of Maternal Beliefs Scale – Original Version

Below is a list of statements dealing with your general feelings about being a parent. Please circle the response that best applies to you, using the following scale.

1-Strongly Disagree	5-Slightly Agree
2-Disagree	6-Agree
3-Slightly Disagree	7-Strongly Agree
4-Neither Agree or Disagree	

1) I should do everything for my baby myself.
2) I feel guilty if I leave my baby with someone else in order to do something for myself.
3) I should be able to figure out and fix parenting difficulties myself.
4) Being a parent means I should not do anything that is morally wrong.
5) Whether I breastfeed or not will not affect my baby.
6) *I feel confident in my ability to parent my baby.*
7) **I make good parenting decisions.**
8) **I should not talk to my spouse if I'm having parenting problems.**
9) It is important to me that others think I'm a good parent.
10) I'm uncomfortable sharing my parenting worries with others.
11) Other mothers have fewer parenting difficulties than I do.
12) Other mothers are better able to comfort their baby.
13) *Being a mother should be enjoyable.*
14) Being a mother should be positive.
15) *I should be able to manage the responsibilities of motherhood.*
16) Having negative thoughts about my baby means something is wrong with me.
17) As a parent, I must be flexible all the time.
18) *I must be patient with my baby.*
19) **I should be able to read my baby's cues.**
20) **I should be able to protect my baby.**
21) If I am doing well as a parent, then my baby will not have difficulties.
22) I should not feel frustrated with my baby when my baby is difficult.
23) I have to interact with my baby all the time when I am with him or her.
24) *I should be able to calm my baby when s/he cries.*
25) If my baby misbehaves, then others will think I am a bad parent.
26) If my baby does not sleep well, it is a sign that I am not going a good job as a mother.
27) *My baby's needs come before my own.*
28) Babies get hurt or sick easily.
29) Babies should not experience any discomfort (such as crying), hardship, or pain.
30) Being a parent means worrying about my baby.

Bold items were removed
italicized items were revised

APPENDIX B

Rigidity of Maternal Beliefs Scale – Final Version

Below is a list of statements dealing with your general feelings about being a parent or becoming a parent. Please circle the response that best applies to you, using the following scale.

1-Strongly Disagree   5-Slightly Agree
2-Disagree   6-Agree
3-Slightly Disagree   7-Strongly Agree
4-Neither Agree or Disagree

1) I should do everything for my baby myself.
2) I feel guilty if I leave my baby with someone else in order to do something for myself.
3) I should be able to figure out and fix parenting difficulties myself.
4) Being a parent means I should not do anything that is morally wrong.
5) Whether I breastfeed or not will affect my baby.
6) I feel confident in my ability to raise a happy and healthy baby.*
7) It is important to me that others think I'm a good parent.
8) I'm uncomfortable sharing my parenting worries with others.
9) Other mothers have fewer parenting difficulties than I do.
10) Other mothers are better able to comfort their baby.
11) I would feel guilty if I did not enjoy being a mother.
12) Being a mother should be positive.
13) I feel confident that I can manage the responsibilities of motherhood.*
14) Having negative thoughts about my baby means something is wrong with me.
15) As a parent, I must be flexible all the time.
16) I feel guilty when I am not patient with my baby.
17) If I am doing well as a parent, then my baby will not have difficulties.
18) I should not feel frustrated with my baby when my baby is difficult.
19) I have to interact with my baby all the time when I am with him or her.
20) If I can't calm my baby when s/he cries, then I am not a good parent.
21) If my baby misbehaves, then others will think I am a bad parent.
22) If my baby does not sleep well, it is a sign that I am not going a good job as a mother.
23) I feel guilty when I put my needs before the needs of my baby.
24) Babies get hurt or sick easily.
25) Babies should not experience discomfort (such as crying), hardship, or emotional pain.
26) Being a parent means worrying about my baby.

*Reverse coded items