Expecting The Unexpected: Testing a Theoretical Model of

Postpartum Depression

by

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ABSTRACT

Postpartum depression has been described as one of the most common complications related to childbirth (Beck, 2008). To understand better the theoretical underpinnings of the disorder, the current study used a vulnerability-stress conceptualization to develop a theoretical model of postpartum depression. The predictive model was tested on 144 mothers with infants under 12-months of age using structural equation modeling. Four alternative models were also tested. A variation of the original theoretical model was found to have the best fit. Consistent with past research, this model indicated that need for approval, relationship conflict, and maternal-efficacy directly predicted postpartum depressive symptoms. Need for approval also moderated the relation between maternal-efficacy and postpartum depressive symptoms, so that this relation was stronger for mothers with high need of approval than for mothers with low need for approval. The role of these risk factors, particularly negative maternal perceptions and cognitions, is highlighted in relation to developing clinical interventions to treat postpartum depression. Limitations of this study are discussed and suggestions are made for future models to be tested through empirical research.

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PROBLEM IN PERSPECTIVE

Nothing can fully prepare a woman for the changes that occur following

childbirth. As she undergoes these adjustments she is exposed to new responsibilities and

challenges in her maternal role. Many women experience fluctuations in mood after the

delivery, and some mothers develop "baby blues" or postpartum depression. While baby

blues are transient, postpartum depression is not. The experience of depressive

symptoms after birth is not uncommon (Terry, Mayocchi, & Hynes, 1996); however,

many women do not seek professional help during this time (Dennis & Chung-Lee,

2006). Oftentimes postpartum depressive symptoms can go unrecognized and untreated

by healthcare providers (Gjerdingen & Yawn, 2007).

In recent decades, the topic of postpartum depression has been extensively studied

(Levitt et al., 2004; Wylie, Hollins, Marland, Martin, & Rankin, 2011). While

researchers previously questioned whether postpartum depression was a culture-bound

disorder that affected only women of Westernized nations (Wile & Arechiga, 1999), the

literature now includes international studies on postpartum psychiatric disorders (e.g.,

Affonso, De, Horowitz, & Mayberry, 2000; Callister, Beckstrand, & Corbet, 2010). The

Edinburgh Postnatal Depression Scale, a common measure used for screening for

postpartum depressive symptoms has been translated into numerous languages and used

in many countries outside of the United States (e.g., Agoub, Moussaoui, & Battas, 2005;

Green, Broome, & Mirabella, 2006; Ngai & Chan, 2010). Longitudinal studies tapping

into depressive symptoms during pregnancy and the postpartum are commonplace (e.g.,

Bernazzani, Saucier, Borgeat, 1997), and depression among adoptive mothers (Senecky

et al., 2009) and paternal depression following childbirth (Edmondson, Psychogiou, Vlachos, Netsi, & Ramchandani, 2010; Goodman, 2003) have even received attention. Depressive symptoms among mothers are known to impact negatively how they parent, as depressed mothers tend to engage in behaviors that expose their children to greater health risks (Leiferman, 2002). The negative sequelae, including the effect that a mother's depressive symptoms can have on her infant's early and later development has been extensively documented (Darcy et al., 2010). A variety of clinical interventions, including Cognitive Behavioral Therapy, group therapy approaches, and prescription drugs have all been evaluated for their efficacy in the treatment of postpartum depression (Hofecker-Fallahpour & Riecher-Rossler, 2005; Wylie et al., 2011).

Postpartum depression is a well-researched disorder. Despite the recent advancements in the understanding and treatment of postpartum depression, the theoretical underpinning of the disorder garners needed attention. Researchers have not yet come to a consensus about whether a common theoretical framework for postpartum depression exists. Although different frameworks have been proposed in an attempt to understand how symptoms manifest after birth, these models often differ in their conceptualization of postpartum depression etiology (e.g., Howell, Mora, Horowitz, & Leventhal, 2005; Ngai & Chan, 2011), making it difficult to draw conclusions about the nature and progression of postpartum depression.

The current study sought to extend past research in several ways. The proposed model was based upon a theoretical framework developed by Hankin and Abramson (2001). Supported by empirical evidence, their model, the Elaborated Cognitive Vulnerability-Transactional Stress Theory, is grounded in a vulnerability-stress

framework of psychopathology. In the current study the theoretical model was modified

so that the examined constructs were made specific to mothers in the postpartum.

Furthermore, the current study used structural equation modeling (SEM) to test the

proposed model and four alternative models. The use of SEM to test these models

assisted in identifying the model with the best fit for the data. It was expected that

through this process, postpartum depression risk factors and etiology would be better

understood, and that this understanding could guide treatment interventions able to assist

mothers who struggle with postpartum depression. An additional aim was to formulate a

theoretically supported baseline model that has the capability of being replicated in future

research.

Postpartum Depression Definition and Risk Factors

Entry into motherhood is typically recognized as a period of celebration for

women and their families. Much time is spent planning for the birth, yet nothing can

prepare a woman for the changes that will occur in her identity, routine, and relationships

following her delivery. As a mother undergoes physical and emotional adjustments, she

is inevitably exposed to new responsibilities and challenges. While it is common to

experience "baby blues" or fluctuations in mood following the delivery (Dennis, Janssen,

& Singer, 2004), some women may feel "blue" for a longer time period. Described as

one of the most common complications related to childbirth (Beck, 2008), postpartum

depression affects approximately 13% of mothers (O'Hara & Swain, 1996). Women who

experience postpartum depression exhibit depressed mood and may feel they are

worthless or hopeless. They may also experience guilt, irritability, difficulty

concentrating, and disturbances in their normal routines such as sleeping and eating

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(APA, 2000). The DSM-IV-TR (APA) uses a "postpartum onset" specifier of major depressive disorder, and a mother's symptoms must have occurred within one to four weeks of the delivery in order for her to receive a diagnosis.

Select factors are thought to place a mother at greater risk for developing postpartum depression. In their review of 59 studies, O'Hara and Swain (1996) identified several risk factors that played a significant role in postpartum depression. These included a history of mental illness and emotional disturbance while pregnant, marital adjustment, low social support, and negative life events. Family income, maternal occupation, birth complications, neuroticism, and negative cognitive style were also significant but these had a small effect size. A review by Beck (2001) that included O'Hara and Swain's (1996) meta-analysis produced similar results. Depression and anxiety during pregnancy, self-esteem, stress associated with childcare, life stress, social support, marital quality, depression history, infant temperament, and maternity blues were found to have a moderate effect size in the prediction of postpartum depression.

While consensus exists about the risk factors implicated in postpartum depression (Robertson et al., 2004), the casual relations among these variables are not always clear. Evidence suggests that postpartum depression is a multifaceted disorder, yet with so many identified risk factors it becomes difficult to determine which factors play a key role in symptom manifestation. Terry et al. (1996) reported that the development of a postpartum depression theory would be "facilitated if researchers used coherent conceptual frameworks when designing research on the disorder" (p. 220). This comment underscores the need for an underlying framework that would guide

researchers' conceptualizations of postpartum depression; however, theory has not always been integrated into past research.

Beck (2002) provided an overview and critique of several theories that have been used to understand postpartum depression etiology. Among those considered, Beck described the medical model that has been adopted by physicians and nurses to describe and treat women's postpartum depressive symptoms. Another theory that was noted was interpersonal, which was developed from Sullivan's (1953) work on social relationships and explains how individuals attempt to decrease the anxiety that results from negative reactions of others around them. A last theory discussed by Beck (2002) was Interpersonal Psychotherapy (IPT). IPT has been used as a therapeutic treatment approach for mothers experiencing depressive symptoms. Beck (1993) also developed a grounded theory of postpartum depression, called Teetering on the Edge, which she later modified to include studies on women of different cultural backgrounds (Beck, 2007). Her original theory explained the process by which mothers attempt to cope with their depressive symptoms. Four stages are proposed; first, mothers are confronted with the terror that surrounds postpartum depression. Second, they grapple with thoughts about dying or self-harm. Third, they struggle to survive how they are feeling and the depression. In the fourth stage mothers are able to regain control over their lives (Beck, 1993).

Although the frameworks that have been described are quite useful to clinicians who are working with mothers experiencing postpartum depression, researchers do not commonly utilize these models. Thus, there appears to be a "disconnect" between postpartum depression theory and clinical practice in some, but not all, of the postpartum

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depression literature. Several researchers (Howell et al., 2005; Ngai and Chan, 2011; Ross, Sellers, Evans, & Romach, 2004) have integrated one or more theoretical frameworks) into their examination of postpartum depression. These models are reviewed below.

Models of Postpartum Depression

The model proposed by Howell et al. (2005) tested several common risk factors for postpartum depression. These included situational demands, physical factors, healthcare perceptions, social context, and personal factors that were relevant to their sample of 655 White, Hispanic, and African-American mothers at 2-6 weeks postpartum. Results of their study indicated that Hispanic and African-American mothers reported more postpartum depressive symptoms than did White women. Howell et al. (2005) also found that feeling burdened by physical symptoms, a lack of social support, and lowered self-efficacy were significant predictors for all of the mothers in their sample. These findings have important implications for researchers as women of different racial/ethnic backgrounds may be affected by postpartum depression at different rates; however, certain risk factors may be common among women and should, therefore, be considered in newer models.

Ross et al. (2004) tested a different model of postpartum depression. Ross et al. (2004) proposed a biopsychosocial framework that included biological variables (hormonal assays, family and personal psychiatric history, and history of premenstrual syndrome) and psychosocial variables (stressful life events, marital adjustment, and educational achievement). Ross et al. (2004) also examined depression during pregnancy using a separate model. Using structural equation modeling, they found that their final

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model for the prenatal data produced adequate fit, supporting the biopsychosocial theory during pregnancy; however, Ross et al. (2004) encountered difficulty with model convergence while testing their postpartum model. They concluded that the risk factors for postpartum depression might differ from those that affect women during pregnancy. These findings have important implications for model development as they suggest that biologically based factors, such as depression history, might contribute to more psychosocial stress in mothers' lives. Such factors, in turn, may lead them to experience more negativity in mood during the perinatal period. Ross et al.'s (2004) model also presents pathways between variables that are similar to a vulnerability-stress conceptualization of postpartum depression, a framework that is discussed later and was central to the current study.

Ngai and Chan (2011) developed a conceptual model that differed from the two models described previously. They focused on how learned resourcefulness, social support, and stress influenced postpartum depression and maternal adaptation. Integrating aspects from Lazarus and Folkman's (1984) transactional model of stress and coping, Rosenbaum's (1990) model of Learned Resourcefulness, and Bandura's (1989) self-efficacy theory, Ngai and Chan (2011) conducted an intervention study with 181 first-time mothers living in Hong Kong. Results of their path analysis suggested that more stress, less coping resources and social support, and lower maternal-efficacy lead to postpartum depressive symptoms. It should be noted that Ngai and Chan (2011) did not test alternative theoretical models, so it is unclear whether another model might have fit their data better. Their study has important implications for model development as the results indicated that stress - both directly and indirectly- leads to postpartum depressive

symptoms, though social support. High social support also contributed to higher maternal-efficacy that, in turn, led to fewer postpartum depressive symptoms. These are evidently important constructs, and the current study focused on how relationship conflict, rather than relationship support, affected maternal-efficacy.

Dennis et al. (2004) used another framework to predict depressive symptoms in the early postpartum (within the first week after the delivery). Their multifactorial model consisted of several risk factors that were categorized as belonging to socidemographic, biological, pregnancy-related, life stressors, support, obstetric, and maternal adjustment domains. Although no specific theory was mentioned in their study, Dennis et al. (2004) conducted a literature search of the most commonly reported risk factors and included these in their model. Among the 594 Canadian mothers who participated, several variables in each domain were found to be significantly associated with postpartum depressive symptoms at one week postpartum. These variables included vulnerable personality, depression prior to childbirth, hypertension while pregnant, life events, global support, feeling unprepared for hospital discharge, less satisfaction with the infant feeding method, and having immigrated in the last five years. The findings of Dennis et al.'s (2004) study are similar to Ross et al.'s (2004) findings in which postpartum depression risk factors may be related to biological, psychological, or social aspects of a mother's life. This study also suggests that the risk factors that affect mothers immediately after birth may be similar to those at later stages in the postpartum.

It is evident that each of the aforementioned studies has made a unique contribution to understanding the factors involved in the manifestation of postpartum depressive symptoms. However, it must also be noted that the models vary in their

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conceptualization of postpartum depression etiology. The complexity of postpartum depressive phenomena and the litany of implicated factors certainly complicate the task of model design. Furthermore, such divergent models make it difficult to draw conclusions about postpartum depression. It has been suggested that general models of depression might be useful when attempting to understand the development of postpartum depression (Whiffen, 1991). Having reviewed several different conceptualizations of postpartum depression, a more general model is now discussed. This theory, the vulnerability-stress framework, has received much attention in the literature on general depression (Hankin & Abramson, 2001; Hankin, Abramson, Miller, & Haeffel, 2004).

Vulnerability-Stress Conceptualization of Postpartum Depression

The period following birth can be very stressful for a mother, yet not all mothers who experience stress develop postpartum depression. Research also indicates that while the relation between stress and emotional health problems is important, stress is not the only factor involved in the onset of symptomatology (Monroe & McQuaid, 1994). It is conceivable that both maternal stressors and vulnerability factors may play a role in postpartum depression etiology (Ingram & Luxton, 2005). According to the vulnerability-stress framework, factors are viewed as either distal or proximal. Distal factors are those that occur early in the etiological sequence, whereas proximal factors occur later, sometimes immediately prior, or simultaneously with the disorder (Alloy, Clements, & Kolden, 1985). Vulnerability to a disorder is conceptualized as a distal factor, as it refers to a trait or set of traits that predispose a person to the disorder. Vulnerability is endogenous, meaning that it occurs within the individual. In the

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literature, cognitive and interpersonal variables frequently represent vulnerability factors (Ingram & Luxton, 2005). Stress, on the other hand, is believed to activate the underlying vulnerability factor(s) and precipitate the disorder. The ability to predict postpartum depressive symptoms thus lies in the interaction between vulnerability and stress. Although empirical support exists for the vulnerability-stress conceptualization of depression (Brown & Harris, 1978), this framework has only been applied in a handful of postpartum depression studies (Bernazzani et al. 1997; Church, Brechman-Toussaint, & Hine, 2005; Grazioli & Terry, 2000).

One study by Bernazzani et al. (1997) used the vulnerability-stress framework to predict postpartum depressive symptoms among 213 French Canadian mothers. Constructs were chosen based on the authors' classification of whether a construct was a "vulnerability" or "stress" variable. Consistent with the theoretical framework, specific interactions between vulnerability and stressor variables were also examined. Bernazzani et al. (1997) hypothesized that proximal factors in the vulnerability-stress sequence (e.g., maternity-related factors such as prenatal depression) would play a more important role in postpartum depressive symptoms than would distal stressors (e.g., whether a woman's parents divorced when she was young). Mothers were assessed during their second trimester of pregnancy and again at six months postpartum. Cognitive, demographic, stressor, and interpersonal relationship variables were included in the model developed for the study. Each model domain (cognitive, demographic, stressor, or interpersonal) consisted of several risk factors; for instance, marital relationship quality was categorized as a stressor while social support was considered an interpersonal relationship variable. Path analyses revealed that stressors, which included income, poor marital relationship

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quality, and employment status, were both directly and indirectly related to postpartum

depressive symptoms. Whether mothers felt a sense of control of their lives was

indirectly related to postpartum depressive symptoms through a higher level of prenatal

depression. Feeling dissatisfied with the level of support they received was also

indirectly related to postpartum depressive symptoms through prenatal depression.

Feelings of control were found to mediate the effect of lower income and stressful life

events on postpartum depressive symptoms. Last, although Bernazzani et al. (1997) did

not find poor marital quality to be directly related to postpartum depressive symptoms,

marital quality was indirectly related to postpartum depressive symptoms through

prenatal depression. From these results Bernazzani et al. (1997) concluded that proximal

and distal risk factors play an equally important role in predicting postpartum depressive

symptoms, supporting the overall vulnerability-stress conceptualization of postpartum

depression. Their study also shed light on the complex nature of postpartum depression,

as certain identified risk factors may interact with other risk factors rather than increasing

a mother's risk of depressive symptoms solely on their own.

Church et al. (2005) used a vulnerability-stress framework to examine postpartum

mood using 406 Australian mothers at 5 to 14 weeks postpartum. The vulnerability and

stress constructs examined in this study differed from those used by Bernazzani et al.

(1997). For instance, in Church et al.'s (2005) theoretical model, dysfunctional attitudes

that were both general and maternal-specific were a focus for the researchers. A shorter

version of the Dysfunctional Attitude Scale, DAS-24 (Power et al., 1994), measured

general dysfunctional attitudes. The Maternal Attitudes Questionnaire (MAQ; Warner et

al., 1997) assessed dysfunctional maternal specific attitudes. Other risk factors included

vulnerable personality, baby difficulties such as infant colic or irritability, educational level, unplanned pregnancy, and depression history. Vulnerable personality and baby difficulties were assessed using Likert-type response scales while the remaining risk factors were assessed by single items in a yes/no response format. These non-cognitive risk factors appeared to represent stressors in the model, although not explicitly stated by the authors. Church et al. (2005) hypothesized that the relations between their five risk factors and postpartum depressive symptoms would be mediated by general and maternal-specific dysfunctional attitudes. Path analyses were in support of their hypothesis. Specifically, maternal specific dysfunctional attitudes served as a mediating variable between baby difficulties and postpartum depressive symptoms as well as between vulnerable personality and postpartum depressive symptoms. Vulnerable personality was also directly related to postpartum depressive symptoms and mediated by general dysfunctional attitudes. General dysfunctional attitudes also mediated the relation between a history of depression and postpartum depressive symptoms. Finally, depression history was directly related to postpartum depressive symptoms. Whereas a negative maternal attitude did not influence the relation between history of depression and postpartum depressive symptoms, having a general dysfunctional attitude did influence this relation. These findings suggest that varying pathways to postpartum depressive symptoms can exist. Newer models should investigate both the direct and indirect effects of postpartum depression risk factors.

A third study conducted by Grazioli and Terry (2000) also utilized a vulnerability-stress conceptualization of postpartum depression. They tested the model that they developed on 65 Australian mothers. Mothers completed study measures during their

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third trimester of pregnancy and again at 6 weeks postpartum. Similar to the cognitive constructs that were assessed by Church et al. (2005), Grazioli and Terry (2000) examined general dysfunctional attitudes and dysfunctional attitudes that were specific to motherhood. They used the DAS-A (Dysfunctional Attitude Scale-A; Weissman & Beck, 1978), which consists of two types of dysfunctional attitudes: those pertaining to performance evaluation and those that reflect a need for approval. To measure maternal-specific dysfunctional attitudes the authors modified a few items on the DAS-A to fit the postpartum context. Grazioli and Terry's (2000) study added a unique component to the postpartum literature by investigating attributional style in addition to dysfunctional attitudes. By incorporating both dysfunctional attitudes and attributional style, the researchers' aim was to test two specific vulnerability-stress theories of depression: the reformulated learned helplessness theory (Abramson, Seligman, & Teasdale (1978) and Beck's (1976) cognitive theory of depression. Among the vulnerability measures in Grazioli and Terry's (2000) study, maladaptive thinking and attributional style were assessed. Additionally, the stress measures that were included were stress related to parenthood and infant temperament. Women's partners also completed measures rating their emotional distress in order to obtain an external measure of the mothers' wellbeing.

In Grazioli and Terry's (2000) study, hierarchical regression analyses were conducted in order to test the hypothesis that cognitive vulnerability together with stress would predict postpartum depressive symptoms. Their results indicated that 6 weeks after birth the relation between maternal-specific negative attitudes and postpartum depressive symptoms was stronger for mothers who reported higher levels of stress. Interestingly, however, cognitive vulnerability (general dysfunctional attitudes, maternal-

specific negative attitudes, and negative attributional style) assessed during pregnancy was not directly predictive of postpartum depressive symptoms. When partner rating of emotional distress was examined as an outcome variable, Grazioli and Terry (2000) found a significant interaction between general dysfunctional attitudes (specifically need for approval) and infant temperament. Given the lack of significant interactions between negative attributional style and the stress measures, the authors concluded that their findings provided greater support for Beck's (1976) cognitive model of depression than for the reformulated learned helplessness model of depression (Abramson et al., 1978). Consistent with the other studies that have applied a vulnerability-stress framework to postpartum depressive symptoms (e.g., Bernazzani et al., 1997; Church et al., 2005), Grazioli and Terry's (2000) model supported a comprehensive framework that includes multiple interactions between stressors and cognitive variables. The role of dysfunctional attitudes and, in particular, general and maternal-specific attitudes should be built into other models of postpartum depression.

The three studies described previously (Bernazzani et al., 1997; Church et al., 2005; Grazioli & Terry, 2000) demonstrate how researchers can apply the vulnerability-stress framework to the study of postpartum depression. Despite the variation in the variables chosen for examination in each study, the inclusion of depression history (either previous depression or depression during pregnancy) as a model variable was consistent across studies. Two of the three studies examined dysfunctional attitudes, with Grazioli and Terry's (2000) results yielding more support for the role of dysfunctional attitudes than for attributional style. These points were considered when developing the current model.

To date, no study has tested a vulnerability-stress framework of postpartum depressive symptoms using mothers living in the United States. The current study attempted to fill the gap in the literature by applying a specific vulnerability-stress model to American mothers in the first year after birth. Specifically, Hankin and Abramson's (2001) Elaborated Cognitive Vulnerability-Transactional Stress model of depression was used as a framework for developing the proposed model. Their model is presented in Figure 1.
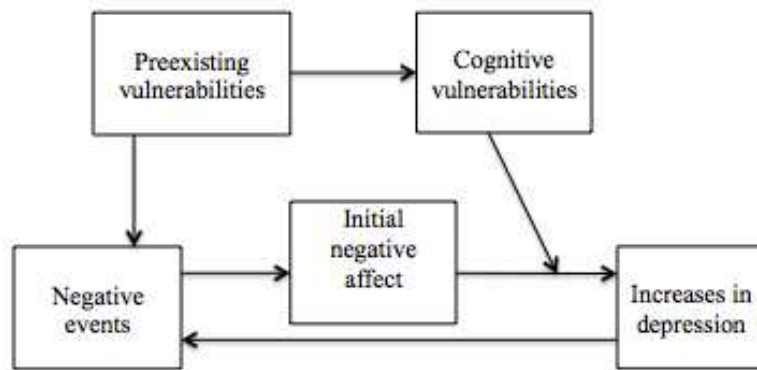
Figure 1. Hankin and Abramson's (2001) theoretical model

Hankin and Abramson's (2001) elaborated framework was designed to improve upon the general vulnerability-stress model, to predict gender differences in depressive symptoms among adolescents, and to provide a more thorough explanation for how individuals can become depressed. In their elaborated model, the etiological casual sequence begins with a person's preexisting vulnerability that may be related to genetic risk, personality, or environmental hardship. Two separate pathways lead from preexisting vulnerability to cognitive vulnerability and to negative events. Preexisting and cognitive vulnerability factors are viewed as separate constructs, as Hankin and Abramson (2001) posited that cognitive vulnerability is more closely related to

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depressive symptoms than are other types of vulnerabilities. In the pathway that leads from preexisting vulnerabilities to cognitive vulnerabilities, cognitive vulnerabilities refers to dysfunctional attitude, negative inferential style, and ruminative response style (Hankin & Abramson, 2001; p. 779). Whereas dysfunctional attitudes and negative inferential style provide the individual with information or content that is negatively based, Hankin and Abramson (2001) emphasize that rumination is what is responsible for activating the negative content and may exacerbate the depressive symptoms experienced by the individual.

Hankin and Abramson (2001) also proposed that having a preexisting vulnerability (genetic risk, personality, or environmental adversity) in addition to a cognitive vulnerability to depression (dysfunctional attitude, negative inferential style, and ruminative response style) will affect an individual's mood (initial negative affect). They hypothesize that the relation between preexisting vulnerability, cognitive vulnerability, and initial negative affect are responsible for producing an increase in depressive symptoms. In the elaborated model, initial negative affect encompasses a range of negative emotions such as anxiety, depression, and anger. Negative affect is believed to precipitate depression and to mediate other variables in the model; specifically, the relation between negative events and increases in depressive symptoms.

A pathway also leads from preexisting vulnerability to negative events. Negative events are categorized as either independent or dependent. Negative independent events refer to situations occurring outside of a person's control (e.g., death of a loved one) while negative dependent events refer to situations in which an individual's personal characteristics may contribute to the situation (e.g., argument with one's spouse).

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Another pathway leads from negative events to initial negative affect, which occurs prior to an increase in depressive symptoms. It is the continuation of negative affect that eventually leads to an increase in depressive symptoms. An increase in depressive symptoms, in turn, leads to more negative events through the model's transactional mechanism.

Hankin and Abramson's (2001) elaborated theory affords a comprehensive overview, and update to the general vulnerability-stress model (Beck, 1987; Abramson, Metalsky, & Alloy, 1989). The authors highlighted several ways in which the elaborated model improved upon the general vulnerability-stress theory. First, the elaborated model incorporated initial negative affect as an intermediate step between negative events and depressive symptoms; second, the authors re-conceptualized how cognitive vulnerability operated within their causal sequence; third, components of interpersonal theories were integrated to form a more interdisciplinary theory; fourth, a developmentally sensitive framework was applied to their model. Hankin and Abramson (2001) posited that their elaborated model applies equally well to adolescents and adults.

In the current study, the elaborated model was chosen as the guiding framework to provide a more detailed description of how postpartum depressive symptoms manifest. One advantage of the elaborated model was that it was developed with women in mind. Whereas the general model does not typically consider the sex of the individual exhibiting the psychopathology, Hankin and Abramson (2001) created their model in an attempt to predict depressive symptoms for adolescent females. A second advantage was the elaborated model allowed for the inclusion of several vulnerability and stress variables, which provided a more complete explanation of postpartum depressive

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symptoms. For instance, Hankin and Abramson's (2001) theoretical justification for separating preexisting vulnerability and cognitive vulnerability allowed for a more careful examination of these constructs to determine the unique role that each potentially plays in postpartum depression. Viewing these constructs as separate may be particularly useful when considering interventions to treat women with postpartum depression. Similarly, the inclusion of initial negative affect allowed the researcher in the current study to examine negative emotions that might precipitate postpartum depressive symptoms for mothers. For these reasons the elaborated model was chosen over the generic model as the guiding theoretical framework.

Proposed Model and Justification of Constructs

One of the aims of Hankin and Abramson's (2001) theoretical model was to be able to account for the development of depressive symptoms for "specific derivable cases" (p. 789). In the current study, this referred to mothers who were at greatest risk for developing postpartum depressive symptoms. The general sequence of the proposed model in the current study remained the same as the sequence in Hankin and Abramson's (2001) model; however, the vulnerability and stress variables were modified to fit the postpartum context. All of the examined variables in the current study have been previously identified as significant risk factors for postpartum depression.

The vulnerability factors of interest included depression history (preexisting vulnerability) and need for approval (cognitive vulnerability). The stressor variable was relationship conflict (negative events). Maternal-efficacy was conceptualized as a separate variable (representing initial negative affect) and served to mediate the relation between relationship conflict and (negative events) and postpartum depressive symptoms

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(increase in depression). The relations among the variables of depression history, need for approval, relationship conflict, and maternal-efficacy were examined to determine the role of each in predicting postpartum depressive symptoms (increase in depression). Below, each construct is defined and a justification is provided, beginning with the definition of distal factors (those occurring early in the theoretical sequence) and progressing to definitions of proximal factors (those occurring immediately prior, or simultaneously with postpartum depressive symptoms).

In the model, depression history referred to whether a woman has a self-reported history of depression prior to childbirth. Depression history has been used to predict future episodes of depression (e.g., Kendler, Thornton, & Gardner, 2001) and has been conceptualized as a preexisting vulnerability for postpartum depressive symptoms. Given its empirical support, depression history was deemed to be the best representation of preexisting vulnerability and was included as a distal factor in the model.

A second construct, need for approval, was used to represent cognitive vulnerability in the model. Early models of psychopathology did not differentiate between preexisting and cognitive vulnerability, but rather these models underscored the importance of biological or genetic factors that were not always easily measured (Ingram & Luxton, 2005). In contrast, Hankin and Abramson (2001) conceptualized preexisting and cognitive vulnerability as separate. They posited that dysfunctional attitudes, negative inferential style, and rumination comprised cognitive vulnerability, which led to the inclusion of need for approval (a dysfunctional attitude) in the current study. Cognitive vulnerability has been a difficult construct for researchers to pinpoint (Ingram, Miranda, & Segal, 1998). Both maladaptive/dysfunctional cognition and negative

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attributional style are cognitive variables that have been assessed (Church et al., 2005; Grazioli & Terry, 2000). Maladaptive cognitions are general and negatively focused schema (Beck, 1976), while attributional style is a tendency to attribute negative outcomes to factors that are internal, stable, and global (Abramson et al., 1978). Dysfunctional cognitions have received stronger support than negative attribution style (e.g., Stewart, Robertson, Dennis, Grace, & Wallington, 2003; Swendsen & Mazure, 2000). In testing a vulnerability-stress model of postpartum depression, Grazioli and Terry (2000) failed to find a significant interaction between attributional style (assessed by a measure of internal locus of control) and stress (assessed by parenting stress and infant temperament measures) in the prediction of postpartum depressive symptoms. However, Grazioli and Terry (2000) did find that dysfunctional attitudes were significant among women who experienced higher stress levels.

Need for approval refers to being overly concerned with others' judgments and being dependent on their approval (de Graaf, Roelofs, & Huibers, 2009). Needing approval may lead to biases in the way that information is processed as evidence suggests that such an attitude might be responsible for causing or maintaining depressive symptoms (Otto et al., 2007). Dysfunctional attitudes play a role in general depression and are believed to interact with stressors that predict depressive symptoms (Shahar, Joiner, Zuroff, & Blatt, 2004). The role of need for approval, a specific dysfunctional attitude, in the manifestation of postpartum depression was investigated in the current study.

Relationship conflict was chosen by the researcher to represent negative events. Relationship conflict refers to the discord a mother experiences in the relationship she has

with her spouse or partner (Hassert & Robinson Kurpius, 2011; Pierce, Sarason, & Sarason, 1991). The inclusion of relationship conflict in the model was justified for several reasons. First, for women who are married or in a committed relationship, this relationship is central to their emotional wellbeing (Logsdon, Birkimer, & Barbee, 1997). The quality of and satisfaction with this relationship, however, has been reported to change after birth, thus warranting further attention. Second, examining aspects of the partner relationship is consistent with Hankin and Abramson's (2001) emphasis on developmental factors in their model. Developmentally sensitive factors are underscored, which for mothers might involve the interrelated tasks of baby care and partnership. Last, since much of the postpartum risk factor literature has focused generally on social support, the current study took a varied approach by investigating whether negative aspects of a woman's relationship with her partner might hinder her emotional wellbeing. A thorough examination of relationship conflict is necessary, given the strong link between partner relationship stress and women's emotional health (e.g., Hassert & Robinson Kurpius, 2011; Roth & Robinson Kurpius, 1996).

The last predictor variable in the model, maternal-efficacy, was chosen by the current researcher to represent initial negative affect. Maternal-efficacy is a woman's view of herself in her maternal role (Haslam, Pakenham, & Smith, 2006). Her maternal-efficacy determines her level of confidence about motherhood. When faced with challenges, how a woman perceives herself as a mother determines how long she will persist during this time and the amount of effort she will exert (Haslam, Pakenham, & Smith, 2006). The beliefs and emotions that are tied to her own maternal perceptions are predicted to play an important role in the postpartum period and may represent a potential

"tipping point" where a woman may or may not begin to exhibit depressive symptoms. In other words, a woman's negative beliefs about her mothering capabilities was conceptualized by the current researcher to function similarly to initial negative affect, as mothers who perceive themselves as less efficacious may also experience negative emotions such as anxiety, depression, or frustration (Hankin & Abramson, 2001). Like initial negative affect, low maternal-efficacy may precipitate postpartum depressive symptoms.

In the study model, the outcome variable, postpartum depressive symptoms, refers to depressive symptoms occurring within the first year after childbirth. These symptoms include depressed mood, worthlessness, hopelessness, guilt, irritability, difficulty concentrating, or disturbances in sleep or eating patterns (APA, 2000). Specific pathways, including the mediating and moderating roles of certain constructs, are depicted in Figure 2 and are described below.
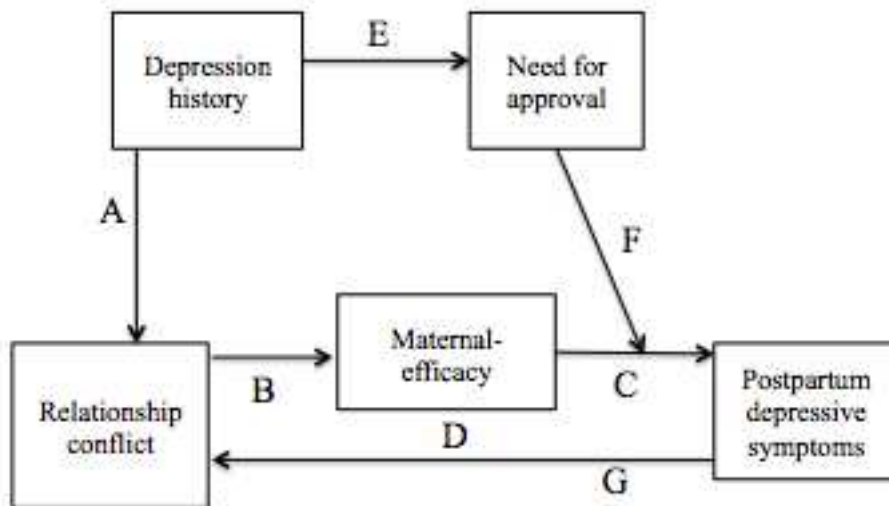

Figure 2. Proposed theoretical model

Explanation of Model Pathways

Pathway A. Depression history has been identified as a strong predictor of depressive symptoms in the postpartum period (e.g., Nagy, Molnar, Pal, & Orvos, 2011; Rich-Edwards et al., 2006; Robertson et al., 2004). Howell, Mora, Chassin, and Leventhal (2010) found among their sample of 720 mothers living in the United States that 39% experienced depressive symptoms at 2 to 6 weeks postpartum and that nearly 19% had a history of depression. In Howell et al.'s (2010) study, mothers reported whether they had been depressed for two or more weeks in the past and whether they had ever received treatment for depression. Hierarchical multiple regressions results indicated that depression history was related to postpartum depression; however, when other factors such as maternal self-efficacy, colicky baby, and social support were included in the hierarchical model, these variables outweighed depression history. Howell et al. (2010) concluded that other variables might be more important in the prediction of postpartum depressive symptoms than depression history. This point was taken into consideration in the current study as the indirect relations between depression history and other risk factors were investigated.

In another study, Rich-Edwards et al. (2006) examined the predictors of depression during and after pregnancy among 1662 racially/ethnically diverse mothers in the United States. Women were administered the Edinburgh Postnatal Depression Scale during pregnancy (10-weeks and 28-weeks gestation) and at 24-weeks postpartum. To assess whether women had a history of depressive symptoms, mothers in the study were asked to respond to the question of whether they had felt depressed for at least two weeks in the past. For women of all racial/ethnic groups, the strongest risk factor for depression during pregnancy was having a history of depression, and the strongest predictor of

postpartum depression was feeling depressed during pregnancy. Although Rich-Edwards et al. (2006) questioned whether the presence of depression prior to, during, and after pregnancy represented an "underlying depressive syndrome," the authors noted that such an assumption is difficult to test. Rich-Edwards et al. (2006) concluded that the role of environmental stressors, such as financial troubles or unwanted pregnancy, might come prior to or even cause depressive symptoms during pregnancy and the postpartum. As a result of past studies, the pathway between depression history and postpartum depressive symptoms was not conceptualized to be direct in the proposed model for the current study. Rather, depression history served as a starting point for conceptualizing preexisting vulnerability. It should be noted that while some evidence suggests prenatal depression to be the only significant predictor of postpartum depression (e.g., Kim, Hur, Kim, Oh, & Shin, 2008), most other studies have found depression history to interact with other risk factors (e.g., Howell et al., 2010; Rich-Edwards et al., 2006).

Based on these past studies, it was hypothesized that women with a history of depression (preexisting vulnerability) would be more likely to experience relationship conflict with their partner within the first year after birth. Inherent within this hypothesis is the belief that mothers who exhibit a vulnerability to depression might be more susceptible to emotional problems such as depression during times of stress. Mothers who have a preexisting vulnerability might perceive the changes accompanying childbirth as more stressful than do mothers who are not vulnerable to depressive symptoms. It is possible that the stress in these mothers' lives may be maintained by certain intrapersonal characteristics. This is consistent with the vulnerability-stress framework, as theorists tend to agree that individuals who are vulnerable to a particular disorder may actually

play a role in creating and maintaining the stressors in their lives (e.g., Hankin &

Abramson, 2001; Ingram & Luxton, 2005).

While the exact mechanism for how women with a preexisting vulnerability to

depression might experience more relationship conflict remains unclear, entry into

parenthood clearly represents a stressful time. Couples must learn to navigate new

challenges together, and for mothers with a preexisting vulnerability to depression, this

time might make cause them to feel more overwhelmed.   They might experience a

greater level of tension in the relationship they have with their partner as a result.

Findings from Demyttenaere, Lenaerts, Nijs, and Van Assche (2007) supported this

notion. Mothers in their sample who exhibited a negative coping style while pregnant

and shortly after giving birth were more likely to experience depressive symptoms at six

months postpartum. Furthermore, those who exhibited this style of coping and who

lacked support from their partners were at greatest risk for depression. Although coping

style was not a focus of the current study, Demyttenaere et al.'s (2007) findings suggest

that underlying vulnerability processes and stressors pertaining to the couple relationship

may work together to contribute to depressive symptoms in the postpartum.

Depression history and relationship conflict have been identified as risk factors

for postpartum depression (Beck, 2001), but the relation between these two variables is

not often investigated. Bernazzani et al. (1997) found that prenatal depressive symptoms

mediated the link between conflict and postpartum depressive symptoms; however, only

depression during pregnancy and general interpersonal conflict (not partner-specific

conflict) were examined in their study. The current study teased apart the relation

between depression history and relationship conflict. In line with Hankin and

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Abramson's (2001) theoretical framework, it was proposed that depression history would lead to an increase in relationship conflict.

Pathway B. This pathway suggests that relationship conflict predicts maternal-efficacy. Consistent with Bandura's (1982) theory regarding the development of self-efficacy, a woman's maternal-efficacy, meaning how she perceives her own mothering abilities, is influenced by a number of events. These events include the temperament of her infant as well as personal memories she has of the relationship with her parents growing up (Leerkes & Crockenberg, 2002). Other social relationships have the ability to influence her maternal-efficacy as well, which is most relevant to the current study. Intimate relationships provide a mother with an opportunity to observe the parenting interactions of people closest to her, such as her partner or other family members. These relationships may also deliver verbal encouragement and support (Porter & Hsu, 2003). The partner relationship is key during the perinatal period; therefore, it is not surprising that a supportive partner might bolster a mother's efficacy by reducing the difficulty of childcare tasks or by providing recognition that she is performing well in her maternal role (Leerkes & Crockenberg, 2002).

This positive effect of relationship support on maternal-efficacy has been a focus in the parenting literature (Haslam et al., 2006; Teti & Gelfand, 1991). For example, one study of 93 first generation Mexican immigrant mothers living in the United States found that mothers who had more social support felt more efficacious about their parenting abilities (Izzo, Weiss, Shanahan, & Rodrigues-Brown, 2000). This study, however, was conducted with mothers of elementary school-aged children and may not necessarily apply to mothers with infants. Another study, conducted in Ireland with 410 mothers at

six weeks postpartum, found that family support was positively related to maternal-efficacy (Leahy-Warren, McCarthy, & Corcoran, 2011) that was, in turn, linked to postpartum depressive symptoms. In the Izzo et al. (2000) and Leahy-Warren et al. (2011) studies, however, the focus was on support from family or friends and not on the partner relationship. Furthermore, neither study examined partner conflict, which is another aspect of intimate relationships.

It is plausible that relationship conflict might significantly interfere with a woman's maternal-efficacy as she may receive less positive recognition from her partner or less assistance with childcare. Porter and Hsu (2003) found among a sample of 61 first-time mothers in the U.S., those who reported negativity in their marital relationships (more conflict and ambivalence) had lower maternal-efficacy and more postpartum depressive symptoms. In their study, Porter and Hsu (2003) assessed the relations among maternal-efficacy, depression, anxiety, marital quality (positivity and negativity in the marital relationship), and infant temperament during pregnancy and again at 1- and 3-months postpartum. Multiple regression analyses revealed that during the last trimester of pregnancy, women who reported more marital negativity, depression, and anxiety had lower maternal-efficacy. Consistent with self-efficacy theory (Bandura, 1982), Porter and Hsu's (2003) findings suggest that during the prenatal period, a woman's mood and the support provided by her partner could serve as potential filters through which she views her maternal role. At 1-month postpartum, maternal-efficacy was not significantly linked with concurrent negativity in the marital relationship or with depressive symptoms but was linked with anxiety and marital positivity. Maternal-efficacy at 1-month postpartum was, however, related to prenatal assessment of marital negativity. Hsu and

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Porter (2003) expressed that the unexpected nature of their results could be due to the ability of the low-risk mothers in their sample to adapt more easily to motherhood after birth. They also speculated that mothers' maternal-efficacy might be less dependent on mood states over time. From Hsu and Porter's (2003) study it cannot be concluded whether depression, anxiety, and marital negativity lead to lower maternal-efficacy or whether the reverse relation was true. Given that their study was conducted with a small sample of first-time mothers, it is impossible to know whether the findings still apply for multipareous women. To extend past research, the current study hypothesized that more relationship conflict would lead to lower maternal-efficacy for mothers after birth. These variables have received attention in the international literature and also in studies with first-time mothers. The current study attempted to fill this gap in the literature by focusing on women in the U.S. and by not limiting the sample to new mothers only.

Pathway C. The next pathway in the theoretical model pertains to the relation between maternal-efficacy and postpartum depressive symptoms. Specifically, it was hypothesized that lower maternal-efficacy would predict more postpartum depressive symptoms. As a mother enters her maternal role, she learns to respond to her baby's needs, to balance the needs of her baby with other children she may have, and to juggle work and childcare. A mother's maternal-efficacy can influence whether she will implement effective coping strategies to deal with these life changes (Haslam et al., 2006). Her adjustment depends, in part, on her own resourcefulness and the strategies she uses to deal with change. Mothers who feel confident about mothering may adjust more easily to the demands of motherhood. In contrast, mothers who perceive themselves as failing at any of these tasks may be more likely to exhibit depressive

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symptoms (Haslam et al., 2006). Past research has identified a negative link between maternal-efficacy and mood (e.g., Gross, Conrad, Fogg, & Wothke, 1994; Haslam et al., 2006; Maciejewski, Prigerson, & Mazure, 2000). The current study explored the relation between maternal-efficacy and postpartum depressive symptoms within the context of a comprehensive theoretical model. Additionally, maternal-efficacy was hypothesized to serve as a mediating variable (pathway D). This mediation is described below.

Pathway D. It was hypothesized that the link between relationship conflict and postpartum depressive symptoms would be mediated by maternal-efficacy. It has been well established that a woman's perception of her relationship as stressful or conflicted has the potential to impact her mood negatively (Dennis & Ross, 2006). Gross, Wells, Radigan-Garcia, and Dietz (2002) found among their sample of 14,609 mothers in the United States, that after childbirth, women who reported a more stressful partner relationship were more likely to be depressed than were those who did not. In another study, Dennis and Ross (2006) found that among 585 Canadian mothers who were surveyed at 1, 4, and 8 weeks postpartum, mothers who perceived their husbands or partners as less supportive were more likely to experience postpartum depressive symptoms. In their study at 8-weeks after birth, women with depressive symptoms were more likely to have a partner who disagreed with how they cared for their baby and who did not help with chores around the home.

Marital quality, including relationship conflict, has been identified as a risk factor for postpartum depressive symptoms (Beck, 2001; Hassert & Robinson Kurpius, 2011). Relationship conflict has also been linked with lower maternal-efficacy (Cutrona &

Troutman, 1986). Furthermore, a negative link has been identified between maternal-efficacy and mood (e.g., Gross et al., 1994; Haslam et al. 2006; Maciejewski et al., 2000).

Given these links, the current study examined whether the relation between relationship conflict and postpartum depressive symptoms was mediated by maternal-efficacy.

Although these specific links among variables have not been examined by other studies, Haslam et al. (2006) found that maternal-efficacy mediated the relation between social support and mothers' postpartum depressive symptoms. For Haslam et al.'s (2006) sample of 168 women assessed during pregnancy and again at 4 weeks postpartum, parental support predicted higher maternal-efficacy that was, in turn, related to lower levels of postpartum depressive symptoms. Being in a supportive and caring relationship might positively impact maternal-efficacy thus decreasing the likelihood of the mother developing postpartum depressive symptoms (Haslam, 2006). Less is known about the links among partner relationship conflict, maternal-efficacy, and postpartum depressive symptoms. The current model was designed in order to shed light on these links.

Pathway E. The pathway from depression history to need for approval allowed the researcher to conceptualize preexisting vulnerability and cognitive vulnerability as separate but overlapping constructs. Since evidence suggests that both contribute to depressive symptoms (e.g., Strodl & Noller, 2003), the current model posited that having a history of depression might facilitate the emergence of dysfunctional beliefs, such as need for approval. As depression history (preexisting vulnerability) is implicated to have ties to genetic risk, personality traits, and environmental adversity (Hankin & Abramson, 2001) it was proposed to proceed need for approval (cognitive vulnerability) in the study model.

Pathway F. The proposed model tested the hypothesis that need for approval would moderate the pathway between maternal-efficacy and postpartum depressive symptoms. Some researchers have conceptualized need for approval as a personality dimension or as a type of experience of depression (Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982; Bornstein, 1992; Robins, 2006). Blatt et al. (1982) theorized that individuals who are most susceptible to depression might be characterized as either self-critical or dependent/needing approval. Those who seek approval remain dependent on others around them to build and support their self-esteem (Bornstein, 1982). The current study conceptualized need for approval as a dysfunctional attitude (de Graaf, et al., 2009), as it most closely aligned with Hankin and Abramson's (2001) notion of cognitive vulnerability. According to Beck's (1976) theory, need for approval may function as a dysfunctional attitude as it represents an unrealistic standard that is based on the judgments of others. Mothers who rely on others for guidance and continuous social approval (Bornstein, 1992) might process information in a way that places them at greater risk for developing depressive symptoms (Beck, 1976). In contrast to women without this cognitive vulnerability, mothers seeking approval might see themselves as helpless, and feel as though they are unable to control the events in their lives.

Need for approval has been found to be an antecedent of general depression (Barnett & Gotlib, 1988). Additionally, it has been linked to depression within intimate partner relationships (Whiffen, 1991). Need for approval is less often studied in the postpartum literature, and findings for mothers have been mixed. One study by Priel and Besser (1999) found no relation at 8 weeks postpartum between need for approval and postpartum depressive symptoms among their sample of 73 mothers living in Israel.

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Another study, conducted in Belgium by Vliegen and Luyten (2009), found the depressed mothers in their sample to differ from the non-depressed mothers on levels of self-criticism, but not on dependency (need for approval). For their non-depressed mothers, need for approval was negatively related to depressive symptom severity. This lead Vliegen and Luyten (2009) to conclude that the need for approval might differ between depressed mothers and mothers who are not depressed. The authors speculated that dependency-like traits might serve as a protective mechanism for non-depressed mothers whereas traits of dependency could be also related to depressive symptoms among those mothers who are already depressed (Vliegen & Luyten, 2009). Small sample sizes are a limitation of both Priel and Besser's (1999) and Vliegen and Luyten's (2009) studies. Need for approval should be examined in future models of postpartum depressive symptoms.

In the current study, need for approval was an important variable to include as it may interact with other model variables, such as maternal-efficacy. Efficacy has been tied to perceptions about agency, causality, and control (Bandura, 1989). The negative beliefs some mothers might experience about themselves regarding personal control could affect their mood and day-to-day functioning. Mothers who exhibit dependent tendencies and who seek approval from others might be more likely to process information in a negative or distorted manner that reinforces their beliefs about the lack of their own effectiveness as mothers.

In addition to the plausible link between need for approval and maternal-efficacy, need for approval might also be related to postpartum depressive symptoms. This pathway was not proposed in the model, as it did not align with Hankin and Abramson's

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(2001) theoretical model. However, dysfunctional attitudes in general have been linked to postpartum depressive symptoms (Grazioli & Terry, 2000), with some evidence suggesting that dysfunctional attitudes might exacerbate postpartum depressive symptoms (Dennis et al., 2004). It is worthwhile to note that while cognitive therapy has been found to be useful in treating postpartum depression, few studies have examined cognitive variables in relation to postpartum depressive symptoms (O'Hara, Rehm, & Campbell, 1982). The current model built upon past research by focusing on need for approval as a dysfunctional attitude, and investigating whether this variable influenced the link between maternal-efficacy and postpartum depressive symptoms.

Pathway G. This pathway proposed that postpartum depressive symptoms would predict relationship conflict. While individual difference variables such as preexisting cognitive vulnerability are frequently emphasized when studying depressive symptoms, it is also important not to overlook interpersonal relationships. Whiffen, Kallos-Lilly, and MacDonald (2001) posited depression to be an "intrapsychic phenomenon" (p. 577), with the final step of Hankin and Abramson's (2001) theoretical model supporting this perspective. Specifically, Hankin and Abramson (2001) hypothesized that a pathway from postpartum depressive symptoms back to relationship conflict would exist, which would represent a transactional-like mechanism. This pathway also aligns with Bandura's (1989) theoretical notion that negative mood might serve as a filter through which people with depressive symptoms might cognitively alter their personal life events so that these events are perceived more negatively.

Women's partners generally play a crucial role in the perinatal period (Logsdon et al., 1997). They typically represent a major source of support. Among their sample of

51,558 pregnant women living in Norway, Røsand, Slinning, Eberhard-Gran, Røysamb, and Tambs (2011) found that dissatisfaction with the romantic relationship predicted greater emotional distress. Of the 37 variables tested, a dissatisfying partner relationship was the strongest predictor of women's anxiety and depressive symptoms. Satisfaction with one's partner relationship, however, buffered the effect of some of the other risk factors including somatic disease, family income, and work dissatisfaction. A satisfying and fulfilling partner relationship can help mothers better adjust to the changes accompanying motherhood (Misri, Kostaras, Fox, & Kostaras, 2000). Women who have more partner support consistently report being more satisfied with their partner relationships, feel less depressed, and are better able to manage stress (Dehle, Larse, & Landers, 2001). At the same time, researchers have also found a link between relationship conflict and depression, with partner conflict being detrimental to women's overall health (Hassert & Robinson Kurpius, 2011; Roth & Robinson Kurpius, 1996). Although studies have shown that stress and problems within these intimate relationships may contribute to postpartum depressive symptoms, research has not always been clear about which one occurs first (Beach & Nelson, 1990; Burke, 2003; Whisman, 2001).

Zelkowitz and Milet (1996) examined the reported marital quality of men whose partners had been diagnosed with a psychiatric disorder following childbirth. Men whose partners were depressed were more dissatisfied with their relationships. Additionally, they reported less intimacy and experienced more changes in their home routine and recreational activities. Another study found that couples where the wife was depressed experienced more difficulty handling relationship conflict, had fewer exchanges of affection, were more sexually dissatisfied, and had more disagreements over their

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finances (Coyne, Thompson, & Palmer, 2002). These findings elucidate how depressive symptoms might contribute to more misunderstandings or conflict within the relationship and suggest that a woman's emotional health and wellbeing might be affected by the partner relationship quality. The current study hypothesized that relationship conflict would contribute to lower maternal-efficacy, subsequently resulting in more postpartum depressive symptoms. It was also predicted that postpartum depressive symptoms, in turn, would lead to more relationship conflict. It was proposed that this transactional process (Hankin & Abramson, 2001) would result in the continuation of conflict in the partner relationship.

Summary and Purpose of Current Study

Postpartum depression is an important women's health issue that affects a significant number of women (Dennis et al., 2004; O'Hara & Swain, 1996). This disorder has been considered one of the most common complications of childbirth (Beck, 2008), and research is still needed that examines its theoretical underpinnings and etiology. While several predictive models have been proposed and tested on diverse groups of mothers after birth (e.g., Dennis et al. 2004; Howell et al., 2005; Ngai & Chan, 2011; Ross et al., 2004), these models frequently vary based on the researchers' own conceptualizations of postpartum depressive symptoms and, due to an often lacking theoretical framework, are not typically replicated. Thus, despite the positive efforts of certain researchers (Howell et al., 2005; Ngai & Chan, 2011), a consistently agreed upon theoretical model to explain women's vulnerability to postpartum depression is absent from the literature.

The use of a vulnerability-stress conceptualization of postpartum depression can create unity among predictive models, and several international researchers have used this conceptualization to explain postpartum depressive symptom etiology (e.g., Bernanazzi et al., 1999; Church et al., 2005; Grazioli & Terry, 2000). There is value in having a model to explain the onset of postpartum depressive symptoms. The vulnerability-stress framework, in particular, has been deemed an important heuristic, as this framework can assist researchers in more clearly classifying "vulnerability" and "stress" variables (Monroe & Simons, 1991). Such clarity can lead to a more precisely assessed model of postpartum depressive symptomatology.

In the current study, Hankin and Abramson's (2001) Elaborated Cognitive Vulnerability-Stress Model was used as a guiding framework. This framework was applied to mothers in the postpartum (up to one year after birth). Based on previous research that has identified risk factors for postpartum depression, the following constructs were included in the predictive model: depression history, need for approval, relationship conflict, and maternal-efficacy. These variables and the hypothesized relations among them have been supported by previous studies; however, this model has not yet been comprehensively tested. The purpose of the current study was to test a model that was grounded in theory and has been supported by past research. The theoretical model is pictured in Figure 2. The specific hypotheses examined were:

H1: Having a history of depression would contribute to more relationship conflict (pathway A); H2: More relationship conflict would lead to lower maternal-efficacy (pathway B); H3: Low maternal-efficacy would predict more postpartum depressive symptoms (pathway C); H4: Maternal-efficacy would mediate the relation between

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relationship conflict and postpartum depressive symptoms (pathway D); H5: Depression history would predict higher need for approval (pathway E); H6: Need for approval would moderate the relation between maternal-efficacy and postpartum depressive symptoms (pathway F); H7: More postpartum depressive symptoms would predict more relationship conflict (pathway G).

Chapter 2

METHOD

Participants and Recruitment

Upon approval by the university's Institutional Review Board (see Appendix A), mothers were recruited from a family medicine outpatient facility, two women's healthcare facilities, four homes for expectant mothers, and the Internet via Facebook and a listserv for new parents. The inclusion criteria for this study included mothers who were at least 18 years of age, had an understanding of the English language, and had a baby aged 12 months or younger. This range was chosen as the "postpartum" period typically refers to up to one year after birth (Stewart et al., 2003). Additionally, O'Hara (1987) found that many women who experience postpartum depressive symptoms have episodes that last 6 months or longer. This suggests that symptoms may continue into the end of the first postpartum year or longer. Mothers who delivered recently (those whose babies were one week of age) were not excluded as the onset of depressive symptoms can occur at any point within the initial year following birth (O'Hara, 1997). Although parity status (whether a woman was primiparous or multiparous) and number of additional children were requested in the demographic questionnaire, this information was not included in the model and, therefore, was not part of the inclusion criteria.

Of the 153 women who completed the survey, 133 took the survey online, and 20 completed the hard-copy version. Eight participants were omitted as they left one or more subscales blank. One additional participant was omitted because her baby was 16 months of age, which was over the study cut-off for baby age. The final sample consisted of 144 mothers who had given birth within the past year. Mothers ranged in age from 18

to 46 years ($M = 29.12$ $SD = 5.35$). Ninety-two (63.9%) identified as Caucasian/White, 19 (13.2%) as Hispanic/Latina, 14 (9.7%) as Asian, 7 (4.9%) as Biracial, 5 (3.5%) as African American/Black, 3 (2.1%) as American Indian or Native American, and 2 (1.4)% as other. The majority was married ($n = 118$, 81.9%), while 22 (15.2%) were single or had a live-in-partner, and four (2.8%) were separated or divorced. Income level was bimodal with a little over a third (39.4%) earning less than $49,999 and 37.2% earning over $90,000. Baby age ranged from 1 week to 12 months. Fifty (34.7%) mothers had a baby 12 weeks old or less, 43 (29.9%) had a baby between 13 and 24 weeks old, 31 (21.5%) had a baby between 25 and 36 weeks old, and 20 (13.9%) had a baby between 37 and 48 weeks old. A little over half ($n = 79$; 54.9%) were first time mothers, and 91 (64.1%) indicated that they were breastfeeding their baby. Twenty-three mothers (16%) reported having been clinically diagnosed with depression prior to their pregnancy, and 40 (27.8%) said they had sought professional help in the past for depression. Thirty-three (22.9%) women reported feeling depressed during pregnancy. Additional participant demographic information is reported in Table 1.

Table 1

Sample Demographic Characteristics

Demographic	*n*	%
Current Employment Status		
Full time employment	60	41.7
Part time employment	27	18.8
Not employed	57	39.6
Income Level		
Below $29,999	31	22.1
$30,000-$49,999	25	17.3
$50,000-$69,999	21	15
$70,000-$89,999	11	8.6
$90,000+	52	37.2
Missing	4	2.8
Education		
Less than High school	6	4.2
High school graduate or GED	8	5.6
Some college or technical school	30	21.0
Associate Degree	15	10.5
Bachelor Degree	33	23.1
Graduate School	51	35.7
Missing	1	.7
Support with Baby		
Maternal grandparents	70	48.6
Paternal grandparents	20	13.9
Other family members	5	3.5
Friends	6	4.3
Nanny/babysitter	18	12.6
No one	12	8.4
Other	4	2.8
Missing	8	5.6

Instrumentation

The survey packet consisted of the informed consent letter, the demographic survey, and four instruments (see Appendix B).

Demographic survey. The demographic survey requested basic information including the mother's age, ethnicity, marital status, infant age, number and age of any additional children, employment status, income level, and highest obtained level of education. Depression history was assessed by a single question on the demographic questionnaire. Mothers were asked to respond (yes/no) to whether they had ever been clinically diagnosed with depression. If they responded "yes," they were asked whether they had ever sought counseling for depression and whether they felt depressed during their pregnancy.

Need for approval. The 6-item Need for Approval subscale from the Dysfunctional Attitude Scale form A-17 (DAS-A-17; de Graaf et al., 2009) was used to measure need for approval. Within the context of interpersonal relationships, being concerned with others' judgments and being dependent on their approval is viewed as a dysfunctional attitude. An item such as, "My value as a person depends greatly on what others think of me," is responded to on a 7-point Likert scale from 1 (fully disagree) to 7 (fully agree). A total score, derived from summing responses across items, can range from 6 to 42, with higher scores reflecting greater need for approval.

de Graaf et al. (2009) identified the Need for Approval subscale as one of two factors on the DAS-A-17. The DAS-A-17 was created from the 40-item DAS-A, which originated from Weissman and Beck's (1978) DAS. de Graaf et al. (2009) tested the DAS-A-17 on a random sample of 8,960 Dutch participants whose ages ranged from 18

to 65 years. Results of a Confirmatory Factor Analysis revealed that a two-factor structure best supported the data, which included a Dependency (Need for Approval) factor and a factor they labeled Perfectionism/Performance Evaluation. de Graaf et al. (2009) examined the correlations between Need for approval, Perfectionism, and the total score, and the Diagnostic Inventory for Depression (DID; Zimmerman, Sheeran, & Young, 2004), a 38-item scale that assesses severity of depression based on the DSM-IV criteria. Total scores on the Need for Approval subscale correlated with DID at .51. The Cronbach's alpha for need for approval was reported to be .81. de Graaf et al. (2009) concluded that the Need for Approval subscale reliably measured dependency/need for approval and has sufficient validity. In the current study, the alpha coefficient was .85.

Maternal-Efficacy. The 8-item Efficacy subscale of the Parenting Sense of Competence Scale (PSOC; Gibaud-Wallston &Wandersman, 1978) was used to measure maternal-efficacy, a woman's perceived competence in her role as a mother. Items are rated on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with higher scores indicating greater perceived maternal competence. A sample item includes, "Being a mother is manageable and any problems are easily solved." Gibaud-Wallston and Wandersman (1978) tested their instrument on 100 Caucasian participants (50 females and 50 males) who were identified as being middle-class status and whose babies were 10 weeks of age. The authors reported an alpha coefficient of .80 for the responses to the Efficacy subscale, which they referred to as Skill/Knowledge. They also reported a 6-week test-retest reliability of .74 for their mothers. Convergent validity was determined by correlating the PSOC with six scales of the Wessman and Ricks' (1966) Personal Feelings Scales, which measures individuals' perceptions of self and personal

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relationships. Significant relations were found between maternal-efficacy and

Respect/Contempt, Tranquility/Anxiety, Self Confidence/ Inadequacy, and Work

Satisfaction/Dissatisfaction, which provide support for convergent validity. In the current

study, the alpha coefficient was .87.

Relationship Conflict. Relationship conflict was assessed using the 12-item

Conflict subscale of the Quality of Relationships Inventory (QRI; Pierce et al., 1991).

This subscale measures conflict within an individual relationship and the degree to which

a person feels anger or ambivalence toward the other person in the relationship. The

designated person in the current study was the mother's romantic partner/spouse. A

sample item for the Conflict subscale includes, "How often do you have to work hard to

avoid conflict in your relationship with your partner/spouse?". A Likert-type response

format ranging from 1 (not at all) to 4 (very much) is used to respond to items on the

Conflict subscale. Total scores can range from 12 to 48 with higher scores indicating a

greater degree of conflict within the mother's romantic relationship.

Pierce et al. (1991) factor analyzed the total QRI using 211 college-aged

participants and principal axis factoring with oblique rotation. The results suggested that

Conflict, in addition to two other correlated factors (Support and Depth), accounted for

approximately 49% of the variance. Participants completed the QRI for key relationships

including their mother, father, and friends; the alpha coefficients for the Conflict subscale

were .88, .88, and .91 (mother, father, and friend, respectively). In another validation

study, Pierce, Sarason, Sarason, Solky-Butzel, and Nagle (1997) found that college

participants who reported more relationship conflict with their mothers also reported

higher depression scores, as measured by the Beck Depression Inventory (BDI; Beck et

al., 1961). Conflict subscale scores were found to remain stable over a 12-month period

(Pierce et al., 1997).

The use of the Conflict subscale has not been limited to college-aged participants.

The Conflict subscale has been used to assess relationship conflict among adult women in

romantic relationships (e.g., Nakano et al. 2002; Verhofstadt, Buysse, Rosseel, & Peene,

2006). It has also been used specifically with women in the postpartum. Dennis and

Ross (2006) reported an internal consistency of .74 for their sample of 396 Canadian

mothers at 1 to 4 weeks postpartum. The Cronbach's alpha for the responses to the

Conflict subscale was .90 for the current study sample.

Postpartum Depressive Symptoms. The 10-item Edinburgh Postnatal Depression

Scale (EPDS; Cox, Holden, & Sagovsky, 1987) is the most commonly used instrument to

detect depression among mothers after birth. It asks mothers to identify how they have

felt in the past week and includes items such as, "I have been able to laugh and see the

funny side of things" and "I have been so unhappy I have difficulty sleeping." Each item

is rated on a 4-point scale (from 0 to 3), with the total score ranging from 0 to 30. In a

validation study, Cox et al. (1987) tested the EPDS on a sample of 84 mothers with

babies 3 months of age. Mothers completed the EPDS and were interviewed using the

Goldberg's Standardized Psychiatric Interview (Goldberg, Cooper, Eastwood, Kedward,

& Shephard, 1970). A diagnosis of depression was based on the Research Diagnostic

Criteria of Spitzer, Endicott, and Robins (1975), and this result was compared with their

EPDS score. Cox et al. (1987) found that EPDS scores correctly distinguished depressed

mothers from non-depressed mothers 78% of the time. Mothers' scores accurately

predicted the presence of depressive symptoms 73% of the time, and the EPDS was

sensitive to changes in the severity of depressive symptoms over time. Cox et al. (1987) reported an alpha coefficient of .87 and split-half reliability of .88, suggesting adequate reliability. The EPDS has been determined to be valid and used throughout the first year after birth (Matthey, Barnett, Ungerer, & Waters, 2000).

Although a cut-off score of 12 or 13 and above has been proposed to be indicative of postpartum depression (Cox et al., 1987). Researchers have used varying EPDS cut-off scores depending on the population they are studying (Matthey, Henshaw, Elliot, & Barnett, 2006). Frequently-used cut-offs include scores such as ≥ 9, ≥ 10, and ≥ 13 (Halbreich & Karkun, 2006). Chaudron et al. (2010) found that when no cut-off score was used, the EPDS performed as well as the Postpartum Depression Screening Scale (PDSS), the Structured Clinical Interview for the DSM-IV (SCID), and the Beck Depression Inventory II (BDI-II) in identifying depression among a sample of primarily Black mothers at 2 weeks to 14 months postpartum. When cut-off scores were imposed, however, mothers were more likely to be misclassified. Mothers who level of distress is reported to be significant on self-report measures such as the EPDS do not always meet DSM-IV criteria for Major Depressive Disorder (Robertson, Celasun, & Stewart, 2003).

The utility of the EPDS lies in its ability to measure depressive mood symptoms after birth, as it is not intended to diagnosis pathology (Cox et al., 1987; Cox & Holden, 2003). As mood disorders are generally considered to be on a continuum without a categorical distinction (Murray & Carothers, 1990), a continuum, rather than a cut-off score, for postpartum depressive symptoms symptomatology was used in the current study. This decision is supported by the lack of absolute EPDS threshold and the debate over an exact cut-off score (Lagerberg, Magnusson, & Sundelin, 2011; Matthey et al,

2006). Some researchers have used the EPDS as a continuous measure (e.g., Grazioli &

Terry, 2000). For comparison purposes only, in the current study 25 women (17.5%)

received a score of > 12 on the EPDS, which is slightly higher than the 13% postpartum

depression prevalence reported by O'Hara and Swain (1996). The Cronbach's alpha was

.87 for the current sample.

Procedures

The director of a family medicine outpatient facility, a midwife and physician at

two women's healthcare facilities, and the supervisors of four homes for expectant

mothers were contacted to see if they would be willing to post flyers about this study or

provide their patients/clientele with the survey. Each site agreed to post flyers that

included the link to the online survey and also distributed the informed consent and

survey to their interested patients or clients. Facilities were given a document that

explained the recruitment procedure so that it was standardized across settings. Clinic

staff informed mothers with a baby under 12-months of age that the study was voluntary.

Women who expressed an interest filled out the survey and were given a $5 gift card

from the staff. Sites were instructed that completed surveys should be kept confidential

and envelopes were provided to the staff.

For mothers who completed the survey online via SurveyMonkey, a similar

procedure was implemented. A standardized email asked mothers to click on the survey

link where they could read the informed consent letter and fill out the survey. The link

was posted on Facebook and was also sent through several new parenting listservs.

Mothers who completed the survey online were emailed a $5 gift card.

Data Analysis

Structural equation modeling (SEM) was used to test the proposed latent variable model in Mplus Version 6.12 (Muthen & Muthen, 1998-2011). Anderson and Gerbing (1988) suggested that when testing a theoretical model within SEM, a confirmatory measurement model should be conducted initially. The measurement model specifies the posited relations of the observed variables to the latent factors, and all factors are allowed to co-vary. Once an acceptable measurement model has been determined, the structural model can be tested (Quintana & Maxwell, 1999).

Data were examined using descriptive analyses in the Statistical Package for the Social Sciences (SPSS) Version 20 to determine the distributional properties of all variables. Almost all of the items were not distributed normally as evidenced by skewness and kurtosis (see Table 2). Of the 144 participants, 28 had missing data that amounted to no more than two items on any given measure. Missing data were assessed using the Little's Missing Completely at Random (MCAR) Test. Based on the results, (χ^2 = 768.322, df = 763 p = .44), it was determined that there was no pattern to the data and missing values were not related to the other variables (Bennett, 2001). Full Information Maximum Likelihood estimation (FIML) was chosen to estimate the missing values (Schlomer, Bauman, & Card, 2010).

Table 2

Descriptive Statistics of Scale Items

Scale Item	N	M	SD	Skewness	Kurtosis
Maternal-Efficacy Scale Items					
The problems of taking care of a baby are easy to solve once you know how your actions affect your child, an understanding I have acquired.	143	4.90	1.15	-1.09	1.30
I would be a fine model for a new mother to follow, to learn what she would need to know to be a good parent.	142	4.76	1.09	-.73	.68
Being a mother is manageable, and any problems are easily solved.	144	4.36	1.25	-.41	-.44
I meet my own personal expectations for expertise in caring for my baby.	143	4.64	1.20	-.67	.19
If anyone can find the answer to what is troubling my baby, I am the one.	144	4.90	1.11	-.77	.16
Considering how long I've been a mother, I feel thoroughly familiar with this role.	140	4.74	1.24	-.84	.33
I honestly believe I have all the skills necessary to be good mother to my baby.	144	5.07	1.09	-1.08	.81
Being a good mother is a reward in itself.	143	5.41	1.01	-1.86	3.84
Relationship Conflict Scale Items					
How often do you need to work hard to avoid conflict with your husband?	142	1.97	.74	.68	.67
How upset does your husband sometimes make you feel?	144	2.19	.79	.60	.24
How much does your husband make you feel guilty?	144	1.42	.72	1.84	3.25
How much do you have to "give in" in this relationship?	144	1.83	.78	.92	.85
How much does your husband want you to change?	144	1.54	.74	1.39	1.77
How critical of you is your husband?	144	1.54	.79	1.62	1.10
How much would you like your husband to change?	143	1.98	.79	.90	.94
How angry does your husband make you feel?	143	1.87	.79	.85	.66
How much do you argue with your husband?	143	2.01	.60	.60	1.86
How often does your husband make you feel angry?	144	1.91	.64	.57	1.38
How often does your husband try to control or influence your life?	143	1.46	.77	1.75	2.56
How much more do you give than you get from this relationship?	144	1.72	.91	1.06	.11

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Need for Approval Scale Items

My value as a person depends greatly on what others think of me.	142	2.70	1.74	.77	-.49
It is awful to be disapproved of by people important to you.	144	4.81	1.75	-.89	-.10
If you don't have other people to lean on, you are bound to be sad.	143	4.24	1.82	-.46	-.78
If others dislike you, you cannot be happy.	143	2.73	1.65	.70	-.55
My happiness depends more on other people than it does on me.	143	2.24	1.46	.99	-.25
What other people think about me is very important.	143	3.92	1.83	-.30	-1.03

Postpartum Depressive Symptom Scale Items

I have been able to laugh and see the funny side of things.	143	.18	.43	2.49	5.75
I have looked forward with enjoyment to things.	143	.30	.58	2.24	5.88
I have blamed myself unnecessarily when things went wrong.	144	1.27	.85	.08	-.68
I have been anxious or worried for no good reason.	142	1.20	.96	.16	-1.08
I have felt scared or panicky for no good reason.	143	.78	.89	.82	-.38
Things have been getting on top of me.	143	1.10	.83	-.03	-1.20
I have been so unhappy that I have had difficultly sleeping.	141	.39	.64	1.74	3.13
I have felt sad or miserable.	143	.85	.85	.50	-.89
I have been so unhappy that I have been crying.	143	.56	.68	1.08	1.09
The thought of harming myself has occurred to me.	143	.20	.61	3.31	10.48

An item parceling approach for the data was elected as such an approach obviates many problems with individual items such as non-normality and poor reliability (Coffman & MacCallum, 2005). Item parcels were created for each of the latent variables (need for approval, relationship conflict, maternal-efficacy, postpartum depressive symptoms, and the moderation variable). Research suggests a minimum of three indicators per latent factor (Hall, Snell, & Singer Foust, 1999), and this was accomplished by averaging the first three items, then subsequent items on each scale to create item parcels. For instance, maternal-efficacy consisted of eight items. The first parcel consisted of the mean of the first three items, the second parcel consisted of the mean of the next three items, and the third item consisted of the mean of the last two items. The creation of item parcels resulted in three indicators loading on the latent factors of need for approval, maternal-efficacy, and postpartum depressive symptoms, while four indicators loaded on the latent factor of relationship conflict.

In order to create the moderation factor, item parcel values for need for approval and postpartum depressive symptoms were centered. After centering all of the item parcels, the first maternal-efficacy item parcel was multiplied with the first need for approval item parcel, the second maternal-efficacy parcel with the second need for approval item parcel, and the third maternal-efficacy parcel with the third need for approval item parcel (Marsh, Wen, Nagengast, & Hau, 2012). This formed three new item parcels that loaded on the moderation factor. The distributional properties of each of the item parcels are presented in Table 3.

Table 3

Descriptive Statistics of Item Parcels

	N	M	SD	Skewness	Kurtosis	Coefficient Alpha
Efficacy 1	141	4.67	.96	-.57	.35	.75
Efficacy 2	140	4.75	.96	-.72	.94	.74
Efficacy 3	143	5.24	.91	-1.13	1.01	.65
Conflict 1	142	1.87	.61	.98	.86	.76
Conflict 2	144	1.64	.61	1.15	1.31	.67
Conflict 3	141	1.95	.60	.87	1.15	.76
Conflict 4	143	1.69	.61	1.09	.55	.70
Approval 1	142	3.76	1.44	-.09	-.47	.53
Approval 2	142	3.48	1.55	-.02	-.76	.74
Approval 3	142	3.09	1.45	.29	-.61	.68
Postpartum1	143	0.58	.47	.99	.62	.59
Postpartum 2	140	1.02	.72	.30	-.94	.73
Postpartum 3	138	0.50	1.25	1.25	1.81	.77

Note. Moderation variable not included

The parcels were non-normally distributed indicating a need for a robust model estimation.   Maximum likelihood robust estimation (MLR) was used as it is robust to violations of normality. Goodness of fit was evaluated using the standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA) and its 90% confidence interval (90% CI), comparative fit index (CFI), and the Tucker-Lewis Index (TLI).   Multiple indices were used as each index offers different information about model fit, producing a more reliable evaluation of the solution. The following recommendations are made by Hu and Bentler (1999) to assist in the evaluation of model fit: RMSEA ($\leq$ .06, 90% CI $\leq$ .06), SRMR ($\leq$ .08), CFI ($\geq$ .95), and TLI ($\geq$ .95).

Chapter 3

RESULTS

Measurement Model

The measurement model, illustrated in Figure 3, included the dichotomous

variable of depression history and five latent factors (need for approval, relationship

conflict, maternal-efficacy, moderation variable, and postpartum depressive symptoms).
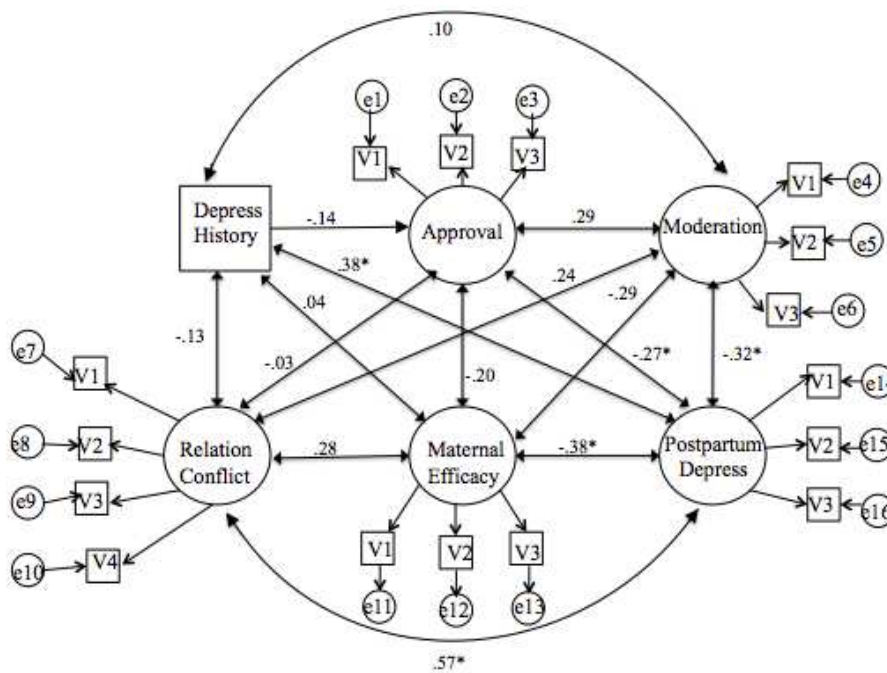

*Figure 3. Measurement model with depression history.   * p <.05*

Because dichotomous variables create integration problems in the calculation of

maximum likelihood estimation, the model with the dichotomous variable had to be

estimated using a MonteCarlo method (N = 5000). The MonteCarlo method, however,

does not produce typical ML fit indices (e.g., chi-squares, RMSEA, SRMR, and CFI),

only the parameter estimates and their standard errors. An examination of the parameters

and their significance (determined by using the t-test of the relation of the parameter to its

standard error) indicated that there was no significant relation between depression history

and any other variable other than postpartum depressive symptoms. This pattern of

results indicates that the relation between depression history and postpartum depressive

symptoms could not be mediated by any of the other variables, as there were no

significant relations (Baron & Kenny, 1986).

The advantage of including depression history in the model was to test whether

the common relation between depression history and postpartum depressive symptoms

was mediated by other variables. This mediation was not present. This result, in addition

to the difficulty of estimating models using the dichotomous variable of depression

history, led to the decision to delete depression history from the model and focus on the
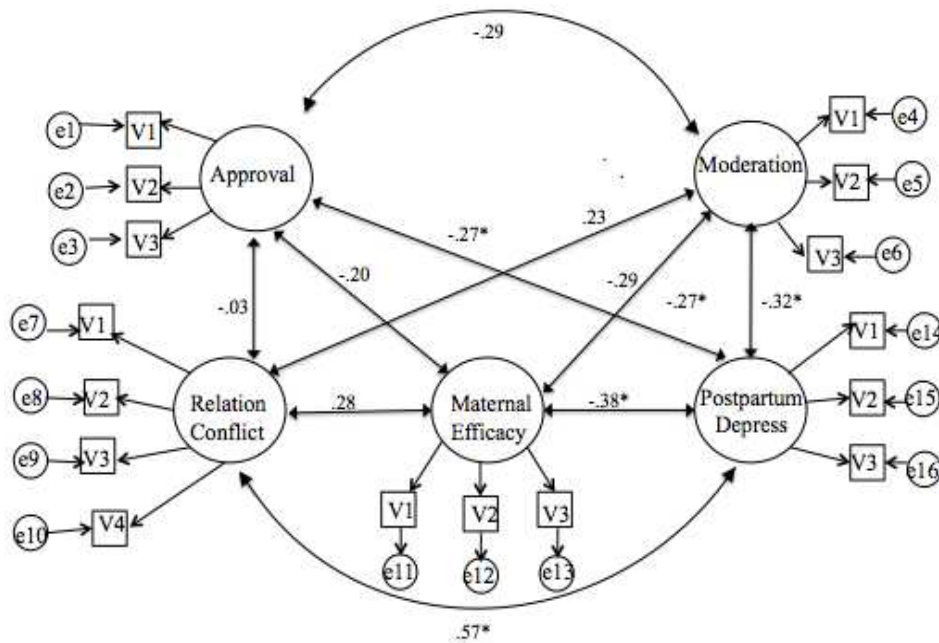
remaining relation (see Figure 4).

*Figure 4. Measurement model without depression history (M1). *p < .05*

Structural Models

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The primary structural model depicted in Figure 5 was tested, and the results are summarized in Table 4. The model was found to be an adequate representation of the data (χ^2 (98) = 144.350, p = .0027, SRMR = .087, RMSEA = .057 (90% CI = .036 - .076), TLI = .938, CFI = .949).
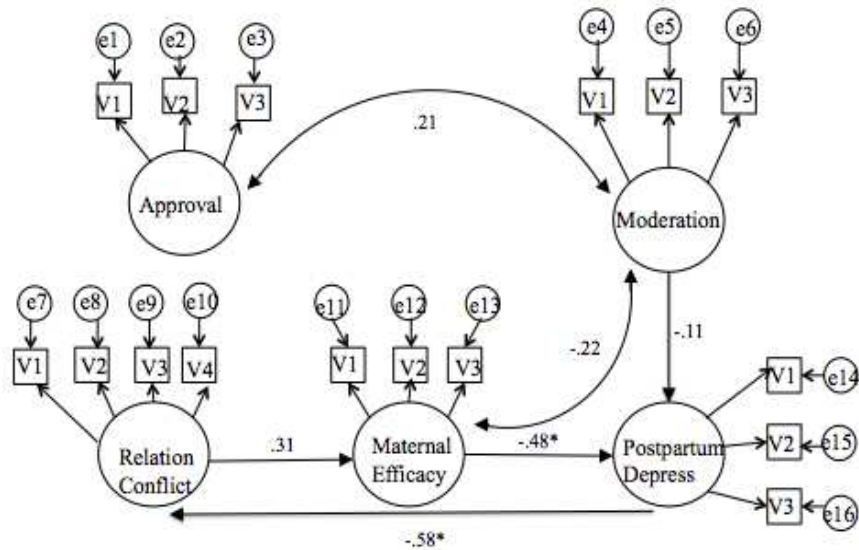

*Figure 5. Theoretical model (S1). Note: * $p < .05$*

To examine whether the model varied in fit from the measurement model, the Satorra-Bentler Chi-Square Difference Test was conducted. A significant chi-square difference, (χ^2 difference (4, N = 144) = 14.34, p = .05) suggested a difference between the measurement and structural model. Because the structural model did not fit the data as well, it was evident that some key paths were not included. Examination of model modification indices suggested that a path from need for approval to postpartum depressive symptoms should be included (MI = 11.16, $p < .001$). This path was added in the second structural model that was tested (S2).

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Table 4

Comparison of Structural Equation Models

Model	χ^2	df	p	CFI	RMSEA	SRMR	Satorra Bentler X^2 Difference
Measurement Model (M1)	130.381	94	.0078	.960	.052	.058	-
Theoretical Model (S1)	144.350	98	.0016	.949	.057	.087	14.34*a*
Additional Path (S2)	135.514	97	.0060	.958	.053	.069	4.99*a*
Reversed Path (S3)	133.275	97	.0086	.960	.051	.070	3.25*a*
Mediation Omitted (S4)	133.541	98	.0099	.961	.050	.071	.266*b*

Note: *a*. Log likelihood ratio test relative to M1. *b*. Log likelihood ratio test relative to S3

Results of the second structural model (S2; see Figure 6) with the included path between need for approval and postpartum depressive symptoms was found to provide an adequate fit to the data as evidenced by the fit indices (χ^2 (97) = 135.514, p = .0060, SRMR = .069, RMSEA = .053 (90% CI = .029 - .072), TLI = .948, CFI = .958). The Satorra-Bentler Chi-Square Difference Test between the measurement model (M1) and the second structural model (S2) was not significant (χ^2 (3, N = 144) = 4.99), indicating that this model adequately represented the data variation.
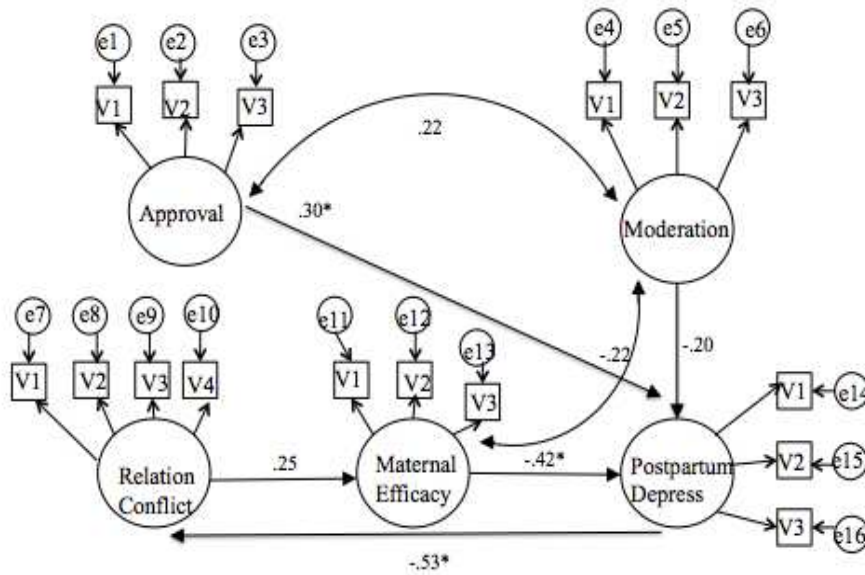

Figure 6. Theoretical model with additional path between need for approval and postpartum depression (S2). * p <.05

A variation of the second model (see Figure 7) was tested as the directionality of the relation between relationship conflict and depression remains highly debated in the literature. Some researchers have argued that marital problems contribute to depression, rather than depression contributing to more marital problems (e.g., Fincham, Beach, Harold, & Osborne, 1997).
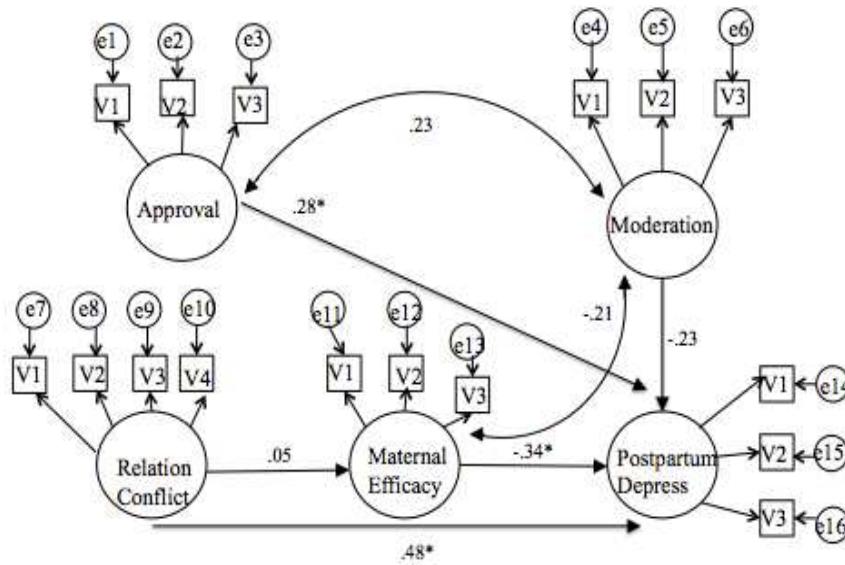
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Figure 7. Theoretical model with reversed path between relationship conflict and postpartum depression (S3). *p < .05*

The result of this model (S3), with the path leading from relationship conflict to postpartum depressive symptoms also suggested adequate fit (X^2 (97) = 133.275, p = .0086, SRMR = .070, RMSEA = .051 (90% CI = .027 - .071), TLI = .951, CFI = .960). The Satorra-Bentler Chi-Square Difference Test between the measurement model (M1) and this model (S3) was not significant (X^2 (3, N = 144)= 3.25), indicating that this model and the measurement model could not be viewed as different with respect to fitting the data. Because models S2 and S3 both fit the data well and they were not nested, it was not possible to conduct a test of relative fit. However, the fit measures of the two models indicated that the fit values were slightly better for model S3 than model S2, as evidenced by the individual fit indices for S3 (see Table 4) and by the slightly smaller chi-square and BIC value for S3 (S3 BIC = 5067.18; S2 BIC = 5068.69). As a result, model S3 was adopted as the better fit to the data. In an attempt to pare down this model to a more parsimonious yet still adequate representation, paths were examined for the

possibility of deletion from the model. The path between relationship conflict and

maternal-efficacy was not significant. However, given that this path tested the hypothesis

that maternal-efficacy would mediate the relation between relationship conflict and

postpartum depressive symptoms, a bootstrapping procedure was applied initially to test

the magnitude and significance of the mediation. The total indirect effect from

relationship conflict to postpartum depressive symptoms was not significant (-.017, 90%

confidence interval ranged from -.072 to .039). This suggested that maternal-efficacy did

not mediate this relation; therefore, the next model (S4) that omitted mediation was tested
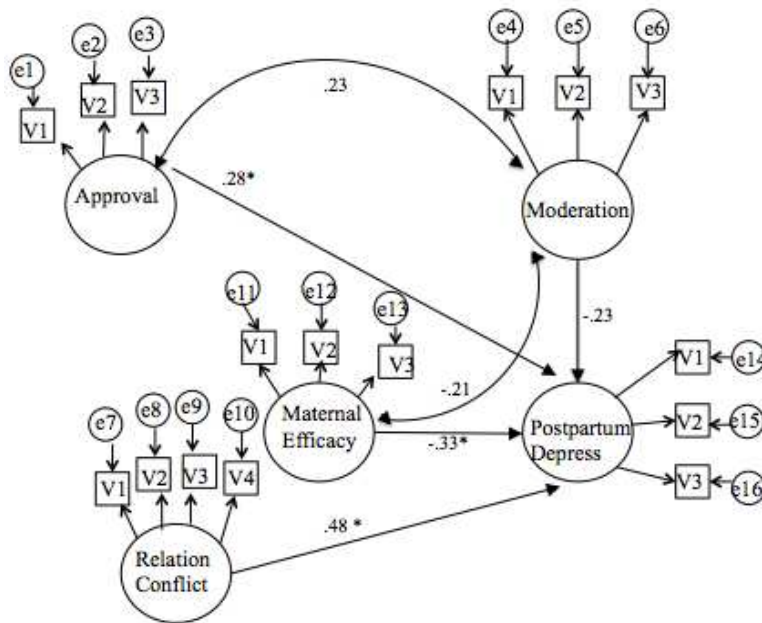
(see Figure 8).

*Figure 8. Final model with omitted mediation (S4). * $p < .05$

In model S4 the path between relationship conflict and maternal-efficacy was

omitted. The result of the final model suggested adequate fit (see Table 4), χ^2 (98) =

133.541, p = .01, SRMR = .071, RMSEA = .050 (90% CI = .026 - .070), TLI = .953, CFI

= .961). The Satorra-Bentler Chi-Square Difference Test between this model (S4) and the previous structural model (S3) was not significant, χ^2 (1, N = 144) = .266. The standardized parameter estimates for model S4 are presented in Figure 8. As can be seen in Figure 8, the parameter estimates indicated that need for approval directly predicted postpartum depressive symptoms (.28, t = 2.98, p = .00). Relationship conflict also had a direct effect on postpartum depressive symptoms (.48, t = 4.77, p < .001), and maternal-efficacy predicted postpartum depressive symptoms (.33, t = -3.63, p < .001). Need for approval moderated the relation between maternal-efficacy and postpartum depressive symptoms (-.23, t = -2.13, p = .03).

The moderating effect of need for approval is illustrated in Figure 9. The relation between maternal-efficacy and postpartum depressive symptoms was moderated by need for approval. In other words, for mothers who had a high need for approval from others, there was a negative relation between maternal-efficacy and postpartum depression, with those mothers who felt more self-efficacious having less postpartum depressive symptoms. For mothers with less need for approval from others there was little relation between maternal-efficacy and postpartum depressive symptoms.
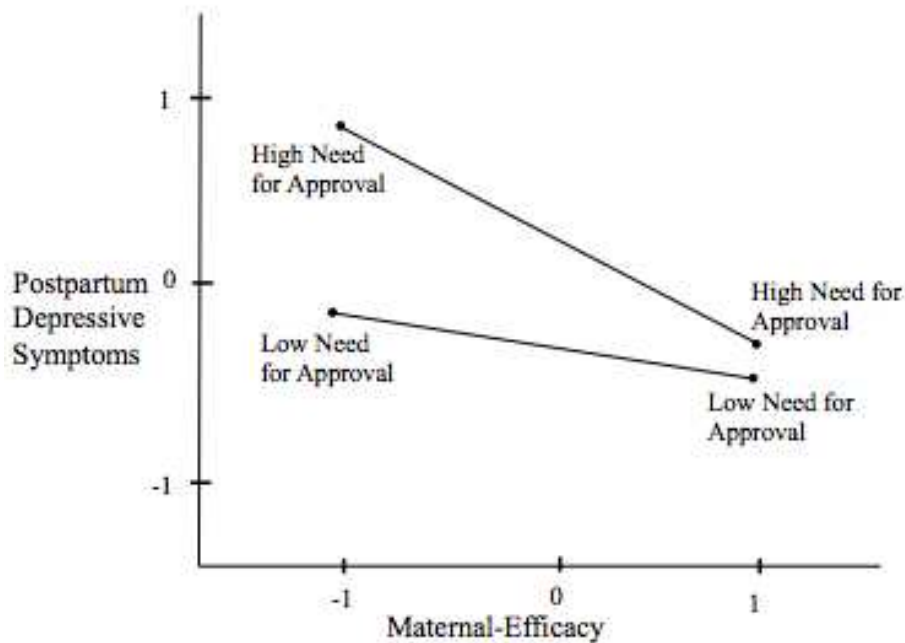
Figure 9. Graph of the simple slopes of the interaction between maternal-efficacy and postpartum depressive symptoms.

In summary, these results provide partial support for the proposed theoretical model, as some paths were not supported by the data, an additional path was added, and the original path between postpartum depressive symptoms and relationship conflict was reversed in the final model. More specifically, the two paths in the proposed model that were supported by the data and thus retained in the final model were the relation between maternal-efficacy and postpartum depressive symptoms (Hypothesis 3) and the moderating role of need for approval (Hypothesis 4). Need for approval was also found to predict postpartum depressive symptoms directly, which was not initially proposed. Depression history, the dichotomous variable, was not kept in the model due to convergence issues and the lack of depression history being related to any of the other variables except postpartum depressive symptoms; therefore, the pathways between

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depression history and relationship conflict (Hypothesis 1) and depression history and

need for approval (Hypothesis 5) were not supported since depression history was not

tested in the structural models. More relationship conflict was not found to contribute to

lower maternal-efficacy (Hypothesis 2). Although maternal-efficacy was not found to

mediate the relation between relationship conflict and postpartum depressive symptoms

(Hypothesis 4), a direct relation was found between maternal-efficacy and postpartum

depressive symptoms. Last, although the theoretical model proposed that postpartum

depressive symptoms would predict relationship conflict (Hypothesis 7), the reverse was

found to be true, so that relationship conflict was a predictor of postpartum depressive

symptoms.

Chapter 4

DISCUSSION

The results of this study suggest that a revised vulnerability-stress theoretical model provided the best fit for mothers in the first year following childbirth. In the revised model, need for approval, relationship conflict, and maternal-efficacy directly predicted postpartum depressive symptoms. Additionally, need for approval moderated the relation between maternal-efficacy and postpartum depressive symptoms.

The role of need for approval in the current model is of particular interest as past research on cognitive variables has been mixed. For example, negative cognitive attributional style was identified as a weak predictor of postpartum depression in the meta-analysis conducted by O'Hara and Swain (1996). Another study, by Jones et al. (2010) found that mothers with recurring depression, who had experienced depression in the postpartum, reported more dysfunctional beliefs and neuroticism than women their control group; however, these differences were not significant when compared to women who did not feel depressed in the postpartum. Still other research has suggested that negative beliefs might have more of an impact on depressive symptoms during pregnancy than in the postpartum (Leigh & Milgrom, 2008). In their study of Australian mothers, Leigh and Milgrom (2008) found negative cognitive style to be a significant predictor of depression among pregnant women, but not among women 10-12 weeks after birth. Since psychosocial risk factors have received the most widespread support for postpartum depressive symptoms (Beck, 2001), past research seems also to suggest that cognitive variables might play a less important role than demographic or psychosocial

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variables. Some researchers have omitted cognitive factors entirely when testing multiple predictors of postpartum depressive symptoms (Bloch, Rotenberg, Koren, & Klein, 2005; Nagy, Molnar, Pal, & Orvos, 2011).

Given these mixed results, there is evidently still much to learn about how cognitive vulnerability factors, such as need for approval, might contribute to the manifestation of postpartum depressive symptoms. In the current study, need for approval both directly and indirectly influenced postpartum depressive symptoms. The indirect effect that need for approval had on postpartum depressive symptoms is consistent with the vulnerability-stress perspective (Ingram & Luxton, 2005). From this theoretical viewpoint, cognitive variables do not cause a depressed syndrome to occur merely on its own, as underlying cognitive vulnerability factors are first activated by stressors in the environment. The fact that need for approval strengthened the relation between maternal-efficacy and postpartum depressive symptoms makes sense intuitively. Mothers who have a higher need for approval might be more sensitive to others' evaluations and less confident in their own maternal role as a result. Past research is also consistent with this finding (Church et al., 2005; Grazioli & Terry, 2000). In an investigation of Australian mothers at 6 weeks postpartum, Grazoli and Terry (2000) found that parenting stress moderated the relation between over-concern with evaluation from others (need for approval) and postpartum depressive symptoms. Although the relations among the constructs in the current study were arranged so that need for approval was examined as a moderating variable, the current finding is in line with Grazoli and Terry's (2000) results. Both suggest that need for approval interacts with

other perceived stressors in the postpartum period to contribute to a greater likelihood of developing depressive symptoms.

The final model also identified a direct path between need for approval and postpartum depressive symptoms. This path was not proposed in the initial model but was added later to improve overall model fit. This direct path is consistent with past research that has found a link between dysfunctional attitudes (need for approval/dependency and perfectionism/performance evaluation) and depressive symptoms (Otto et al., 2007; Weissman & Beck, 1978). This direct path might also be consistent with the vulnerability-stress framework. The vulnerability-stress framework highlights the interaction between stressors and vulnerability factors and emphasizes the extent to which individuals have their own point at which they will begin manifesting symptoms (Ingram & Luxton, 2005). This point depends, in part, on the levels of the preexisting vulnerability and experienced stressor. The direct path between need for approval and postpartum depressive symptoms may reflect, for some mothers, a higher level of cognitive vulnerability and very low level of perceived stress. It may also be the case for some women with postpartum depressive symptoms that relationship conflict has subsided, although the need for approval and the depressive symptoms still remain. The data from this study suggest that need for approval is a significant predictor on its own and should be examined in the context of other postpartum stressors in the future (e.g., infant temperament, financial strain, maternal health issues) to determine whether this pathway is influenced by other variables.

Another finding was that maternal-efficacy and relationship conflict directly predicted postpartum depressive symptoms. It was initially proposed that the link between relationship conflict and postpartum depressive symptoms would be mediated by maternal-efficacy; however, this hypothesis was not supported in the final model.. Several plausible explanations exist for why no mediation effect was found. First, it is possible that relationship conflict does not negatively affect a woman's perceived competence in the same way that partner support bolsters it. Perhaps the conflict that some couples face after childbirth is in no way linked to a woman's self-efficacy. Relationship conflict may be related to other challenges in the relationship, such as work-family balance or monetary strain. Rather than having disagreements that might affect a woman's perceived maternal-efficacy (e.g., arguments over childcare or parenting), others issues that have no effect on maternal-efficacy might arise.

It also is possible that other social relationships in the postpartum play a more significant role in shaping a woman's confidence than the partner relationship, and that the partner relationship truly does not affect maternal-efficacy. In their study of Australian mothers, Haslam et al. (2006) found that support from one's parents enhanced a woman's maternal-efficacy that, in turn, was related to lower levels of postpartum depressive symptoms. Haslam et al. (2006) did not find a relation between maternal-efficacy and support from a mother's partner. Thus, it is plausible that for mothers in the postpartum period, conflict with one's parents or other immediate family members has a more negative effect on maternal-efficacy than does conflict with one's partner. Since maternal-efficacy and postpartum depression have been linked (Haslam et al., 2006;

Maciejewski et al., 2000), future studies should examine elements of conflict and support in other significant relationships a mother has during the postpartum. By understanding how social relationships impact maternal-efficacy, researchers might be able to develop preventative interventions that bolster a mother's sense of confidence.

The finding that maternal-efficacy was directly related to postpartum depressive symptoms is consistent with past studies (Fowles, 1997; Gross et al., 1994; Haslam et al,. 2006; Maciejewski et al., 2000). Maternal-efficacy was included in the original theoretical model to represent the negative beliefs and emotions that might be tied to postpartum depressive symptoms. Based on the theoretical framework (Hankin & Abramson, 2001) that was used in the design of the study model, it was postulated in the current study that lower maternal competence might represent a potential "tipping point" when a woman begins to exhibit depressive symptoms. While the lack of the mediation effect discussed above makes it difficult to ascertain whether maternal-efficacy precedes postpartum depressive symptoms, the present findings suggest that a mother's perception of her competence is tied to her postpartum depressive symptoms. This finding is significant as there has been some uncertainty in the literature about the causal relation between these two variables. Earlier researchers found maternal-efficacy to be negatively associated with maternal depression (Cutrona & Troutman, 1986). The identified path between maternal-efficacy and postpartum depressive symptoms supports Beck's (1996) perspective that a mother's feelings of inadequacy may intensify her symptoms and potentially lead her to experience more frustration toward her baby. After birth, a mother must quickly learn to respond to her infant's needs, balancing these needs and caring with

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other home, work, and social responsibilities. Consistent with Bandura's (1982) theoretical construct of self-efficacy, a mother's ability to overcome such challenges in the postpartum depends on her resourcefulness and the strategies she employs following the delivery (Haslam et al., 2006). The current finding provides additional support for maternal-efficacy as a predictor of postpartum depressive symptoms and suggests that mothers who do not possess the coping skills that reflect higher maternal-efficacy might be more likely to feel depressed.

The finding that relationship conflict directly predicted postpartum depressive symptoms but that postpartum depressive symptoms did not necessarily contribute to more relationship conflicts taps into an area with mixed research findings (e.g., Dennis & Ross, 2006; Hassert & Robinson Kurpius, 2011; Zelkowitz & Milet, 1996). To be consistent with Hankin and Abramson's (2001) theoretical framework in which depression contributes to negative life events, the current study hypothesized that postpartum depressive symptoms would contribute to more relationship conflict in the initial model. The pathway between depression and negative events in Hankin and Abramson's (2001) model aligns with the interpersonal theory of depression (Coyne, 1976); from the interpersonal perspective, individuals who are depressed are more likely to have negative interactions with others and elicit negative responses from them. Hankin and Abramson's (2001) model also recognizes the role that negative events play in the manifestation of depression, as an indirect path from negative events to depression was postulated. In this regard, the finding that relationship conflict predicted postpartum depressive symptoms is not out of line with Hankin and Abramson's (2001)

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conceptualization. This finding highlights the importance of the partner relationship in the postpartum period. It is also consistent with past studies that have found partner conflict and lack of support to be associated with more maladjustment for mothers (Dennis & Ross, 2006; Logsdon et al., 1997). Problems in the couple relationship might contribute to mothers feeling less satisfied. Conflict might also cause mothers to receive less partner support. More conflict and less support in a woman's relationship with her partner may affect other areas of her mood and functioning and cause her to feel depressed. As partner support has been a key focus of past postpartum depression research (Lemola, Stadlmayr, & Grob, 2007), the current finding can be used to encourage future examinations of how other characteristics of the partner relationship might affect women's mood in the postpartum period.

A final result of this study was that depression history directly predicted postpartum depressive symptoms but that it was not related to the other predictors in the model. Depression history was included as a pre-existing vulnerability to postpartum depressive symptoms, as depression occurring prior to and during pregnancy is one of the most commonly cited risk factors of postpartum depression (Beck, 2001; Bloch et al., 2006; Robertson et al., 2004). Research has shown depression history to have both a direct and indirect effect on postpartum depressive symptoms (e.g., Bernazzani et al., 1997; Church et al., 2005). Church et al. (2005) found that depression history indirectly predicted postpartum depressive symptoms among Australian mothers and was linked to general negative beliefs. Among a sample of Canadian mothers, Bernazzani et al. (1997) found that depressive symptoms during pregnancy predicted depressive symptoms during

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the postpartum and mediated the relation between other risk factors and postpartum depressive symptoms. It was, therefore, surprising that while depression history was linked to postpartum depressive symptoms, but was not associated with any of the other risk factors in the measurement model. It possible that the yes/no format used to assess depression history was an inadequate measure of this construct. As the researcher in the current study was most interested in the potential relations and interaction among the model variables, the lack of association between depression history and the other risk factors lead to the decision to exclude it from the subsequent models that were tested. It should be noted, however, that depression history was a key predictor, and researchers need to evaluate its significance when developing future models.

Limitations

There are several limitations of this study that should be noted. Almost two-thirds (64%) of the sample identified as White/Caucasian. The majority reported that they were highly educated (58% had received a Bachelors Degree or higher), and 38% of the women reported that their yearly income was $90,000 or above. As a result of these sample demographics, it cannot be said for certain whether the model findings are applicable to groups of women with different racial/ethnic backgrounds or those who have a lower educational or income level. Mothers were also assessed at a single time-point, so causal claims cannot be made about postpartum depressive symptoms. It was possible that mothers who scored higher on the EPDS (measure of postpartum depressive symptoms) felt depressed prior to birth. An inclusion criterion for this study was that the mother had an infant between one week and one year of age. This broad age range may

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be viewed as a limitation. Although postpartum depressive symptoms can occur at any point during the first year after giving birth, it is possible that the factors that place a mother at risk for postpartum depressive symptoms immediately after birth differ from those factors that may affect mothers at later stages of the postpartum.

Limitations that pertain to the theoretical model itself include that the proposed model used a history of depression prior to childbirth to represent a pre-existing vulnerability to depression. Underlying vulnerability has been difficult for researchers to measure (Ingram et al., 1998), thus it is possible that another vulnerability factor, such as psychiatric history or prenatal anxiety, would be a better indicator of pre-existing vulnerability. The use of specific variables to represent theoretical model constructs applies to the other model variables as well. Constructs were chosen based on Hankin and Abramson's (2001) theoretical framework as well as the relevance of these constructs to mothers in the postpartum period; for instance, relationship conflict was included in the model as relationship satisfaction has been found to decrease after childbirth for some couples and relationship quality has been found to predict postpartum depression (Kohn, Rholes, Simpson, McLeish Martin, Tran, & Wilson, 2011; Dennis & Ross, 2006). There are many ways to conceptualize stress in the postpartum (Swendsen & Mazure, 2000), and other stressors, such as financial strain, pain related to the birth, and childcare issues, evidently exist; however, this study did not examine these other potential stressors.
Future Directions

Despite the noted limitations, this study has several important implications for researchers who study maternal health. Study findings can inform researchers and aid in

the development of future models of postpartum depressive symptoms. Researchers can improve upon the methodological issues in the current study by having a larger sample size and by collecting data during pregnancy or even earlier in a woman's life. Using a longitudinal rather than a cross-sectional design would shed light on whether women with postpartum depressive symptoms share common personality traits or demographic characteristics that are already in place when their infant arrives. Multiple indicators could be used to test various model constructs and to provide better measurement of these constructs. For instance, other scales, such as the Perceived Maternal Parental Self-Efficacy tool (Barnes & Adamson-Macedo, 2007), have been developed to test maternal-efficacy. It has been used in other studies of postpartum depression (Leahy-Warren et al., 2011). To quantify maternal-efficacy better, this scale or others could be used along with the Parenting Sense of Competence scale (PSOC), the measure used in the current study. Given the subjective nature of the measures used in the current study, to understand better how the risk factors contribute to the development of postpartum depressive symptoms, future research could also include information from a secondary source and individuals closest to the participant, such as the woman's partner. To elucidate how relationship conflict might contribute to postpartum depression, both the woman and her partner could be given measures of relationship conflict or didactic adjustment. For unmarried/single women it might be useful to gather information from other family members or those who assist with childcare.

The current study set the groundwork to develop and test similar models that utilize a vulnerability-stress framework. In this study, negative beliefs that were general

(need for approval) as well as beliefs that related more specifically to motherhood (maternal-efficacy) were examined. Other studies have investigated both general and maternal-specific negative beliefs among mothers in the postpartum (Church et al., 2005; Grazoli & Terry, 2000). Although maternal-specific negative beliefs tap more into the negative perceptions of motherhood (Warner et al., 1997) and differ from maternal-efficacy, both of these constructs are related to the beliefs that women may have about mothering. Consistent with past studies, the findings of the current study highlight the importance of both types of beliefs in postpartum depression etiology and should be included in future models.

As previously noted, whereas the current study focused solely on relationship conflict, multiple stressors can exist for women after birth and these stressors might differ for single mothers and for first-time mothers. Qualitative research could be conducted to determine which factors are perceived as most stressful by women and then incorporate these variables when testing future theoretical models. Several international studies have found that the relationship mothers have with their own parents or in-laws can be stressful (Green et al., 2006); therefore, researchers might want to consider these types of familial relationships when developing future models.

The current model should also be retested using women of more diverse ethnic and cultural backgrounds, including mothers living outside of the United States. Cultural beliefs shape perceptions and feelings about motherhood (Garcia Coll & Magnuson, 1996; Harkness, 1987). Thus, it would be interesting to examine whether this model would still apply to mothers who have different beliefs and values about motherhood.

Postpartum depression has been recognized as a health concern internationally, and replication of this theoretical model could provide a broader understanding of how international mothers are affected by postpartum depressive symptoms.

Implications for Counseling Psychology

The current theoretical model has several practical applications for psychologists who work with mothers during pregnancy and in the postpartum period. First, clinicians must be aware of the high prevalence of postpartum depressive symptoms among mothers and should try to focus on prevention and the identification of risk factors whenever possible. Psychoeducation about the symptoms and areas to focus on during therapy can be explained to mothers in the initial sessions. For clinicians, the awareness that postpartum depression often goes unrecognized by other healthcare professionals who might also be working with these women (Gjerdingen & Yawn, 2007) can help them become more sensitive to the signs and symptoms of depression in their work with clients. Clinicians should screen new mothers for postpartum depressive symptoms and learn to recognize the factors that place women at greater risk, including those risk factors that were a focus in the current study.

For mothers who are at greater risk for developing postpartum depressive symptoms or for those who are already exhibiting depressive symptoms and seeking therapy to reduce their symptoms, negative beliefs should be explored in session (Appleby, 1996). Given the finding that need for approval both directly and indirectly affects postpartum depressive symptoms, psychologists should consider using Cognitive Behavioral Therapy (CBT) that has been found useful in the treatment of prenatal and

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postpartum depression (Cho, Kwon, & Lee, 2008). CBT focuses on helping clients to

understand and reframe their specific negative beliefs, and need for approval is one belief

that could be explored. Psychologists can help mothers to develop a healthy sense of self

and to integrate any feedback that they receive from others in a way that ensures that their

worth is not dependent on this feedback.

Psychologists should also discuss women's view of and expectations about their

maternal role. It is important that women who suffer from postpartum depressive

symptoms receive the support and validation that they need after childbirth to increase

their maternal-efficacy. As low maternal-efficacy was found to be a predictor of

postpartum depressive symptoms in the current study, psychologists should help the

mothers with whom they work to find ways to strengthen their maternal-efficacy.

Discussing what it means to be a mother and the expectations that are tied to this role

could invite a mother to explore her own beliefs in a safe environment. Some techniques

again may be related to cognitive restructuring and the reframing of negative beliefs

about her mothering capabilities. Additionally, role playing as well as having the mother

bring her infant to the sessions are ways a mother can begin to feel more confident in her

maternal role.

Although conflict with one's partner was not found to influence maternal-efficacy

in the current study, if mothers are in a committed relationship, conflict between partners

should be minimized or resolved as it was found to contribute to postpartum depressive

symptoms. Interpersonal Therapy (IPT) has been deemed an effective treatment

approach for postpartum depression as it seeks to reduce interpersonal conflicts that

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commonly arise in the postpartum over issues of parenting, intimacy, or infant care (O'Hara, Stuart, Gorman, & Wenzel, 2000). Given the role that relationship conflict plays in postpartum depression, IPT may be an appropriate technique for mothers in committed relationships as well as those who are not in committed relationships, but who experience significant interpersonal conflicts. Women with a partner may want to consider partner involvement in treatment it has been shown to reduce postpartum depressive symptoms (Misri et al., 2000). In couples' therapy sessions, the psychologist can help mothers and their partners to identify ways in which the mother can receive more support from her partner as social support has been found to foster a woman's self-efficacy (Cutrona, 1986) and has been linked to lower postpartum depressive symptoms (Hassert & Robinson Kurpius, 2011). Receiving support from family and friends or attending a maternal support group where a woman has an opportunity to interact with other mothers may help to normalize her feelings.

Finally, psychologists can help mothers to understand that postpartum depression is a complex disorder without a single cause and also remind them that they are in no way responsible or at fault for how they feel. Like other emotional health conditions, there are many treatment options available to women. There are also multiple ways that a psychologist and family members can intervene and enhance a mother's wellbeing in the time after birth. Mothers can be reminded that motherhood is a journey and that they are not alone; by seeking counseling and support, a mother is taking her first steps toward being able to enjoy this lifelong journey.

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APPENDIX A

IRB APPROVAL
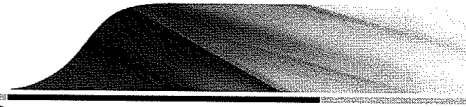
Office of Research Integrity and Assurance

To: Sharon Kurpius EDB

From: Mark Roosa, Chair Soc Beh IRB

Date: 12/01/2011

Committee Action: Exemption Granted

IRB Action Date: 12/01/2011

IRB Protocol #: 1111007142

Study Title: Predicting Maternal Well-Being: Postpartum Depression across Culture

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX B

RECRUITMENT MATERIALS

Greetings,

I am a graduate student in Counseling Psychology at Arizona State University who is interested in examining factors related to postpartum mood. I am inviting individuals to participate in this study by filling-out an anonymous questionnaire on-line which will take approximately 10 minutes. If you are a new mother, 18 years or older, who has given birth in the last 12 months you are eligible to participate. Your participation is voluntary. Please visit www.postpartumstudy to fill-out a short survey about your experiences.

Thank you,

Silva Hassert, M.C.

Dear New Mother,

I am a graduate student under the direction of Dr. Sharon Robinson Kurpius, a professor in the Counseling Psychology Program at Arizona State University in Tempe, Arizona. I am conducting a study to examine factors related to postpartum depression.

I am inviting your participation in this study. You will be asked to fill out questions about your relationship with your husband, support you receive from your family, and what you think about being a mother. Filling-out the questions online will take approximately 10 minutes. Your responses to the questions will be anonymous.

Your participation is totally voluntary. You must be at least 18 years old to participate. You may choose not to participate or to withdraw from the study at any time. You can skip any questions you do not wish to answer. If you choose not to participate or to withdraw from the study, there will be no penalty. If you are receiving post-delivery healthcare, this healthcare will not be impacted in anyway. At no time during the study will anyone be informed of whether or not you chose to participate. The results of the study may be published but your name will not be used.

Your participation in this research study may contribute to a greater understanding of postpartum depressive symptoms. There are no known risks from taking part in this study, but in any research, there is some possibility that you may be subject to risks that have not yet been identified. If your participation in this study produces any emotional discomfort, please visit the postpartum support resources listed in the survey.
If you have any questions concerning the study, you can contact me at <silva.hassert@asu.edu> or Dr. Robinson Kurpius at <sharon.kurpius@asu.edu>.

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at 480-965-6788.

Filling-out the questionnaire will be considered your consent to participate.

Sincerely,

Silva Hassert, M.C.
Doctoral Student, ASU

Sharon Robinson Kurpius, Ph.D.
Professor, Counseling Psychology, ASU

APPENDIX C

SURVEY

Demographic Information

1. What is your age? _____ 2. What is your ethnicity? _____

3. What is your marital status?
___ Married   ___ Live-in Partner   ___ Single   ___ Separated
___ Divorced   ___ Widowed

4. How old is your baby? _____

5. How many **other** children do you have? _____

6. What are the ages of your other children? (leave blank if no other children)
_____

7. Are you currently employed?
___ Yes, full-time   ___ Yes, part-time   ___ No, not currently employed

8. What is your family yearly income level?
___ Below $19,999   ___ $20,000-$29,999   ___ $30,000-$39,999
___ $40,000-$49,999   ___ $50,000- $59,999   ___ $60,000-$69,999
___ $70,000-$79,999   ___ $80,000-$89,999   ___ $90,000-$99,999
___ $100,000+

9. What is your highest completed education level?
___ Less than 12th grade   ___ High school diploma or GED
___ Some college or technic al school   ___ Associate degree
___ Bachelor's degree   ___ Graduate degree

10. Are you currently breastfeeding your baby?
___ Yes   ___ No   ___ I was breastfeeding but I am not currently

11. Have you ever been clinically diagnosed with depression?
___ Yes   ___ No

12. Were you depressed during your pregnancy?
___ Yes   ___ No

13. Have you ever sought professional help for depression?
___ Yes   ___ No

14. Other than your husband/partner who helps you the most with your new baby?

___ Mother ___ Mother-in-law ___ Father ___ Father-in-law ___ Sister___
Sister-in-law ___ Nanny/baby-sitter Other: _____

Please rate how much you agree with each of the following statements related to parenting:

1	2	3	4	5	6
Strongly agree	Somewhat agree	Agree	Disagree	Somewhat disagree	Strongly disagree

	1	2	3	4	5	6
1. The problems of taking care of a baby are easy to solve once you know how your actions affect your child, an understanding I have acquired.						
2. I would be a fine model for a new mother to follow, to learn what she would need to know to be a good parent.						
3. Being a mother is manageable, and any problems are easily solved.						
4. I meet my own personal expectations for expertise in caring for my baby.						
5. If anyone can find the answer to what is troubling my baby, I am the one.						
6. Considering how long I've been a mother, I feel thoroughly familiar with this role.						
7. I honestly believe I have all the skills necessary to be good mother to my baby.						
8. Being a good mother is a reward in itself.						

Please answer the following questions regarding your relationship with your husband/partner:

1	2	3	4
Not at all	A little	Quite a bit	Very much

	1	2	3	4
1. How often do you need to work hard to avoid conflict with your husband?				
2. How upset does your husband sometimes make you feel?				
3. How much does your husband make you feel guilty?				
4. How much do you have to "give in" in this relationship?				
5. How much does your husband want you to change?				
6. How critical of you is your husband?				
7. How much would you like your husband to change?				
8. How angry does your husband make you feel?				
9. How much do you argue with your husband?				

10. How often does your husband make you feel angry?				
11. How often does your husband try to control or influence your life?				
12. How much more do you give than you get from this relationship?				

The following questions are about the support you receive from your parents. On a scale ranging from 1 to 7 mark how often an event occurs:

1	2	3	4	5	6	7
Almost never			Sometimes			Very often

	1	2	3	4	5	6	7
1. How often do you have contact with your parent(s) in person?							
2. How often do your parent(s) help with the baby? (Answer according to the parent who helps most.)							
3. How often do your parent(s) baby-sit?							
4. Do you feel you can count on your parent(s) for financial help, if you should need it?							
5. How often do your parent(s) help with other practical matters (i.e., household chores, errands)?							
6. How often do you and the baby spend time with your parent(s) (i.e., social activities, shopping, or visiting together)?							
7. How often do you confide in, share your problems with, or tell your troubles to your parent(s)?							
8. How often do your parent(s) confide in, share their problems with, or tell you their troubles?							
9. How often do your parent(s) give you advice or guidance about the baby?							
10. How often do you discuss your concerns about the baby with your parent(s)?							
11. In general, do you feel that your parent(s) have been supportive since the baby's birth?							

Please check the answer that comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today. In the past 7 days:

1. I have been able to laugh and see the funny side of things. ___ As much as I always could ___ Not quite so much now ___ Definitely not so much now	2. I have looked foward with enjoyment to things. ___ As much as I ever did ___ Rather less than I used to ___ Definitely less than I used to

___ Not at all	___ Hardly at all
3. I have blamed myself unncessarily when things went wrong. ___ Yes, most of the time ___ Yes, some of the time ___ Not very often ___ No, never	4. I have been anxious or worried for no good reason. ___ No, not at all ___ Hardly ever ___ Yes, sometimes ___ Yes, very often
5. I have felt scared or panicky for no good reason. ___ Yes, quite a lot ___ Yes, sometimes ___ No, not much ___ No, not at all	6. Things have been getting on top of me. ___ Yes, most of the time I haven't been able to cope at all ___ Yes, sometimes I haven't been coping as well as usual ___ No, most of the time I have coped quite well ___ No, I have been coping as well as ever
7. I have been so unhappy that I have had difficulty sleeping. ___ Yes, most of the time ___ Yes, quite often ___ Not every often ___ No, not at all	8. I have felt sad or miserable. ___ Yes, most of the time ___ Yes, sometimes ___ Not very often ___ No, not at all
9. I have been so unhappy that I have been crying. ___ Yes, most of the time ___ Yes, quite often ___ Only occasionally ___ No, never	10. The thought of harming myself has occurred to me. ___ Yes, quite often ___ Sometimes ___ Hardly ever ___ Never

The questions below list different attitudes or beliefs which people can hold. Decide how much you agree or disagree with each statement. For each attitude, indicate the number that best describes how you think. To decide whether an attitude is typical of your way of looking at things, keep in mind what you are like most of the time.

1	2	3	4	5	6	7
Totally	Agree	Agree	Neutral	Disagree	Disagree	Totally

			agree very much		slightly			slightly		very much		disagree	

	1	2	3	4	5	6	7
1. It is difficult to be happy, unless one is good looking, intelligent, rich, and creative.							
2. If I do not do well all the time, people will not respect me.							
3. If a person asks for help, it is a sign of weakness.							
4. If I do not do as well as other people, it means that I am an inferior human being.							
5. If I fail at my work, then I am a failure as a person.							
6. If you cannot do something well, there is little point in doing it at all.							
7. If someone disagrees with me, it probably indicates that he/she does not like me.							
8. If I fail partly, it is as bad as a complete failure.							
9. If other people know what you're really like, they will think less of you.							
10. If I am to be a worthwhile person, I must be truly outstanding in at least one major respect.							
11. If I ask a question, it makes me look inferior.							
12. My value as a person depends greatly on what others think of me.							
13. It is awful to be disapproved of by people important to you.							
14. If you don't have other people to lean on, you are bound to be sad.							
15. If others dislike you, you cannot be happy.							
16. My happiness depends more on other people than it does on me.							
17. What other people think about me is very important.							

Thank you for taking the time to complete this survey!