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MOTHERS' ADAPTATION IN THE NEONATAL INTENSIVE CARE UNIT:
AN EXAMINATION OF THE EFFECTS OF MEANING MAKING, CONTROL
AND SELF-ENHANCEMENT ON DEPRESSION

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Science at Virginia Commonwealth University.

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Abstract

MOTHERS' ADAPTATION IN THE NEONATAL INTENSIVE CARE UNIT: AN EXAMINATION OF THE EFFECTS OF MEANING MAKING, CONTROL AND SELF-ENHANCEMENT ON DEPRESSION

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A Thesis submitted in partial fulfillment of the requirements for the degree of Master at Virginia Commonwealth University.

Virginia Commonwealth University, 2010

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With over 400,000 infants being hospitalized in the NICU annually, it is important to understand adjustment in their mothers. Taylor's cognitive theory of adaptation asserts that three factors, meaning making, control, and self-enhancement, influence positive adjustment in a crisis situation such as a NICU hospitalization. Since it has never been examined, the purpose of the current study was to test the utility of Taylor's model in mothers with an infant in the NICU. Data was collected from mothers with an infant in the NICU (N = 181) and the main hypothesis was that meaning making, control, and self-enhancement would explain a significant portion of variance in depression scores in mothers with an infant in the NICU. Results from this study did not support this hypothesis. Still, this study is important in guiding future research to better understand the adjustment process of mothers with an infant in the NICU.

Mothers' Adaptation in the Neonatal Intensive Care Unit: An Examination of the Effects of Meaning Making, Control and Self-Enhancement on Depression

Each year, over 400,000 infants are admitted to Neonatal Intensive Care Units (NICU) in the United States which averages out to about one in nine babies staying in the NICU for a period of time after birth (Cole, 2006). Infants are admitted to the NICU for a variety of reasons, including prematurity and low birth weight as well as medical complications and other conditions. A study examining the most common reasons for NICU admission found that respiratory problems were the most common precipitating factor, along with a need for feeding tubes, and problems with temperature control (Darlow, Mogridge, Horwood, Wynn-Williams, & Austin, 2007). Researchers found that 41% of admissions were full term infants while 40% were moderately preterm infants (33-36 weeks gestation), and 5% were extremely preterm (< 28 weeks; Darlow, Mogridge, Horwood, Wynn-Williams, & Austin, 2007).

The NICU is a stressful environment equipped with advanced technology, large machinery, and unfamiliar sights and sounds that interfere with normal parental activities, and the chaotic appearance of the NICU can increase feelings of stress when parents first begin adjusting to this new environment (Siedman, Watson, & Corff, 1997; Merenstein & Gardner, 2006). Stressors in the NICU cover many domains with parents reporting stress related to financial, practical, social, and psychological areas (Eriksson & Pehrsson, 2002). Some mothers have reported a struggle to parent in the NICU setting when nurses are often in charge of meeting their infant's basic needs (Fenwick, Barclay, & Schmied, 2001). This

new environment coupled with the birth of a fragile infant creates a considerable amount of stress for parents. When parents were asked to describe the most stressful aspects of the NICU, one sample responded that parental role alteration was the most stressful, followed by infant behavior and appearance, sights and sounds of the NICU, and difficulty with staff relationships (Siedman, Watson, & Corff, 1997).

The admission of an infant to the NICU is a crisis situation for many families. Janoff-Bulman argues that the difference between a negative event and a trauma or crisis is both the severity of the event and, more importantly, the internal disorganization and break down that follows from the event (Janoff-Bulman, 1992). She argues that all individuals hold a set of fundamental assumptions that inform our working model of the world. These assumptions are built from personal experiences and guide our cognitive and emotional development as we engage the world (Janoff-Bulman, 1992). These fundamental assumptions are constructed as a child and typically go unchallenged into adulthood. They provide a frame for our basic expectations, outcomes and interactions in the world and often include feelings of invulnerability and security (e.g. nothing bad will happen to me; I am protected), meaningfulness (e.g. bad things happen to bad people) and safety (e.g. I will not be physically harmed; Janoff-Bulman, 1992).

A crisis occurs when a situation, such as one's infant being admitted to the NICU, shatters these internal assumptions. In relation to the NICU, parental assumptions of invulnerability, security, meaningfulness and safety are shattered as well as core assumptions related to the role of parenting as they cope with their infant's life-threatening condition. Ordinary defense mechanisms that are useful in managing daily stressors are typically not

robust enough to effectively cope with crisis situations which make adjustment more difficult (Janoff-Bulman, 1992).

Parental adjustment in the NICU is both crucial and difficult. Studies have found that mothers in the NICU report significantly more Acute Stress Disorder (ASD) symptoms than mothers with healthy infants (Vanderbilt, Bushley, Young, & Frank, 2009). This study found that while 24% of NICU mothers met criteria, only 3% of non-NICU mothers report clinically significant levels of ASD. General levels of distress have followed a similar pattern with 28% of mothers in the NICU reporting clinically significant levels of psychological distress compared to the 10% norm for mothers of non-hospitalized infants (Meyer, Coll, & Seifer, 1995). Symptoms of depression and anxiety are also significantly higher in NICU parents than non-NICU parents (Vanderbilt, Bushley, Young, & Frank, 2009; Carter, Mulder, Bartram, & Darlow 2005) with one study finding that fathers report 35% higher rates of depression and anxiety than the norm and mothers reporting levels 51% higher than the norm (Doering, Drawp, & Moser, 1999). Other studies have found that as many as 63% of NICU mothers have scores indicating clinically significant levels of depressive symptoms during hospitalization (Miles, Holditch-Davis, & Schwartz, 2007). A study examining potential racial differences in adaptation to the NICU found no between group differences on anxiety, depression, or parental stress scores suggesting all parents with an infant in the NICU are at risk for poor psychological adjustment (Lau, Hurst, Smith, & Schanler, 2007).

Researchers have sought to better understand the difference in adjustment in the NICU for mothers versus fathers. Many studies show that mothers have a more difficult time coping with the admission of their infant to the NICU with higher rates of state anxiety, poorer general adjustment, and more depression for mothers being reported (Doering, Drawp,

& Moser, 1999; Doering, Moser, & Dracup, 2000; Pinelli, 2000). Long term studies have noted that mothers show more mood disturbances than fathers at discharge from the NICU and 18 months later (Affleck, Tennen, & Rowe, 1991). Research has therefore indicated that mothers in particular have a more difficult time adjusting to and coping with the admission of their infant to the NICU.

There are negative consequences resulting from poor maternal adjustment in the NICU for both the mother and the infant. The endorsement of depressive symptoms and anxiety in the NICU is linked to depression and anxiety symptoms post discharge in mothers, indicating long-term, negative effects stemming from poor initial adjustment (Meinyk, Crean, Feinstein, & Fairbanks, 2008). Perhaps even more problematic are the infant outcomes associated with early maternal depression. Some immediate concerns for the infant that arise from maternal depression include a decrease in milk production from the mother, less breastfeeding, and poorer sleeping environments for infants (Lau, Hurst, Smith, & Schanler, 2007; Paulson, Dauber, & Leiferman, 2006). Depressive symptoms in mothers have also been linked to engagement in fewer positive enrichment activities with the child such as reading, singing, and telling stories (Paulson, Dauber, & Leiferman, 2006). Along with physical and environmental concerns, maternal depression can psychologically impact the infant and the mother-infant relationship. A study examining 101 Caucasian mothers of newborn infants found that early maternal depression negatively affected mother-infant interactions and behaviors at 2 weeks, 6 weeks, and 4 months. The results from this study suggest that interactions at 6 weeks were the most negatively impacted by maternal depression (Moehler, Brunner, Reck, & Resch, 2006). Taken together, these studies highlight the importance of early positive adjustment to protect against depression in the NICU.

Consequences of early maternal depression continue as an infant ages. Correlates between maternal psychological status and childhood emotional and mental well-being at school-age have been found for low birth-weight and preterm children (Singer, Salvator, Guo, Collin, Lilien, & Baley, 1992). A study following 94 mothers and infants from birth to four years old found that significant deficits in cognitive functioning were found in four year olds when their mother's depression occurred in the first year of life. These deficits were found on the general cognitive index, a combination of verbal, perceptual, and quantitative indices, of the McCarthy scales (Cogill, Caplan, & Alexandra, 1986). Studies have even linked higher amounts of parenting stress during the first year of life with behavioral problems in children as old as seven (Benzies, Harrison, & Magill-Evans, 2004).

In summary, it is a crisis situation for a family when an infant is admitted to the NICU, and the NICU environment is extremely stressful (Janoff-Bulman, 1992; Seidman, Watson, & Corff, 1997; Merenstein & Gardner, 2006). Adjustment and adaptation to this situation is difficult for parents, and higher rates of anxiety, depression, hostility, and parental stress have all been reported, with especially high rates being reported in mothers (Doering, Drawp, & Moser, 1999; Vanderbilt, Bushley, Young, & Frank, 2009; Meyer, Coll, Seifer, Ramos, Kilis, & Oh, 1995; Carter, Mulder, Bartram, & Darlow, 2005; Affleck, Tennen, & Rowe, 1991; Pinelli, 2000; Doering, Moser, & Dracup, 2000). Research has also shown that difficulty in maternal adjustment, and subsequent maternal depression, has serious consequences for the mother and child both immediately and in the future (Paulson, Dauber, Leiferman, 2006; Moehler, Brunner, Wiebel, Reck, & Resch, 2006; Singer, Salvator, & Guo, 1992; Cogill, Caplan, Alexandra, Robson, & Kumar, 1986). It is therefore important to gain a better understanding of what factors influence depression in mothers who have an

infant in the NICU. If we are able to better understand these factors, interventions can be designed to ensure the best possible psychological outcomes for the mother, infant, and family.

Cognitive Theory of Adaptation

Taylor (1983) asserts that when an individual experiences a stressful event, the readjustment and adaptation process focuses on three main themes: a search for meaning in the experience, an attempt to regain control over the event, and an effort to self-enhance, or feel better about their situation, by comparing it to others. See Figure 1 for an illustration of this model.

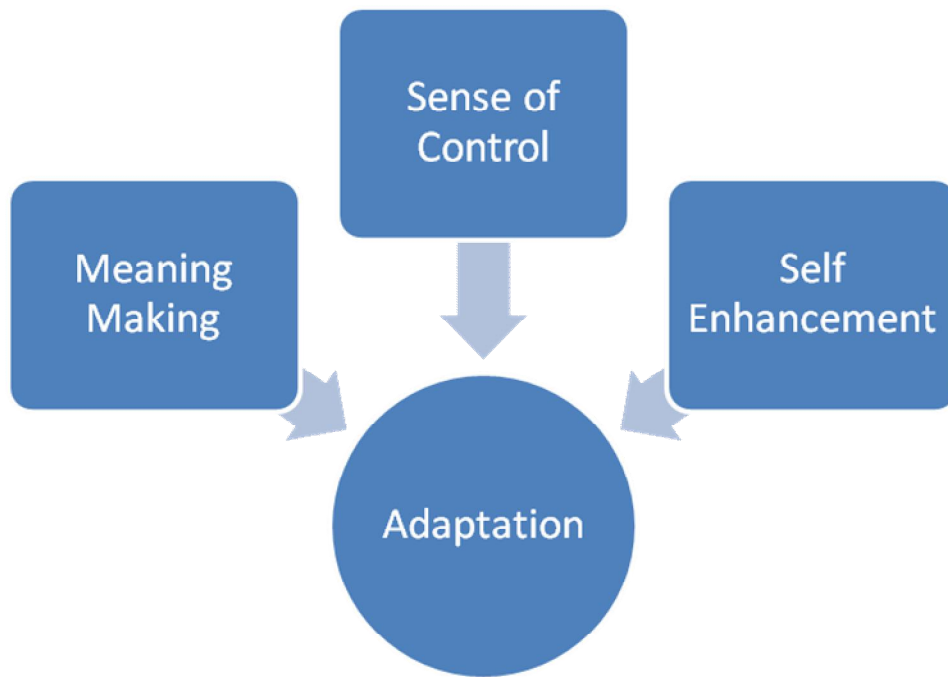


Figure 1. Taylor's Cognitive Theory of Adaptation

The search for meaning includes the search for causal meaning, or why the event occurred and an attempt to understand implications of the circumstances (Janoff-Bulman,

1992). Traumatic events can undermine one's sense of control, and efforts to regain this feeling of control help in the coping process. Regaining control can be both behavioral and psychological. Finally, Taylor (1983) asserts that in order to adjust and adapt to a stressful, threatening situation, individuals try to enhance their feelings of self. Taylor argues that this is done by the use of downward comparisons where people compare their situation to other people in worse situations (Taylor, 1983).

Taylor (1983) argues that these three ways of adapting to a stressful situation depends on the person's ability to create and maintain a set of illusions. These illusions include looking at the facts of the situation from the right "slant" that will allow for meaning making, feelings of control, and downward social comparisons. These illusions also help individuals handle their situation since illusions need no factual basis.

Taylor's theory of cognitive adaptation has been used to understand adjustment and adaptation in individuals in various populations. Taylor developed her theory based on work with adult breast cancer patients and the theory has subsequently been applied to better understand adaptation in a wide range of other populations such as men with HIV and college freshmen (Taylor, 1983; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000; Aspinwall & Taylor, 1992). These studies have consistently found that individuals who are able to find positive meaning from their stressful experience, feel a sense of personal control over the situation, and find ways to enhance their sense of self despite their difficult circumstances have better psychological adjustment, more optimistic views of the future, and greater motivation (Taylor, 1983; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000; Aspinwall & Taylor, 1992). Furthermore, for men living with HIV, finding meaning in the experience was also associated with a less rapid course of illness, suggesting that meaning

making, personal feelings of control, and an enhanced sense of self may have both physiological and psychological benefits (Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000).

Research suggests that the cognitive theory of adaptation helps to explain how individuals adapt to stressful, unexpected, and threatening situations. As previously discussed, having one's infant admitted to the NICU is threatening, stressful, and often unexpected. One major study highlighting the necessity of understanding the process of adjustment in the NICU was completed by Affleck and colleagues in 1991. Data was collected from questionnaires and interviews from 114 families who had an infant in the NICU for at least 10 days. Although they examined many variables, including meaning making, control, and self-enhancement, they focused on these constructs independently rather than understanding them as a model as suggested by Taylor (1983; Affleck, Tennen, & Rowe, 1991). Participants in this study were primarily middle class and white; therefore other populations in the NICU need to be studied to obtain a better understanding of their adjustment process. This study is also dated, and with recent advances in both medical and psychological care for infants and families in the NICU, the examination of these constructs as a model of adjustment needs to be re-examined.

Meaning Making

The cognitive theory of adaptation suggests that one process necessary to achieve optimal adjustment when a negative, traumatic event transpires is meaning making. Meaning making is a cognitive process that occurs when one's global and situational meanings are not congruent (Skaggs & Barron, 2006; Park & Ai, 2006). Global meaning is a person's general life meaning that is informed by the person's goals, beliefs, and values. Situational meaning

is the meaning that a person derives from a particular event they encounter. Global meaning provides a framework for the interpretation of all life events, so that when a person encounters a situation they will try to match the meaning of that event to their global meaning (Skaggs & Barron, 2006). Meaning making becomes necessary when there is a discrepancy between global and situational meaning. Similar to Janoff-Bulman's (1992) idea of shattered assumptions, meaning making is used when one's global meaning is "shattered" by an event (Skaggs & Barron, 2006). The process of meaning making begins when a person attempts to change the situational meaning to be congruent with their global meaning. If this process fails, a person will then change their global meaning to reach the goal of meaning correspondence, where the situational meaning and global meaning are similar (Skaggs & Barron, 2006).

The process and effects of meaning making have been explored in different populations including women with a previous hospitalization for Major Depressive Disorder (MDD, N = 13) and young adults (N = 48) with serious mental illness. In both studies, meaning making was reported as one way individuals coped with their mental illness, though the impact of this search was varied. While the women with MDD found that the search for meaning allowed them to reflect on their life, believe in the future, feel a sense of control over their lives, and personally grow (Skarsater, Dencker, Bergbom, Haggstrom, & Fridlund, 2003), the young adults who searched for meaning did not all report positive outcomes (Philips & Stein, 2007). While some young adults searched for meaning and found positive spiritual implications, others searched for meaning and concluded that their illness was a punishment from God (Philips & Stein, 2007). Both of these views were a result of meaning making, indicating that while some types of meaning making are adaptive, others can have

harmful effects on psychological well-being. Other studies have reported similar results and distinguish between types of meaning that differentially impact psychological adjustment (Farran, Miller, Kaufman, & Davis, 1997). Although both of these samples were small and thus generalizations need to be made with caution, these results suggest that meaning making is a powerful process that is used to cope with and understand a variety of negative events.

Meaning making is related to both psychological and physical outcomes important to optimal adjustment. The relationship between quality of life and meaning making has been studied in individuals with Multiple Sclerosis (MS; Russell, White, & White, 2006). Results showed that individuals with low personal meaning scores had significantly lower quality of life scores than those who reported medium to higher levels of meaning making, highlighting the importance of the meaning making process (Russell, White, & White, 2006).

Furthermore, physical improvements have also been linked to meaning making in a sample of 40 men with HIV/AIDS (Bower, Kemeny, Taylor, & Fahey, 1998). Men who reported finding meaning in their illness had lower rates of AIDS related death, even when controlling for health status and behaviors (Bower, Kemeny, Taylor, & Fahey, 1998). Taken together, these studies highlight the complexity of meaning making and the influence this process has on adjustment to stressful, traumatic life events. Still, it is important to note that individual differences impact the perceived importance of meaning making, and some individuals feel it is not a useful or helpful process (Russell, White, & White, 2006).

Many studies have specifically examined the relationship between meaning making and depression in various samples of individuals adapting to traumatic situations or crises. One way meaning making has been studied in this population is through the examination of “sense of coherence” (SOC; Parker & Lee, 2007). The concept of SOC was first introduced

by Sagy and Antonovsky (1992) in relation to adaptation within the family system but has since been applied to individual adaptation to an array of stressful life events. SOC is a “disposition-like tendency in individuals to see the world as comprehensible, manageable, and meaningful” (Parker & Lee, 2007, p. 1186). Though SOC is a more general construct related to personality and global views, SOC is related to meaning making in that they both focus on understanding the cause and implications of an event and attempt to find a meaning in the situation that is congruent with their worldview. The concept of SOC has been examined in various populations, including Australian women with a history of abusive adult relationships (N = 143) and Taiwanese family caregivers (N = 253; Parker & Lee, 2007; Tang & Li 2008). Both studies reported that SOC had a significant effect on psychological well-being with higher levels of distress and depression being related to lower SOC scores (Parker & Lee, 2007 Tang & Li, 2008). These findings suggest that those individuals who were unable to understand and find meaning from their stressful experience were more likely to be experiencing psychological problems and again highlights the importance of understanding and finding meaning in a negative situation.

Though SOC has been of interest to some researchers, much research has been conducted using more direct measures of meaning making such as measuring coping strategies centered on a search for meaning (King, Shade-Zeldow, Carlson, Feldman, & Philip, 2002). Studies examining meaning making in individuals suffering from a stroke and chronic pain have reported that meaning making is a significant predictor of depression and mediates the relationship between anger and depression (King, Shade-Zeldow, Carlson, Feldman, & Philip, 2002; Graham, Lobel, Glass, & Lokshina, 2008).

The effects of meaning making on depression in caregivers have also been examined. Caregivers as a group have the unique experience of not only having to adjust to the difficult situation their loved one is facing, but they must also cope with their new role as a caregiver. Therefore, the meaning making process is more complex for these individuals. Pakenham (2008) followed caregivers (N = 232) of people with MS over twelve months and found that those who were unable to find meaning or purpose in their caregiving role reported higher levels of depression and anxiety. Other studies have found similar results, with those caregivers reporting higher amounts of meaning making showing lower levels of depression and higher life satisfaction (Haley, LaMonde, Han, Burton, & Schonwetter, 2003). Racial differences in meaning making have also been examined in caregivers and results suggest that there are no differences between Caucasian and African American caregivers in the process by which depression is influenced by meaning making and the caregiving experience (Farran, Miller, Kaufman, & Davis, 1997). The reviewed studies show a consistent relationship between meaning making and depression in caregivers, but they are limited. All of these studies focus on meaning making in relation to the *role* of being caregiver but they do not examine the caregivers' attempt to make meaning out of the suffering of the loved one they are caring for. This is a crucial part of adjustment in the caregiving situation and therefore needs to also be examined.

When a parent has a sick child, they become a medical caregiver to that child as well as a mother or father which makes parental caregiving a unique situation (Young, Dixon-Woods, & Heney, 2002). The process and impact of meaning making on bereaved parental caregivers has been examined in mothers who had a child going through stem cell transplant (SCT) and mothers who experienced the death of a twin or other multiple child. For mothers

who had a child that underwent SCT, it was found that those who reported *searching* for meaning at the time of SCT had higher amounts of anxiety and depression 3 months after the death of their child while mothers who reported *finding* meaning at SCT reported less depression and anxiety 3 months later (Wu, Bonanno, DuHamel, Redd, Rini, Austin, Nereo, Ostroff, Parsons, Martini, Williams, Mee, Sexson, & Manne, 2008). This study highlights the importance of understanding the difference between the search for meaning and actually finding meaning. Results suggest that an unsuccessful search for meaning may be more detrimental to adjustment and coping than not searching at all, but finding meaning may serve as a protective factor in adjustment to crisis situations. The examination of mothers who lost a twin or other multiple child reported that while a significant relationship was found between spirituality and the extent to which the mother reported believing their loss served a larger purpose, no difference on grief was found between mothers who believed there was purpose and meaning for the loss of their child and those who did not (Swanson, Pearsall-Jones, & Hay, 2002). Though this study is interesting as it gives information regarding the potential relationship between meaning making and grief, it is also fraught with methodological errors. One problem is that no parameters were set for when the child died, so some mothers had a multiple die in-utero, while others had died in adolescence. Though both events are devastating, the experiences of these losses are too different to meaningfully compare. Another issue with this study was that the grief scales were filled out retrospectively. Though not a methodological problem, this study was examining grief rather than depression which are different experiences. Still, this study is valuable in that it suggests a need for more information about the experience mothers have when they lose a child.

While a few studies have examined the effects of meaning making on mothers when their child or infant dies, virtually no studies have examined the impact of meaning making on mother's adjustment when their newborn infant is ill and hospitalized in the NICU. Affleck, Tennen and Rowe (1991) did examine meaning making and depression in the NICU, and at the time of their study they found no relationship between these two variables. However, this study was conducted over two decades ago and much has changed in the NICU since the mid 1980's. Infants are now born earlier and are surviving due to advances in technology and information. The NICU experience in the 1980s is vastly different than the NICU experience in the twenty-first century which warrants a re-examination of the relationship between meaning making and depression in this population. In order to fully understand the relationship between the NICU experience, meaning making, and depression in mothers, further studies are needed.

Control

Taylor's cognitive theory of adaptation focuses on three factors that influence adjustment to stressful or traumatic events, one of which is regaining a sense of control. One assumption individuals make is that the world is controllable rather than chaotic or unpredictable (Pyszczynski & Greenberg, 1987). Unexpected and unpredictable experiences can lead to a pervasive sense of losing control (Velissaris, Wilson, Saling, Newton, & Berkovic, 2007). Therefore, when an individual is in an unexpected situation, their assumption of control is shattered and adjustment is difficult. Loss of control has been described as a sense of vulnerability, an increase in negative affect, an increase in thoughts of mortality, and a feeling that a major life change has occurred (Velissaris, Wilson, Saling, Newton, & Berkovic, 2007).

Control is a construct that is discussed in a variety of different ways and described as personal control, locus of control, mastery, self-efficacy, and perceived control among others (Keeton, Perry-Jenkins, & Sayer, 2008; Ross & Sastry, 1999). The concept of personal control has been defined by many researchers. Yang (2006) describes sense of control or mastery as, “the extent to which people see their lives as being under their control as opposed to being ruled by outside ... forces” (Yang, 2006, p. 357). Self-efficacy is similar to control in that it, “mirrors a sense of control over one’s environment and reflects the belief of being able to master challenging demands by means of adaptive actions” (Luszczynska, Benight & Cieslak, 2009, p.51) For the purposes of this study, literature was reviewed that measured perceived control, mastery, and self-efficacy since these conceptualizations of control include a sense of being involved in a situation in such a way as to have an impact, (i.e., having *control over* the situation). According to Taylor (1983), in order for mothers to adapt to the NICU, they need to be able to gain a sense of control in relation to the new crisis situation.

Studies have examined the relationship between sense of control and various outcomes related to psychological well-being in stressful situations in a variety of populations. While a study examining the experience of losing a spouse in mid-life found an inverse relationship between self-efficacy and grief (Bauer & Bonanno, 2001), two other studies examining people suffering from depression (N = 189), and individuals with severe allergies (N = 156, M_{age} = 45.6), both found a relationship between feelings of control and more adaptive coping strategies (Kelly, Sereika, Battista, & Brown, 2007; Knibb & Horton, 2008). It is important to note that while depressed women reporting more control used more adaptive coping methods, this difference was not found with men in the sample. Such findings indicate that perceptions of control may be especially important to psychological

health and adjustment in women. Taken together, these studies suggest that feelings of control are related to the positive adjustment in individuals encountering a stressful situation or crisis.

Negative thinking, such as the belief that one has no control or is powerless, is theorized to contribute to higher levels of depressive symptoms (Keeton, Perry-Jenkins, & Sayer, 2008). This relationship has been examined in a wide variety of populations, but few studies have sought to understand this relationship in mothers with an infant hospitalized in the NICU. A review of the literature examining the relationship between self-efficacy and depression in collective trauma events (i.e. natural disaster, community violence) found that self-efficacy was consistently associated with lower levels of distress, less depressive feelings, less anxiety, negative affect, and lower levels of PTSD symptoms (Luszczynska, Benight, & Cieslak, 2009). Other studies have reported similar results, including a study examining older adults with disabilities that found a relationship between both sense of control and depression (Yang, 2006). It was reported that nineteen percent of the effect of disability on depression was mediated by sense of control. These studies present strong evidence that one's sense of control when confronted with a difficult situation influences depression.

Many researchers have examined the effect of perceptions of control on adjustment and depression in adults with chronic illness, including individuals with breast cancer and those diagnosed with a seizure disorders. These studies both report an inverse relationship between sense of control and depressive symptoms. While Barez and colleagues found that breast cancer patients endorsing more control also reported better adaptation to their cancer at five time points throughout a year (Barez, Blasco, Fernandez, & Viladrich, 2007),

Velissaris found that at one month post diagnosis, psychological distress was significantly higher for the stroke victims experiencing a pervasive loss of control group when compared to those reporting a limited loss of control (Velissaris, Wilson, Saling, Newton, & Berkovic, 2007). Taken together, these studies indicate that an individual facing a serious, chronic illness may show better adjustment if they are able to increase their sense of control over their illness.

When an adult is dealing with a life-threatening illness or trauma, the loss of control is a personal loss of control. As a caregiver caring for an individual, the loss of control is in relation to the situation which is a different experience that warrants further investigation. The experience and effects of losing control as a caregiver were examined in a sample of caregivers (N = 192) for adults undergoing bone marrow transplant (BMT; Fife, Monahan, Abonour, Wood, & Stump, 2009). Caregivers were followed over the course of six weeks and emotional distress (sadness, anger, anxiety, and guilt) and personal control were measured. Results suggested that the sense of control in these caregivers remained stable at all three time points and that those who perceived more control reported significantly less distress. The researchers posit that because personal sense of control remained stable over the course of the study, it may be a stable and protective factor rather than a specific situational response (Fife, Monahan, Abonour, Wood, & Stump, 2009).

It is a unique experience when a parent feels a loss of control in relation to their role as a caregiver to their child. The feeling of loss of control is related to the situation, but the parent may also feel a personal loss of control in relation to their role as a parent. A study examining new mothers (N = 31) of preterm infants delivered between 26 and 36 weeks found that most mothers report low levels of mastery (Younger, Kendell, & Pickler, 1997).

Twenty-one mothers reported clinically significant levels of depression while only four mothers reported that they achieved mastery of certainty, change, acceptance, and growth. A significant, inverse relationship between mastery and depression was found within these mothers (Younger, Kendell, & Pickler, 1997). Findings from this study indicate that many mothers of preterm infants feel little control over their role as parent or over the situation of having a preterm child. This lack of mastery was also related to higher levels of depression, indicating that mothers of preterm infants may be at particularly high risk of depression. Other studies have found high depression and low control in a variety of new mothers. Howell and colleagues examined correlates of postpartum depression among mothers and found that of the 720 participants, 39% screened positive for depression. Depression was predicted by nonwhite race, more physical symptoms, lack of social support, and *lower self-efficacy scores* (Howell, Mora, & Leventhal, 2006). Again, this study found many variables to be related to depression, one of which was self-efficacy. It is important to understand the amount of variance self-efficacy accounts for in depression to gain a better understanding of their relationship.

The transition to parenthood is difficult even in the absence of medical difficulties. Keeton and colleagues (2008) sought to better understand this transition in 153 couples giving birth to their first child. They followed these families over the course of a year and examined depression, anxiety and perceptions of control antenatally and at four points postnatally. They found perceived control to have two distinct parts, a temporal, more malleable component based on the specific situation, and a permanent, enduring component that is present across all situations. Results show that increases in feelings of control significantly predicted a reduction in depressive symptoms over time. Since the temporal and

malleable sense of control is the one that can change over time, these authors conclude that it is more important in relation to depression during the transition to parenthood than the permanent and enduring sense of control parents may have (Keeton, Perry-Jenkins, & Sayer, 2008). This study found that event specific personal control has a stronger relationship to depression in new parents, suggesting that temporal feelings of control may be particularly important in the processes of adaptation to parenting and to a crisis situation such as having a newborn admitted to the NICU.

Few studies have examined the relationship between control and depression in the NICU, but the situations in which this relationship has been examined are similar to the NICU in that there is a sudden and unpredictable experience that affects one's sense of personal control (Velissaris, Wilson, Saling, Newton, & Berkovic, 2007). A study by Doering, Moser and Dracup (2000) followed 461 parents, mostly mothers, of infants in the NICU and reported that mean depression scores indicated moderate to severe depression in this sample. Perceived control was found to be related to depression along with hostility, anxiety, and adjustment. Perceived control, gender, race, family functioning, and social support accounted for 21.5% of the variance in depression scores within this sample. This study indicates an important relationship between perceptions of control and depression in NICU parents, supporting Taylor's notion that control is related to adjustment to stressful, traumatic situations. While research indicates an important relationship between control and depression, more research is needed to fully understand the importance of feelings of control in the NICU and the relationship between control and depression in mothers who have infants in the NICU.

Self-Enhancement

The third component to Taylor's cognitive theory of adaptation is self-enhancement. Taylor argues that self-enhancement takes place by using downward social comparisons (Taylor, 1983). Downward comparisons occur when an individual compares themselves to someone who is in a worse off situation than they are. This comparison makes a person feel better about the situation they are dealing with as they are reminded that things could be worse. A person can base comparisons on many dimensions to ensure that they are always doing better than someone else. For example, a woman who has breast cancer and did not need surgery may compare herself to someone who had a lumpectomy, whereas a person who had a lumpectomy would compare themselves to someone who had a mastectomy (Taylor, 1983). If the person making the comparison cannot find a person worse off on a certain dimension, people will then often compare themselves to "hypothetical others" (Taylor, 1983, p.1165). Wilson and colleagues assert that when people are in a threatening situation they may compare themselves to "less fortunate others, worse times, or hypothetical worse worlds to cope" (Wilson, Gil, Kaezer, 1997, p. 443).

The use of downward comparisons in individuals involved in negative situations such as breast cancer has often been a topic of study. One study, whose results influenced the development of Taylor's model, examined 78 women with breast cancer and looked at four different theories regarding social comparison: super-coper (comparing against individuals in the media portrayed as coping very well), similarity (comparing against someone in a similar situation), upward (comparing against individuals doing better on a certain dimension), and downward (comparing against individuals doing worse in an area; Wood, Taylor, & Lichtman, 1985). It was found that nearly all women used downward comparisons. Sixty

percent of women said that other patients were doing a worse job of coping with breast cancer than they were and 80% agreed that they had adjusted at least slightly better than other women. (Wood, Taylor, & Lichtman, 1985). Other studies have reported similar results with individuals with HIV and as well as people with type II diabetes (Derlega, Greene, Henson, & Winstead, 2008; Derlega, Robinett, Winstead, & Saadeh, 2005) In both studies, it was found that participants rated themselves as better off physically than fictional people with poor physical adjustment, and in the diabetes sample, participants also rated their coping as better after reading about poor psychological adjustment in a vignette (Derlega, Greene, Henson & Winstead, 2008; Derlega, Robinett, Winstead, & Saadeh, 2005). In both samples, the use of downward comparisons was evident.

It has been asserted that comparative strategies for self-enhancing are associated with better psychological adjustment (Wilson, Gil, & Kaezer, 1997). Many studies have examined the relationship between downward comparisons and adjustment to negative life events with outcomes such as post traumatic growth, perceived quality of life, and depression. A study examining the relationship between downward comparisons and post-traumatic growth in sixty stroke victims found that post-traumatic growth was correlated with positive cognitive restructuring, downward comparisons, resolution and denial. Time played an important role in the relationship between downward comparisons and post-traumatic growth. As the time since the stroke increased, the relationship between these two variables became more significant (Gangstad, Norman, & Barton, 2009). Results from this study suggest that over time, downward comparisons may become a more important component of coping with a negative event. Another study examining perceptions of quality of life in older adults and its relationship with social comparisons found that participants reporting the use of downward

comparisons had significantly higher perceptions of quality of life (Beaumont & Kenealy, 2004). These studies suggest that the use of downward comparisons is adaptive and may help to facilitate an individual's adjustment.

Other studies have sought to better understand the relationship between social comparisons and depression. One such study examined older, Chinese individuals (N = 205) and found that the strongest predictor of depression was living status, with those living alone reporting significantly higher rates of depression. However, they found that the effects of living alone on depression were stronger in individuals who rarely used downward comparisons but those who lived alone and frequently used downward comparisons reported less depressive symptoms (Cheng, Fung, & Chang, 2008). These results suggest that the impact of negative life events or situations can be minimized with the use of downward comparisons. Taken together, these studies highlight the important relationship between the use of downward comparisons and adjustment to difficult life situations.

The majority of information about the relationship between downward comparisons and depression has been gathered in medical populations. The relationship between comparisons and depression was examined in a sample of African American adults with sickle cell disease (N = 47; Wilson, Gil, & Raezer, 1997). Both upward comparisons and downward comparisons were examined, and it was reported that social comparison was a significant predictor of level of depressive symptoms, with more frequent downward comparisons predicting less depressive affect, even after controlling for pain and type of sickle cell disease (Wilson, Gil, & Raezer, 1997). Other studies have focused on the negative impact of upward comparisons. Neugebauer and colleagues attempted to better understand the relationship between physical impairment, upward social comparisons and well-being in

436 adults with Rheumatoid Arthritis (RA). They found that greater disability in valued activities and more upward comparisons predicted an increase in depressive symptoms (Neugebauer, Katz, & Pasch, 2003). While this study focused on upward comparisons, it can be inferred that as upward comparisons increase depression, downward comparisons may have the opposite effect. Buunk and colleagues found that identifying with, rather than comparing against, individuals adjusting poorly to a similar situation led to an increase in depressive symptoms for 70 individuals with spinal cord injury (Buunk, Zurriaga, & Gonzalez, 2006). This study indicates that the process of comparing and making oneself feel better off is a factor that protects a person from depressive symptomology.

Not all studies have found similar relationships between depression and social comparisons. While DeVellis and colleagues found that most of their 71 participants with RA made downward comparisons, they found that downward comparisons were associated with both higher levels of depression and lower levels of self-esteem (DeVellis, Holt, Renner, Blalick, Blanchard, Cook, Klotz, Mikow, & Harring, 1990). This is in contrast to Taylor's theory of cognitive adaptation and other research findings. There are some problems with the methodology in this study, as they did not separate downward comparisons for ego enhancing purposes versus information gathering. Previous research has found that those seeking information may benefit from gathering that information from individuals who are better off than they are, while those seeking to enhance their self image do better comparing against those doing worse (Dedega, Greene, Henson & Winstead, 2008; Dedega, Robinett, Winstead & Saadeh, 2005; Neugebauer, Katz, & Pasch, 2003). Still, this study indicates that we need more information regarding the relationship between downward comparisons and depression.

Few studies have examined social comparisons in the NICU. One study examined the use of social comparisons among 42 preterm mothers and 42 full-term mothers (Blanchard, Blalock, DeVellis, DeVellis, & Johnson, 1999). Results show that preterm mothers made significantly more downward comparisons than full-term mothers. While 76% of preterm mothers made at least one social comparison, only 38% of full-term mothers did the same. Of the 47 comparisons preterm mothers reported, 64% were downward comparisons while 19% were upward and 17% were lateral, again showing the high prevalence of downward comparisons. Preterm mothers tended to rate their infants as being better off than the “typical” preterm infant. It was also found that the use of downward comparison against a typical preterm infant was a significant predictor of adjustment (Blanchard, Blalock, DeVellis, DeVellis, & Johnson, 1999). Similar results have been reported in the NICU with more downward comparisons being reported than upward comparisons (Affleck, Tennen, & Rowe, 1991). Affleck and colleagues also found that downward comparisons were based on selected dimensions, with small infants being compared to those on ventilators and larger infants being compared to smaller infants. It was found that those mothers who made more downward comparisons at discharge from the NICU had less depression at six months. However, after controlling for mood at discharge and demographic variables, this relationship did not hold. This again highlights the need to further examine this relationship in the NICU population.

Current Study

The purpose of the current study was to examine the effects of meaning making, perceived control, and self-enhancement on depression in mothers with an infant in the NICU. Extant literature suggests that having an infant in the NICU is extremely stressful and

mothers often have a difficult time adjusting to this crisis (Durrette, 2007; Siedman, Watson, & Corff, 1997; Fenwick, Barclay, & Schmied, 2001; Meyer, Coll, & Seifer, 1995). Mothers who have an infant in the NICU are more likely to be depressed, and this depression has both immediate and long term negative consequences (Doering, Drawp, Moser, 1999; Carter, Mulder, Bartram, & Darlow, 2005; Moehler, Brunner, Reck, & Resch, 2006; Cogill, Caplan, & Alexandra, 1986). Taylor's cognitive theory of adaptation suggests that mothers who are able to find meaning in their infants NICU admission, who are able to identify areas they still have control over with their neonate, and who are able to enhance their own situation by comparing it to worse-off others, will have lower levels of depression (Taylor, 1983). While links have been made between these factors of meaning making, control, self-enhancement and depression, few studies have examined these in the context of the NICU.

Hypotheses

1. *Meaning making and control would be negatively correlated with depression.*

Those mothers reporting higher amounts of meaning making would have lower depression scores. Furthermore, mothers reporting higher levels of perceived control would also have lower depression scores.

2. *Mothers who used downward comparisons would be significantly less depressed than mothers who did not use downward comparisons.* Mothers who rated their infant as "better than average" compared to most infants in the NICU would have significantly lower depression scores than mothers who rated their infant as "average" or "worse than average."

3. *Depression would be related to a mothers search for meaning.*

- a. Mothers who engaged in a search for meaning would have lower depression scores than mothers who had not engaged in a search for meaning.
 - b. Mothers who reported searching and finding meaning would report less depression than mothers who reported searching but not finding meaning.
4. *Meaning making, control, and self-enhancement would explain a significant portion of variance in depression scores in mothers with an infant in the NICU.*
- Mothers who reported higher amounts of meaning making, higher amounts of perceived control, and more self-enhancement through downward comparisons would have lower depression scores. See Figure 2.

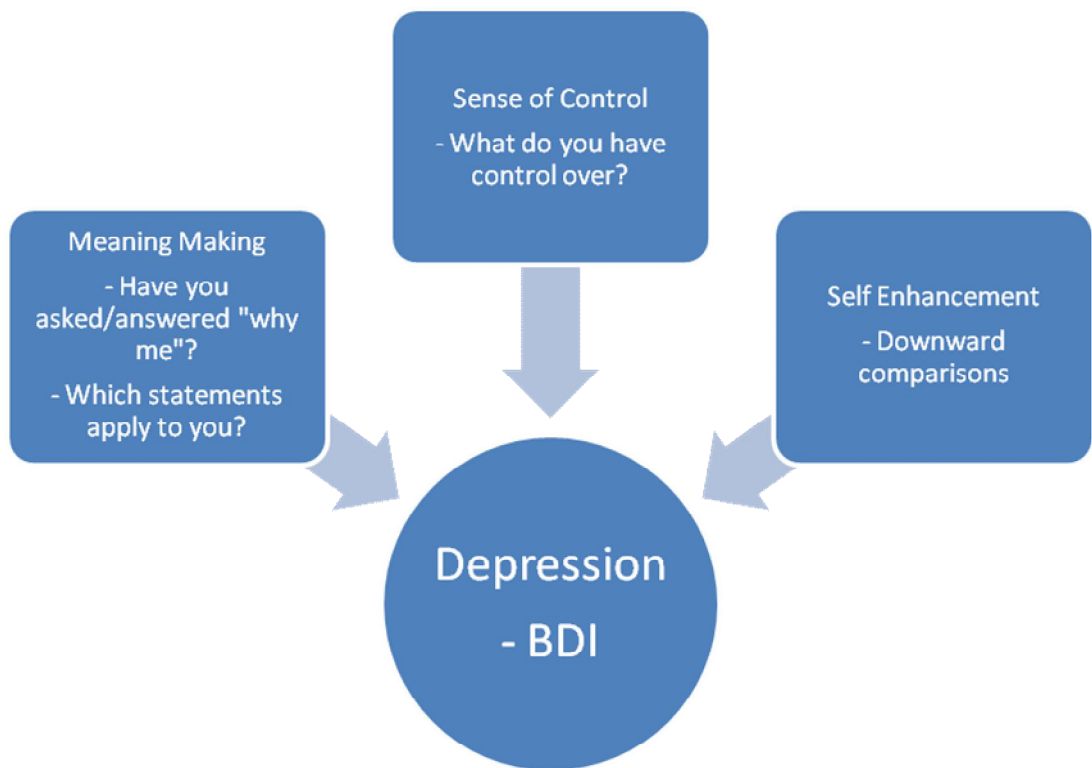


Figure 2. Taylor's Cognitive Theory of Adaptation in the NICU

Methods

Participants

Eligible participants for this study were mothers who had given birth to infants hospitalized in one of three NICU's located in Richmond, VA: VCU Health System's Critical Care Hospital, St. Mary's Hospital, and Henrico Doctor's Hospital. To participate, mothers had to speak and understand English in order to complete study interviews and tasks, be at least 18 years of age, and non-drug abusers (e.g., cocaine). Only mothers of infants without severe handicapping conditions or severe neurological impairments were recruited.

Procedure

Parents of infants hospitalized in the NICU were initially approached by the NICU nursing staff to determine if the mother and infant were stable enough to participate. The NICU nurse would briefly explain the study, and if the mother was interested in participating, a research staff member would further explain the study. Mothers who agreed to participate in the first phase of the study were asked to complete and sign consent forms. Consented mothers then participated in a structured interview with a research staff member which focused on how the mother was coping with having an infant in the NICU. In addition, mothers were asked to complete a set of paper and pencil questionnaires, and they also observed a short video of an unfamiliar infant labeled as premature or full-term and answered questions about the video. Though there were multiple stages of data collection, this completed phase one of data collection. Data for this study focused only on phase one of the project.

Measures

Demographics. Demographic information was collected in the structured interview. Information on mother's age, income, educational level, marital status, and ethnicity were collected. Medical information related to the infant was also gathered, including infant birth weight, gestational age, and type of delivery.

Meaning Making. Meaning making information was collected in the structured interview with the mother. The structured interview contained sets of questions and probes designed to gain a better understanding of the NICU experience for the mother and learn about their coping processes. Some questions were designed to evaluate meaning making within this sample. The first section examined the search for meaning and prompted the mother with, "Many parents of children who require newborn intensive care ask themselves the question 'Why me?' 'Why am I the one whose child has to be hospitalized in an intensive care unit?'" The mother was then asked, "Have you ever asked yourself this question?" and, "Do you have an answer to this question?" For this project, mothers were divided into two groups: those who searched for meaning, and those who had not. Mothers who indicated that they engaged in such a search were further split into those who had searched and found meaning and those who had searched but not found meaning based on their given response to the above questions.

The second section of the structured interview that measured meaning making was a group of five statements. The first of these statements was, "We're better able than most parents to care for a sick baby" followed by, "This happened so that I can learn something important about myself;" "God picks parents who can cope with the problem;" "This challenge is a test of my faith;" and, "God selected me to give special care to this child." For

each statement, the mother was asked to agree, which was coded as a “1”, or disagree, which was coded “0”. Total meaning making scores were a sum of the five statements, with a possible range of 0 – 5, where higher scores indicated more meaning making.

Control. Two sets of questions in the structured interview examined the amount of control parents felt they had over their infant’s well-being. The first question asked, “How much control or responsibility do you feel for your child’s medical condition?” Mothers were asked to rate the amount of control they felt on a 10-point scale, with 10 being “high control”. The second interview question that measured amounts of control asked parents, “How much control or responsibility do you feel for your child’s future and developmental status? What kinds of things do you feel like you can control?” Parents were asked to give examples of things they felt they could control and things they felt were out of their control.

A total control score was derived from these two questions for each mother. The total score was a combination of the rating on the 10-point scale along with the number of examples the parent listed as ‘controllable’ for the second question. Therefore, if a mother answered the first question with a “6” and then listed three things she felt she had control over, her total control score was a nine. The lowest possible control score was zero and there was no ceiling. Higher scores indicated a greater sense of control.

Self-Enhancement. Self-enhancement was assessed with a question on the structured interview about social comparisons. The interview question asked, “Compared with other babies in the NICU, how do you compare your child’s medical condition?” Mothers were able to respond that their infant was “better than average,” “about average,” or, “worse than average.” This item in the interview was used to understand the types of social comparisons

the mother was making in relation to her infant. Mothers who rated their infants as better than average were compared to those who rated their infant as average or worse than average.

Depression. The Beck Depression Inventory (BDI) was used to measure self-reported depression levels within the sample (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). Twenty questions of the BDI were used and asked about the presence and severity of various depressive symptoms. These symptoms were rated on a scale from 0-3 with total scores ranging from 0 – 60. Higher numbers indicated more depressive symptoms, with a score of 16 or greater signifying clinically significant depression (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The BDI has been shown to have good estimated reliability ($\alpha = .86$; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

Statistical Analyses. SPSS Version 16 was used to analyze the data. To begin, all data was inspected for conformance to the assumptions of the General Linear Model (GLM; Tabachnick & Fidell, 2007). Measures of symmetry were conducted to check for skewness and kurtosis, and the data was examined for linearity, homoskedasticity, collinearity, and range. Necessary adjustments were made to ensure that the analyzed data was normally distributed. Next, correlations were analyzed to identify covariates in the data. Though extant literature suggested that factors such as maternal age, marital status, and infant gestational age are likely to be covariates while race and ethnicity will not (Miles, Holditch-Davis, & Schwartz, 2007; Lau, Hurst, Smith, & Schanler, 2007), for the purpose of this study, all demographic variables were correlated with meaning making, control, self enhancement, and depression. Identified covariates were then controlled for in further analyses.

After the data was checked for normality and covariates were identified, hypothesis testing began. Hypothesis one, *meaning making and control would be negatively correlated*

with depression, was tested using Pearson's correlations. Correlations between meaning making and depression and sense of control and depression were analyzed. Hypothesis two, *mothers who used downward comparisons would be significantly less depressed than mothers who did not use downward comparisons*, was tested with an independent-samples t-test to determine if two categorical independent variables are significantly different on an outcome variable (Tabachnick & Fidell, 2007). The outcome variable was depression, and the categories for the independent variable were: 1) mothers who rated their infant as better off than most infants in the NICU, and 2) mothers who rated their infant as average or worse off than other infants in the NICU. For hypothesis three, *depression would be related to a mothers search for meaning*, two separate independent-samples t-tests were run, with depression being the outcome in both. For hypothesis 3a, *mothers who engaged in a search for meaning would have lower depression scores than mothers who had not engaged in a search for meaning*, the categories for the independent variable were: 1) mothers who endorsed searching for meaning, and 2) mothers who did not endorse searching for meaning. For hypothesis 3b, *mothers who reported searching and finding meaning would report less depression than mothers who reported searching but not finding meaning*, the categories were: 1) mothers who searched for meaning and found meaning, and 2) mothers who searched for meaning and did not find meaning.

Finally, to test hypothesis four, *meaning making, control, and self-enhancement would significantly predict depression scores in mothers with an infant in the NICU*, a multiple regression was used with meaning making, sense of control, and self-enhancement as the predictors and depression as the outcome. A multiple regression was used because there are no a-priori hypotheses about the amount of variance each predictor will contribute

to the overall model. This analysis allowed for the examination of the amount of variance each predictor contributed to the outcome as well as the overall predictive ability of the model (Tabachnick & Fidell, 2007).

Results

Before running analyses, assumptions of the General Linear Model (GLM) were examined. Univariate outliers were checked through the examination of standardized values and one item was deleted as it was above the critical value. Linearity and homoscedasticity were both checked by examining the residual scatterplot, and no cases were deleted. Univariate normality was examined by checking skewness and kurtosis values for all continuous variables. All values were between -1 and 1, indicating that the variables were not skewed or kurtotic. Next, multicollinearity was examined by examining Tolerance and VIF scores. All Tolerance scores were more than .10 and all VIF scores were less than 10, indicating that multicollinearity was not a problem with these variables. Finally, multivariate outliers were examined with Mahalanobis distances, and two cases had scores higher than the critical value and were deleted. A total of three cases were deleted for not meeting the assumptions of GLM.

Sample Characteristics

One hundred eighty one mothers with an infant in the NICU agreed to participate in the current study. Mothers' mean age was 28.6 years old ($SD = 6.3$), and a majority of mothers were Caucasian (58%), completed high school (25.4%), reported an annual income greater than \$60,000 (35%), and were married (60%). See Table 1 for more information on mothers' demographic characteristics.

Table 1

Mother's demographic characteristics (N = 181)

	N	%
Age (Mean, S.D)	28.6	6.3
Ethnicity		
Caucasian	105	58%
African American	61	34%
Asian	4	3.3%
Hispanic	6	2.2%
Other	3	1.7%
Education		
Some high school	17	9.4%
High school diploma	46	25.4%
College degree	43	23.8%
Completed college	45	24.9%
Some graduate school	9	5%
Graduate degree	19	10.5%
Income		
Less than \$15,000	35	19.3%
\$15,000 - \$24,999	15	8.3%
\$25,000 - \$34,999	22	12.2%
\$35,000 - \$44,999	14	7.7%
\$ 45,000 - \$59,999	24	13.3%
Greater than \$60,000	64	35.4%
Marital status		
Married	108	59.7%
Living with baby's other parent	21	11.6%
Single	37	20.4%
In contact with baby's father	13	7.2%

The average birth weight for infants in the current samples was 3.97 pounds (SD = 2.08), with weights ranging from 1 pound to 11.73 pounds. A majority of the infants in the NICU were delivered by caesarian section (64.2%) with the average gestational age being 32 weeks (ranging from 23 – 43 weeks). The average number of days spent in the hospital at the time of the structured interview was 29.7 (SD = 33.3), and the average number of days that NICU infants in this sample required ventilation was 11.3 days (SD = 26.9). A slight majority of the infants were boys (51.9%). Fifty percent of mothers identified prematurity as the reason their infant was in the NICU, however, 84% of all infants were born prior to gestational age of 37 weeks, thus meeting criteria for prematurity. Other stated reasons for an infant's NICU admission included preeclampsia (12.2%), respiratory problems (8.3%), incompetent cervix (2.2%), infection passed from the mother (2.2%), and stressful delivery (1.1). Many other infants were hospitalized for less common health problems such as feeding problems, an infected appendix, gestational diabetes, and heart defects.

Control, Social Comparison, Meaning Making, and Depression

Total control scores were derived from the number of items an individual reported as being in their control (M = 2.4, SD = 1.4) and the rating of amount of control or responsibility they felt for their infant's condition (M = 4.5, SD = 3.4). Total control scores ranged from 0 to 15 with an average score of 6.9 (SD = 3.6). Though not calculated in the total control score, the number of items mothers reported as being out of their control was also gathered (M = 1.0, SD = .8). When examining the use of social comparisons, 57.5% of the mothers reported the use of downward comparisons while 42.5% rated their infant as average or worse off than other infants in the NICU.

Meaning making total had a possible range of 0 – 5 with the mean score of 3.3 (SD = 1.7). More mothers reported searching for meaning (60.8%) than those who reported not searching for meaning (38.1%). When asked if mothers had found an answer to their search for meaning, 64.2% reported they had no answer while 35.8% reported finding meaning. Categories were developed to better understand the types of meaning these mothers reported finding. The most common type of meaning reported was religious in nature (10.5%; e.g. “God trusts me to take care of this baby”), followed by mothers with a medical explanation (8.3%; e.g. “Because I have diabetes”). For some mothers (7.7%), their meaning making answer included statements such as, “Everything happens for a reason,” or, “there is purpose for everything.” Fewer mothers had answers involving self-blame (1.1%; e.g. “I feel guilty because I was too active or picking up other children”), answer eluding to this being a random occurrence (1.7%; e.g. “It was random- there's really no explainable reason for why (or why not) me”), or other answers not captured in the above categories (2.8%; e.g. “To make me appreciate him more”).

To get a better idea of the relationship between the search for meaning and finding meaning, a new meaning making variable was created by combining the question about searching and finding meaning with the total meaning making scores. Four categories were developed: 1. Those who reported searching for meaning, and also had a score of at least one on meaning making total, indicating that they found meaning (58.4%); 2. Those who did not report searching for meaning, but had a score of at least one on meaning making total (31.8%); 3. Those who reported no search for meaning and had a score of zero on meaning making total (5.2%); 4. Those who reported searching for meaning but had a score of 0 on meaning making total (4.6%). Further analyses with this new variable will be discussed later.

The average score on the BDI was 11.7 (SD = 9.2) with a range from 0 – 35. Higher scores on the BDI indicate higher levels of depressive symptoms, with a potential range in scores from 0 - 63 (Beck, Ward, Mendelson, Mock and Erbaugh, 1961). Scores from 0 – 13 on the BDI indicate no depressive symptoms, 14 – 19 mild depressive symptoms, 20 – 28 indicate moderate depressive symptoms, and scores of 29 or greater on the BDI indicate an individual has a severe amount of depressive symptoms. Within our sample 50.3% of individuals had scores indicating no depressive symptoms, 8.8% reported mild depressive symptoms, 12.2% self-reported moderate depressive systems, and 5% of participants reported severe levels of depressive symptoms.

All variables of interest (control, meaning making, social comparison, and depression) were correlated with demographic variables, including age of mother, mother's ethnicity, income, educational attainment, and marital status as well as infant characteristics including gestational age, birth weight, number of days requiring ventilation, number of days in the hospital, infant gender, and type of delivery. See Table 2 for a summary of the significant correlations.

Table 2

Correlations between Variables of Interest and Significant Demographics

	Control (1)	Meaning Making (2)	Depression (3)	Days in the NICU (4)	Days on Vent (5)
(1)	1.00	-.117	.124	-.029	-.015
(2)		1.00	*-.171	*.174	.084
(3)			1.00	*-.22	*-.166
(4)				1.00	*.785
(5)					1.00

Total control scores had no significant relationships with any of the examined demographic variables. However, when the total control score was broken down and the number of items that the mother reported as being in her control or out of her control were examined, some significant relationships were found. To begin, a significant difference on future control scores was present between White mothers and Black, Hispanic, Asian and other mothers $t(161) = 2.80, p = .006, \eta^2 = .046$, with White mothers reporting more things as being in her control ($M = 2.64, SD = 1.39$) than Nonwhite mothers ($M = 2.01, SD = 1.4$). Furthermore, a significant relationship between future control and days in the NICU was found, $r(163) = -.227, p = .004$, with those mothers who had an infant in the hospital longer reporting fewer items as being in her control in the future. Social comparison was significantly related to the number of days an infant required ventilation $t(170) = 2.40, p = .02, \eta^2 = .033$. Mothers who reported not using downward comparisons had infants who spent longer amounts of time on a ventilator ($M = 17.6$ days, $SD = 35.8$) compared to those who used downward comparisons ($M = 6.7, SD = 1.7$). Social comparison was also significantly related to the number of days spent in the NICU $t(172) = 2.66, p = .01, \eta^2 = .040$, with those using downward comparisons spending less time in the NICU ($M = 24$ days, $SD = 26.8$) than those not using downward comparisons ($M = 38.1, SD = 39.8$). Depression was significantly related to the number of days an infant required ventilation, $r(136) = -.17, p = .05$, and the number of days infants had been hospitalized in the NICU, $r(135) = -.22, p = .01$, with mothers reporting more depressive symptoms as days requiring ventilation and days in the hospital decreased.

The total meaning making score was significantly related to the number of days on ventilation, $r(169) = .17, p = .02$, and mother's race, $t(169) = -2.16, p = .03, \eta^2 = .027$.

Mothers who reported that their infants spent longer amounts of time on the ventilator also reported higher meaning making total scores. Furthermore, White mothers reported lower overall meaning making scores ($M = 3.03$, $SD = 1.72$) than Non-White mothers ($M = 3.57$, $SD = 1.5$). Whether or not a mother engaged in a search for meaning was significantly related to gestational age, $t(176) = 2.19$, $p = .03$, $\eta^2 = .027$, number of days on the ventilator, $t(175) = -2.71$, $p = .01$, $\eta^2 = .040$, number of days in the hospital, $t(177) = -2.81$, $p = .01$, $\eta^2 = .043$, mothers age, $t(175) = 2.39$, $p = .02$, $\eta^2 = .032$, and mother's income, $\chi^2(5, N = 174) = 12.48$, $p = .03$, $V = .27$. Mothers were more likely to engage in a search for meaning if their infant had a lower gestational age, spent more time on a ventilator, and was hospitalized for longer in the NICU. Furthermore, younger mothers were more likely to report searching for meaning as well as those making \$15,000 or less annually.

Other exploratory analyses were conducted, including examining the relationship between gratitude and social comparisons. However, this relationship was not significant, $t(89) = .47$, $p = .64$, $\eta^2 = .002$, nor was gratitude related to meaning making, depression, or control. Next, the Maternal Efficacy Questionnaire was examined to see if it related to the control variables and depression, but no significant relationships were found with future control $r(56) = -.003$, $p = .99$, no future control $r(56) = -.17$, $p = .20$, or depression $r(57) = -.13$, $p = .34$. Finally, a comparison between the variables of interest and parity were examined and no significant relationships with meaning making, $t(168) = -.62$, $p = .53$, $\eta^2 = .002$, future control $t(160) = .47$, $p = .64$, $\eta^2 = .001$, no future control $t(160) = -1.54$, $p = .13$, $\eta^2 = .015$, social comparison $\chi^2(1, N = 173) = .42$, $p = .52$, $V = .05$, or depression, $t(135) = -.52$, $p = .61$, $\eta^2 = .002$, and parity were found.

Hypothesis Testing

After examining the relationships between demographic variables and the main variables of interest for this study, analyses to test this study's hypotheses were conducted. The first hypothesis had two parts, with the first stating that *control will be negatively correlated with depression*. It was asserted that those mothers reporting higher levels of perceived control would also have lower depression scores. Pearson's correlations were used and results show that total control scores were not significantly related to depression scores, $r(120) = .12, p = .18$. However, when looking at the separate components that made up the total control score, a better idea of the relationship could be derived. While the amount of control or responsibility a mother reported feeling for her infant's illness was not significantly related to depression, $r(128) = .03, p = .73$, both the number of items a mother listed as being in her control, $r(136) = .22, p = .01$, as well as the number of items listed as not being in her control, $r(136) = .23, p = .01$, were significantly related to depression. In both cases, as the number of items a mother listed as being in her control or being out of her control in the future increased, so did depression scores. The second part of the first hypothesis was, *meaning making would be negatively correlated with depression*. That is, mothers who have higher meaning making total scores would have significantly fewer depressive symptoms. This was also examined with Pearson's correlation, and total meaning making scores and depression were significantly related in the expected direction, $r(128) = -.17, p = .03$. To see if meaning making scores could predict depression, a simple regression was run and it was found that meaning making is a significant predictor of BDI scores, $F(1, 128) = 3.86, p = .05, R^2 = .029$, with meaning making accounting for 2.9% of the variance in depression scores.

The second hypothesis was that *mothers who use downward comparisons would be significantly less depressed than mothers who did not use downward comparisons.*

Independent sample t-tests were used to test this hypothesis. However, no significant relationship was found between the use of downward comparisons and depression $t(132) = .34, p = .89, \eta^2 = .0007$.

The third hypothesis, *depression would be related to a mothers search for meaning,* also had two parts. The first was that mothers who engaged in a search for meaning would have lower depression scores than mothers who did not engage in a search for meaning. The second part was that mothers who reported searching and finding meaning would report less depression than mothers who reported searching but not finding meaning. Both of these hypotheses were tested with independent sample t-tests, but neither of these relationships were found with this sample, $t(135) = -.14, p = .46, \eta^2 = .0015$, and $t(78) = -.91, p = .37, \eta^2 = .011$, respectively.

As previously mentioned, to further explore the relationship between searching and finding meaning, individual were split into four groups: 1. Those who reported searching for and finding meaning (based on their total meaning making score), 2. Those who did not report searching for meaning but reported finding meaning; 3. Those who reported no search for meaning and had a score of zero on meaning making total, and 4. Those who reported searching for meaning but had a score of 0 on meaning making total. An ANOVA was run to see if differences in depression existed between these groups, but no significant relationship was found $F(34, 96) = 1.11, p = .34$. Because groups three and four had such small numbers, nine and eight respectively, a t-test was run with groups one and two to examine any potential differences in depression, but a significant relationship was still not present $t(113) =$

1.27, $p = .21$, $\eta^2 = .014$. Finally, meaning making categories were further examined to see if the type of meaning a mother reported was related to depression levels, but there was no significant differences between the six groups of meaning making on depression, $F(4, 42) = 0.73$, $p = .58$. Further analyses were conducted to compare those who had a religious response with all other responses to see if people with religious answers had lower levels of depression, but again, no significant differences were found $t(41) = .161$, $p = .115$.

The fourth and final hypothesis for this current study was, *meaning making, control, and self-enhancement would explain a significant portion of variance in depression scores in mothers with an infant in the NICU*. It was hypothesized that those mothers reporting higher amounts of meaning making, higher amounts of perceived control, and more self-enhancement through downward comparisons would have lower depression scores. However, due to the insignificant relationship between total control and depression as well as social comparison and depression, running a multiple regression with these variables was not deemed logical. Instead, a multiple regression was run with the variables significantly related to depression including meaning making total, the number of items a mother listed as being in her control in the future, and the number of items a mother listed as not being in her control in the future while controlling for covariates including number of days in the hospital and number of days requiring a ventilator.

A significant model was not found, $F(5,112) = 1.76$, $p = .126$, $R^2 = .073$. Examining this more closely, the model reveals that the only significant predictor was the number of items mothers listed as being in their control in the future $B = 1.21$, $t(116) = 2.01$, $p = .047$, indicating that as future control raises one point, depression scores raise 1.21 points. Both meaning making, $B = -.438$, $t(116) = -.93$, $p = .36$, and the number of items not in the

mothers control, $B = .643$, $t(116) = .51$, $p = .61$, were no longer significant when entered into this model.

Discussion

The purpose of the current study was to assess the utility of Taylor's cognitive theory of adaptation for mothers with an infant in the NICU. More specifically, the effects of perceived control, self-enhancement, and meaning making on depression in these mothers were examined. Gaining a better understanding of the variables that influence depression in mothers with an infant in the NICU can help to improve interventions within this population with the goal of preventing depression and the negative consequences for the mother and infant that often occur as a result of maternal depression in early infancy.

Control

After cleaning the data and assuring that the assumptions of the GLM were met, mean scores were examined. With control, it was found that most mothers rated between two and three things that they felt were in their control regarding the future of their infant (range 0 – 7). Some examples of things mothers felt in control of included taking their child to the doctor, nurturing their infant, providing appropriate early intervention, and education. The average amount of items a mother listed as being out of her control was one (range 0 – 5), and examples included medical complications, future medical problems, and decisions their child will make in adolescence. These mothers were, on average, able to generate more things they felt they had control over in relation to their infant's future than things they felt they could not control. This is similar to findings by Doering and colleagues (2000) who reported that on average, mothers rate themselves as feeling more in control than out of control of their infant's health problems. However, it should be noted that within the current

sample, many mothers (45%) listed medical related issues as at least one of the things they felt they could *not* control. So while these mothers still seemed to generally feel more in control of their infant's future, a key difference in findings with Doering and colleagues is *what* the mothers felt in control of.

Although most mothers in the current sample generally felt more in control of the future, the overall numbers of items that mothers identified as in their control were still low. Younger, Kendell and Pickler (1997) found similar results as the sub-scores on their mastery scale were lowest for those scales associated with the future (growth – mastery of life transition, and change – mastery of fate). These finding suggest that mothers may be better able to feel in control of the current moment while gaining a sense of control in relation to the future is more difficult.

A couple of problems were present in the variables used to measure control in the mothers of infants in the NICU. To begin, mothers in the current study were also asked to rate the level of control or responsibility they felts for their child's condition, and the average score was 4.5 on a scale of 10, indicating that most mothers felt a moderate amount of responsibility for their child's condition. This scale was not related to depression and therefore not used in subsequent analyses. It is possible that this scale is tapping into the construct of self-blame rather than feelings of control. However, if this scale is measuring self-blame, a significant relationship with depression would still be expected (Bifulco, & Brown, 1996). It is therefore unclear exactly what this scale is measuring. Another problem with the control measures in the current study was that they were all problem-focused in nature since they asked what could be controlled in the infant's future. There are two general categories of coping: problem focused coping and emotion focused coping. While problem

focused coping is aimed at the stressor itself (e.g. the situation of having a sick infant) and involves generating ideas to help solve the problem, emotion focused coping is aimed at reducing negative emotions associated with a difficult time (Lazarus & Folkman, 1984). With emotion focused coping, the attention is on the persons feelings rather than the situation itself (Lazarus & Folkman, 1984). Perhaps better insight would have been gained into the relationships between control and depression in these mothers by examining both control over the situation as well as the control mothers felt over how they handled the situation emotionally.

Self-Enhancement

Mothers in the current study were asked to compare their infant to other infants in the NICU, and as expected, more mothers (57.5%) rated their infant as better off than other infants in the NICU, while fewer (42.5%) rated their infant as average or worse off than other infants in the NICU. These rates are similar to previous findings that also found more mothers making downward social comparisons (Affleck, Tennen, & Rowe, 1991). Furthermore, the rates found in the current sample were similar to those found by Blanchard and colleagues (1999) who reported that 64% of their sample of mothers of preterm infants made downward comparisons while 46% made lateral or upward comparisons. One limitation of this measure of social comparison was that only one question was asked. In future studies, more extensive measures of social comparisons should be utilized to gain a more complete picture of self-enhancement.

Meaning making

The average meaning making score was 3.3, with a possible range of 0 – 5 with 5 indicating more reported meaning-making. Variability in how meaning making is measured

makes it difficult to compare this number to previous studies, but an average score of 3.3 indicates that the majority of mothers reported finding some meaning in their infants NICU hospitalization. Furthermore, more mothers reported searching for meaning (60%) than not searching (38%), but of those who searched, only 36% reported finding meaning. This is slightly lower than previous studies examining meaning making in the NICU. Affleck, Tennen, and Rowe (1991) found that 75% of the mothers in their sample reported searching for meaning and 42% of those mothers reported finding an answer. These findings suggest that perhaps mothers now have a harder time finding meaning in their infant's hospitalization than previous samples. This could be because of advances in medicine that have made it more likely for very ill infants to be treated in the NICU, whereas in 1991, infants with these conditions may have not survived. While the increase in survival is positive, the suffering parents witness and experience in the NICU may be higher, making it more difficult to find meaning. To gain a further understanding into the most common types of meaning making mothers in the NICU utilized, mothers' open-ended responses to the question about finding meaning were analyzed and six categories were found: religious, medical, self-blame, sayings such as "everything happens for a reason", random occurrence, and other. Religious forms of meaning making were the most common (10.5%) which is consistent with previous research that suggests that religion and spirituality is important in the NICU setting (Catlin, Guillemin, Thiel, Hammond, Wang, & O'Donnell, 2001).

Depression

The average score on the Beck Depression Inventory (BDI) was 11.7 indicating that most mothers reported no clinically significant depressive symptoms (50.3%). Twelve percent of the mothers reported moderate levels of depressive symptoms, 8.8% had mild

levels, and severe amounts of depressive symptoms were reported in 5% of mothers. These rates are similar to some studies examining mothers in the NICU, where the average score of the BDI was 10.26 (Meinyk, Crean, Feinstein, & Fairbanks, 2008), but lower than many other studies. A study examining urban mothers found that 39% of the mothers met criteria for post-partum depression (Vanderbilt, Bushley, Young, & Frank 2009), and another study found that 63% of mothers of preterm infants reported clinically significant levels of depression at their first point of data collection (Miles, Holditch-Davis, Schwartz, & Scher, 2007). It should be noted that the studies reporting higher of depression used other measures of depressive symptoms, and the one study also using the BDI reported similar levels to those found in the current study, indicating that these differences could be a result of measurement variation.

Demographics

Two infant characteristics, the number of days in the NICU at the time of the interview and number of days the infant required ventilation, were related to many of the variables of interest in this study. These two variables are often indicative of an infant's health, with those spending more time on a ventilator or more time in the NICU usually experiencing more severe health concerns. The use of social comparisons was significantly related to both of these variables, with those mothers who had an infant on a ventilator for longer periods of time being more likely to rate their infant as 'average or worse off' than other infants in the NICU. This suggests that though different dimensions can be used for comparison (Taylor, 1983), the presence of a ventilator may be particularly worrisome for parents and cause them to view their infant as doing worse than other infants. Furthermore, mothers with an infant who had spent more time in the NICU were also less likely to use

downward comparisons, indicating that an infant requiring a longer stay may be viewed as average or worse off than infants requiring a shorter stay.

Similar relationships were found with meaning making, where mothers with an infant who had spent more time on a ventilator reported higher total meaning making scores. Similarly, whether or not a mother engaged in a search for meaning was related to the number of days an infant spent on a ventilator, days in the NICU, and gestational age. Again, these infant characteristics are an indication of a greater severity of health issues for the infant. It is therefore possible that mothers who have an infant who is hospitalized for longer periods of time or an infant who requires a ventilator are experiencing greater trauma due to their infants increased fragility. Furthermore, it is possible that their world assumptions are being tested more than other mothers in the NICU (e.g. “not only is my infant sick which goes against my idea of how the world should be, but my infant is more sick than many of the other infants here which challenges my assumptions to an even greater degree”). With their worldviews at a greater risk of being broken, meaning making becomes an even more important coping mechanism which could be why they report greater amounts of meaning making (Janoff-Bulman, 1992).

Depression was also related to the infant characteristics, though not in the expected direction. Depression had an inverse relationship with number of days in the NICU and number of days on the ventilator, with mothers reporting lower levels of depressive symptoms as the number of days their infant spent in the NICU and needed a ventilator increased. Perhaps these variables are related to depression not through implications of an infant’s status but as an indicator of time since being admitted to the NICU. This would suggest that the initial period of time in the NICU is the most stressful for mothers and that

they are more likely to experience depressive symptoms at this time, a finding reported in several studies (Moehler, Brunner, Wiebel, Reck & Resch, 2006; Miles, Holditch-Davis, Schwartz, & Scher, 2007). It is also possible that upon entering the NICU, effective coping strategies and mechanisms are not in place, but as an infant's stay in the NICU continues, mothers are better able to developing coping strategies and adjust. Both social comparison and meaning making are more likely to occur as time in the NICU increases, and it is possible that that they then contribute to the decrease in depressive symptoms over time. More information is needed in order to understand how mothers interpret their infant's health status and how this relates to adjustment processes and outcomes in the NICU.

Exploratory Analyses

While investigating the data, exploratory analyses were conducted that examined gratitude, maternal self-efficacy, and parity. Gratitude is defined as, "focusing on what we have" (Adler & Fagley, p. 81) and is related to positive affect and improved coping (Adler & Fagley, 2005). One would therefore expect for gratitude to be inversely related to depression and furthermore, it is possible that people who are more grateful could feel 'better off' than people with less gratitude. Given this, exploratory analyses with gratitude and the variables of interest for this project were examined, but no significant relationships were found. It is possible that the context of a crisis, in this case the admission of an infant to the NICU, changes how gratitude is related to depression and other variables. Furthermore, gratitude could make an individual feel better off, but the question assessing social comparisons asked about the mother's infant rather than the mother herself which is a possible explanation as to why a significant relationship was not found between social comparison and gratitude. Perhaps a significant relationship would have been found if the question asked, "how are you

coping/adjusting compared to other mothers with an infant in the NICU.” More research is needed to understand the effect of gratitude on well-being during a crisis situation.

Other exploratory analyses were examined with the Maternal Efficacy Questionnaire (MEQ; Teti, & Gelfand, 1991). Though the sample size was low (N = 64) due to its later addition into the study’s battery of assessments, the relationship between the MEQ, depression, and both the control variables used in the current study were examined. The MEQ and the control variables used in this study were not significantly related to one another, suggesting that they measure separate constructs. It is possible that the variables used in the current study were more situational in their focus while the MEQ is more broad and stable, an important difference that has been noted in other studies as well (Keeton, Perry-Jenkins, & Sayer, 2008). Depression and self-efficacy have consistently been found to be inversely related to one another (Luszczynska, Benight, & Cieslak, 2009), but no significant relationship between the MEQ and depression was found in this study. Again, it could be that maternal self-efficacy is a personal variable for the mother and what is more salient in the NICU is not the efficacy of the mother but whether or not a mother feels control over the situation. A mother who feels very efficacious as a mother could feel completely out of control in the NICU given the rarity and severity of the situation. Results from this study imply that maternal self-efficacy and control over the situation of having a critically ill infant are separate constructs, and that maternal self-efficacy is not related to depression in the context of the NICU. Still, these relationships should be further examined in a larger sample.

Finally, further examination was given to the potential relationship between parity and the variables of interest. Though other studies have not found relationships when examining maternal stress and parity (Meyer, Coll, Seifer, Ramos, Kilis, & Oh, 1995), it is

also possible that having other children could increase stress since the mother would need to balance care for her other children and her hospitalized infant (Eriksson & Pehrsson, 2002). Having siblings at home has also been linked with the father visiting the hospital less which could again increase stress for the mother (Latva, Lehtonen, Salmelin, & Tamminen, 2006). For this study, it was found that parity was not related to perceptions of control, depression, meaning making, or social comparisons which is more consistent with findings from Meyer and colleagues (1995).

Hypothesis Testing

Hypotheses for this study were based on the cognitive theory of adaptation (Taylor, 1983) which asserts that adjustment in a crisis situation involves three components: gaining a sense of control, making meaning, and using social comparisons for self-enhancement purposes. The first hypothesis was that both meaning making and control would be negatively correlated with depression. Previous literature has found meaning making to be related to depression in caregivers (Haley, LaMonde, Han, Burton, & Schonwetter, 2003) but the literature looking at parents with a sick child is varied (Wu, et. al., 2008; Swanson, Pearsall-Jones, & Hay, 2002). The one study examining meaning making in mothers with a hospitalized infant found no relationship (Affleck, Tennen, & Rowe, 1991). However, in our sample, a significant relationship between meaning making and depression was found, suggesting that those mothers who report more meaning making also report less depression. Meaning making accounted for 2.9% of the variance in depression scores, indicating that while meaning making significantly contributes to depression, it is only one small factor that impacts depressive symptoms.

Control has also been consistently related with depression in the literature with caregivers (Fife, Monahan, Abonour, Wood, & Stump, 2009), and mothers of preterm infants (Younger, Kendell, & Pickler, 1997), and the current study found a significant relationship as well. Both the number of items a mother listed as being in her control as well as the number of items the mother listed as being out of her control were related to depression. In both cases, listing more items was linked with an increase in depression. This finding is interesting, as one would expect that these two categories of control would be related to depression in opposite ways. One possibility is that any thoughts of the future, whether positive or negative, increase depressive symptoms in mothers. In fact, one study found that a major source of stress for mothers in the NICU was thinking about their infants outcome, or what the future holds for their infant (Holditch-Davis, & Miles, 2000). While feeling out of control of the future can increase depressive feelings, so can pressure to control the various things the mother thinks she should be able to control. It could also be that these mothers realize that their own futures are now going to be dictated by their child's needs rather than their own personal needs. This can be overwhelming for any parent to think about, but especially when the child could have developmental or physical delays and problems. This again speaks to the idea that thinking of the future is difficult for parents with a sick infant in the NICU. Few studies have examined feelings of control over the future in mothers with an infant in the NICU. Most studies examining control focus on control in the NICU or immediately after going home. Furthermore, many of these studies use maternal self-efficacy to measure control, but findings in the current study suggest that maternal self-efficacy is different from feelings of control over the situation of having an infant in the NICU. These

findings suggest that both feelings of control and feelings of no control over the future can be harmful to the mother's well-being and is an area that needs to be further explored.

The second hypothesis in the current study was that mothers who reported using downward comparisons would be significantly less depressed than mothers who did not use downward comparisons because the use of downward comparisons would be self enhancing. Previous studies have found that while the use of downward comparisons is common among mothers of preterm and ill infants, the effects on depression and adjustment are less clear (Blanchard, Blalock, DeVellis, DeVellis, & Johnson, 1999; Affleck, Tennen, & Rowe, 1991). Indeed, results from the current study also show that while the use of social comparisons is common, with over half (57.5%) of the mothers reporting that their infant was better off than the other infants in the NICU, social comparisons are not significantly related to depressive symptoms. The link between social comparisons and depression seems to be stronger in populations personally experiencing a negative event (e.g. sickle cell disease; Wilson, Gli, & Raezer, 1997), rather than caregivers of an individual, family member, or child experiencing a negative, life-threatening event. This suggests that the utility of downward comparisons is different for caregivers and parents. According to Taylor (1983), the purpose of using downward comparisons is to *self* enhance. In this case, the comparisons being made by the mothers are not about the mother herself but about her infant. The mother is therefore trying to feel better about the situation rather than trying to feel better about herself. With the role of social comparisons no longer being to self-enhance and instead being to *situation*-enhance, the effects of social comparisons on adjustment could change. This is another example of the complexity of the situation a parent faces when their infant or child is ill. More research is

needed to understand the adaptive use of social comparisons for caregivers and parents, if there is an adaptive use at all.

The third hypothesis for this study was that depression would be related to a mother's search for meaning. More specifically, it was hypothesized that mothers who reported searching for meaning would have lower depression scores than mothers who did not report searching, and that mothers who reported searching and finding meaning would report fewer depressive symptoms than mothers who reported searching but not finding meaning. This hypothesis was based on the article by Wu and colleagues (2008) that was previously reviewed. Results from this study suggested that the relationship between meaning making and depression may be a more complicated one based on searching and finding meaning rather than one or the other exclusively. Results from the current study were not significant, and breaking groups further down based on reports of searching and finding meaning as well as the overall meaning making scores also yielded no significant results.

Meaning making answers were also categorized to better understand if types of meaning making answers influenced depression, but no significant differences were present between mothers who had religious, medical, self-blame, "everything happens for a reason," random occurrence, or other answers. Further analyses to compare religious meaning making answers with all other categories were examined. Whereas religious coping has been conceptualized as understanding how spirituality and religion help people to face difficult life circumstances (Koenig, Pargament, & Nielsen, 1998), religious meaning making is defined as, "attributions of a stressful life event that involve the sacred" (Phillips & Stein, 2007, p. 529). Recently, some models have combined meaning making and coping with religion (Park, 2005). Park (2005) asserts that religion has been linked with positive outcomes for

people and one path to these positive outcomes could be through religious meaning making. Religious meaning making therefore involves how individuals perceive a God as being part of their stressful event (Park, 2005). Meaning making coping may be particularly helpful in situations where it is not possible for the individual to personally “solve” the problem, such as having an infant who is critically ill (Mattlin, Wethington, & Kessler, 1990). Religious meaning making has been found to be related to positive outcomes such as adjustment after bereavement (Lichtenthal, Currier, Neimeyer, & Keesee, 2010), so it was thought that mothers in this sample who made meaning in religious or spiritual ways would potentially have lower depression scores. However, no significant differences were found between mothers who used religious meaning making compared to other forms of meaning making. In this sample, meaning making and depression were only significantly related in that those mothers who had higher total meaning making scores also reported fewer depressive symptoms, suggesting that being able to find more meaning, not searching, searching and finding, or using a certain type of meaning making is what may prevent depression in this population.

The fourth and final hypothesis of this study was designed to test Taylor’s model based on the theory of cognitive adaptation. Originally, the use of social comparisons, control, and meaning making were going to be entered into the model with depression as the outcome. However, since social comparisons were not significantly related to depression in the independent t-tests, it was not entered into the final model. Therefore, a modified model was tested using the variables found to be significantly related to depression in the preliminary analyses, including meaning making, total items listed as being in control, total items listed as being out of control for the infants future, and number of days in the hospital

and number of days requiring a ventilator as covariates. A significant model was not found. This suggests that while meaning making and feelings of control in relation to the future are related to depression when examined separately, when examined all together and with covariates being controlled for, they do not significantly contribute to variance in depressive symptomology.

Limitations

There are several limitations in this study, in addition to the limitations already noted, that need to be addressed in future research. To begin, many of the measures used for the current project were based on open-ended interview questions. Though this provides valuable data and the ability to collect unique information, the reliability and validity of these measures is unknown which is a significant limitation. It is possible that validated measures that were more thorough could have provided results more consistent with the examined model and previous studies. Furthermore, the cross-sectional design of this study prevents the possibility of drawing causal conclusions, which again is a significant limitation. Future studies should examine these constructs with validated, in-depth measures and with a longitudinal design to strengthen our understanding of the cognitive theory of adaptation and how it relates to maternal adjustment in the NICU.

Implications

Despite the above limitations, the current study provides valuable insight and has important implications. To begin, findings from this study suggest that early intervention in the NICU is important, since depressive symptoms often peak upon arrival to the NICU. Though it can be difficult to involve parents in interventions during the early stages of a health crisis for their child (Stehl, Kazak, Alderfer, Rodrigues, Hwang, Pai, Boeving, &

Reilly, 2009), ways to overcome these barriers and provide necessary services to ensure positive short-term and long-term adjustment in the NICU and beyond are necessary.

Though feelings of control in relation to the future and meaning making were significantly correlated with depression, they did not contribute to variance in depression in the overall test of the model. Still, both of these variables should be further examined in future studies that address the limitations of the current study. Future studies are needed to better understand these constructs and their importance in the NICU to see if it would be helpful for interventions to incorporate helping a mother find meaning and addressing her future concerns.

Future studies should continue exploring variables that influence depression in mothers with an infant in the NICU, with a focus on the above suggestions as well as finding constructs that contribute to variance in depression. Again, the important focus of future research should be on designing interventions that can help to ameliorate depression and avoid the negative consequences for the mother and infant that are related to poor adjustment (Paulson, Dauber, Leiferman, 2006; Moehler, Brunner, Wiebel, Reck, & Resch, 2006; Singer, Salvator, & Guo, 1992; Cogill, Caplan, Alexandra, Robson, & Kumar, 1986). This study highlights the need to further explore and understand variables that impact depression in this population.

Though understanding and preventing depression is an important focus for interventions involving mothers in the NICU, an interesting finding within this sample of mothers was that most of the sample had low levels of depressive symptoms. It is therefore possible that few significant results were found because the model tested in the current study is designed to explain depression and this sample was not depressed. It seems that these

mothers are resilient and were generally adapting well to the life changing experience of having an infant in the NICU. Since it is possible that models focusing on depression may not be the best way to understand these mothers' experiences, future studies should examine other variables related to adjustment in this population that may better capture the adjustment process.

Conclusion

In conclusion, the purpose of this study was to examine the utility of the cognitive theory of adaptation in the NICU (Taylor, 1983). Meaning making, control, and self-enhancement were examined to understand their impact on depression in mothers with an infant hospitalized in the NICU. Results suggest that while meaning making and feelings related to control in the future are correlated with depression, they do not contribute to variance in depression scores when examined in conjunction with one another and significant covariates. The findings in this study further highlight the need to better understand the experience of a parent when their child is sick since it is different than personally experiencing an illness or life-threatening event. This study provides valuable insight into the variables that influence depression in these mothers and implications for future research in this population.

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