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Parental Stress and the Level III NICU Experience:
An Analysis of Gender and Coping Strategies

by

Amy Camodeca, B.S., M.A.

A Thesis
Submitted to the Faculty of Graduate Studies and Research
Through Psychology
In Partial Fulfillment of the Requirements for the
Degree of Master of Arts at the
University of Windsor

Windsor, Ontario, Canada
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ABSTRACT

This study applied the Transactional Model of Stress and Coping to parents of infants hospitalized in a Neonatal Intensive Care Unit (NICU). Gender differences in stress, coping, and outcome were expected. Eighteen mothers and 11 fathers between the ages of 20 and 45 completed questionnaires assessing daily hassles, NICU-related stress, controllability, coping, and psychological adjustment.

Gender differences in stress and coping were observed. Mothers perceived more stress related to the parental role than did fathers. Mothers used problem focused and emotion focused coping in tandem whereas fathers showed no relationship between coping methods. For mothers, increased use of problem focused coping was associated with increased hostility, and increased use of problem focused coping in the context of higher levels of controllability was associated with increased overall negative affect. These findings have implications for service development and provision in hospitals and well as in therapy settings.

DEDICATION

For Tulip, my quiescent company during multitudinous hours of lucubration.

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INTRODUCTION

Overview

The birth of an infant into the family is a eustressful event. However, approximately 15-20% of all pregnancies are high risk, defined as a medical problem on the part of the mother or the fetus during the gestation, delivery, or perinatal period that may adversely affect the outcome of the pregnancy (Levy-Schiff, Har-Even, Lerman, & Hod, 2002; Sadosky & Samueloff, 1991). Prematurity, low birth weight, and respiratory distress syndrome are just a few of the common medical problems typically experienced by medically fragile infants admitted to Neonatal Intensive Care Units (NICUs) (Levy-Schiff et al., 2002). When potentially life threatening medical complications are present on the part of the infant, the amount of distress the family is under increases (Buist, Morse, & Durkin, 2002). Through advances in medical technology, it has become possible to save some of even the tiniest babies and those with life-threatening problems (Ohio Right to Life, 2005; Kuster & Merkle, 2004). Thus, more parents are exposed to the NICU experience and the aftermath of medical problems.

While research attests to the stress involved in the NICU experience, little research has focused on how parents cope with these stressors (Doering, Dracup, & Moser, 1999). Another limitation of the available research on coping with the NICU experience is the almost exclusive focus on maternal coping (Doering et al., 1999). Because mothers and fathers have different gender roles and face different problems associated with the hospitalization of a child, there is a possibility that gender differences in coping mechanisms will be present (Matud, 2003). This dearth of research is

significant because the identification of effective coping strategies could aid in providing effective intervention services to both mothers and fathers with infants who must spend time in the NICU. These services could be beneficial in ameliorating the parental anxiety and depression that are so often seen in families of NICU infants (Dyregrov & Matthiesen, 1991).

The current study will utilize Lazarus' Transactional Model of Stress and Coping as a basis for assessment of parental stress and subsequent coping strategies utilized when the birth of an infant necessitates a NICU placement. The present study will also address gender differences in choice of coping skill by parents of NICU infants.

The Transactional Model of Stress and Coping

According to the Transactional Model of Stress and Coping, a stressor is defined as "demands made by the internal or external environment that upset balance, thus affecting physical and psychological well being and requiring action to restore balance" (Lazarus & Folkman, 1984, p. 125). This model posits that stressful experiences come about through transactions between the person and the environment. These transactions are mediated by two constructs: appraisal and coping. The goodness of fit between the appraisal of controllability of the stressor and the coping strategies utilized determines the impact of the stressor on the individual's psychological adjustment (Lazarus & Folkman, 1984) (refer to Figure 1 throughout).

The first transactional mediator, appraisal, has two components. Primary appraisal refers to the individual identifying the situation as relevant to their lives and as exceeding their current resources to deal with the problem (i.e., it is stressful). Secondary appraisal follows the identification of stressful event and refers to the assessment of the

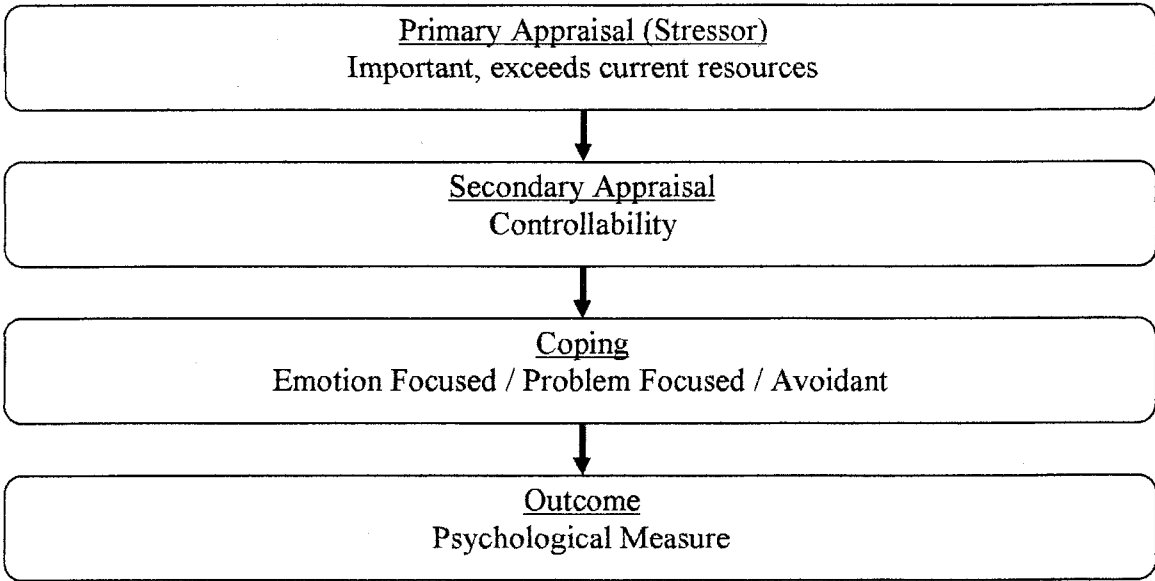


Figure 1. Pictorial Representation of Lazarus and Folkman’s Transactional Model of Stress and Coping.

controllability of the stressful situation (Hammermeister & Burton, 2001).

The second mediator of the transactions between the person and the environment is coping. Coping is conceptualized as “the constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141). Lazarus’ model identifies two different types of coping: problem focused and emotion focused. Problem focused coping refers to taking active steps to solve the problem or to change the situation that is causing the stressor. Information gathering or talking with someone who is causing the problem are examples of problem focused coping. Emotion focused coping refers to behaviors directed at managing the feelings associated with the stressor, and not the stressor itself. Social support is the most often utilized emotion focused coping mechanism (Lazarus & Folkman, 1984).

Parker and Endler (1996) expanded on Lazarus’ model to include avoidance as a specific coping mechanism with chronic illness (Parker & Endler, 1996). Avoidance as a coping mechanism refers to engaging in an activity for the purposes of getting away from the stressor, such as playing basketball. Attempting to deny the impact of a stressor would also be an avoidance coping mechanism (Parker & Endler, 1996; Lazarus & Folkman, 1984). For the purposes of this study, the combined model will be utilized, since avoidance is such a common response seen in coping with illness (Parker & Endler, 1996).

The choice of coping strategy depends on the perceived controllability of the stressor, as assessed in secondary appraisal. If the stressor is perceived as controllable, then the individual is likely to utilize a problem focused strategy, whereas if the stressor

is perceived as uncontrollable, the individual is likely to choose an emotion focused or avoidant strategy (Park, Armeli, & Tennen, 2004; Edwards & Holden, 2001). Coping is a construct distinct from outcome, which is a product of the coping related transactions with the environment (Kim & Duda, 2003). According to Lazarus' Transactional Model, the determinant of positive psychological outcome is the goodness of fit of the strategy utilized with the controllability of the stressor (Lazarus & Folkman, 1984). That is, when the problem is controllable, utilizing a problem focused strategy may be more beneficial. When a problem is uncontrollable, utilizing an emotion focused strategy may be most effective (Park, Armeli, & Tennen, 2004; Gray, 2003; Kim & Duda, 2003). The outcome of the transactions between the person and the environment can be operationally defined as any measure of psychological well being, such as depression, anxiety, obsessiveness, etc. In the current study, perceived controllability of the stressor will be assessed in addition to the coping strategy used (problem focused, emotion focused, or avoidant). In the present study it is presumed that the coping strategies utilized will be aimed at decreasing stress associated with the NICU experience.

The NICU Experience as a Stressor

With the birth of a high risk infant comes many stressors. Research has implicated the NICU environment itself as a stressor to parents (Cronin, Shapiro, Castro, & Cheang, 1995). Also often reported are feelings of loss associated with the birth of an "imperfect" infant, caring for siblings in the family and providing financially for both the family and the medical expenses incurred by the infant. In some cases, parents must also cope with infant death (Forinder, 2004; Cronin, et al., 1995). If the infant does survive, continued specialized medical treatment may be required. This specialized treatment may engender

in parents concern about their ability to care for the infant after discharge (McKim, 1993). Also, there is continual concern about the infant's future, which may include learning disabilities, chronic physical problems, or other significant limitations, such as brain damage or paralysis that may lead to lifetime impairment (Gray, 2003).

Since primary appraisal is such an important component of the transactional model of stress and coping, it is important to ascertain if any gender differences exist in terms of primary appraisal of the NICU experience (Lazarus & Folkman, 1984). Some research indicates that at least in response to the work environment, women experience more stressors than do men, and report more distress in reaction to these stressors as well (Krajewski & Goffin, 2005; Tamres, Janicki, & Helgeson, 2002; Narayanan, Menon, & Spector, 1999). Although the self-report nature of these studies may reflect gender role expectations as opposed to actual stress levels (Krajewski & Goffin, 2005), this finding that women report more distress than do men was reiterated in a meta-analysis of six studies that assessed couple's reactions to infertility (Jordan & Revenson, 1999). Again, however, this finding may be related to the idea that infertility is the problem of the female in the relationship. Furthermore, still another limitation of this research is that it focuses on stressors that occur before pregnancy and birth. However, it is likely that couples react differently to stressors that relate to their personal lives versus those at work; that is, it appears that couples cope singly with stressors related to the workplace, but cope as a couple with stressors that relate to their personal lives, which would likely include the entire process of having a child (Badr, 2004; vanEmmerick, 2002; Jordan & Revenson, 1999). Thus, it is likely that women are in fact experiencing more stress in the area of infertility, and that this is not a result of the couple viewing it as the female

partner's problem. Additionally, these findings are likely generalizable to the current study despite focusing on the pre-birth process.

Some research does exist that has specifically assessed parental stress, gender differences, and coping with child illness, allowing for preliminary conclusions to be made. One study utilized the Malaise Inventory, a 24-item checklist of psychosomatic symptoms, to assess gender differences in stress levels with parents of children with Down Syndrome (Sloper & Turner, 1993). This study indicated that having a child with Down Syndrome was more stressful for mothers than fathers (Sloper & Turner, 1993). However, other research indicates no gender differences related to stress. One such study was a qualitative, interview-based research project conducted with 30 parents of children who had epilepsy. This study indicated that parents commonly cited having negative emotions about how epilepsy was affecting their child and daily hassles associated with the disease as stressors (Haddad, 2003). However, this study indicated that no gender differences in stressors were evident (Haddad, 2003). Further, another interview-based research study indicated no gender differences in the stress appraisals or the levels of subjective grief associated with the birth of a high risk infant (McGrath & Chesler, 2004). It is a significant limitation that no quantitative data are available on how levels of stress compare between mothers and fathers (McGrath & Chesler, 2004). Furthermore, since couples were interviewed together in these studies, it is very possible that the mothers' stressors influenced what the fathers had to say about the experience in such a way as to mask gender differences.

However, one limitation to all the studies discussed above is that they were not conducted at the onset of the illness or time of birth. This is a significant oversight

because other studies related to the impact of childhood cancer diagnosis on mothers and siblings indicates that by one month after diagnosis, the impact of the stressor is lessened (Houtzager, Oort, Hoekstra-Weebers, Caron, & Grootenhuis, et al., 2004; Steele, Long, Reddy, Luhr, & Phipps, 2003).

It is possible to interpret available research evidence to indicate that mothers may experience more stress related to the hospitalization of an infant. Research consistently indicates that mothers are the parents most likely to be on sick leave to take care of the child and to spend more hours in the NICU with the infant, while the father often works and takes care of the remaining children (McGrath & Chesler, 2004). Thus, it is reasonable to conclude that, with regard to this time period in the couples' life, the mother may experience more stress related to the NICU experience (being in the NICU, being away from friends, being around other sick children) than will fathers. Since the current study is examining stressors associated with the NICU experience itself, it is expected that mothers will experience more stress related to the NICU experience than will fathers.

Controllability of the NICU Experience

Perceived controllability of the stressor is an important notion to be assessed in the present study, as it is theoretically the goodness of fit between the controllability of the stressor and the choice of coping strategy that is influential in outcome (Lazarus & Folkman, 1984). In a review of research related to coping, Forinder (1999) reported that the types of illnesses typically associated with babies in the NICU are often fraught with uncertainty, which would seem to indicate lack of controllability of the stressor. However, no research was cited to back up this statement. Thus, inferences must be made

based on research with populations with other chronic illnesses, but the results of the research in this area are equivocal.

There is some evidence that illness, whether acute or chronic, is perceived as uncontrollable (Endler, Kocovski, & Macrodimitris, 2001). A qualitative study of 9 families who had a child with asthma indicated that these families felt high levels of uncertainty, helplessness and guilt (Trollvisk & Severinsson, 2004). One study assessed parents' experiences after their child was diagnosed with acute myeloid leukemia, a unique group that is at an increased chance of experiencing child death. These individuals reported feeling an overwhelming sense of uncertainty surrounding the illness (McGrath, Paton, & Huff, 2004). This finding that illness is perceived as uncontrollable is consistent with the conclusion made in a review of the literature conducted by Williams & Koocher, (1998), who stated that loss of control is a common perception in life threatening illness. Based on this research, one might conclude that having an illness requiring hospitalization in the NICU would be associated with perceptions of loss of control. However, these studies did not compare individuals with non-life threatening illnesses to the participants in the study. It is possible that level of illness severity may be related to perceived control. Support for this hypothesis is consistent with a review of the research conducted by Kupst (1994) of parents of child cancer patients. Findings indicated that there were more negative psychological outcomes in terms of significant levels of depression and child behaviour problems with families of children who had aggressive treatments, treatments that lasted for several years, and children who relapsed during treatment (Kupst, 1994). Since more aggressive treatment is associated with more severe illness, it may be reasonable to state that more severe illness was associated with more

negative outcomes (Kupst, 1994). Of course, this study did not take into consideration the notion of match between controllability of the stressor and coping in terms of outcome, and thus does not perfectly generalize to the current study. However, this review does provide support for the idea that less severe illnesses may have different impact on parents than more severe illnesses (Kupst, 1994). This distinction is an important as infants are not always placed in the NICU for life-threatening illnesses, and thus some of the infants will have more severe illnesses than others.

Support for the idea that severity of illness is directly related to perceived controllability of the illness has been found in research with adults with chronic illness. There is some evidence that the perceived controllability of the illness is in fact related to the severity of the illness. An early study of adults with chronic illnesses indicated that more severe illness symptoms were associated with decreased health-related locus of control (Magy & Wolfe, 1983). One limitation of this study is that the measure of health-related locus of control actually assessed internal versus external locus of control. Internal and external locus of control is more related to personality traits and may or may not represent the perceived controllability of the illness experience. In addition, it may be that those individuals with less perceived control over their illness may have been likely to induce worse symptoms by not following treatment protocols (Magy & Wolfe, 1983). A more recent study of 274 adults with acute and chronic illnesses revealed a negative correlation between the severity of illness and the perceived control specifically surrounding the illness (Endler, et al., 2001). This study utilized a situation specific measure; however, the likelihood that the individuals in this study may have been acting in ways to promote illness symptoms is still present; that is, those with less perceived

control may have acted in ways to produce worsening symptomatology. However, qualitative study conducted in Sweden of parents of 20 children with leukemia who underwent bone marrow transplantation indicated that problem focused coping was better than emotion focused coping in producing a favorable psychological outcome on the part of the parents (Forinder, 2004). Prima facie, this research seems to indicate that this severe illness was in fact perceived as controllable, at least in the context of Lazarus and Folkman's theory (Lazarus & Folkman, 1984). However, a serious limitation of this study was that it was conducted 4 years after the child received the transplant, and only parents of children with successful transplants were included in the study. It is very possible that verbal hindsight bias (the "knew it all along phenomenon", see Harley, Carlson, & Loftus, 2004; Sanna, Schwarz, & Small, 2002; Wood, 1978; Fischhoff, 1975) may have played a role in the perception of the effectiveness of problem focused coping as a coping mechanism for the child's illness, circumventing the ability to make an accurate recollection (Forinder, 2004). Furthermore, even if their retrospection is accurate, it is possible that these results might not generalize to the current study, as children with cancer are often treated on a semi-inpatient basis and parents are often responsible for a great deal of care for their child; thus problem focused coping strategies related to being involved with the child's care may have in actuality been present (Forinder, 2002). This may not be true for the parents of the current study, because NICU infants are under the care of doctors and nurses.

Based on the current literature it is difficult to determine whether or not parents of NICU infants will perceive the situation as controllable. The current study will address this void in the literature and determine how controllable parents of NICU infants

perceive their situation. It is likely that at least some perception of uncontrollability will be present in parents of NICU infants; however, it seems that in those with less medical risk, this perception of control will be increased. The current study will by design and participant selection eliminate the possibility that perceived controllability of the infant's illness will influence symptomatology due to the fact that treatment protocol will be executed by someone other than the person who has the illness.

Coping

According to Lazarus, after the controllability of a situation is assessed, the stressed individual selects a coping strategy appropriate to the situation. Thus, an uncontrollable situation would be associated with an emotion focused coping strategy, and a controllable situation would be associated with the choice of a problem focused strategy (DeCoster & Cummings, 2004; Lazarus & Folkman, 1984). Based on the research indicating that the NICU hospitalization is likely to be perceived as uncontrollable, perhaps the use of emotion focused coping strategies will predominate the parents' coping repertoire.

Unfortunately, little information on how families specifically cope with chronic problems on the part of the child is available. A qualitative study of families of children with Asperger's Disorder or High Functioning Autism indicated that parents utilized denial (an avoidant coping strategy) and normalization (an emotion focused coping strategy) to effectively cope with their child's illness (Forinder, 1999). However, these families also utilized participation, and believed that putting reason before emotion was a good coping strategy, both of which are problem focused coping strategies (Forinder, 1999). However, a limitation of this study in terms of Lazarus' Transactional Model is

that the controllability of the situation was not assessed. In addition this study may not be generalizable to parents of infants in the NICU due to the fact that in this study, the children had socio-emotional, not medical problems. Furthermore, the children were school age or older, which may affect choice of coping strategies.

Scant research exists on how families cope with having an infant with specifically medical problems. One qualitative study of parents of children with various chronic medical problems indicated that families utilized social support in coping with their child's illness (Montagnin & Mauricio, 2004). Additionally, a study of parents of 115 children with chronic physical illness indicated that receiving social support from nurses was an effective coping strategy during their child's hospitalization (Burke, Harrison, Kaufman, & Wong, 2001). However, the above findings are limited to mothers; despite the assertion that "families" participated, the overwhelming majority of participants were mothers (Montagnin & Mauricio, 2004; Burke, Harrison, Kaufman, & Wong, 2001). This limitation is important due to potential gender differences in choice of coping strategies, discussed below.

Summary: Lazarus and Folkman's Transactional Model of Coping as Applied to the NICU Experience

The components of Lazarus and Folkman's Transactional Model are primary appraisal of the stressfulness and controllability of the situation, and secondary appraisal, an evaluation of the coping strategies available to deal with the stressor (Lazarus & Folkman, 1984). In terms of primary appraisal of stressfulness, research consistently shows that the NICU experience is highly stressful for families (Rollings, 2006; Fowlie & McHaffie, 2006; Cronin et al., 1995). The limited research available on the NICU

experience indicates that mothers may be likely to experience more stress than fathers because they spend more time in the NICU than do fathers (McGrath & Chestler, 2004). Research is less clear on the perceived controllability of the NICU experience, the second part of primary appraisal. It is likely that the more severe the infant illness is, the less perceived control will be reported by either parent (Endler, et al., 2001). Secondary appraisal and the choice of coping strategies may be influenced by parent gender. Research indicates that in general, women are more likely to utilize social support when faced with a stressor, and men are more likely to engage in problem solving behaviors (Krajewski & Goffin, 2005). One limitation of the above studies on coping behavior, however, is that avoidant coping strategies have yet to be as extensively compared across genders as have emotion and problem focused strategies (Parker & Endler, 1996). However, the use of avoidant coping strategies across genders has been discussed in more depth in relation to grief situations as discussed below (McGrath & Chesler, 2004).

Gender and Coping

Most research indicates that men and women typically engage in different coping strategies. A recent study utilized the Cybernetic Coping Scale (Edwards & Baglioni, 1993) to assess the use of coping strategies in interpersonal work overloads (having to engage in a group effort to solve a problem). This scale is a 40-item questionnaire assessing five types of coping strategies: Changing the Situation (e.g., problem solving), Accommodation (e.g., decrease expectations), Devaluation (e.g., tell oneself the problem is unimportant), Avoidance (e.g., using distraction or other activities to avoid thinking about the problem), and Symptom Reduction (e.g., talking to others about the problem) (Krajewski & Goffin, 2005). It was found that although men and women did not

significantly differ on the Changing the Situation subscale, which seems to indicate that the male and female participants utilized similar amounts of problem focused coping, women were significantly more likely than men to utilize greater emotional expressive coping as evidenced by higher scores on the Symptom Reduction subscale of the Cybernetic Coping Scale (Krajewski & Goffin, 2005). The above study supports the findings of a 2004 qualitative study of 34 adults with type-2 diabetes. Results of interviews indicated that males were more likely to utilize problem focused strategies such as seeking education and self discipline in controlling dietary intake and exercising. Women were more likely to utilize avoidant or emotion focused strategies such as preoccupying the mind and prayer (Decoster & Cummings, 2004). Similarly, a recent review of the literature related to partner loss showed support for the idea that women are more aware of and discuss emotions more than men (Stroebe, Stroebe, & Schut, 2001). Finally, a recent study of 403 female and 664 male academic staff indicated that women benefit more than do men from social support and mentoring from supervisors and their colleagues, as assessed by reports of job satisfaction and burnout (vanEmmerik, 2002). Based on the research mentioned above, it may be that the reason women benefit more than men is because social support complements their preferred coping strategy.

However, some research indicates that men and women utilize similar coping strategies. In a recent study of 88 women and 66 men who had obstructive pulmonary disease, no gender differences were found in overall coping skill use or on eight different types of coping strategies assessed by the Revised Jalowiec Coping Scale (Frey, 2000). This measure is a 60-item questionnaire that asks participants to indicate the frequency of particular strategies, and scores yield a quantification of the individual's coping style on 8

dimensions: confrontive, evasive, optimistic, fatalistic, emotive, palliative, supportant, and self-reliant (Jalowiec, 1987, as cited in Frey, 2000). However, there may be selection bias at play in this study, as all of the participants were selected from people who were in support groups for obstructive pulmonary disease, and thus may have recruited males who were more likely to be seeking social support as a coping mechanism (Frey, 2000). Furthermore, since the revised scale (yielding the above listed coping scores) as opposed to the original scale (yielding a problem focused and emotion focused score) was utilized in this study, conclusions about problem focused and emotion focused coping with regard to gender can only be made with re-classification of the dimensions into problem and emotion focused dichotomies, which was not performed in this study (Frey, 2000; Kinash, Fischer, Lukie, & Carr, 1993).

In addition, in a recent study of gender and coping with occupation stress, results indicated that men and women utilized similar coping strategies, classified as either problem focused or emotion focused (Torkelson & Muhonen, 2004). Interestingly, however, this pattern only held true when the occupational level was taken into account. That is, men and women were equally likely to utilize problem focused strategies at the managerial level. However, at the non managerial level, men tended to utilize more planning, a problem focused strategy, and alcohol use, an emotional coping strategy that is avoidant. In contrast, the women utilized seeking social support and focusing on their emotions (Torkelson & Muhonen, 2004). This finding is in line with the research related to controllability of the stressor and use of coping strategies; both women and men at the managerial level probably had more control over the problem than did non managers. However, the discrepancy between the genders at the non managerial level seems to

indicate the influence of gender roles on choice of coping strategies (Torkelson & Muhonen, 2004). Also, the difference in the use of coping strategies may be due to gender role rather than gender, as to succeed in the workplace, females need to exhibit more masculine traits such as resilience, independence, and assertiveness (Gianakos, 2002).

The idea that coping strategies are related to gender role is supported in a 2000 study of 94 primiparous Israeli women (Dimitrovsky, Levy-Shiff, & Perl, 2000). This study indicated that women who were categorized as feminine or androgynous on the Bem Sex Role Inventory utilized more support seeking strategies than did women who were categorized as masculine (Dimitrovsky et al., 2000). Feminine women also utilized less problem focused coping than did cross gender typed women, as assessed by the Ways of Coping Checklist, and feminine women also utilized more emotion focused coping strategies than did cross gender typed women (Dimitrovsky et al., 2000). Thus, there does seem to be an influence of gender, and perhaps gender roles on use of specific coping strategies, which may translate into different choices of coping strategies for parents while their child is in the NICU.

In the current study, it is expected that gender and gender role will be relatively synonymous, with males and females assuming more traditional roles. In recent studies of families with infants and young children with acute and chronic illnesses, it has been consistently found that mothers are the ones most likely to be on sick leave to take care of the child, to spend more hours in the NICU with the infant, and to choose to not return to work following a diagnosis in their child (McGrath & Chesler, 2004). Thus, it is reasonable to expect that in cases of NICU infants, there will be gender differences in

terms of coping mechanisms used, and that women will be more likely to utilize emotion focused coping strategies than will men, who will be more likely to utilize problem focused strategies.

Coping Strategies and the NICU Experience by Gender

Because of the limited information available on coping with an infant in the NICU, many of the conclusions underlying the hypotheses in the current study are based on coping with infant death and with child illness. However, it is likely that these coping strategies would be similar in cases of a high risk birth. In a qualitative study of fathers whose young children had recently been diagnosed with acute lymphoblastic leukemia (ALL), it was revealed that many of these experiences were very similar to those experienced in the actual death of the child, such as experiencing shock and anger (McGrath & Chesler, 2004). In addition, the experience of having an infant born with medical problems is accompanied by feelings of loss—the parents grieve the loss of the perfect infant. (McGrath & Chesler, 2004; Wing, Clance, Burge-Callaway, & Armistead, 2001).

Emotion Focused Coping. The majority of research comparing males and females in cases of infant death assesses emotion focused versus problem focused coping. In general, males are more likely to turn only to their spouse for support, whereas females are more likely to have other friends with whom to share information (Volers, 1999). A recent qualitative review of the research related to infant bereavement indicates that women are more prone to engaging in coping strategies that fall under the category of seeking social support, such as talking to others about their feelings and expressing their sadness (Wing et al., 2001). In addition, it seems as though fathers are also more likely to

engage in social withdrawal than are women, as they tend to avoid social interaction and choose to deal with their feelings alone (Wing et al., 2001). This finding is supported by another qualitative study of fathers who had experienced the death of their child from cancer. These fathers specifically indicated that while they experienced feelings that were similar to those that mothers experience, such as shock, anger, and sadness, they found it hard to share their feelings with people (McGrath & Chesler, 2004).

Based on this limited research, it appears that females will be more likely to engage in the emotion focused strategy of social support than will males. The current study will assess this finding in terms of the experience of having an infant in the NICU.

While there is a plethora of research on the use/nonuse of emotion focused coping, the use of avoidance and problem focused coping has been extremely limited. The support for the hypotheses with regard to these constructs is based on literature reviews and qualitative evidence.

Avoidance. Fathers seem to engage in more avoidance coping than do mothers when dealing with children with medical problems. A review of the research related to infant bereavement indicated that fathers tend to engage in strategies such as focusing on practical matters relating to the family, and engaging in work and recreational activities. (Wing et al., 2001; Endler & Parker, 1996). Denial, another form of avoidant coping, seems to be more common in fathers than mothers as well (Wing et al., 2001; Endler & Parker, 1996; Lazarus & Folkman, 1984). However, this may reflect attempts to be supportive of their spouses, a hypothesis that finds support in a study of 171 Taiwanese couples of children with cancer. Results of this study indicated significant differences between mothers and fathers in coping strategies, with fathers coping with the illness by

providing emotional stability for their spouses and support for themselves (i.e., relying on themselves for support) (Yeh, 2004). Putting the above research together, it is possible either that fathers look like they are avoidantly coping because of their stoicism, but that providing support for their wives is actually a way of making themselves feel better about the situation, or they are in fact engaging in avoidance coping by providing support for their wives at the expense of dealing with their own stressors. This argument finds support in a qualitative study of 22 fathers of children with Juvenile Rheumatoid Arthritis, which indicated that father's attempts to be strong for their wives and children resulted in being overly self-reliant in coping with the child's illness (McNeill, 2004).

One study inadvertently addressed the use of avoidance as a specific coping strategy with regard to having an infant in the NICU. This qualitative study assessed post-traumatic stress disordered symptoms in a convenience sample of 30 mothers of high risk premature infants (Holdtich-Davis, Bartlett, Blickman, & Miles, 2003). The results of this study indicated that almost all of the mothers engaged in some avoidance; however, this avoidance was related more to the NICU experience itself and referred to trying to avoid thinking about the hospitalization and trying to focus on the here and now (Holdtich-Davis, et al., 2003). However, no information about gender differences is available based on this study, as only mothers were assessed.

Problem Focused Coping. Even less research has been conducted on the use of problem focused coping by parents of NICU infants. One qualitative study briefly mentioned that immediately after the diagnosis of a child with cancer, the family engaged in problem focused coping (McGrath & Chesler, 2004). However, no gender comparisons were made in this study. In addition, this problem focused coping was directed

specifically at choosing a treatment option for their child, and thus may not be representative of the entire experience of having a child with cancer, which is more in line with the focus of the current study (i.e., on the entire experience of having a child in the NICU) (McGrath & Chesler, 2004).

Another study of 19 mothers and 3 fathers of children who were hospitalized for an acute illness in the Pediatric Intensive Care Unit indicated that performing more child care activities was associated with increased levels of problem focused coping, as measured by the Revised Ways of Coping Checklist (RWCCCL) (LaMontague, Hepworth, Johnson, & Deshpande, 1994). Given the research indicating that parents typically fall into traditional gender roles, and that the mother's gender role typically involves increased child care activities, it could be argued that mothers would engage in more problem focused coping (Dimitrovsky et al., 2000). However, the findings of LaMontague et al., (1994) may in fact not be generalizable to the current study. The problem focused coping assessed in this study may have been related to general child care and may not have been specific to the child's hospitalization. Furthermore, even if parents answered the questionnaire with regard to the care and problem focused coping they provided related to the child's hospitalization, their use of problem focused coping may be overestimated. That is, parents were assessed within 24 hours of their child's admission, and the report of problem focused coping likely reflected the period when the child became acutely ill and needed to be brought to the hospital, which would be facilitated by the parent (LaMontague et al., 1994). The parents in the current study did not have had the opportunity to establish several years of child care responsibilities. Furthermore, the infants in this study were in the NICU from birth, turning the burden of

diagnosis and hospitalization on the hospital staff, not the parents, which could translate into less problem focused coping for the parents in this study.

Summary: Gender and Emotion Focused, Problem Focused, and Avoidant Coping as it Relates to the NICU Experience.

Research relating to gender differences in coping with the NICU experience is scant, and the quantitative research that has been conducted existence focuses exclusively on mothers (Holditch-Davis, Bartlett, Blickman, & Miles, 2003). Inferences about coping must be made based on related stressors, such as infant death and dealing with child medical problems (Wing et al., 2001). Research indicates that mothers are more likely than fathers to utilize emotion focused coping strategies, whereas fathers are likely to engage in problem solving and avoidance behaviors (McGrath & Chestler, 2004; Wing et al., 2001).

Limited research indicates that fathers may be more likely than mothers to engage in avoidance coping strategies such as hyperactivity and denial. However, this research is so scant that these conclusions are tentative at best. The current study will investigate gender differences, if any, in the use of avoidance coping strategies. While research is scant about avoidant coping strategies, even less research attests to the use of problem focused strategies. The current study will examine the use of problem focused coping strategies with regard to the NICU experience and will examine potential gender differences as well.

Psychological Outcomes

According to Lazarus' Transactional Model, it is the goodness of fit between the coping strategy and the controllability of the event that determines positive psychological

outcome (DeCoster & Cummings, 2004). Research attests that many parents of NICU infants experience significant negative psychological outcomes associated with the NICU experience; thus, according to the theory, these individuals are utilizing less than optimal coping strategies.

In a qualitative study of 42 mothers with infants in the NICU, it was revealed that mothers of high risk infants experience heightened worry about the child's potential handicaps, fear the death of their child, and have self-classified disturbing memories of the NICU ward (Von Gantard, Schwarte, Kribs, & Roth, 1999). An interview study of 30 mothers with high risk infants revealed that all mothers had at least one symptom of Post Traumatic Stress Disorder. The most often reported symptoms were increased arousal, re-experiencing, and avoidance (Holditch-Davis, Bartlett, Blickman, & Miles, 2003).

Quantitative research has also supported this notion that the NICU experience has a detrimental impact on mothers' psychological adjustment. The results of a previous study of 67 mothers of medically fragile infants, indicated that at the time of discharge of their infant, 45% of mothers had an increased risk of depression as evidenced by a score of 16 or above on the Center for Epidemiologic Studies Depression Scale (Miles, Holditch-Davis, Burchinal, & Nelson, 1999). The depressive symptoms may actually be even more widespread than this study suggests. Data were collected at discharge, when the mothers may have felt less depressed about their infant's illness as they were going home. A study of 153 mothers of NICU infants and full-term infants indicated that mothers of low birth weight infants were more likely to report depressive symptoms as assessed by the Zung's Self Rating Depression Scale while the child was in the NICU (Nagata, Nagai, Sobajima,

Ando, & Honjo, 2004). Thus, it appears that mothers experience negative psychological outcomes, specifically anxiety and depression, associated with the NICU experience.

One limitation of these studies, however, is that fathers' experience of stress is largely ignored. A study specifically addressing first time fathers' adjustment to childbirth indicated that the majority (88%) of fathers did not experience clinically significant levels of psychological distress, as evidenced by scores on the Beck Depression Inventory-Short Form, the Spielberger State Anxiety Scale, and the Spielberger State Anger Scale (Buist, Morse, & Durkin, 2002). However, a limitation of this study was that no information was available on the health of their infant; thus, it is likely that these fathers are not representative of the sample to be utilized in the present study.

One study has specifically addressed paternal outcome in cases of high risk infants. A study conducted by Doering, Dracup, & Moser, (1999) examined the psychological outcome of both fathers and mothers who had high risk infants in the NICU. The results of this study indicated that, as assessed by the Multiple Affect Adjective Checklist, both spouses experienced levels of anxiety, hostility, and depression that were higher than the general population as evidenced by a normative data comparison. In addition, when the spouses were compared, mothers were significantly more anxious, hostile, and depressed than were fathers. Fathers reported significantly better adjustment to their infant's illness, as assessed by the Psychosocial Adjustment to Illness Scale (Doering et al., 1999). However, this study is not very recent, and no available research has built on these findings. Also, this study did not assess coping strategies associated with the illness, and whether they were optimal or not.

One study did specifically assess the relationship between planning (a problem focused coping strategy) and psychological outcome in 207 mothers of children who underwent a bone marrow transplant. This problem focused coping strategy was actually associated with more depression over the course of the study (3 months) (Manne, Duhamel, Ostroff, Parsons, & Martini, et al., 2003). Along with the research indicating that often severe child illness is perceived as uncontrollable, this study adds more weight to the argument that it is the match between the coping strategy and controllability of the stressor that is associated with better psychological outcome (Manne et al., 2003).

Summary: Outcomes of NICU Hospitalization

In sum, research consistently indicates that the NICU experience is associated with negative psychological outcomes for both mothers and fathers. However, the burgeoning research in this area focuses mainly on maternal outcome. Inferences based on limited research indicate that fathers are likely to report better psychological outcome than are mothers.

Goodness of Fit, Gender, and Coping with the NICU Experience

The current study recognizes that both mothers and fathers experience significant distress when faced with the birth of an infant that must be placed in the NICU. Fathers may experience less negative psychological impact than mothers, due to the goodness of fit between their appraisal of the controllability of the experience and their choice of coping skill. However, no gender differences have been indicated in perceptions of controllability of the NICU experience, and fathers have been reported as engaging in more “mismatched” coping mechanisms as defined by Lazarus (1984), like problem solving (DeCoster & Cummings, 2004; Lazarus & Folkman, 1984). Thus, one would

expect that fathers would experience *more* detrimental impact than would mothers. However, fathers also engage in avoidance; perhaps the avoidance coping strategy used by fathers in cases of infant illness is beneficial. In combining the above research, however, the conclusion is that avoidance is more beneficial (would be associated with better outcome) than is emotion focused coping. However, an alternative explanation has to do with the self-report nature of the surveys—perhaps fathers deemed it less socially acceptable to report negative psychological symptoms. Still another explanation is that fathers and mothers experience different problems during the NICU experience, since the mothers are the ones who typically spend the most time with the infant (McGrath & Chesler, 2004). Obviously, this discrepancy in the literature requires further study. The current study attempted to describe the coping strategies utilized by the parents of NICU infants in terms of Lazarus' goodness-of-fit model and examined depressive, anxious, and hostile feelings in both mothers and fathers in relation to their NICU experience. The current study assessed these three outcomes for two reasons. Firstly, past research has consistently indicated heightened levels of depression, and anxiety in parent outcome of NICU hospitalization (Nagata et al., 2004; McGrath & Chesler, 2004; Buist et al., 2002, Miles et al., 1999). However, quantitative research has yet to assess hostile feelings to the extent that depression and anxiety have been researched (McGrath & Chesler, 2004). Secondly, it is important to include a measure of hostility to reduce the likelihood of gender bias in assessment (Bradley, Zittel, & Western, 2005; Stewart & Harmon, 2004). This study contextualized the findings in coping theory to provide a starting point for future research.

Limitations of the Current Literature

There are two significant limitations of the current literature relating to coping with the NICU experience. The first limitation that is evident from the above studies is that very little information on the specific coping strategies of parents of NICU infants is available (Doering, et al., 1999). The second limitation is that while extensive research is available relating to maternal outcomes, the impact of the NICU experience on fathers has been almost completely ignored (Doering, et al., 1999; Holditch-Davis, et al., 2003). The current study will attempt to address these limitations.

Purpose of the Current Study

The current study had two purposes. The first was to address the significant void in the literature relating to the use of coping mechanisms by parents who have an infant in the NICU. This study was partly descriptive in nature, in that it sought to determine what coping skills are utilized. However, this study is grounded in the transactional model of stress and coping, and thus there was the expectation that a match between the controllability of the stressor and the choice of coping skill utilized will be associated with better outcome (Lazarus & Folkman, 1984).

Secondly, there was the possibility that gender differences would emerge in the choice of coping mechanism utilized. The research on coping mechanisms utilized by parents of NICU infants is extremely scant; what little research that does exist focuses mainly on maternal coping and outcome (Doering et al., 1999). However, based on the research related to infant death and gender role expectations, it was anticipated that gender differences would emerge in coping strategy choices as well. The current study addressed this possibility in relation to outcome as well.

Hypotheses

Hypothesis 1: Primary Appraisal.

1a. It was anticipated that parents would perceive the hospitalization of their infant in the NICU as stressful.

1b. It was anticipated that mothers would experience more stress related to the NICU experience than would fathers.

1c. It was anticipated that fathers would experience more stress related to daily living than would mothers.

Hypothesis 2: Controllability. It was anticipated that the more severe the infant's illness was (as defined by risk levels) the less perceived control would be associated with the illness. No gender differences were expected in this hypothesis.

Hypothesis 3: Coping Strategies. It was anticipated that gender differences would exist in the choice of coping mechanisms utilized by parents immediately following hospitalization of their infant.

3a: It was expected that mothers would utilize more emotion focused strategies than would fathers.

3b: It was expected that fathers would utilize more problem solving strategies than would mothers.

3c: It was expected that fathers would utilize more avoidant coping strategies than would mothers.

Hypothesis 4: Goodness of Fit. A goodness of fit between the secondary appraisal and the type of strategy utilized would be predictive of psychological symptom outcome.

4a: Poor fit would be associated with increased depressive symptoms.

4b: Poor fit would be associated with increased anxiety symptoms.

4c: Poor fit would be associated with increased hostility symptoms.

METHOD

The current study presents findings of a research project from data collected beginning February 2006 and ending in July 2006. Data were collected at the Level III NICU at Windsor Regional Hospital. This unit is located in a small southern Ontario city and serves infants from many parts of the Ontario Province. This unit was built in a “pod” (three-walled room) format. In each of the 5 pods there was space for 5 incubators or cribs. Each incubator space had floor to ceiling privacy curtains. Additionally, babies’ incubators or cribs were spread out over all of the pods before increasing pod occupancy, such that usually only 2-3 incubators were present in one pod at a time. The unit had 2 “care by parent rooms” across the hall from the pods, in which parents could reside if they were from out of town or if their babies were stable enough to be moved out of the pod and live in the parents’ room before going home. Each care by parent room had a fold out couch so that both parents had a comfortable place to stay. Each baby was assigned a nurse upon admission, although nursing assignments could change depending on who was on duty during which shifts. Also, babies were moved from one pod to another at times as well, and might change nurses as a result. A further note about this NICU is that while the outer part of the unit was painted in pale yellow and orange with harsh lighting, the pods were painted white and light purple, with blue-green counters and made use of fewer overhead fluorescent lights. These colours coupled with the difference in lighting made the unit look less austere and also more assuasive.

Participants

Overall Sample Characteristics: Parents. A total of 29 parents participated in this study. Nine heterosexual couples (62.1%) participated as a couple, and the remaining 11

(37.9%) participated individually (9 mothers, 2 fathers). Thus, the sample was primarily comprised of mothers (62.0%). Participants ranged in age from 20-45 (Mothers: $M=32.39$; $SD = 5.32$; Fathers: $M=34.82$; $SD=6.48$). The sample was primarily Caucasian (89.67%), had a college education or better (75.9%), and were upper middle class or higher in socioeconomic (SES) background, as assessed by Hollingshead's Four-Factor Index of Social Status (82.7%) (Hollingshead, 1975, as cited in Yoo, Galabova, Edwin, & Thuluvath, 2002). Further demographic information for parents is summarized in Table 1.

Overall Sample Characteristics: Infants. Results for the sample of infants were computed separately for each gender. There were 20 unique pregnancies included in the study, including 2 sets of twins and 2 sets of triplets. Two of the mother respondents in this study had twins, and two had triplets. None of the father respondents had twins, but two had triplets. Mean infant age at time of participation in this study was 15.17 days for mothers and 13.00 days for fathers (see Table 2). For both mothers and fathers, the most frequently cited reason for NICU hospitalization was Prematurity (72.4% for mothers, 63.7% for fathers), followed by lung problems (11.2% for mothers, 27.3% for fathers). Other problems cited by 1 of the participants in each gender group, corresponding to 5.6% for mothers and 9.1% for fathers were jaundice, meconium aspiration, and brain hemorrhage. Mothers also included cleft palate (5.6%) and inherited heart problem (5.6%) as reasons for hospitalization. For matched couple pairs, the correspondence rate for the infant's reason for hospitalization was 100%. Fathers and mothers both spent over 70 hours per week in the NICU ($M=74.65$, $SD=55.03$ for mothers; $M=71.10$, $SD=58.81$ for fathers). In terms of infant risk status, the majority (66.7% for mothers and 63.6% for fathers) of infants were high risk, and 33.3% (mothers) and 36.4% (fathers) of infants

Table 1

General Demographic Information for All Parents, Separated by Gender

Characteristic	Mothers (n = 18)		Fathers (n = 11)	
	%	Mean (SD)	%	Mean (SD)
Age		32.39 (5.32)		34.82 (6.48)
Marital Status				
Married	88.9		100.00	
Cohabitation	5.6		0.00	
Ethnicity				
Caucasian	88.9		72.7	
Other	11.2		11.1	
Highest education level obtained				
High school	11.1		9.1	
Some college/University	11.1		18.2	
College/University graduate	50.0		36.4	
Graduate school or professional training	11.1		9.1	
Hollingshead SES		51.20 (9.35)		42.50 (10.73)
Length of relationship in years		6.19 (3.37)		6.91 (2.98)
Number of additional children at home		.88 (.99)		.91 (.94)

Table 2

Demographic Information for All Parents, Separated by Gender, Regarding Infants in the Neonatal Intensive Care Unit

Characteristic	Mothers (n = 18)		Fathers (n = 11)	
	%	Mean (SD)	%	Mean (SD)
Age of infant (days)		18.58 (17.38) ^d 15.17 (11.54) ^e 13.94 (10.62) ^f		16.27 (20.44) ^d 13.00 (12.50) ^e 10.70 (10.43) ^f
Type of birth				
Singleton	77.80		81.8	
Twins	11.10		0.0	
Triplets	11.10		18.2	
Weight of infants (g) ^a		2144.42 (955.34)		2242.35 (957.17)
Weeks gestation		32.58 (3.89)		33.59 (3.77)
Reason for NICU hospitalization ^b				
Prematurity	72.40		63.70	
Lung problems	11.20		27.30	
Cleft palate	5.60		0.00	
Jaundice	5.60		9.10	
Meconium aspiration	5.60		9.10	
Brain haemorrhage	5.60		9.10	
Inherited heart Problem	5.60		0.00	
Hours per week spent in NICU		74.65 (55.03)		71.1 (58.81)
Risk Classification ^c				
High risk	66.70		63.60	
Low risk	33.30		36.40	

(continued on next page)

(Table 2 *continued*)

^aFor multiple births, the average weight of all infants was taken and included for computation of the average of the sample. ^bPercentages are greater than 100 because infants had duplicate problems by parental report. ^c See results section for calculation of this variable. ^d Includes outlier. ^e With outlier windsorized (presented in text). ^f With outlier deleted.

were low risk. This classification is based on birth weight and gestational age and is discussed in further detail in the results section.

Response Rate. Participants were recruited from a sample of all current and new infant admits through invitation of the Clinical Practice Coordinator of the NICU. If at least one of the parents consented to be approached by the researcher, the researcher met with the participant(s), informed them about the study, and gave them information packets to complete. Due to the recruitment process, it is unknown as to how many participants were approached about participation and declined to participate. However, 36 couples consented to be approached for participation. Of those 36 couples, only 2 mothers indicated they would participate singly, for a total of 36 packets distributed to mothers and 34 distributed to fathers. It is known that 1 of these mothers who participated singly indicated that her husband would not fill it out and requested only a packet for herself. For mothers, the response rate was 50%. It is known that 1 mother dropped out of the study due to high stress levels. For fathers, the response rate was 32.4%.

Measures

Demographics. A demographics sheet created by the researcher will assess variables of interest including age, gender, and family structure. Also assessed with this questionnaire was hours worked outside the home, current employment status, and number of hours per week spent with the child in the NICU. This questionnaire was also utilized to assess risk level of the infant, akin to severity of illness. Medically high risk is defined as weight of less than 2500 grams at birth and being less than 37 weeks gestation (Doering et al., 1999). A question pertaining to infant birth weight and gestational age was included on the demographics sheet in order to compute an index of high risk birth

(see Appendix B). SES was computed based on Hollingshead's Four-Factor Index of Socioeconomic Status (Hollingshead, 1975, as cited in Yoo et al., 2002). Questions pertaining to current occupation and educational level were included on the demographics sheet in order to enable computation of this SES variable. Responses on each of these variables were converted to a Hollingshead Education score and Hollingshead Occupation score (both of which range from 1-8). These scores were then computed to create the Hollingshead SES Index, which has a range of 8-66; higher scores correspond to higher SES. Although this index can also be subdivided into five levels, the continuous form of this variable was used in the current study as the continuous form was what was appropriate for the data analyses.

Stress. Two measures of stress were utilized in this study.

Depression, Anxiety, and Stress Scales. The Depression, Anxiety, and Stress Scales (DASS) is a 42-item self-report questionnaire that asks participants to indicate how much each given symptom applied to them in the last week, from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time) (Lovibond & Lovibond, 1995). This measure has three subscales which were created based on the results of a principal components analysis with a Varimax rotation. A factor loading of .30 was utilized as the criterion for inclusion on the factor (Antony, Bieling, Cox, Enna, & Swinson, 1998; Brown, Chorpita, Kortitsch, & Barlow, 1997). The resultant factors are: Depression, Anxiety, and Stress. The score for each subscale is calculated by adding the numerical value of the responses for each item on the subscale, with higher values indicating worse psychological symptoms (Lovibond & Lovibond, 1995). As the purpose of this questionnaire was to assess potential stress that is not associated with the NICU

environment, and because psychological outcome is already being assessed by a more comprehensive instrument in this study, only the Stress scale of this measure was utilized in this study.

The DASS has been shown to have high internal consistency reliability. In a study of 437 adult subjects with varying psychiatric diagnoses, the internal consistency reliabilities were .96 for depression, .89 for anxiety, and .93 for stress (Brown, et al., 1997). Similarly high reliabilities of .97 (depression), .92 (anxiety), and .95 (depression) were found in a combined sample of psychiatric outpatients and community volunteers (Antony, et al., 1998). High test retest reliability was obtained in a study with a subset of a larger clinical sample, with α values for the 3 subscales ranging from .71-.81 with a two week retesting period (Brown et al., 1997).

The DASS has demonstrated effective criterion related validity in known groups comparisons, distinguishing between persons with panic disorder with agoraphobia, generalized anxiety disorder, social phobia, obsessive compulsive disorder, and mood disorders, (Brown et al., 1997). However, it is not recommended for use with chronic pain patients due to poor criterion validity (Taylor et al., 2005). Concurrent validity of the Depression subscale of the DASS has been established with the Beck Depression Inventory (BDI; Beck & Steer, 1987), with an observed correlation of .74 in a non clinical sample (Lovibond & Lovibond, 1995). Similarly high concurrent validity for the Anxiety subscale of the DASS was established with the Beck Anxiety Inventory (BAI; Beck & Steer, 1990), with an observed correlation of .81 in a non-clinical sample (Lovibond & Lovibond, 1995). A more recent research study attested to the convergent and discriminant validity of the DASS with clinical ratings in two large clinical samples

totaling 678 subjects, although no quantitative data were provided related to this comparison (Brown et al., 1997)

Multiple exploratory and confirmatory factor analysis of the DASS have continually supported its 3 factor structure. Similar factor loadings have been found in studies of subjects with varying degrees of psychiatric impairment, community samples medical diagnosis, ages, and geographic locales as well (Taylor, Lovibond, Nicholas, Cayley, & Wilson, 2005; Crawford & Henry, 2003; Antony et al., 1998; Brown et al., 1997; Lovibond & Lovibond, 1995).

Parental Stressor Scale: Neonatal Intensive Care Unit. The Parental Stressor Scale: Neonatal Intensive Care Unit (PSS:NICU) was utilized to assess the construct of stress (Miles, Funk, & Carlson, 1993). This measure consists of 35 items that are answered in a Likert scale format (Miles et al, 1993). This measure has three subscales which were created based on the results of a principal components analysis with a Varimax rotation. Six factors were extracted with eigen values greater than one; examination of a scree plot indicated that three factors should be retained from the analysis. A factor loading of .40 was utilized as the criterion for inclusion on the factor. With minor exceptions, the factor analysis supported the a priori conceptualization of the subscales (Miles et al., 1999).

The Sights and Sounds subscale addresses the stress associated with the noises of the NICU machines, the bright lights, and seeing others' infants in varying levels of distress. The Relationship and Parental Role subscale addresses stress related to the impact of the infant being in the NICU on the development of the parental role and parent-baby relationship. The Infant Appearance and Behaviour subscale measures the

stress associated with seeing the infant, the infant's associated machines, and the corresponding behavior of the infant, such as inactivity, response to treatment, or medical emergencies on the part of the infant (Miles et al., 1993).

This measure has three scoring options. The simplest way is to tabulate the number of "yes" responses given on the entire questionnaire. This method is not recommended by the authors due to the loss of data inherent in this method. Metric 1 yields the Stress Occurrence Level, the level of stress produced when experiencing an event. This method of scoring is recommended if the focus of the research is the NICU environment. Metric 2, the Overall Stress Level is the quantification of the overall stress from the NICU environment. This method of scoring is recommended if the focus of the research is on the parents' experience of the NICU environment (Miles et al., 1993). In this scoring method, parents indicating they did not experience an item are scored as 1, indicating no stress. Those who experienced the item are given their endorsed score (for example, 3). Scale scores can be calculated by averaging the stress responses for the subscales and the total score.

The reliability and validity of the PSS:NICU has been calculated using Metric 1 and Metric 2 only. Since the present study will utilize Metric 2, reliability and validity for that metric will be discussed in depth. The PSS:NICU has a Cronbach's alpha $>.70$ for all subscales, and an overall alpha of .94. The content validity of this measure has been established through several reviews conducted with psychometricians, parents of NICU infants, and health practitioners (Miles et al., 1993). The construct validity of the PSS:NICU has been established with the State-Trait Anxiety Inventory (Miles et al., 1993). The authors of the instrument published a .41 correlation between State Anxiety and the

infant appearance subscale and a .40 correlation between the State Anxiety and the parental role alterations subscale. For the total score, a .45 correlation was obtained, indicating good construct validity (Miles et al., 1993).

Controllability. The Event Perception Scale (EPS; Endler & Parker, 1996) was utilized to assess the construct of control. This 9-item self report scale is presented in a Likert scale format. It yields a total score which corresponds to the perceived controllability of a specific event, which for the purpose of this study will be the infant's illness leading to hospitalization in the NICU. This instrument is utilized often in health related research, and has good reliability and validity (Endler & Parker, 1996). The Chronbach's alpha of the EPS is .74. Convergent validity of the EPS has been established with the Perceived Control of Internal States Scale; a moderate correlation was reported. A correlation of this size was expected as these measures assess slightly different constructs (Endler & Parker, 1996).

Coping. The construct of coping will be assessed with the Revised Ways of Coping Checklist (RWCCCL; Vitaliano, Russo, Carr, Maruro, & Becker, 1985). This measure was developed from Lazarus' transactional model of stress and coping (Vitaliano et al., 1985; Lazarus, 1966). This self-report measure consists of 60 statements answered in a Likert scale format in response to a specific stressor. The questionnaire has a blank for the participant to identify a specific stressor; in this study, the participants will be directed to answer the questionnaire in response to their NICU experience.

The questionnaire yields five subscales corresponding to different ways of coping with the identified stressor: Problem Focused (15 items), Seeks Social Support (6 items), Blamed Self (3 items), Wishful Thinking (8 items), and Avoidance (10 items). Problem

Focused Coping consists of 15 items and refers to taking active steps to deal with the stressor, such as trying to make the desired outcome possible and not letting feelings interfere with actions (Vitaliano, et al, 1985). Also loading on this factor are some statements that refer to positive reappraisal, such as looking for something positive coming out of the stressful experience, and believing that personal growth occurred as a result of the experience. Seeks Social Support consists of 6 items and refers to talking with friends, family, or professionals about what one is feeling, getting more information about the situation, as well as accepting sympathy from others (Vitaliano, et al, 1985). The Blamed Self subscale consists of 3 items. It refers to internalizing responsibility for the problem. The Wishful Thinking subscale consists of 8 items and consists of statements in which the desired outcome is imagined, but no action is being taken to achieve the desired outcome. Also loading on this factor is imagining the situation disappearing or wishing the situation had never occurred. The Avoidance subscale consists of 10 items (Vitaliano et al., 1985). This factor refers to both emotionally avoiding the stressor by way of denial as well as utilizing coping strategies such as smoking or drinking to temporarily soothe the problem (Vitaliano et al., 1985). In the current study, the Problem Focused, Seeks Social Support, and Avoidance subscales will be scored, to correspond with Problem Focused, Emotion Focused, and Avoidant Coping, respectively.

The RWCCCL has been assessed for reliability and validity with psychiatric patients, spouses of patients with medical problems, and with community samples of situationally stressed individuals (Vitaliano et al., 1985). Chronbach's alpha's for all three groups for the subscales are $>.73$. For the purpose of the present study, the

Cronbach's alpha for the spouses of the medical patients will be included, as that sample is most similar to the population in the present study. For spouses of medical patients, the mean alpha of the subscales was .83. The alphas for individual subscales are as follows: Problem Focused, .85, Wishful Thinking, .86, Seeks Social Support, .79, Blamed Self, .80, and Avoidance, .73 (Vitaliano et al., 1985). Additionally, a recent study of the RWCCCL with 510 chronically disabled patients, their next of kin, and college students showed support for the 8 factor model for purposes of comparing individuals within samples (Lundqvist & Ahlstrom, 2005).

Psychological Outcomes. The psychological outcomes of interest to this study were depression, anxiety, and hostility. The outcomes of depression and anxiety have been frequently assessed in studies related to stress and coping with infant illness. The current study assessed hostility as well. Hostility was included to reduce the likelihood of gender bias in assessment (Bradley et al., 2005; Stewart & Harmon, 2004). All three of these constructs were assessed by the Multiple Affect Adjective Checklist-Revised: State/Today Form (MAACL-R:S) (Lubin & Zuckerman, 1999). The MAACL-R:S is a self-report questionnaire that contains 132 adjectives related to emotional states. The only difference between the state and trait forms of this questionnaire is that responses on the state form are restricted to emotional states experienced during the current day (Lubin & Zuckerman, 1999).

The MAACL-R:S is comprised of 5 scales, which can be added to create 2 scales that are representative of overall negative (Dysphoria) and overall positive affect (Positive Affect/Sensation Seeking) (Lubin & Zuckerman, 1999). The Dysphoria (DYS) scale is comprised of the total adjectives checked from the Anxiety (A), Depression (D)

and Hostility (H) scales. The Positive Affect/Sensation Seeking (PASS) scale is comprised of the total adjectives checked from the Positive Affect (PA) and Sensation Seeking (SS) scales (Lubin & Zuckerman, 1999).

The Anxiety scale consists of 10 adjectives, including “afraid”, “fearful”, and “worrying”. The Depression scale consists of 10 adjectives, including “alone”, “sad”, and “discouraged”. The Hostility scale consists of 15 adjectives, including “angry”, “cross”, and “irritated” (Lubin & Zuckerman, 1999). The Sensation Seeking scale consists of 8 adjectives, including “active”, “energetic”, and “enthusiastic”. The Positive Affect scale consists of 21 adjectives, including “free”, “happy”, and “loving” (Lubin & Zuckerman, 1999).

It is possible to obtain *T*-scores for all scales of the MAACL-R:S. Norms are available for many different groups, including Air Force Cadets, College Students, Community College Students, and the Elderly. Separate norms are available for each gender. Within each sample and gender group, norms are additionally broken down into groups based on the total number of adjectives checked on the MAACL-R:S (Lubin & Zuckerman, 1999). Further information on how *T*-scores were calculated for this study is discussed in the results section.

The MAACL-R:S has high internal consistency reliability. In a sample of 816 community college students, Chronbach’s alpha’s of $>.79$ were obtained for all scales except the Anxiety scale, which had an alpha of $.69$. Specifically, alpha’s $>.91$ were obtained for Dysphoria and Positive Affect, alpha’s $>.80$ were obtained for Hostility, Sensation Seeking, and Positive Affect/Sensation Seeking. Depression had the alpha of $.79$ (Lubin & Zuckerman, 1999).

Test retest reliability is low, as is expected with this State form. For analyses on the Trait form that shows evidence of high test-retest reliability, see Lubin & Zuckerman, 1999. In a sample of normal adults, 34 males and 44 females, test retest reliabilities ranged from .27-.50 (males), and .29-.52 (females) at a 1 day interval. These reliabilities decreased to ranges of .09-.26 (males) and .09-.31 (females) at a 5 day interval. These findings were similarly replicated in a sample of 30 male and 35 female psychiatric inpatients, as well as with a sample of 416 college students (Lubin & Zuckerman, 1999).

Convergent validity has been established with the State-Trait Anxiety Inventory (only State-State correlations will be discussed here). All scales on the MAACL-R:S that had a corresponding scale on the STAIT (here, Anxiety, Depression, and Hostility), correlated with each other at $p \leq .001$, with alphas of .56 for Anxiety/Anxiety, .62 for Depression/Depression, and .47 for Hostility/Anger. As for non-corresponding correlations, convergent validity is also moderately good. Anxiety, Depression, and Anger all had moderately low (.31-.52) but statistically significant correlations with the MAACL-R:S scales assessing negative affect, and moderately low but significant negative correlations with scales assessing positive affect (.21-.49), except for the correlation between Anger (STAIT) and Sensation Seeking (MAACL-R:S), which was not significantly correlated. These two measures were also correlated in a sample of 210 primary care patients, which yielded high correlations between the respective scales of this measure: with alphas of .79 for Anxiety/Anxiety, .73 for Depression/Depression, and .72 for Hostility/Anger (Lubin & Zuckerman, 1999).

Additionally, predictive validity for the MAACL-R:S has been indicated with a study evidencing its ability to successfully classify 65.5% of Air Force Cadets who were

Graduates and Dropouts of the 6 week training program. Finally, discriminate validity was evidenced in a study of 76 controls and 76 psychiatric inpatients. High scores on Anxiety, Depression, Hostility, and Dysphoria, and low scores on Positive Affect, Sensation Seeking, and Positive Affect/Sensation Seeking were shown to be associated with psychiatric inpatients (Lubin & Zuckerman, 1999).

Procedures

This study received clearance through the Research Ethics Boards at the University of Windsor and Windsor Regional Hospital. Subjects were recruited by the Clinical Practice Coordinator of the NICU. One or both members of the dyad were approached for participation in the study, which involved receiving a letter of invitation informing them of the purpose and methodology of the research. If the parents agreed to participate, the researcher met with them on the NICU unit at their convenience to review the informed consent form and answer any questions they had. Participants were informed at this meeting that the purpose of the study was to investigate couples, and that this was the preferred method of participation. However, responses would not be excluded if one of the members of the dyad failed to participate. Participants were assured of the confidentiality of their responses, informed of their right to withdraw or choose not to participate, and told that participation in the study was not related to their or their infant(s)' current or future medical treatment. Each member of the dyad was given a numbered packet of questionnaires to fill out at their convenience. To avoid fatigue effects, measures were counterbalanced using random starting order with rotation. The demographic sheet was always first in the packet, followed by the DASS:S, PSS:NICU, EPS, MAACL-R:S, and RWCCCL, with random starting order. Also included

in the packet was two copies of the informed consent form, the letter of information, and a blank 1/16th sheet of paper to fill out for a draw for a \$50 gift certificate to a local restaurant. Participants were instructed to sign one of the consent forms and write their initials or name (their preference) and their phone number on the draw sheet and turn both in with their questionnaire packet. Questionnaire packets could be turned in to any of the NICU staff. The researcher picked up the completed packets from the Clinical Practice Coordinator of the NICU for data entry and analysis. All participants will be able to receive feedback and information about the study through the University of Windsor Research Ethics Board Website as well as through the NICU at Windsor Regional Hospital.

Results

Preliminary analyses were conducted for the purpose of data screening, assessing potential correlations between continuous variables, and detecting any relationship between group membership on outcome variables. Then the main analyses to test the hypotheses were conducted. Analysis of qualitative data followed. Finally, supplementary analyses were conducted.

Preliminary Analyses

Data Screening. Prior to analysis, all variables were examined for accuracy of data entry, missing values, outliers, and assumptions of analysis. Variables were examined separately for mother and father participants. Several demographic variables had greater than 5% missing values (see Table 3). Those variables that were not crucial to this study and did not have an empirical case for gender differences to exist were excluded from analysis. Additionally, 5 mothers and 5 fathers did not respond to a question on the last page of the PSS:NICU questionnaire, asking about overall stress level. Due to the high amounts of missing data and the fact that this study already has two measures of stress that are psychometrically sound, that question was excluded from analysis as well. Greater than 5% of males and females were missing one of the two variables (level of education, occupation) that was necessary to compute Hollingshead's Four-Factor Socioeconomic Status. Hollingshead's Index was calculated for the cases that had both necessary variables, and missing values for Hollingshead's index were imputed using the Estimation Maximization method as recommended by Tabachnick & Fidell (2001).

Table 3

Summary of Missing Data and Indication of Variables with Imputed Values

Measure		Percent Missing Mothers	Percent Missing Fathers
Demographics	Years of schooling completed ^a	11.11%	27.27%
	Participate in future research	27.78%	45.45%
	Number of children at home*	5.55%	-----
	Parental leave in weeks	11.11%	9.09%
	Hours work outside the home*	-----	9.09%
	Unpaid leave of absence in weeks	-----	9.09%
	Hours spent in NICU*	5.55%	9.09%
	Cost burden	5.55%	-----
	Support from family	5.55%	-----
Depression Anxiety and Stress Scales:			
Stress Scale	Question 1*	5.55%	-----
Parental Stressor Scale: NICU			
	Question 1* ^b	5.55%	9.09%
	Question 17* ^c	11.11%	18.18%
	How stressful in general	27.78%	45.45%
Revised Ways of Coping Checklist			
	Question 1* ^d	22.22%	9.09%
	Question 2* ^e	11.11%	-----
	Question 26* ^f	-----	9.09%
	Question 28* ^f	-----	9.09%
	Question 34* ^d	11.11%	-----
	Question 36* ^g	11.11%	-----
	Question 37* ^d	11.11%	-----
	Question 42* ^f	11.11%	-----
	Question 48* ^g	11.11%	-----
	Question 52* ^g	11.11%	-----
	Question 51* ^g	11.11%	-----

Note. *Denotes use of the Estimated Maximization method of missing value imputation.

(continued on next page)

(Table 3 *continued*)

^aHollingshead's Index was calculated, and missing Hollingshead Index values were imputed. ^bFrom the Sights and Sounds subscale. ^cFrom Infant Appearance and Behaviour subscale. ^dFrom Problem Focused Coping subscale. ^eFrom the Seek Social Support subscale. ^fFrom the Avoidance subscale. ^gFrom subscales not scored in this study (Blamed Self or Wishful Thinking).

With regard to the dependent variable measures, missing values were imputed for 1 question on the DASS:S and 11 questions of the RWCCCL using the Estimation Maximization method. For one question on the RWCCCL and one question on the PSS:NICU, it was observed that a total of 5 mothers and fathers and a total of 8 mothers and fathers had missing data for those questions, respectively. Estimation maximization was performed on these variables as well, and scale means with and without missing values were computed. Since Estimation Maximization did not appreciably change the means of these variables for either gender group, it was decided to include these questions in computation of their respective scales. Furthermore, when the Estimation Maximization method was utilized for imputation of these variables, Little's MCAR test was not significant, indicating that data were missing completely at random.

There were several cases in which either the MAACL-R:S or the RWCCCL was incomplete. Specifically, 4 parents (1 mother-father pair and 1 each father and mother single participant), did not check any adjectives on the MAACL-R:S. These data were treated as missing. In order to preserve power, especially for fathers in this study, it was decided to exclude these data pair wise. To be certain there were no systematic influences related to not answering this questionnaire, independent samples t-tests were conducted for each gender with the demographic and outcome variables. No significant differences between those who completed or did not complete the MAACL-R:S were found. As well, when the Estimation Maximization method was utilized for imputation of these variables, Little's MCAR test was not significant, indicating that data were missing completely at random.

Finally, one mother did not complete one of the outcome measures (RWCCCL); rather than impute values, it was decided to exclude data pairwise in order to preserve power.

Univariate outliers were examined by converting demographic variables and dependent variables to Z scores. Outliers were defined as Z scores greater than ± 2.50 . One variable (age of infant) had a positive outlier and was also positively skewed, as defined by Tabachnick & Fidell (2001) as having a value of greater than $|2|$ standard estimates of skew (*ses*), where *ses* is equal to $\sqrt{6/n}$. In accordance with Tabachnick and Fidell (2001), a square root transformation was performed on this variable, which decreased skewness to an acceptable level, but did not eliminate this outlier. A logarithmic transformation was performed, which decreased skew to an ideal level ($<.10$) and eliminated the outlier. All analyses were conducted using this transformed variable. However, in order for the mean of infant age to be meaningful for descriptive purposes, the mean of infant age was computed with the outlier, with the outlier deleted, and with the outlier winsorized; that is, given the next highest value + 1 unit, in this case days. These means are presented in Table 2. No other variables had significant levels of skew, and no other univariate outliers were observed. No multivariate outliers were found.

There were two variables that had a 90-10 split between groups for fathers. For mothers, these variables were also close to a 90-10 split. These variables were marital status and ethnicity. For mothers, 5.55% were cohabiting, and 88.9% were married (1 respondent, or 5.55% was missing). For fathers, 100% were married. For ethnicity, 88.89% of mothers were Caucasian, and 11.11% were "Other" ethnicity. For fathers,

90.90% of fathers were Caucasian, and 9.1% were “Other” ethnicity. These variables were excluded from analysis as well.

Correlations Between Variables. Correlations between parent demographic variables, including infant variables, were computed. Correlations were computed separately for each gender. These correlations are presented in Tables 4 and 5.

Demographic variables and outcome variables. Correlations between demographic and outcome variables were computed separately for each gender as well. Significant correlations between demographic and outcome variables were found. For mothers, number of children in the pregnancy was negatively correlated with Emotion Focused Coping ($r = -.732, p = .001$). No other significant correlations were observed. As well, for fathers, a significant positive correlation was observed between number of hours spent in the NICU and Emotion Focused Coping ($r = .899, p = .005$). Additionally, number of children at home was significantly negatively correlated with Emotion Focused Coping ($r = -.650, p = .030$). No other significant correlations were observed.

Participation as a Couple or as an Individual. T-tests to assess for group differences related to completing the questionnaire as a couple on the measures included in this study were also computed separately for each gender. For mothers, results indicated that there were no significant differences between groups (all t 's < 1.973 , all p 's $> .070$). The same was true for fathers (all t 's < 1.222 , all p 's $> .253$). However, for one of the father groups there was only one case per cell. Thus, a correlation between the outcome variables and participation status was conducted (single=1, couple=2). No significant correlations were found. For mothers, all r 's $< .481$, all p 's $> .070$. For fathers, all r 's $< .363$, all p 's $> .273$.

Table 4

Bivariate Correlations Among Demographic Variables in the Sample of Mothers

	1	2	3	4	5	6	7	8
1. Age								
2. SES	-.277							
3. Length of current relationship	.176	.262						
4. Number of additional children at home	.160	.068	-.245					
5. Number of children in pregnancy	-.070	-.142	.161	.153				
6. Hours per week spent in NICU	.092	.101	.241	-.021	-.262			
7. Infant weight	.197	-.070	-.286	-.081	-.494*	.021		
8. Infant age ^a	-.126	-.171	.202	.051	.582*	-.227	-.619**	
9. Gestational age	.123	-.178	-.240	-.191	-.522*	.115	.901***	-.780***

^aTransformed variable (log) was used in correlational analyses.* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 5

Bivariate Correlations Among Demographic Variables in the Sample of Fathers

	1	2	3	4	5	6	7	8
1. Age								
2. SES	.255							
3. Length of current relationship	.260	.019						
4. Number of additional children at home	-.346	-.159	-.216					
5. Number children in pregnancy	-.139	-.385	.347	.048				
6. Hours per week spent in NICU	.581	.114	-.098	-.627*	-.372			
7. Infant weight	.110	.308	-.481	.231	-.558	.181		
8. Infant age ^a	.184	-.241	.378	-.006	.732**	-.266	-.641*	
9. Gestational age	.007	.391	-.577	.143	-.667*	.109	.909***	-.828**

^aTransformed variable (log) was used in correlational analyses.* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Main Analyses

The means, standard deviations, and minimum and maximum values of the correlational (dependent) variables included in this study are presented in Table 6 (mothers) and Table 7 (fathers). Although this study involved a high number of analyses, this study also had low statistical power due to small sample size. Thus a p value of .05 was utilized in all analyses.

Assumptions. The main analyses of this study were conducted through correlations. The assumptions of correlations are that the observations are independent, variables are normally distributed and that the variance of X and Y is homoskedastic (Hopkins, 1987). Independence of observations was accomplished through computation of correlations separately by genders. All variables were tested for normality of distributions in preliminary analyses. Additionally, all new calculated continuous variables were examined for the assumptions of correlations.

Hypothesis 1: Primary Appraisal. It was expected that participants were likely to perceive the hospitalization of their infant in the NICU as stressful. Specifically, it was thought that mothers would experience more stress related to the NICU environment, but fathers would experience more stress related to daily living than would mothers due to their parental roles.

Due to sample size, the only analyses possible to ascertain this gender difference is a dependent samples t-test with the completed couple pairs, and correlational analyses of the relationship between daily living stress and NICU related stress.

A dependent samples *t*-test was conducted with the 9 couple pairs, with gender as

Table 6

Means, Standard Deviations, and Minimum and Maximum Values for All Dependent Measures: Mothers

Variable (Measure)	Mean	SD	Minimum	Maximum
General stress Total (DASS: Stress Scale)	20.28	12.47	1.00	42.00
NICU Stress Total (PSS:NICU)	98	23.67	56.00	131.00
Sights and Sounds	2.62	1.13	1.00	4.67
Infant Appearance and Behaviour	3.26	.82	1.47	4.06
Relationship and Parental Role	3.27	.95	1.73	5.00
Controllability (EPS)	15.56	2.97	10.00	21.00
Coping (RWCCL ^a)				
Problem Focused Coping	34.13	10.56	13.00	49.75
Emotion Focused Coping	17.64	4.12	9.00	24.00
Avoidant Coping	15.23	5.57	6.00	24.00
Psychological Outcome (MAACL-R:S ^a)				
Anxiety	57.07	13.06	41.00	81.00
Depression	51.81	10.23	44.00	72.00
Hostility	45.80	3.59	43.00	53.00
Dysphoria ^b	52.93	10.81	40.00	78.00

Note. DASS = Depression, Anxiety, and Stress Scales; PSS:NICU = Parental Stressor

Scale: Neonatal Intensive Care Unit; EPS = Event Perception Scales; RWCCL = Revised

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(Table 6 continued)

Ways of Coping Checklist; MAACL-R:S = Multiple Affect Adjective Checklist-Revised:
State/Today Form.

^aThere is no meaningful total score for this measure. ^bThis scale is produced through
converting the sum of raw scores on the Anxiety, Depression, and Hostility Scales to a *T*-
score.

Table 7

*Means, Standard Deviations, and Minimum and Maximum Values for All Dependent**Measures: Fathers*

Variable (Measure)	Mean	SD	Minimum	Maximum
General Stress Total (DASS: Stress Scale)	15.45	11.57	1.00	35.00
NICU Stress Total (PSS:NICU)	78.93	24.27	46.00	117.00
Sights and Sounds	2.38	1.02	1.00	4.17
Infant Appearance and Behaviour	2.72	1.04	1.39	4.47
Relationship and Parental Role	2.16	.83	1.09	3.73
Controllability (EPS)	15.10	6.98	10.00	24.00
Coping (RWCCL ^a)				
Problem Focused Coping	32.01	11.48	10.00	49.14
Emotion Focused Coping	13.54	3.98	8.00	20.00
Avoidant Coping	12.61	4.69	4.00	19.00
Psychological Outcome (MAACL-R:S ^a)				
Anxiety	57.56	14.75	42.00	83.00
Depression	46.89	3.55	44.00	54.00
Hostility	44.11	9.98	37.00	62.00
Dysphoria ^b	52.22	9.61	41.00	65.00

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(Table 7 continued)

Note. DASS = Depression, Anxiety, and Stress Scales; PSS:NICU = Parental Stressor Scale: Neonatal Intensive Care Unit; EPS = Event Perception Scale; RWCCCL = Revised Ways of Coping Checklist; MAACL-R:S = Multiple Affect Adjective Checklist-Revised: State/Today Form.

^aThere is no meaningful total score for this measure. ^bThis scale is produced through converting the sum of raw scores on the Anxiety, Depression, and Hostility Scales to a *T*-score.

the independent variable and total score on the DASS:S, total score on the PSS:NICU, and average scores on the PSS:NICU subscales of Sights and Sounds (SS), Infant Appearance and Behaviour (IAB), and Relationship and Parental Role (RPR). The results of this t-test indicated no significant differences between genders on DASS:S total, PSS:NICU total, SS, IAB, or RPR (all t 's $< |1.248|$, all p 's $> .247$). However, significant differences between genders were observed on the variable RPR ($t=-2.307$, $p=.050$), with mothers indicating more parental role stress than fathers (M mothers=3.06, M fathers=2.18). It is possible that that at least for couples, mothers do experience more stress related to the parental role than do fathers; however, for other variables this is not the case.

There is the possibility that these findings may be influenced by alpha or beta error; thus, correlations between the aforementioned variables were computed separately for each gender for purposes of comparison of the relationship between types of stress between genders, for the purposes of conducting a Fisher's r - z transformation, which takes into account sample size. For both mothers and fathers, significant correlations between total DASS:S (non-NICU related stress) and RPR (mothers: $r=.516$, $p=.028$, fathers: $r=.805$, $p=.005$), IAB, (mothers: $r=.563$, $p=.015$; fathers: $r=.658$, $p=.028$) and Total PSS:NICU score (mothers: $r=.682$, $p=.002$; fathers: $r=.876$, $p=.001$) were observed (see Table 8). A significant correlation between total DASS:S and SS was observed for mothers ($r=.471$, $p=.048$), but not for fathers ($r=.289$, $p=.388$).

A Fisher's r - z transformation was computed to ascertain if there were significant differences in these correlations between genders (see Table 9). No significant gender differences in the relationships between life stress and NICU stress variables were

Table 8
Intercorrelations Among Stressors

	1	2	3	4
Mothers				
1. Sights and Sounds				
2. Infant Appearance and Behaviour	.764**			
3. Relationship and Parental Role	.211	.245		
4. PSS:NICU Total	.804**	.884**	.631**	
5. DASS Stress Total	.471*	.563*	.516*	.682**
Fathers				
1. Sights and Sounds				
2. Infant Appearance and Behaviour	.594			
3. Relationship and Parental Role	.247	.668*		
4. PSS:NICU Total	.557	.940**	.828**	
5. DASS Stress Total	.289	.658*	.803*	.876**

Note. PSS:NICU = Parental Stressor Scale: Neonatal Intensive Care Unit; DASS = Depression, Anxiety, and Stress Scales.

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

Table 9

Correlations and Fisher's r-z Transformations for Life Stress and NICU Stress Variables

	DASS:S ^a Total (Z value)		Z value	Fisher's r-z transformation Z value
	Mothers	Fathers		
PSS:NICU ^b	.682** (.833)	.876*** (1.358)	-.525	1.58
Sights and Sounds	.471* (.510)	.289 (.296)	.214	1.06
Infant Appearance and Behaviour	.563* (.636)	.658* (.789)	-.153	.89
Relationship and Parental Role	.516* (.571)	.803** (1.104)	-.533	1.59

Note. PSS:NICU = Parental Stressor Scale: Neonatal Intensive Care Unit; DASS = Depression, Anxiety, and Stress Scales: Stress Scale.

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

observed (all Z 's $<|1.59|$). A limitation to this type of analysis is that it is impossible to tell if either gender experiences more stress than the other related to these variables.

However, it can be concluded that the relationship between life stress and NICU stressors, including those specifically related to the environment of the NICU, how the child looks and behaves, and the parental role, are similar between genders.

Summary hypothesis 1. The hypothesis that fathers would perceive more stress related to daily living than would mothers, and that mothers would experience more stress related to the NICU than would fathers was only somewhat supported by the results of a dependent samples T-test with 9 couples. The only gender difference observed was that mothers perceived more stress related to the parental role than did fathers. It was also observed that the relationship between daily living stress and NICU stress was similar between genders.

Hypothesis 2: Controllability.

Infant illness and controllability. The current study hypothesized that more severe the infant's illness, the less perceived control will be associated with the illness. It was hypothesized that gender differences would not exist in this relationship. To conduct correlational analyses, first an index of infant risk was computed utilizing the transformed log of infant age variable and weight of infant in grams. To ensure that both variables received approximately equal weight in computation of this index, infant weight in grams was divided by 100 and added to infant age. Since this resulted in babies with higher numbers having less risk, this result was subtracted from a constant (50), so that babies with a lower index would have lower risk, and babies with a higher index would

have a higher risk. To ensure that this computation was an effective means of quantifying infant risk, an independent samples t-test was computed with risk status (high or low) as the independent variable and risk index score as the dependent variable. Significant differences between high and low risk groups were found on this index ($t=5.546, p<.001$). The mean of the high risk group on this index was 32.14, and the mean for the low risk group was 17.73.

Bivariate correlations were computed separately for each gender with the variables infant risk index and total score on EPS. No significant correlations between perceived control and infant risk index were observed. For mothers, $r=-.030, p=.905$. For fathers, $r=-.176, p=.604$. The average EPS scores were 15.56 (mothers) and 14.81 (fathers), corresponding to an overall perceived control level of 2.59 for mothers and 2.46 for fathers on a scale of 1 (not at all in my control) to 5 (very much under my control). Thus, it appears that the overall perceived control level of “somewhat under my control” is not related to an objectifiable quantification of infant risk status for either gender.

Specific stressors. It is possible that stress as assessed by this study would be related to control. Partial correlations were computed for each gender separately for EPS and DASS:S total, SS average, IAB average, RPR average, and Total PSS:NICU score. No significant correlations were found for either gender. For mothers, all r 's $<|.317|$, all p 's $>.20$. For fathers, all r 's $<|.392|$, all p 's $>.23$ (See Table 10).

Summary hypothesis 2. The hypothesis that a negative correlation between infant risk and perceived control would exist was not supported by this study. On average parents tended to perceive the infant hospitalization as “somewhat under my control”.

Table 10

Correlations among Controllability and Stressors, and Intercorrelations Among Stressors

	1	2	3	4	5
Mothers					
1. Event Perception Scale Total					
2. Sights and Sounds	-.055				
3. Infant Appearance and Behaviour	-.317	.764**			
4. Relationship and Parental Role	.003	.211	.245		
5. PSS:NICU Total	-.203	.804**	.884**	.631**	
6. DASS Stress Total	.165	.471*	.563*	.516*	.682**
Fathers					
2. Sights and Sounds	-.214				
3. Infant Appearance and Behaviour	.028	.594			
4. Relationship and Parental Role	-.349	.247	.668*		
5. PSS:NICU Total	-.386	.557	.940**	.828**	
6. DASS Stress Total	-.392	.289	.658*	.803*	.876**

Note. PSS:NICU = Parental Stressor Scale: Neonatal Intensive Care Unit; DASS = Depression, Anxiety, and Stress Scales.

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

Additionally, no significant relationships between specific stressors and controllability were observed.

Hypothesis 3: Coping Strategies. It was anticipated that gender differences would exist in the choice of coping mechanisms utilized by parents immediately following hospitalization of their infant. The current sample size limitations prevent analysis and discussion of mean values of levels of emotion utilized by each gender. However, it is possible to discuss the nature of correlations between the three coping strategies utilized in this study.

First, bivariate correlations were computed to ascertain intercorrelations between coping strategies as well psychological variables. Significant intercorrelations between types of coping were observed for mothers, but not for fathers (see Table 11).

A Fisher's r - z transformation was computed for the correlations to ascertain if gender differences existed in the correlations. A significant difference between genders was observed for the association between Emotion Focused and Problem Focused coping ($Z=1.98, p<.05$) (see Table 12). These results indicate that there is a moderate positive relationship between emotion focused and problem focused coping for mothers, but there is essentially no relationship between emotion focused coping and problem focused coping for fathers.

Summary hypothesis 3. Small sample size prevented testing of the hypothesis that gender differences in choice of coping strategies would exist. Gender differences in correlations between use of the three different coping strategies measured in this study were observed, with mothers using problem focused and emotion focused coping in tandem, and fathers evidencing no relationship between coping methods.

Table 11

Intercorrelations Among Coping Strategies for Mothers and Fathers

	Problem Focused Coping	Emotion Focused Coping
Mothers		
Problem Focused Coping		
Emotion Focused Coping	.657** ^a	
Avoidant Coping	.585*	.301 ^a
Fathers		
Problem Focused Coping		
Emotion Focused Coping	.066 ^b	
Avoidant Coping	.383	.015 ^b

^a Partial correlation coefficient with type of birth as control variable. ^b Partial correlation coefficient with number of additional children at home and hours spent in NICU as control variables.

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

Table 12

*Bivariate and Partial Correlations and Fisher's r-z Transformations for
Intercorrelations Between Coping Styles*

	Problem Focused Coping (Z value)		Z difference	Fisher's r-z transformation Z value
	Mothers	Fathers		
Emotion Focused Coping	.657** ^a (.786)	.066 ^b (.006)	.720	1.98*
Avoidant Coping	.585** (.669)	.383 (.402)	.267	.735

^a Partial correlation coefficient with type of birth as control variable. ^b Partial correlation coefficient with number of additional children at home and hours spent in NICU as control variables.

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

Hypothesis 4: Goodness of Fit. The current study predicted that a goodness of fit between the secondary appraisal and the type of strategy utilized will be related to psychological symptom outcome. Specifically, it was predicted that good fit would be associated with lower depression, anxiety, and hostility scores as measured by the MAACL-R:S.

Raw scores for the MAACL-R:S scales of depression, and anxiety, and hostility were converted to T-scores. The norms for Community College Males and Females were utilized to correspond with the average level of education attained by the sample as measured by Hollingshead's Education Levels in computation of SES. For mothers, the mean education level was 5.72 ($SD=.826$), and for fathers, the mean education level was 5.36 ($SD=.9244$). Subjects were broken down into groups for calculation of T-scores based on the number of responses, as separate norms are presented for groups based on number of adjectives checked (Lubin & Zuckerman, 1999). The average total for mothers was 25.47 ($SD=14.85$), with a range of 5-52. The average total for fathers was 17.56 ($SD=9.61$), with a range of 4-32. For mothers, there were 8 respondents in group 1 (1-23 adjectives checked), 3 respondents in group 2 (24-37 adjectives checked), and 4 respondents in group 3 (more than 38 adjectives checked). For fathers, there were 5 respondents in group 1 (1-22 adjectives checked), 4 respondents in group 2 (23-36 adjectives checked), and 0 respondents in group 3 (more than 37 adjectives checked) (Lubin and Zuckerman, 1999).

To conduct correlational analyses related to these psychological outcome variables, it was necessary to compute an index of goodness of fit or "match" between

controllability and outcome. All of the following computations were conducted separately for each gender. Total score on the Event Perception Scale was divided into quartiles, with the lowest score corresponding to a percentile group of 1, indicating lowest control of the four groups. Then total score on Problem Focused Coping was divided into quartiles, again with the lowest score corresponding to a percentile group of 1. These scores were then multiplied, such that an index of “match” was computed, with higher values (i.e., 16) indicating better match (high scores on controllability and high scores on Problem Focused Coping). This same technique (quartile division) was conducted with Emotion Focused Coping, defined as score on the Seeking Social Support scale of the RWCCCL. In this case, however, higher scores were given lower rankings so that when multiplied with the percentile group of Control, higher scores would still indicate a better match. This reverse assignment of rankings was necessary because according to Lazarus and Folkman’s theory, there is a negative correlation between perceived controllability and levels of emotion focused coping for a positive psychological outcome. That is, low levels of emotion focused coping work best in cases in which there is high control, but high levels of emotion focused coping work best in cases in which there is low control.

Correlational analyses were conducted separately for each gender to see if the variables that were correlated with the continuous Seeking Social Support Score were correlated with the transformed “Matched” variable of Emotion Focused Coping. No significant correlations were observed.

First, two separate bivariate correlational analyses (one for each gender) were conducted with Match of Problem Focused Coping with the outcome variables of

Anxiety, Depression, and Hostility from the MAACL-R:S, as well as the Dysphoria score, which is the sum of Anxiety, Depression, and Hostility, and is considered an index of overall negative emotion.

For mothers, a significant positive correlation was observed for the match of level of control and level of problem focused coping on level of anxiety ($r=.592, p=.020$). Significance did not occur with this correlation in the father sample ($r=-.209, p=.589$). Additionally, match of level of control and problem focused coping was also significantly correlated with overall level of negative emotion for mothers, but not for fathers ($r=.557, p=.031$). For fathers the correlation between the match variable and overall level of negative emotion was $-.387, p=.304$. No other significant correlations were observed for either group (see Table 13).

A Fisher's r - z transformation was computed for both of these variables to ascertain if the relationship between match and Anxiety and Dysphoria was significantly different between males and females. Significant differences between genders were not observed for the Anxiety correlations ($Z=1.784, p>.05$). However, significant gender differences were observed for the Dysphoria correlations ($Z=2.068, p<.05$) (see Table 14). These results seem to indicate that mothers' use of problem focused coping in the context of greater perceived levels of control is actually associated with more overall negative affect. However, there is no relationship between father's use of problem focused coping in the context of greater perceived levels of control and negative affect.

A second set of bivariate correlational analyses were conducted with the same outcome variables of the MAACL-R:S and the variable Match of Emotion Focused Coping. For this correlation, no significant correlations were observed for either gender.

Table 13

Correlations Between Psychological Outcome Variables on the MAACL-R:S and Match of Problem Focused Coping and Emotion Focused Coping for Mothers and Fathers

	1	2	3	4	5	6
Mothers						
1. Match EFC						
2. Match PFC	-.068					
3. Match AVD	.417	.090				
4. Anxiety	-.206	.592*	-.036			
5. Depression	-.276	.394	-.289	.646**		
6. Hostility	.105	.392	.197	.476	.102	
7. Dysphoria	-.201	.557*	-.160	.946**	.818**	.450
Fathers						
1. Match PFC	.510					
2. Match AVD	.414	.097				
3. Anxiety	-.436	-.209	-.422			
4. Depression	-.007	-.012	-.624	.431		
5. Hostility	.168	-.460	-.039	-.086	.225	
6. Dysphoria	-.277	-.387	-.486	.842**	.667*	.385

Note. EFC = Emotion Focused Coping; PFC = Problem Focused Coping; AVD = Avoidant Coping.

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

Table 14

Correlations and Fisher's r-z Transformations for Match of Problem Focused Coping and Psychological Outcome Variables

	Match Problem Focused Coping (Z value)		Z difference	Fisher's r-z transformation Z value
	Mothers	Fathers		
Anxiety	.592* (.681)	-.209 (-.211)	.892	1.784
Dysphoria	.557* (.627)	-.387 (-.407)	1.034	2.068*

* $p \leq .05$.

For mothers, all r 's $< |.276|$, all p 's $> .30$. For fathers, all r 's $< |.436|$, all p 's $> .109$ (see Table 12).

Finally, the correlations between Match of Avoidance Coping and outcome indicated that Match of Avoidant Coping was not significantly associated with outcome variables of the MAACL-R:S for either gender. For mothers, all r 's $< |.289|$, all p 's $> .277$. The correlation for fathers' Match of Avoidant Coping showed a moderate negative correlation with a p value that was near significance ($r = -.624$, $p = .072$). For the remaining correlations for fathers, all r 's $> |.039|$, all p 's $> .184$) (see Table 13).

Summary hypothesis 4. The hypothesis that a goodness of fit between controllability and coping style would be associated with better psychological outcome in terms of Anxiety, Depression, and Hostility was not supported in this study. Interestingly, overall negative affect (Dysphoria) was significantly negatively correlated with use of problem focused coping in more controllable situations (i.e., a "good" fit, according to Lazarus and Folkman, 1984), but this relationship was only observed for mothers. For fathers, no relationship between goodness of fit and overall negative affect was observed.

Qualitative Analyses

Three open-ended questions were included for qualitative research purposes. Two of these were on the demographic questionnaire and asked: 1. What do you consider to be some of the stressors associated with having your infant in the NICU? 2. What are you finding to be the best ways to cope with your infant's hospitalization? The third was on the PSS:NICU and asked: Was there anything else that was stressful for you during the time that your baby has been in the neonatal intensive care unit? Analysis of the qualitative data was conducted with the narrative or phenomenological research method,

which involved asking the same questions to all participants, transcribing responses, and extracting general themes or categories from the transcribed data (Creswell, 2002; Morse & Field, 1995).

Out of the entire sample, 26 (89.66%) unique participants responded to the two qualitative demographic questionnaire questions. This group of respondents was comprised of 16 females and 9 males, which corresponds to a response rate of 88.89% and 81.81% of the total sample, respectively. All 26 of these participants responded to both qualitative questions on the demographic questionnaire. Of this group, 3 (11.54%) also gave an answer to the qualitative question on the PSS:NICU. All of these respondents were female. For ease of analysis, and since the responses on the PSS:NICU question corresponded with the responses on the demographic questionnaire, the results from both questionnaires are presented together.

Stressors. The most commonly cited stressor was related to uncertainty regarding the outcome of the baby's health. Secondly participants cited strain on family relationships, including the relationship with the infant, as stressors. Participants mentioned that they had difficulty keeping in touch with friends and family, weren't able to brag about their infant to others like other parents were, they weren't able to bring their other children to the NICU and have a place to entertain them, and they wanted to be able to hold and feed their infant more. Respondents also mentioned many stressors that could be classified as "daily hassles" (Lazarus & Folkman, 1984). The most often cited hassle was travel time to and from the hospital, and not being able to find a parking space once they got there. In fact, many of the participants who were "rooming in" (staying in a hospital room adjacent to the NICU) mentioned how convenient this arrangement was for

them. Anecdotally, one participant who was rooming in specifically mentioned to the researcher before beginning the study packet that she thought the NICU could use more of the rooming in rooms.

Also mentioned by both parents were some stressors related to the NICU itself. Stressors were related to staff, including many differences of opinion being given, and not having the same nurse all the time, the NICU environment, including alarms going off and bustle of people. This qualitative evidence corresponded to the sights and sounds subscale of the PSS:NICU. Also, parents mentioned that they experienced stress related to all of the equipment in the NICU, specifically how much was attached to their infant. Again, this corresponds to stress as assessed by the PSS:NICU.

Finally, mothers in particular mentioned the need to take care of themselves as well as the infant; this makes sense as mothers had experienced giving birth to the infant; some had had C-sections, and some were experiencing complications such as high blood pressure. Additionally, mothers also mentioned that they had a difficult time maintaining a life outside of the NICU, such as keeping up with friends and family. Finally, 3 mothers cited lack of control and helplessness as stressors; at least one of these mothers had had a C-section and this was related to her depending on her husband to drive her to and from the hospital to see her infant. Other mothers referred to the illness being out of their control and feeling that there was nothing they could do about it. These results are summarized in Table 15.

Coping. The researcher utilized the narrative research method of extracting categories from the data, and then classified the themes as Problem Focused, Emotion

Table 15

*Stressors Associated with NICU Hospitalization: Open-ended Question Categories in
Descending order of Frequency of Total Respondents*

Category	Total (%) respondents ^{a,b}	Total (%) Mothers ^b	Total (%) Fathers ^b	Examples
Uncertainty about health of infant	11 (42.31)	8 (50.00)	3 (33.33)	*Concerned about future *Not knowing what is going to happen
Family Relationships	9 (34.62)	8 (50.00)	1 (00.09)	*Other children at home *Being away from friends and family
Hassles	8 (30.77)	5 (31.25)	3 (33.33)	*Parking spaces *Traveling to and from hospital
Physical needs	6 (23.08)	6 (37.50)	---	*Recovering from C-section *Lack of sleep
Staff	6 (23.08)	3 (18.75)	3 (33.33)	*Frequent staff changes *Different opinions and information from different staff
Life outside of NICU	4 (15.38)	4 (25.00)	---	*Communicating with friends and family *Things that are left undone at home
Environment	4 (15.38)	4 (25.00)	---	*Alarms going off *Noise of people talking
Baby's equipment	3 (11.54)	3 (18.75)	---	*IV's in the infant *Equipment is overwhelming
Dependency on others	3 (11.54)	3 (18.75)	---	*Lack of control *Feeling helpless

(continued on next page)

(Table 15 *continued*)

Note. Dashes indicate no respondents in that category.

^aNumber of respondents refers to the frequency of participants who made at least one reference to that category in their response. ^bPercent was computed from the subsample of 26 respondents.

Focused, and Avoidant Coping strategies (Creswell, 2002; Morse & Field, 1995; Lazarus & Folkman, 1984). These coping strategies seemed to complement the stressors. The most frequently cited coping strategy for both parents was getting support from family, such as having them visit or talking to them, an Emotion Focused Strategy. Secondly, an equal number of mothers and fathers stated that being involved with the care of the infant was an effective coping strategy for them, which seems to complement the stressor of feeling helpless as well as the stressors related to not having the baby at home and not being able to “share” the infant with family members (the “Family Relationship” category).

Not surprisingly, gathering information was another frequently cited coping strategy; this was especially true for males in this study, with 5 of them indicating this as a coping strategy, and only 2 of the mothers citing this as a coping strategy. Almost the opposite pattern was seen with another coping strategy, that of Doctor/Nurse Support and Physical Care, referring to talking to the medical staff and also taking comfort in the care they are receiving from them. Anecdotally, this researcher noted that the nursing staff at the NICU where the study was conducted were highly involved with the parents; they could often be observed sitting and talking with them, and they took steps to individualize the infant’s stay by providing certificates of “crib graduation” and “welcome to the NICU”. Furthermore, one of the participants mentioned that the nurses at this unit were much more personally involved and easy to talk to than another NICU where she had recently been with her infant. Thus it does seem that, for this sample, the women in the study more frequently cited the emotional support available from the nurses and the males more frequently cited the educational information obtainable from

the nurses/doctors as coping mechanisms. Interestingly, however, only 1 male mentioned the use of an avoidant coping strategy (working), which is a typical response in the research in this area. More females than males mentioned avoidant coping strategies, including doing yoga and small projects. The least mentioned coping strategy was having a positive attitude, which included having a sense of humour and being optimistic. These results are summarized in Table 16.

Supplemental Analyses

Coping and Stressors. Since no association was observed between control and any of the stressors, it may provide more information to assess coping with specific stressors without considering control. Furthermore, since controllability of infant illness is less open to intervention than are coping strategies, this information would be important for service planning.

Bivariate and partial correlations were computed for each gender for the stressor variables (DASS Stress total, Sights and Sounds, Infant Appearance and Behaviour, and Relationship and Parental Role) and the coping styles of Problem Focused Coping, Emotion Focused Coping, and Avoidant Coping. The correlations between these variables are summarized in Table 17.

For mothers, significant correlations were observed between stress related to the Relationship and Parental Role with the infant and Problem Focused Coping ($r=.617$, $p=.008$), Emotion Focused Coping ($r=.592$, $p=.016$), and Avoidant Coping ($r=.595$, $p=.012$). Additionally, stress related to Sights and Sounds of the NICU was significantly associated with Avoidant Coping ($r=.570$, $p=.017$). Everyday stress as measured by the

Table 16

*Coping with Stressors Associated with NICU Hospitalization: Open-ended Question**Categories in Descending Order of Frequency of Total Respondents*

Coping Type	Category	Total (%) respondents ^{a,b}	Total (%) Mothers ^b	Total (%) Fathers ^b	Examples
EFC	Support from family	14 (53.85)	8 (50.00)	6 (66.67)	*Friends and family visiting *Talking to my spouse
PFC	Being involved with care	10 (38.46)	5 (31.25)	5 (55.56)	*Being able to hold the baby/be involved in his/her care *Being able to room see the baby whenever I wanted
EFC	Having Information	7 (26.92)	2 (12.50)	5 (55.56)	*Asking questions of the doctors/nurses *Educating myself on my baby's condition.
EFC	Doctor/Nurse support and physical care	8 (30.77)	5 (31.25)	3 (33.33)	*Talking to the doctors and nurses *Seeing the great care the infants are getting
AVD	Doing another activity	5 (19.23)	4 (25.00)	1 (11.11)	*Yoga, small projects *Working (male response)
EFC	Positive attitude	3 (11.54)	1 (6.25)	2 (22.22)	*Humour *Being optimistic

Note. EFC = Emotion Focused Coping; PFC = Problem Focused Coping; AVD =

Avoidant Coping.

(continued on next page)

(Table 16 *continued*)

^aNumber of respondents refers to the frequency of participants who made at least one reference to that category in their response. ^bPercent was computed from the subsample of 26 respondents.

Table 17

Summary of Bivariate and Partial Correlations Between Stressors and Coping Strategies for Mothers and Fathers

	Problem Focused Coping	Emotion Focused Coping ^a	Avoidant Coping
Mothers			
Depression, Anxiety, and Stress Scales: Stress Scale	.438	.299	.731***
Sights and Sounds	.414	.199	.570*
Infant Appearance and Behaviour	.098	.047	.453
Relationship and Parental Role	.617**	.592*	.595*
Fathers			
Depression, Anxiety, and Stress Scales: Stress Scale	.248	-.261	.503
Sights and Sounds	-.165	-.152	.546
Infant Appearance and Behaviour	.521	-.207	.605*
Relationship and Parental Role	.051	.099	.239

^a Partial correlation coefficients with type of birth as control variable for mothers and with number of additional children at home and hours spent in NICU as control variables for fathers.

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

DASS:S was also significantly associated with Avoidant Coping ($r=.731, p=.001$).

Finally, the relationship between stress related to Infant Appearance and Behaviour and Avoidant coping was close to significance ($r=.453, p=.068$). No other significant correlations were observed (all r 's and pr 's $<.438$, all p 's $>.079$).

For fathers, significant correlations were observed between stress related to the Relationship and Parental Role with the infant and Avoidant Coping ($r=.605, p=.049$). No other significant correlations were observed (all r 's and pr 's $<|.546|$, all p 's $>.082$).

A Fisher's r - z transformation was computed to ascertain if there were any significant differences between genders in terms of the correlations between these variables. No significant gender differences were observed (all Z 's $<|1.73|$, all p 's $>.05$) (see Table 18).

Coping Strategies and Outcomes. Separate correlations and partial correlations were computed for each gender with coping variables of (Problem Focused Coping, Emotion Focused Coping, and Avoidance), and specific stressor variables (SS, IAB, RPR) (see Table 19). Partial correlations were utilized for the correlations that involved Seeking Social Support. For mothers, the control variables were number of children in the pregnancy. For fathers, control variables were number of children at home and hours a week spent in the NICU.

Significant correlations were observed between use of Problem Focused Coping and Hostility for both mothers and fathers. For Mothers, a significant moderate positive correlation was observed ($pr=.617, p=.025$) and for fathers, a significant moderate negative correlation was observed ($pr=-.676, p=.046$). Additionally, for males, there was

Table 18

Correlations and Fisher's r-z Transformations for Specific Stressors and Coping Strategies

	Avoidant Coping (Z value)		Z difference	Fisher's r-z transformation Z value
	Mothers	Fathers		
Depression, Anxiety, and Stress Scales: Stress	.731*** (.929)	.503 (.555)	.374	1.03
Sights and Sounds	.570* (.648)	.546 (.613)	.015	.041
Infant Appearance and Behaviour	.453 (.487)	.605* (.699)	-.212	-.584
Relationship and Parental Role	.595* (.684)	.239 (.243)	.441	1.14
	Problem Focused Coping (Z value)			
	Mothers	Fathers		
Relationship and Parental Role	.051 (.050)	.617** (.719)	-.669	-1.73

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

Table 19

Bivariate and Partial Correlations Between Coping Strategies and Outcomes for Mothers and Fathers

	Problem Focused Coping	Emotion Focused Coping ^a	Avoidant Coping
Mothers (n=15)			
Depression	-.268	.506	.249
Anxiety	-.015	.063	.221
Hostility	.617*	-.487	.017
Fathers (n=9)			
Depression	.160	.419	-.322
Anxiety	.426	.073	-.519
Hostility	-.676*	-.356	-.741

^a Partial correlation coefficients with type of birth as control variable for mothers and with number of additional children at home and hours spent in NICU as control variables for fathers.

* $p \leq .05$.

a moderate to strong negative association between Emotion Focused Coping and Hostility, which was close to significance ($pr=-.741$, $p=.057$). Mothers also had two moderate correlations that were close to significance; Avoidance had a positive correlation with Depression ($pr=.506$, $p=.078$), and Emotion Focused Coping had a weak to moderate negative correlation with Hostility ($pr=-.487$, $r=.078$). No other significant correlations were observed. The results of these correlations are summarized in Table 19.

A Fisher's r - z transformation was computed for the significant correlations between hostility and problem focused coping to ascertain if there were gender differences in this relationship. Significant gender differences were observed ($Z=3.082$, $p<.05$). This result indicates that for mothers, increased problem focused coping is associated with increased hostility, but for fathers, increased problem focused coping is actually associated with decreased hostility.

Goodness of Fit. Fisher's Exact tests were conducted for each gender to determine the goodness of fit of these subjects with regard to the three coping strategies assessed in this study. The goodness of fit variables utilized in hypothesis 4 were recoded into the values of "poor match" (≤ 4), "moderate match" (5-15), and "excellent match" (16). Then six Fisher's Exact tests (one for each coping style match for each gender) were conducted.

All parents scored in "poor match" or "moderate match" categories. For fathers, no significant group frequency deviations were found (all $\chi^2<.818$, all $p's\geq .366$). For mothers, significant group frequency deviations were observed for match of Avoidant Coping ($\chi^2=7.118$, $p=.008$) and match of Emotion Focused Coping ($\chi^2=9.941$, $p=.002$).

For both Avoidant and Emotion Focused Coping, there were significantly more mothers in the “poor match” category than the “moderate match category”. The Fisher’s Exact test for Problem Focused Coping was not significant ($\chi^2=.059, p=.808$). Thus it appears that mothers in this study are significantly more likely to have a poor match between controllability of the situation and use of Avoidant and Emotion Focused Coping Strategies.

DISCUSSION

Overview

The current study assessed stressors and coping strategies associated with the hospitalization of an infant in the NICU. The purpose of this study was two-fold: First, it set out to describe what stressors were being experienced and what coping strategies were currently being utilized by parents in the NICU, which would fill a void in the literature in this area. Secondly, it purported to determine if gender differences in the experience of stressors and use of coping mechanisms were present.

The results of this study supported the hypothesis that mothers report more stress than do fathers related to the NICU. There was a significant relationship for both genders between stress within the NICU and stress associated with daily life. However, there was no significant relationship between perceived controllability of the situation and the particular stressor (daily life stressor or NICU stressor). Interestingly, there appeared to be gender differences in the relationship between problem focused and emotion focused coping, with females having a strong positive relationship between the two types of coping, and males having essentially no relationship. For the most part, the match between controllability of the stressor and type of coping was not associated with significant differences in psychological variables. However, there was a significant relationship between match of coping and anxiety for women, although this was in the opposite direction of what was expected (negative as opposed to positive). Finally, supplementary analysis indicated a surprising finding for problem focused coping and hostility; whereas problem focused coping seems to be associated with decreased hostility in men, it is actually associated with increased hostility in women.

These results are discussed in detail below. Implications of the findings, suggestions for intervention for parents of NICU infants, and strengths and limitations of the current study are presented. Last to be discussed is suggestions for future research in this area.

Hypothesis 1: Primary Appraisal

Responses to the qualitative questions included on the demographic questionnaire indicated that parents did in fact perceive many facets of the NICU experience as stressors. For example, parents reported major illness-related stressors to be uncertainty about the health of their infant, their relationship with and about (i.e., sharing the baby with others) the infant, the machines in the NICU, and the NICU environment. Additionally, parents also reported daily hassles such as finding a parking place, and having to travel to and from the hospital (Lazarus & Folkman, 1984). These stressors corresponded very well to the measures of stress utilized in this study, as well as with past research in this area (Fowlie & McHaffie, 2006; Miles et al., 1999; Doering et al., 1999; Lovibond & Lovibond, 1995). It was also not surprising that parents felt isolated from other family members as they felt that their lives were centered in the NICU, as this is also a finding among parents whose children have been hospitalized for cancer and other chronic physical illnesses (Coffey, 2006; Forinder, 2002). Finally, the stressor of many staff changes is also consistent with research related to children with cancer and other physical illnesses (Coffey, 2006; Forinder, 2002).

Descriptive data. One notable finding is that the averages of the respondents indicated low to moderate levels of stress on the subscales of the PSS:NICU. Part of this relative lack of stress may be related to the NICU environment where this study was

conducted; the “pod” format allows for more privacy and less noise, related to the Sights and Sounds subscale (American Institute of Architects, 2005; White, 2003). Although many parents indicated relationship and parental role problems to be a stressor, the overall average score on this subscale was in the moderate range. This may be because parents are encouraged to hold, touch, and talk to their infants by the nurses in the unit. Even parents whose infants were tube fed were encouraged to attempt breast or bottle feeding, which research indicates is associated with increased parental role satisfaction (Rollins, 2006). Additionally, since all of the infants had been in the hospital since birth, the parents had never had an established routine with the infant. Thus, there were no established routines to be broken, something that often is a problem for parents of children with illnesses (Forinder, 2002). That Infant Appearance and Behaviour stress was in the moderate range was also somewhat surprising. This may be due to the fact that many of the infants in the unit, while medically high risk, were not seriously ill, and thus the Infant Appearance and Behaviour of the infant was not as impacted by the reason for hospitalization.

T-tests. This hypothesis was not entirely supported by a dependent samples *T*-test, as the only significant gender difference that was observed was in the stressors related to the parental role. However, these results are related to such a small sample size that they should be interpreted with caution. Since *t*-tests between those who completed the questionnaire as a couple versus individually indicated no significant differences, it is possible that low statistical power influenced this finding.

This finding somewhat inconsistent with the research related to stress in child illness, in that differences in the overall stress level and the subscales was expected

(Doering et al., 1999; Cronin et al., 1995). One explanation for this finding, aside from sample size, is that the current study utilized a more specific measure of stress than did past research, allowing for better differentiation between types of stressors mothers and fathers experience (Krajewski & Goffin, 2005; Doering et al., 1999; Cronin et al., 1995). One explanation for the non-significant finding that is supported by past research is that the couples approached the stressor as a couple, as has been found in other research studies related to illness in the family unit (Badr, 2004; vanEmmerick, 2002; Jordan & Revenson, 1999). However, that mothers would experience stress related to the parental role more so than fathers, was not entirely unexpected; in fact this is congruent with the research indicating that couples fall into traditional gender roles during NICU hospitalization, with the mother as the caretaker, and that fathers are more accepting of leaving much of the baby's care to the hospital staff (Jackson, Ternstedt, & Schooling, 2003; Dimitrovsky et al., 2000). However, clearly a larger sample size is necessary before any conclusions and explanations can be made about these stress levels.

Correlations. The correlational analyses conducted in this study for all participants broken down by gender indicated that for both genders, there was a significant relationship between NICU stress and stress in everyday life (DASS:S score). This finding is not necessarily unexpected, as it does not make assumptions regarding the mean levels of stress between genders. This finding is supported by past research that indicates stress in one area impacts feelings of stress in other areas. This is the case for the couples in this study.

Hypothesis 2: Controllability

It was anticipated that infant illness severity would be associated with perceived control such that parents of infants with higher risk levels would perceive their situation as less controllable than parents of infants with lower risk levels. This hypothesis was not supported by this study. This finding is inconsistent with past research related to child cancer which indicates that more severe illnesses are associated with decreased levels of control (Kupst, 1994). It is possible that NICU hospitalization should be conceptualized as a severe illness. In fact, in this study, on average parents indicated that the illness was “somewhat out of their control”, a finding also supported by the results of the qualitative data analysis, in which the most frequently cited stressor was the uncertainty of the outcome of their child’s illness. Perhaps, then, the conclusions put forth by other researchers of child cancer, diabetes, and brain injury, which state that illness is perceived as uncontrollable regardless of severity are in fact more valid, at least for this sample (McGrath et al., 2004; Endler et al., 2001; Williams & Koocher, 1998). However, this finding does not necessarily contradict the findings of Kupst (1994). Explanations for why most parents felt the illness was out of their control could be that the parents of NICU infants are not as involved in child’s physical care related to the illness as are parents of children with cancer (Clarke, Fletcher, & Schneider, 2005; Forinder, 2002). It is also possible that the retrospective nature of many of the research studies related to controllability of a stressor created a base for an unfounded hypothesis; that is, perhaps in cases of “severe” illness, with invasive treatments and relapses, parents’ recollections of the feelings of the events are less impacted by a favourable outcome than are those with less severe illness (Sann et al., 2002; Forinder, 2002).

Another alternative explanation for these findings related to controllability and risk level is that conceptualization of infant risk based on gestational age and birth weight may not have been an accurate representation of their medical fragility (i.e., severity of medical problem or setbacks). This potentially inaccurate index may have impacted the observed correlations between controllability and risk level. Sampling bias might have played a role in the findings as well, such that parents who perceived less control related to the NICU experience were in fact too overwhelmed to participate in the study. This restriction of range may have decreased correlation coefficients related to controllability and risk variables.

Finally, another explanation for these findings is perhaps that that “lack of control” in itself can be conceptualized as a stressor, which research has indicated to be the case for some individuals with chronic illness (Hoff, Mullins, Chaney, Hartman, & Domek, 2002). This idea was supported with the qualitative data analysis of this study, in which many parents listed the uncertainty of the illness, as well as an overall lack of control, when asked about stressors. Having information is related to Lazarus and Folkman’s idea of the illusion of control, in which getting information is a method of problem focused coping aimed at increasing feelings of control. Many parents cited getting information as a coping mechanism. Thus, perhaps a more inclusive conceptualization of secondary appraisal would include how controllable the participants felt the lack of control was. In other words, how much do you think you can change the uncertainty related to the child’s illness? Future research could elucidate this hypothesis.

Hypothesis 3: Coping Strategies

It was anticipated that gender differences would exist in the choice of coping mechanisms utilized by parents immediately following hospitalization of their infant. Specifically, it was expected that mothers would utilize more emotion focused strategies than fathers, and that fathers would engage in more problem focused and avoidant strategies than would mothers.

To address this hypothesis with the sample size and composition of this study, correlations between types of coping strategies were examined. For the females in the study, there was a significant positive relationship between Problem Focused Coping and Emotion Focused Coping, but there was essentially no relationship between these two variables for the fathers in this study. Additionally, there was a significant, moderate positive relationship between Problem Focused Coping and Avoidant Coping for mothers, which was not observed for fathers, although gender did not significantly impact this correlation.

These results indicate that for mothers, increased use of Problem Focused Coping is associated with increased use of Avoidant Coping and Emotion Focused Coping, but that this is not the case for fathers. This positive relationship between use of problem focused and emotion focused coping by females is consistent with the findings of Jordan & Revenson (1999). In fact, this finding is not necessarily inconsistent with other past research, as it makes no assumptions about the levels of coping that are utilized by the parents. There are many explanations for this finding. Perhaps, since the females are the ones who are expected to take care of the infant, they engage in more problem focused coping related to learning how to take care of their infant, including how to feed, weigh,

and best hold their infant (Forinder, 2002; Dimitrovsky et al., 2000; LaMontagne et al., 1994). However, as one person indicated in the qualitative data, there is a lot of sometimes contradictory information to absorb at one time, and new parents may be unsure of their abilities to take care of their infant; this has been observed even in healthy babies. Past research has implicated these two factors as stressors (Nuutila & Salanterä, 2006). Thus, learning how to take care of their infant and being involved in their care (Problem Focused Coping) may be a so-called double-edged sword for mothers, as it could expose the mother to further stress related to the parental role. These additional stressors might require more Avoidant and Emotion Focused Coping strategies. Support for this idea is found in the qualitative analysis, where one mother specifically mentioned that she found it helpful to receive reassurance that she was being a good parent from the nurses (Emotion Focused Coping), as well as in past research (Jackson et al., 2003). Furthermore, if the mother is on the unit feeding and taking care of the infant, she may be doing so at the expense of her own needs for rest, which was identified in the qualitative analysis as a significant stressor for mothers. Fathers, on the other hand, reported less stress associated with the parental role, according to the dependent samples t-test, and, according to qualitative data, describe less stress related to their own needs than do mothers. Thus it is possible that engaging in problem focused coping would not require them to engage in other types of coping due to the nature of the stressors they would face. One limitation to this explanation is that the explanation is based on the notion that the stress related to caring for the infant is controllable, and the others are less controllable, which was not specifically addressed in this study. Future research could better

understand the positive relationship between Problem Focused, Emotion Focused, and Avoidant Coping seen in mothers but not fathers.

Hypothesis 4: Goodness of Fit

Descriptive data. On average, the parents in this study reported levels of negative emotion in the average range (T-scores of 50 ± 10). This finding is inconsistent with the research indicating that parents experience heightened levels of depression, anxiety, and hostility associated with the NICU experience (Doering et al., 1999; Cronin et al., 1995). However, research conducted with parents of child cancer patients does indicate that it is the minority (20-25%) of individuals who experience clinically elevated levels of psychological maladjustment (Kazak, 1994). Based on this observation and Lazarus and Folkman's theory, it is inferred that parents are utilizing optimal coping strategies to cope with the NICU experience (Lazarus & Folkman, 1984).

Correlations. This study predicted that goodness of fit between controllability and coping would be associated with more favorable psychological outcome (less depression, less anxiety, and less hostility). For both genders, there was no relationship between the Match of Emotion Focused Coping and Avoidant Coping on the psychological variables. However, for females, there was a significant moderate positive relationship between Match of Problem Focused Coping and Anxiety and Dysphoria, which was not observed in males; for Dysphoria, it was determined that gender had a significant impact on the observed correlation coefficients. This finding was unexpected, because it indicates that for mothers, a situation appraised as controllable and approached with Problem Focused Coping actually increased Dysphoria (overall negative affect). This finding contradicts the research (and theory) of Lazarus and Folkman (1984) (Decoster & Cummings, 2004).

However, this is consistent with the findings of Manne et al., (2003), which indicated that for mothers, planning related to child cancer increased depressive symptoms.

One explanation for could be related to the relationship between Problem Focused and Emotion Focused Coping observed in the previous hypothesis. Perhaps for mothers, even though taking care of their infant is controllable (i.e., they feel they can master it), engaging in mastering it creates feelings of negative affect; perhaps then Emotion Focused Coping and Avoidance are engaged as a coping mechanism.

Supplemental Quantitative Analyses: Stressors and Coping Strategies

The results of supplementary analyses indicated that females have significant moderate positive correlations between stress related to the parental role and all three types of coping. These correlations were not observed for fathers. Furthermore, it appears that women utilize Avoidance Coping to cope with stress related to everyday life, Sights and Sounds of the NICU, and with stress related to the Relationship and Parental Role. Fathers utilize Avoidant Coping to cope with Infant Appearance and Behaviour and Problem Focused Coping to cope with the Relationship and Parental Role. Z-tests indicated that all of the above correlations were not significantly different between genders. A significant gender difference was observed related to Problem Focused Coping: for females, Problem Focused Coping was associated with increased Hostility; for males, Problem Focused Coping was associated with decreased Hostility. These findings were unexpected in the light of the Transactional Model (DeCoster & Cummings, 2004; Lazarus & Folkman, 1984)

These findings indicate that for women, Problem Focused Coping, Emotion Focused Coping, and Avoidant Coping were associated with the experience of stress in

the parental role. Since all three of these coping strategies are associated in the same direction with the stressor, it is unlikely that these results are due to an improper match between the stressor and the coping strategy (DeCoster & Cummings, 2004).

Additionally, the use of Problem Focused Coping is actually associated with increased Hostility on the part of the mothers. Perhaps these results should be interpreted as support for the argument put forth above; that mothers experiencing stress in the parental role engage in coping strategies to deal with the stressor; however, dealing with the stressor is associated with negative affect, which has to be dealt with through other coping strategies. It is interesting, however, that mothers also use Avoidance to cope with the Relationship and Parental Role. It is possible that different facets of the parental role are associated with different coping strategies.

The results of the supplementary Fisher's Exact test indicated that with regard to stressors overall, mothers were likely to have a poor match between controllability and Emotion Focused and Avoidant Coping. Interestingly, mothers were equally likely to have a poor or moderate match between controllability and problem focused coping, which as one may recall was associated with increased Dysphoria and Hostility. This finding does not necessarily contradict the argument put forth above related to match and stress associated with the parental role, as the Fisher's Exact test refers to stressors in general. This finding seems to indicate that mothers are perceiving more control than is valid in the situation, and are acting as such. However, the results of this study indicated that overall, parents perceived only moderate levels of control. A more likely explanation is that since lack of control was identified as a stressor for parents, the mothers are trying

to gain control in a situation that might not allow for it in an attempt to alleviate this stressor. Further research could better elucidate the relationships outlined above.

Qualitative Analyses

As mentioned above, the stressors and coping responses assessed by this study were congruent with the qualitative data presented. One interesting observation regarding the stressors was that more respondents mentioned daily hassles than did those who mentioned issues related to the NICU environment, and infant appearance and behaviour. At first glance one might believe that this is because the questionnaires had already asked about these issues. However, this idea is disputed by the fact that when one examines the *coping* responses, it is evident that the frequent responses there (such as talking to people about the situation) were addressed on the questionnaires; furthermore, it is likely that most participants filled out the questionnaires in the order they were presented; thus the open ended questions were presented first, before any questions of the PSS:NICU that addressed how the child looks and the NICU environment. A likely explanation rests with another aspect of Lazarus and Folkman's theory, which states that daily hassles are often associated with significant amounts of stress (Lazarus & Folkman, 1984). An additional explanation for this finding, however, is that individual's heightened stress levels associated with the hospitalization of their infant make the parents more irritable and more likely to feel that these inconveniences (having to drive back and forth, not finding a parking place) are stressful. This idea was supported in this study, in that total level of non-NICU related stress (DASS:S total score) was positively correlated with NICU stress.

An additional finding of note was that many parents cited both lack of information and receipt of information (too much at one time, contradictory information and opinions) as stressors. These findings replicate those of past research with parents of children with cancer and other physical illnesses and seem to indicate a need to find a balance of information provision on the part of hospital staff, especially in the light of research implicating effective information gathering with trust in the hospital staff (Nuutila & Salantere, 2006).

Lazarus and Folkman's Theory Revisited

This study identified stressors, coping strategies, and outcomes particular to the NICU experience in relation to Lazarus and Folkman's Transactional Model of Stress and Coping. The results of this study raise the question of the utility of including secondary appraisal in the model for optimal application to the NICU experience (see Figure 2 throughout).

Primary Appraisal. In terms of primary appraisal, findings were congruent with Lazarus and Folkman's theory. The NICU experience was reported as stressful, and positive correlations between NICU stressors and daily hassles were observed for each gender. Importantly, mothers appraised issues related to their parental role as more stressful than fathers.

Secondary Appraisal. Controllability may or may not be implicated in coping with the NICU experience. Controllability was not associated with any particular stressor, nor was controllability associated with risk level of the infant in this sample. Additionally, respondents indicated that lack of control in and of itself was a stressor.

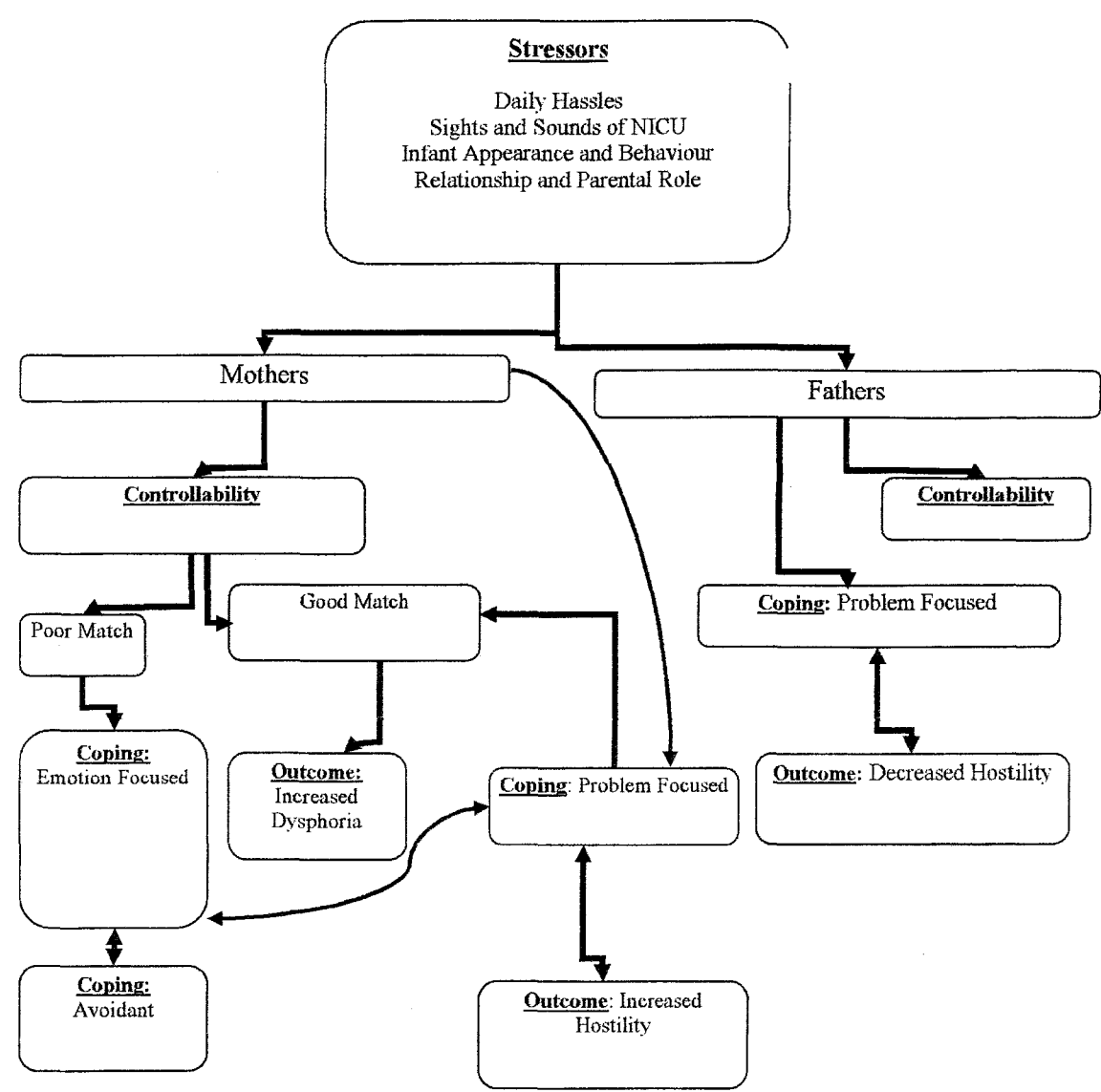


Figure 2. Pictorial Representation of Lazarus and Folkman’s Transactional Model of Stress and Coping Delineating the Observed Relationships of the Current Study.

Perhaps in terms of the NICU experience, secondary appraisal is not relevant for coping. This quandary will be discussed further below.

Coping. Lazarus and Folkman's theory does not mention the possibility that two types of coping might be utilized for the same situation. While for fathers no modifications to the model were indicated in the current study, for mothers coping with the NICU experience, Problem Focused Coping and Emotion Focused Coping occur together. The possibility of exposure to negative emotions related to caring for their infant and the multi-faceted nature of the NICU experience as a stressor are all possible explanations for the findings related to mothers' coping strategy use.

Coping and Outcome: With Good Match. For fathers, "match" was not related to outcome. However, for mothers, a good match between Problem Focused Coping and controllability was associated with increased dysphoria. This is incongruent with the Transactional Model; it is possible that use of Problem Focused Coping brings on other stressors associated with the NICU experience, discussed immediately above.

Coping and Outcome: Regardless of Match. Mothers' and fathers' use of Emotion Focused Coping and Avoidant Coping strategies was unrelated to a particular outcome, but use of Problem Focused Coping was associated with increased hostility for mothers and decreased hostility for fathers. This observation was unrelated to the perception of controllability of the stressor, and thus is not supportive of the Transactional Model.

The Quandary of Controllability. Whether controllability should be considered as a component of primary or secondary appraisal is unclear. There was one instance of "match" of controllability and the stressor being related to outcome in this study (mothers

with good match with PFC and increased dysphoria), and the finding was incongruent with Lazarus and Folkman's theory. Additionally, for the other two coping strategies (Emotion Focused Coping and Avoidant Coping), mothers were likely to have a "poor match" between perceived controllability and use of coping strategies. No associations were observed between "match" and outcome for fathers, and fathers were equally likely to be a good or poor match in all three coping strategies. Also, fathers' use of Problem Focused Coping was associated with decreased Hostility regardless of match.

One explanation for the above findings is that the theory's implicit assumption that perceived control and actual control of the situation is congruent impacted the results of the current study, such that mothers were less realistic in perceptions of control than were fathers. For example, mothers may have perceived "high" levels of control when they were really "low" and used PFC, resulting in increased dysphoria. The observed likelihood of mismatch regarding mothers' perceived control in the context of EFC and AVD seems to indicate that, if the "invalid perception" hypothesis is true, mothers are perceiving (or reporting) higher levels of control overall than is valid.

Another explanation is that controllability means something qualitatively different for the respective genders. This "qualitative difference" hypothesis would explain the differential observations observed between the genders in this study, discussed immediately above, and seems to indicate that the construct of secondary appraisal in the Transactional Model should only apply to mothers. The applicability of secondary appraisal even in the context of the qualitative difference hypothesis loses some support in light of the fact that mothers, not fathers, indicated "lack of control" as a *stressor*. Thus, the qualitative difference might be that for mothers, controllability is an applicable

construct in the Transactional Model as a part of primary appraisal (i.e., a stressor). This lack of control may be felt in relation to a stressor that is particular to the female gender (i.e., stress related to the parental role), or may be related in some way to the experience of being or having recently been under medical care, which was exclusively experienced by the mothers in the study. Further research related to the specific nature of controllability is necessary before a final decision on the construct's applicability to the NICU experience for either gender can be reached.

Practical Implications

The purpose of this study was not only to further the academic research in this area; it was hoped that the results of this study would assist Windsor Regional Hospital in identifying intervention methods to reduce parent stress.

These results provide evidence first to indicate that mothers experience more stress related to the parental role than do fathers. These results also indicate that on average, parents are reporting moderate amounts of stress associated with the hospitalization of their infant and low to moderate amounts of stress associated with daily life, which may be related to the atmosphere of the NICU that the hospital is providing. Furthermore, regardless of the "objective" risk status of their infant, parents do feel that the infant's hospitalization is at least somewhat out of their control. As well, the mothers in this study tend to utilize Problem and Emotion Focused Coping together, whereas fathers' use of coping strategies is not significantly related. The match between controllability and coping strategies was only significantly related to Anxiety, and it appears that for mothers, coping "optimally" with stressors actually increases anxiety. Interestingly, gender has a significant impact on the correlation between Hostility and

Problem Focused Coping, with a positive impact (i.e., negative relationship—less hostility) observed for fathers, but a negative impact (i.e., positive relationship—more hostility) observed for mothers.

These results provide evidence that the NICU in which this study was conducted provides a suitable atmosphere for the parents in this study, at least in terms of stressors and psychological variables. When conducting interventions or providing support to parents of infants in the NICU, it would be prudent to recall that parents are likely feeling out of control of the situation regardless of the “objective” nature of the risk status; that is, while doctors or nurses may feel that the illness is controllable because it is “low risk”, these feelings are not mirrored in the parents.

In terms of coping, it appears that mothers utilize the coping strategies of Problem Focused Coping and Emotion Focused Coping together. For mothers, Problem Focused Coping is associated with increased negative affect. Perhaps interventions that capitalize on the use of both problem focused and emotion focused coping strategies would be optimal for mothers. However, further research into the relationship between Problem Focused Coping and negative emotion does need to be conducted, as perhaps it is the use of Problem Focused Coping that is “causing” the Anxiety. For fathers, however, there does not appear to be a significant relationship between the coping strategies.

Interventions for fathers would be less complex. Perhaps, since the situation appears to be out of their control, emotion focused strategies aimed at increasing the illusion of control could be implemented. This likely would benefit mothers as well.

Receiving information related to their child’s illness is one way to create the illusion of control, and receiving information was indicated as a desired coping strategy

by parents in this study. Concise information presented in ways that parents can understand, coupled with sensitivity to the dissatisfaction that comes with receiving contradictory information would likely be beneficial to parents of hospitalized infants, and is also likely to facilitate trust in the medical staff.

Strengths

One of the strengths of this research is that it included fathers of hospitalized infants, a sample that has been overlooked in much previous research. Furthermore, this study also included quantitative as well as qualitative analysis of mother and father responses, whereas other studies have often only had qualitative analyses. Another strength of this study is that it was grounded in theory. This is beneficial because it created a research base to begin from as well as established a relationship between the variables. Finally, this study assessed coping, stressors, and outcome, as opposed to just stressors and outcomes.

Limitations

Measures. The current study had several notable limitations. Firstly, the MAACL-R:S was a state measure, but the other measures asked about the overall NICU experience. While it is possible that their answers were a representation of their emotions over the time they spent in the NICU, there is the possibility that participants' usual emotions did not correspond with the emotions checked off. This creates a mismatch between the stressor, controllability, and coping, and the outcome. This argument becomes more valid when one remembers that the parents filled out the questionnaires at their convenience; it is likely that parents filled out the questionnaires on days that were going well for them. That is, it is unlikely that for many parents filling out a form would

be an effective coping mechanism for a setback with their infant in the NICU. Perhaps the instructions could be re-worded (i.e., how have you usually felt during your NICU stay, or please check all of these that have pertained to you during your NICU stay) so this mismatch between the constructs does not occur.

Sampling bias. Firstly, the current study was a survey study and thus is subject to response bias. This researcher noted that several of the mothers expressed their desire to participate because they were under stress and had ideas about what would decrease their stress, usually having information. Thus the study may overestimate the amount of stress parents are experiencing. Alternatively, at least one participant dropped out due to high levels of stress; it is possible that other surveys were not returned because parents were experiencing high levels of stress that precluded their desire to participate. Additionally, no information was available on the number or characteristics of parents who were not approached for participation by the Clinical Practice Coordinator of the NICU and thus did not have the opportunity to participate in this study.

Additionally, it is possible that fathers who participated in this study are not representative of all of the fathers in the NICU. It was observed in this study that for fathers, number of hours spent in the NICU was significantly negatively correlated with the number of additional children at home. It is possible then, that fathers for whom this was not their first child were more difficult to recruit for participation and thus are underrepresented in the current sample.

Thirdly, this sample also may not have been representative of all parents who might have infants in the NICU in terms of demographic variables. It is of particular concern that so few participants in the current study were non-Caucasian. While the

persons who were approached for participation were mostly Caucasian, the response rate for those who were approached that were non-Caucasian was low. Specifically, eight persons who were non-Caucasian were approached; only three returned their questionnaires. It was observed that those who returned their questionnaires had greater understanding of English, and spoke English without a pronounced accent, and appeared to be part of the majority group. It is possible that a language or cultural barrier prevented participation of non-Caucasian individuals.

Sample Size. The low sample size in this study translates to low power and limitations on the types of analyses that can be conducted.

Time of Sampling. It may be that the time of sampling impacted the results of this study. Effective coping does not necessarily occur in a short period of time. Perhaps the reason that studies show decreased impact of stressors after approximately one month (three months in some studies) is that the benefits of coping effectively with stressors are not seen immediately. On average, infants were approximately 10-15 days old, well inside the one-month period where the psychosocial impact of the stressor is supposedly at its worst. This could be kept in mind when coming up with interventions.

Suggestions for Future Research

Future research studies should address weaknesses of the current study. This might include changes to protocol, such as improving sampling methods to extend participation to all new admits to the NICU. Additionally, it would be nice to better ascertain the differences between those who respond to these surveys and those who do not. Additionally, simply increasing sample size would enable further hypothesis testing with increased power. These changes would increase the external validity of the research.

Specific questions that were brought up in this study's results could be addressed in future research. One area of interest is the conceptualization of controllability as a factor in appraisal or a stressor in itself. Further, an explanation for the relationship between types of coping for mothers but not fathers could also be examined. Additionally, it would be beneficial, albeit idealistic, to elucidate the temporal relationship between the variables of the theory that underlies this study. For example, it was assumed that better coping would be associated with better psychological outcome, but perhaps it is the psychological outcome (i.e., the feeling of being angry or anxious) that instigates coping responses. Thus perhaps it would be better to examine participant's feelings of controllability over their feelings, not the situation. Additionally, it might be interesting to see if there is a so called "sleeper" effect of coping strategies in that changes are not observed until after 1 month.

Other research could build upon the findings of this study. One potential area could address differences in the measured variables between couples who have a child in the Paediatric NICU and those whose neonate is in the NICU. One could also address differences between parents whose infants (or children) have been ill since birth (i.e., chronic illness or congenital illness) versus children who were once healthy but have an acute illness. Additionally, one could also research differences between couples for which this child was their first and for those who had other children at home. As well, during the review of the consent form, two of the participants in this study who had at least one other child at home indicated that they had already been through one NICU experience with the first child. They indicated that in some ways it was less stressful in that they knew what to expect in terms of routines, but in other ways having the

experience before did not help with stress. Additionally, it would be interesting to ask participants what services they would like to have as opposed to indirectly elucidating what they might benefit from; research related to this might also examine the congruity between the indirect and direct measures of service desire. Finally, it would be interesting to conduct this research in a NICU with the typical open concept format and in NICUs that are adopting the single room format, and examine differences in stress and coping associated with the NICU environment. For example, in the pod and single room format there is more privacy, which might translate into less contact with other parents but more contact with your spouse; the opposite might be observed in an open concept NICU, which has implications for coping in terms of receiving social support.

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Appendix A



Letter of Invitation

You are invited to participate in a study on parental stress in the NICU. We are concerned about the stress that parents like you experience when they have a sick baby in the NICU, and we hope that our results will help us to develop better ways of helping parents with this very difficult situation. This study is being conducted by Amy Camodeca, M.A., and Dr. Sylvia Voelker, Ph.D., at the University of Windsor, and Dr. Cory Saunders at the Windsor Regional Children's Centre.

By participating in this study, you will be providing information about how parents cope with stress associated with having an infant in the NICU. If you choose to participate, you will fill out 6 questionnaires. This would take approximately 45 minutes of your time.

If you choose to participate, your questionnaires will be identified by number only. In addition, your participation in this study would not be known by anyone except for the researchers that are directly involved in data collection.

Participating in this study is entirely up to you. The care of your infant will **in no way** be impacted by your participation in this study.

If you think you would like to participate in this study, please inform one of the nurses that you would like to be approached to be given more information about this study. The co-investigator (Amy Camodeca) can provide you with further information and, if you choose to participate, a questionnaire packet to fill out at your convenience.

Thank you,

Amy Camodeca, M.A.
University of Windsor
Psychology Department

Appendix B

Demographic Questionnaire

Thank you for your participation in this study. Please answer the following questions by circling the appropriate response or filling in the blank.

I am: Male Female

Age: ____ years

Ethnicity: African American
 Asian
 Caucasian
 Indian
 Pacific Islander
 Other (please indicate): _____

Number of years of schooling completed: _____

Marital Status: Married Cohabitation

How long have you been together as a couple? ____ years

Number of children IN ADDITION to the infant: _____

Occupation: _____
(If currently unemployed or on sick leave, please give most recent occupation)

How many hours a week do you work outside the home? ____ hours

How much parental leave have you taken? _____

How much unpaid leave of absence have you taken? _____

Approximately how many hours a week do you spend in the NICU? _____ hours

How old is your infant currently? ____ years ____ months ____ weeks

At birth, my infant weighed ____ grams **and was** ____ weeks gestation.

My infant's reason for being in the NICU is (if known):

How much of a burden have extra costs associated with having an infant in the NICU been to your family?

1 2 3 4 5
None Very much

How much support has been available to you from your extended family?

1 2 3 4 5
None Quite a bit

What do you consider to be some of the stressors associated with having your infant in the NICU?

What are you finding to be the best ways to cope with your infant's hospitalization?

Appendix C



LETTER OF INFORMATION FOR CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Parental Stress and the Level III NICU Experience: An Analysis of Gender and Coping Strategies

You are asked to participate in a research study conducted by Amy Camodeca, Dr. Sylvia Voelker, and Dr. Cory Saunders from the Department of Psychology at the University of Windsor. This research is being conducted in cooperation with Windsor Regional Hospital. The results of this study will contribute to a student Master's Thesis.

If you have any questions or concerns about the research, please feel free to contact Dr. Sylvia Voelker, Faculty Supervisor at the University of Windsor, (519) 253-3000 ext. 2249, or Dr. Cory Saunders at the Windsor Regional Children's Centre, (519) 257-5288 x74052.

PURPOSE OF THE STUDY

The purpose of the study is to understand the experience of parents of infants placed in the Neonatal Intensive Care Unit. We are interested in the perceived stressors associated with your infants' hospitalization as well as how you are coping with these stressors.

PROCEDURES

If you volunteer to participate in this study, we would ask you to read and answer questions on 6 surveys. The questions relate to the stressors you perceive to be important to you and how you are coping with them. We would like you to complete the questionnaires at the Windsor Regional Hospital. Completing the surveys will take approximately 45 minutes of your time.

Possibly, a follow up study will be conducted to determine the long term outcome associated with having a child in the NICU. If you elect to be a potential participant in this study, the researchers will contact you by phone through Windsor Regional Hospital with your consent.

POTENTIAL RISKS AND DISCOMFORTS

The questionnaires in this study will ask you about your current NICU experience. There is the possibility that reading and answering questions related to this experience will increase the stress and psychological discomfort associated with the hospitalization of your infant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participation in this study will not necessarily benefit you individually. However, by participating in this study, you are providing information to the Windsor Regional Hospital as well as to society in general. This information can be utilized in the development and implementation of services to help other parents who have a hospitalized infant.

PAYMENT FOR PARTICIPATION

You will not receive any payment for participation. If you choose, you may enter your name in a raffle to win a gift certificate to a local restaurant. Your responses to the questionnaires will still remain anonymous and confidential.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. To ensure confidentiality of your responses, please do not put your name on any of the surveys. All data will be kept by the investigator in a locked area. Only the investigators listed in the first paragraph will have access to this data. Limited information may be released to Windsor Regional for service planning purposes and may be published in scientific journals. Such information will consist of general results of the study, such as group averages. No specific individuals will be identified, and no identifying information will be released. Data from this study will be retained by the researchers for 5 years after the results are published.

PARTICIPATION AND WITHDRAWAL

Participation in this study will not have any impact on the medical care of your child or any other services you currently receive from the Windsor Regional Hospital. You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. Since collection of the data is anonymous, you will not be able to withdraw participation after you have returned your questionnaires.

FEEDBACK OF THE RESULTS OF THIS STUDY TO THE SUBJECTS

Results of this study will be available by December 2006. A description of the results of this study will be provided to participants upon request. Also, results may be viewed on the University of Windsor website at www.uwindsor.ca/reb.

RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator
University of Windsor
Windsor, Ontario N9B 3P4
telephone: 519-253-3000, ext. 3916
e-mail: lbunn@uwindsor.ca

OR Windsor Regional Hospital Research Ethics Board
1995 Lens Ave
Windsor, Ontario N8W 1L9
telephone: 519 254-5577, ext. 52278

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies with your consent. You do not have to volunteer to be contacted for further studies in order to participate in the current study.

Please read and indicate your response:

I am willing to be contacted in the future should a follow up study be conducted to determine how parents are doing after their infant is discharged from the NICU. Do you give consent to be contacted by phone to ask if you are willing to participate?

☐ Yes

☐ No

Participant Initials: _____

IF YES: please indicate a number where you can be reached: _____

Appendix D



CONSENT TO PARTICIPATE IN RESEARCH

Title of Study: Parental Stress and the Level III NICU Experience: An Analysis of Gender and Coping Strategies

You are asked to participate in a research study conducted by Amy Camodeca and Dr. Sylvia Voelker, from the Department of Psychology at the University of Windsor, and Dr. Cory Saunders from the Windsor Regional Children's Centre. This research is being conducted in cooperation with Windsor Regional Hospital. The results of this study will contribute to a student Master's Thesis.

If you have any questions or concerns about the research, please feel free to contact Dr. Sylvia Voelker, Faculty Supervisor, at the University of Windsor, (519) 253-3000 ext. 2249, or Dr. Cory Saunders at the Windsor Regional Children's Centre, (519) 257-5288, x74052.

PURPOSE OF THE STUDY

The purpose of the study is to better understand the experience of parents of infants placed in the Neonatal Intensive Care Unit. We are interested in the perceived stressors associated with your infants' hospitalization as well as how you are coping with these stressors.

PROCEDURES

If you volunteer to participate in this study, we would ask you to read and answer questions on 6 surveys. The questions relate to the stressors you perceive to be important to you and how you are coping with them. We would like you to complete the questionnaires at the Windsor Regional Hospital. Completing the surveys will take approximately 45 minutes of your time.

POTENTIAL RISKS AND DISCOMFORTS

The questionnaires in this study will ask you about your current NICU experience. There is the possibility that reading and answering questions related to this experience will increase the stress and psychological discomfort associated with the hospitalization of your infant.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

Participation in this study will not necessarily benefit you individually. However, by participating in this study, you are providing information to Windsor Regional Hospital as well as to society in general. This information can be utilized in the development and implementation of services to help other parents who have a hospitalized infant.

PAYMENT FOR PARTICIPATION

You will not receive any payment for participation. If you choose, you may enter your name in a raffle to win a gift certificate to a local restaurant. Your responses to the questionnaires will still remain anonymous and confidential.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission. To ensure confidentiality of your responses, please do not put your name on any of the surveys. All data will be kept by the investigator in a locked area. Only the investigators listed in the first paragraph will have access to this data.

Limited information may be released to the Windsor Regional Hospital for service planning purposes and may be published in scientific journals. Such information will consist of general results of the study, such as group averages. No specific individuals will be identified, and no identifying information will be released. Data from this study will be retained by the researchers for 5 years after publication.

PARTICIPATION AND WITHDRAWAL

Participation in this study will not have any impact on the medical care of your child or any other services you currently receive from the Windsor Regional Hospital. You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and still remain in the study. Since collection of the data is anonymous, you will not be able to withdraw participation after you have returned your questionnaires.

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Results of this study will be available by December 2006. A description of the results of this study will be provided to participants upon request. Also, results may be viewed on the University of Windsor website at www.uwindsor.ca/reb.

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You may withdraw your consent at any time and discontinue participation without penalty. This study has been reviewed and received ethics clearance through the University of Windsor Research Ethics Board. If you have questions regarding your rights as a research subject, contact:

Research Ethics Coordinator	OR	Windsor Regional Hospital Research Ethics Board
University of Windsor		1995 Lens Ave
Windsor, Ontario N9B 3P4		Windsor, Ontario N8W 1L9
telephone: 519-253-3000, ext. 3916		telephone: 519 254-5577, ext. 52278
e-mail: lbunn@uwindsor.ca		

SIGNATURE OF RESEARCH SUBJECT/LEGAL REPRESENTATIVE

I understand the information provided for the study. **Parental Stress and the Level III NICU Experience: An Analysis of Gender and Coping Strategies** as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Signature of Subject

Date

SIGNATURE OF INVESTIGATOR

These are the terms under which I will conduct research.

Signature of Investigator

Date

SUBSEQUENT USE OF DATA

These data may be used in subsequent studies with your consent. You do not have to volunteer to be contacted for further studies in order to participate in the current study.

Please read and indicate your response:

I am willing to be contacted in the future should a follow up study be conducted to determine how parents are doing after their infant is discharged from the NICU. Do you give consent to be contacted by phone to ask if you are willing to participate?

☐ Yes

☐ No

Participant Initials: _____

IF YES: please indicate a number where you can be reached: _____

Appendix E

Debriefing Statement

Thank you for participating in the study **Parental Stress and the Level III NICU Experience: An Analysis of Gender and Coping Strategies**. Your participation is greatly appreciated. By participating, you have provided information to the Windsor Regional Hospital as well as to society in general. This information can be utilized in the development and implementation of services to help other parents who have a hospitalized infant. If you have any questions or concerns about the research, please feel free to contact Dr. Sylvia Voelker, Faculty Supervisor, at the University of Windsor, (519) 253-3000 ext. 2249, or Dr. Cory Saunders at the Windsor Regional Children's Centre, at (519) 257-5288, x74052. It is hoped that participation in this study has not led to psychological distress. If you feel that you would like to discuss your situation with someone, such as a Mental Health Professional, please contact:

Windsor Regional Hospital
1995 Lens Ave
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