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Infant health care use: the influences of maternal psychosocial factors

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INFANT HEALTH CARE USE: THE INFLUENCES OF MATERNAL

PSYCHOSOCIAL FACTORS

by

Tracy E. Moran

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Psychology
in the Graduate College of
The University of Iowa

August 2008

Thesis Supervisor: Professor Michael O'Hara

ABSTRACT

Infant health care use has rarely been examined empirically. A growing literature links maternal health and psychosocial variables to broadly defined pediatric health care use. The Common Sense Model of health and illness behaviors (CSM) provides a framework from which to view the role of the maternal psychosocial variables examined (i.e. maternal negative affect, lay consultation and parenting self-efficacy) in infant health care decision-making. Findings for infant health care use are reported specific to referral source (i.e. mother versus physician initiated infant health care). Physician initiated visits were not significantly predicted by the models tested, consistent with the independence of predictor variables from initiation source (i.e. mothers versus physicians). Mother initiated visits were significantly predicted by the model containing the Lay Consultation worry item, which was also the only variable that significantly predicted infant health care use in the model. The main dissertation study finding is the independence of infant health care use decision-making from most of the maternal psychosocial, demographic and enabling variables examined. The finding is positive for the health care system as it suggests that mothers generally do not seek infant health care for their own emotional regulation and/or reassurance in their parenting competency. The contextual component of the CSM, as measured by lay consultation, received support from the findings, suggesting that mothers' perceived worry of her lay consults results in greater infant health care use. Implications for mothers and infants include community psychoeducation programs and home visiting programs focusing on infant health and development psychoeducation.

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Graduate College
The University of Iowa
Iowa City, Iowa

CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph.D. thesis of

Tracy E. Moran

has been approved by the Examining Committee
for the thesis requirement for the Doctor of Philosophy
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To my son, Farouk Shaaban, my inspiration and my constant source of amazement

I may not, perhaps be forgiven for introducing sober matters with a frivolous notion, but the problem of making sense out of the seeming chaos of experience reminds me of my childish desire to send someone a parcel of water in the mail. The recipient unties the string, releasing the deluge in his lap.

Alan Watts
The Wisdom of Insecurity

ACKNOWLEDGMENTS

The Prophet Muhammad (pbuh) stated, "'Heaven lies at the feet of a mother." Apparently, in my case, so does a doctorate of philosophy. To acknowledge my mother for her emotional support, childcare assistance, financial contributions, wisdom, and endless worry is but a hint of the gratitude that I continually feel towards her, even when it seems otherwise. I know, mom, I'll call soon!

My advisor, Dr. Michael O'Hara, has both fostered intellectual independence and provided an immense amount of knowledge and support. I feel lucky to have worked with such a renowned and kind academic and administrator. My Child Psychiatry mentor, Dr. Beth Troutman, guided my path more than she even realizes. I owe her my passion for dyadic research and clinical work. My primary clinical supervisor, Dr. James Marchman, continues to inspire me to do more for my patients, to read and integrate the clinical research literature, and to live life according to my values. My undergraduate and master degrees advisor, Dr. Richard Kurtz, supported my leap into academia at a young age. The psychology faculty at the University of Iowa challenge their students to be the best and brightest. Now that I have completed the program, I can honestly thank them for holding us to a high standard. The faculty at Tulane University, particularly Drs. Larrieu, Smyke, Wajda-Johnston, and Zeanah, have gone above and beyond to train and support me at a time when all are overwhelmed with rebuilding the city we love.

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ABSTRACT

Infant health care use has rarely been examined empirically. A growing literature links maternal health and psychosocial variables to broadly defined pediatric health care use. The Common Sense Model of health and illness behaviors (CSM) provides a framework from which to view the role of the maternal psychosocial variables examined (i.e. maternal negative affect, lay consultation and parenting self-efficacy) in infant health care decision-making. Findings for infant health care use are reported specific to referral source (i.e. mother versus physician initiated infant health care). Physician initiated visits were not significantly predicted by the models tested, consistent with the independence of predictor variables from initiation source (i.e. mothers versus physicians). Mother initiated visits were significantly predicted by the model containing the Lay Consultation worry item, which was also the only variable that significantly predicted infant health care use in the model. The main dissertation study finding is the independence of infant health care use decision-making from most of the maternal psychosocial, demographic and enabling variables examined. The finding is positive for the health care system as it suggests that mothers generally do not seek infant health care for their own emotional regulation and/or reassurance in their parenting competency. The contextual component of the CSM, as measured by lay consultation, received support from the findings, suggesting that mothers' perceived worry of her lay consults results in greater infant health care use. Implications for mothers and infants include community psychoeducation programs and home visiting programs focusing on infant health and development psychoeducation.

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SECTION 1 INTRODUCTION

Prior Attempts at Explaining Pediatric Health Care Use

Child health status is the single greatest determinant of pediatric health care use; however, several studies have agreed that child health only accounts for around one-sixth of the statistical variance in predictions of pediatric health care use (Black & Jodorkovsky, 1994; Janicke & Finney, 2001; Kelleher & Starfield, 1990; Newacheck & Halfon, 1986; Starfield et al., 1985; Wolfe, 1980). In addition to physical symptoms, children's psychosocial symptoms are also associated with heightened levels of use of pediatric medical services (Janicke & Finney, 2001; Riley, Finney, & Mellits, 1993; Woodward et al., 1988). These prior studies examined health care use in older children. Psychosocial symptoms in younger children and infants have seldom been studied in relation to health care use. Signs, symptoms and ill defined conditions seen during infancy (e.g., fussiness, irritability) likely heighten both infant and parent distress, perhaps leading parents to seek pediatric health care for a dual purpose (i.e. to alleviate both their infant's and their own personal distress). Fussiness and irritability, for example, are positively correlated with maternal negative affect (Newacheck & Halfon, 1986; Riley et al., 1993; Tessler & Mechanic; 1978; Wolfe, 1980), which is related to adult health care seeking. Additionally, researchers have found that the parents' perception of their children's health status is a significant, but weak predictor of both use versus nonuse and of frequency of use. Specifically, mothers who perceive their child to be vulnerable use significantly more emergency services for their child than mothers who do not perceive their children as vulnerable, even when their perception is deemed unwarranted by physicians (Black & Jodorkovsky, 1994).

Pediatric health care decision-making is a relatively understudied area of health psychology, however, numerous variables related to the child, parents, and family have been examined alone and in combination to predict pediatric health care use. Much of the work in predicting children's health care use based on Behavioral Model of Health Services Use developed by Andersen and Aday (1995). The model accounts for factors important to determining health care use, that is, predisposing (e.g., sociodemographic and belief variables influencing health care seeking for the self), enabling (e.g., family resources such as insurance and income), and need (e.g., perceived and actual health status) factors. Out of the numerous variables included in predictions of child health care use, need factors (i.e. health status measures) variables typically account for the greatest additional variance in use (Janicke & Finney, 2003). However, multivariate studies of numerous variables found to be correlated with pediatric health care use typically account for around a third of the overall variance. As discussed by Janicke and Finney (2003),

> "The literature does not present a coherent picture of the processes that drive and maintain diverse patterns of pediatric primary care services. As primary care physicians take on a greater role as gatekeepers of the health care system, better understanding of the diverse factors that influence a parent's decision to seek physician assistance are critical to ensure that families are connected with the services best suited to address their concerns" (p. 547).

Many of the significant predictors of children's health care use reflect the importance of family characteristics such as maternal education level, maternal employment status, family size, family dysfunction, and parenting stress (Abidin & Wilfong, 1989; Mechanic, 1974; Riley, et al., 1993; Tessler, Mechanic, & Dimond, 1976; Ward et al., 2006; Wolfe, 1980). Prior studies have found that patterns of health care use tend to be similar across siblings and within families (Shor, Starfield, Stidley, & Hankin, 1987; Ward et al., 2006), perhaps due to parental modeling of health care use, attitudes

regarding health care, propensity towards symptom focus in the family, or any combination of these factors (Janicke & Finney, 2000).   Individual differences resulting in higher use of care include predisposing factors such as young age, white race, non Hispanic ethnicity, higher maternal education level, higher socioeconomic status, and 2-parent households (Newacheck & Halfon, 1986; Riley et al., 1993; Woodward et al., 1988). In addition, factors enabling health care seeking such as insurance coverage and continuity of care (Newacheck & Halfon, 1986 & Riley et al., 1993) have been shown to be influential determinants of initial care seeking as well as frequency of care seeking for children (Riley et al., 1993; Starfield et al., 1985 & Woodward et al., 1988). There is much speculation regarding the implications of the findings from the child health care use literature. Smaller family size, for example, is positively associated with pediatric health care use perhaps due to greater parental attentiveness to children's symptoms, less parenting experience accompanied by a greater likelihood to seek advice from a knowledgeable source such as a physician, or greater discretionary income and time to seek services (Janicke & Finney, 2001). Younger child age may be associated with greater use due to the greater number of physician initiated check-ups, parental inexperience, or perceived vulnerability at younger ages.

The Importance of the Caregiver

In studies specific to pediatric health care decision-making, an examination of the characteristics of the child's primary caregiver(s) is essential, largely because pediatric health care is typically caregiver initiated. Therefore, the characteristics of the person making decisions for the child, often the mother, are influential in predicting whether treatment will be sought. As Abidin (1982) highlights, health care use in infants and

toddlers is dependent upon the caregiver's sensitivity to and awareness of the child's physical state. Given that young children do not seek treatment for themselves, health care use in infants should be viewed as an interactive event between parent and child. This interaction is evidenced by many of the significant predictors of referral for treatment of children (e.g., high maternal education level, nonworking mother, small family size, greater family dysfunction, and parenting stress; Abidin & Wilfong, 1989; Mechanic, 1974; Riley et al., 1993; Tessler, Mechanic, & Dimond, 1976; Wolfe, 1980).

Following the thinking of infant health care decision-making as interactive, examining variables associated with maternal health care use when predicting infant health care use (i.e., both use and nonuse regardless of appropriateness of decision) may be fruitful. Maternal characteristics are especially important to examine because maternal health care use is consistently found to be significantly positively correlated with pediatric use. This relationship holds whether health care use is measured dimensionally (i.e., as total frequency of use; Hankin et al., 1984; Janicke et al., 2001; Riley et al., 1993; Starfield et al., 1985; Ward, Klerk, Pritchard, Firth, D'Arcy, & Holman, 2006; Ward & Pratt, 1996) or dichotomously as use versus nonuse within a specified period of time (Newacheck & Halfon, 1986; Wolfe, 1980). In one study, maternal health care use, neuroticism and attitudes towards preventative medical services were the most significant predictors of pediatric health care use (Newacheck & Halfon, 1986) in older children. Maternal health care use was closely associated with pediatric use as measured by both the presence versus absence of a visit in one year and the total number of visits per year in children aged two to sixteen years. In fact, maternal use was a more powerful predictor of child use than the other variables examined (i.e., maternal

neuroticism and attitudes towards preventative services). Further evidence for focusing on mothers derives from findings that mothers serve as primary decision-makers with regards to their children's health care (Minkovitz, O'Campo, Chen, & Grason, 2002). For example, when maternal and paternal use of health care are examined separately as potential determinants of pediatric health care use, maternal use is twice as influential as paternal use (Shor et al., 1987). For this reason, the dissertation study focused on maternal psychosocial factors for their influence on infant health care use. This focus is not intended to diminish the role of fathers, but merely to provide clarity and parsimony to the research methods and findings.

Minkovitz et al. (2002) examined associations between maternal and child health care use via use of the 1996-1997 Community Tracking Household Survey. The survey collected information via maternal self-report on 9,803 mother-child pairs. The researchers used dichotomous use/nonuse variables to describe health care use across types (i.e., physician visits, emergency department use, hospitalizations, and mental health care visits) during the 12 months prior to the survey. The findings suggested that mother and child health care use was "strongly associated" across all of the types of health care use assessed. There are a number of implications of Minkovitz et al.'s (2002) findings that are relevant to the study of infant health care use. The significant associations between mother and child health care use are suggestive of similar cross generational tendencies in health care seeking. The authors suggest studying maternal care patterns as a clue to understanding and improving patterns of use for children and argue for examining pediatric health care use starting in infancy. Specifically, Minkovitz et al. (2002) described the associations between maternal and infant health care seeking

as more readily examinable during the postpartum period due to the frequency of early childhood immunizations and well child care visits. According to Minkovitz et al. (2002), links between maternal and child use will have "profound implications for programs and policies aimed at enhancing appropriate health care use for children (p. 86)."

Looking Beyond the Usual Suspects

Prior examinations of variables in the child's broader family context have contributed to a greater understanding of how parents make health care decisions for their children. However, the amount of variance in pediatric health care use explained by the "usual suspects" (i.e. sociodemographic, enabling, child health, and maternal health care use) is small. Therefore, the usual suspects have thus far failed to adequately explain what leads parents to seek medical care for their children. The large degree of unexplained variance is suggestive of the exclusion of important variables, inadequate models due to lack of insight into significant relationships among variables, and/or a great amount of randomness to health care use. Modeling pediatric health care has proven to be difficult due to 1) the use of adult models to attempt to explain child health care use, 2) a scarcity of research that examines parental characteristics, 3) small, or highly selective samples, 4) recall biases when relying solely on maternal report, 5) samples cutting across wide and developmentally disparate age groups and 6) the paucity of research in general. Further complicating examinations of pediatric health care use is confusion within the literature regarding what outcome variable is studied. The meaning of the construct, "pediatric health care," varies from study to study, includes a wide age

range of children, and types of visits (e.g., emergency room visits, procedural visits, acute care or "sick" visits, well child visits, and multi-purpose visits).

The work described here is an attempt to direct the field beyond its current knowledge by illuminating maternal factors that influence infant health care decision-making. Prior limitations are addressed in a variety of manners. First, the use of the Common Sense Model of health and illness behaviors (CSM; Martin, Rothrock, Leventhal & Leventhal, 2003; Meyer, Leventhal, & Gutmann, 1985) allows consideration of the role of maternal cognitive, affective and contextual variables involved in pediatric health care decision-making. Second, examining numerous maternal and family characteristics including affective symptoms, parenting self-efficacy, lay consultation, maternal health care use, and demographic data allows for a broader understanding of the context of infant health care use. Third, clarifying the role of maternal negative affect by examining the influences of anxious arousal, anhedonic depression, and general distress provides greater clarification of the maternal symptomatology implicated in infant health care decision-making. Fourth, the use of a broad definition of "pediatric health care" while also specifying type of use, allows for examining numerous relationships between maternal predictors and outcome variables pertinent to health care use. Fifth, limiting the sample to infants during the first six months of life, allows for examination of perinatal emotional factors and for greater specification of the sample. Sixth, recruiting a large sample of women and infants with the only exclusion criteria being maternal age, gestational age at birth, and Intensive Care Unit treatment fosters generalizability of the findings. Lastly, collecting maternal report and medical record data on infant health care use aids in accuracy and diminishes participant recall bias.

An Application of the Common Sense Model

What psychosocial factors influence health care use decision-making? Much of the work attempting to answer this broad question is guided by the CSM (Martin, et al., 2003; Meyer, Leventhal, & Gutmann, 1985). The CSM is typically applied from the standpoint of seeking care for oneself based on a change in somatic activity recognized as a symptom (Cameron, Leventhal, & Leventhal, 1993). The CSM includes relationships between bodily states and cognitive representations, affective reactions and contextual factors as influential components to health care decision-making. In other words, how a person perceives and interprets symptom(s), the advice received from lay consults, along with the emotional responses the symptom(s) provoke determine whether treatment is sought. The CSM posits that the cognitive, affective and contextual components are independent and potentially interactive in influencing health and illness behaviors such as treatment seeking.

In determining whether or not to seek health care, the symptomatic individual undergoes a process of self-diagnosis prior to seeking treatment, thereby taking on the role of a "lay physician" (Martin et al., 2003). The "lay physician" examines symptom characteristics such as severity, chronicity, and onset in determining how best to proceed with self-care. Symptoms are often ambiguous in nature with regards to whether they require medical attention. For example, a severely painful stomach ache may be caused by appendicitis, requiring immediate treatment or may be caused by indigestion, easily and inexpensively treated with home remedies. Therefore, symptoms can prompt unnecessary medical visits, particularly in individuals who perceive themselves as less capable of caring for themselves on initial symptom presentation. In fact, a significant

number of patients seek medical care for minor complaints that could have been more parsimoniously cared for independently at home (National Center for Health Statistics, 1980; Martin et al., 2003). The meaning of any particular symptom is often attached to the social and emotional contexts in which they occur (Martin et al., 2003). Cognitive appraisals such as whether one feels capable of handling care for the symptom(s) independently (i.e. self-efficacy in the self-care domain) come into play in deciding whether to seek medical care. Health care use may be initiated for a specific concern due in part to affective considerations such as a desire to alleviate negative emotions evoked by bodily symptoms and associated cognitive appraisals. Continued, prolonged health care use may result, in part, from emotional reactions to initial care seeking such as relief at being heard, anxiety reduction, and feeling supported.

A multiple pathways model of the impact of affective disturbance on illness behaviors, which overlaps in some respects with the CSM, has also been used to elucidate the impact of psychopathology on physical health (Cohen, Doyle, Skoner, Fireman, Gwaltney, Newsom, 1995). Behavioral, cognitive, and social pathways of the influence of negative affect on health care use are elucidated. The behavioral path suggests that affective disturbances could lead to inappropriate health care use. For example, people high in negative affect (trait or state) report more symptoms when ill (Cohen et al., 1995) and over or underutilize health care (Cameron, Leventhal, & Leventhal, 1995). The cognitive path suggests that affective disturbances could lead to biased interpretations of physical symptoms and/or a biased health decision-making process. The use of cognitive distortions such as catastrophising, perfectionism, and dichotomous thinking results in a cascade of negative outcomes including increases in affective disturbances and perceived

stress and decreases in perceived self-efficacy, self-esteem, and control. Depressive symptoms, anxiety symptoms, and/or low self-efficacy have been linked to health care use in adults (Aneshensel, Freirichs, & Huba, 1984; Cameron, Leventhal, & Leventhal, 1993; Roy-Byrne, 1996; Roy-Byrne & Katon, 1997) and in some cases children (Mandl, Feit, Larson, Kohane, 2002). The social path suggests that affective disturbances could lead to interference in role functioning, avoidance by social supports (Coyne, 1976), and deterioration of the social network. Social networks foster physical health by promoting healthy practices and positive views of the world, and by providing resources in times of stress. The potential role of lay consultation, a form of social support specific to healthcare decision-making, in infant health care decision-making is discussed further below. In the model of Cohen et al. (1995) and the CSM, each path (i.e. affective, cognitive, and social) interacts to impact illness behaviors, or in this study, health care use. Importantly, these pathways can result in care-seeking independent of physical illness. Physical illness may be present, but is not necessary to result in care-seeking.

Negative Affect and Adult Health Care Use

Negative affect refers to undifferentiated subjective distress and thereby encompasses a broad class of related emotions such as anxiety, worry, sadness, anger, and fear (Watson & Clark, 1984). Negative affect is the common emotional component and general factor across anxiety and depressive disorders (Kendler, Heath, Martin, & Eaves, 1987). Assessment of both specific factors within negative affect (i.e. anxious arousal and anhedonia) is important because although the constructs are highly correlated, each construct also has distinct somatic components and anxious arousal, but not anhedonia, is associated with heightened activation. Furthermore, both state and trait

negative affect are linked to heightened levels of physical complaints (Watson, 1988; Watson & Clark, 1984; Watson & Pennebaker, 1989), but the mechanism responsible for this relationship is currently unclear.

A number of potential roles of negative affect have been proposed in relation to health care seeking. Consistent with the CSM, research has implicated negative affect in health care use both directly (Tessler, Mechanic, & Dimond, 1976; Kinsman, Wildman, & Smucker, 1999) and indirectly via symptom reporting (Mechanic, 1980). Negative affect has been shown in many studies to be positively correlated with subjective symptom reporting unrelated to objective indices of health (Costa & McCrae, 1980; 1985, 1987; Watson & Pennebaker, 1989). Individuals high in negative affect seem to be prone to greater physical symptom reporting than individuals low in negative affect (Leventhal, Hansell, Diefenbach, Leventhal, & Glass, 1996; Watson & Pennebaker, 1989). The mechanism(s) accounting for the significant correlation between negative affect and symptom reporting are currently unclear. Negative affect may lead to disease and by default, symptom reporting (Aneshensel, Freirichs, & Huba, 1984). Negative affect has been shown to be predictive of objective health measures such as risk for heart disease (Kubzansky et al., 1998) and impaired immune system functioning (Cohen, et al., 1995; Leventhal, Hansell, Diefenbach, Leventhal, & Glass, 1996). Alternatively, physical symptoms may result in the creation of negative affect (Aneshensel, Freirichs, & Huba, 1984; Diefenbach, Leventhal, Leventhal, & Patrick-Miller, 1996). Negative affect may relocate attention to the body's internal processes thereby increasing attention to somatic activity and resulting in increased symptom reporting (Diefenbach et al., 1996; Gray, 1982; Watson, 1988; Watson & Clark, 1984). Persons high in trait negative affect

have tendencies towards introspection and rumination and/or are vigilant to bodily sensations (Gray, 1982; Watson & Clark, 1984). The findings linking negative affect to symptom reporting influenced the development of the symptom perception hypothesis which states that people high in negative affect may exaggerate the significance of their symptoms or may even make false symptom claims (Watson & Pennebaker, 1989). Finally, some studies have not demonstrated a significant association between negative affect and symptom reporting (Diefenbach, Leventhal, Leventhal, & Patrick-Miller, 1996). In attempting to integrate these discrepant findings, Martin et al. (2003), conclude that the key to understanding the role of negative affect in health care seeking is specifying the context in which symptom reporting is being examined.

Symptom reporting is important to the purposes of this study because it leads, in part, to health care use. Symptoms do not merely reflect biological processes. Rather, they are a function of psychosocial factors that can impact symptom perceptions (Cameron, Leventhal, & Love, 1998). The symptom perception hypothesis states that high negative affect individuals either exaggerate the severity of their symptoms or report false symptoms. Over-reporting is thought to reflect a tendency towards being internally focused and highly attuned to physical sensations; phenomena not applicable to the current study due to the position of the subjects as caregivers for those experiencing symptoms. However, the idea that high negative affect individuals may chronically scan their environment for potential problems, thereby potentially interpreting ambiguous stimuli such as infant coughing/sneezing as threatening is applicable to the work discussed here and highlights the importance of examining depressive and anxious symptoms, two disorders notable for being high in negative affect.

Health Care Seeking as Emotional Regulation Behavior

Negative emotional states may encourage treatment seeking as an attempt at emotional regulation. In this case, care seeking serves a critical function of reducing the emotional distress accompanying symptoms and life stressors. It is possible that some individuals seek medical care for treatment of their anxiety or depressive symptoms due to unawareness of mental health resources, lack of accessibility to mental health care, stigma associated with mental health care, comfort with their general physician, or a number of other potential explanations (Janicke & Finney, 2000; 2001; 2003; Barsky, 1981). One study (Leventhal et al., 1996) parsed out depressive from anxious negative affect in an attempt to discover which component was responsible for enhanced symptom reporting. Their hypothesis stated that heightened depressive but not anxious affect results in an increased number of reported symptoms over a six-month period. Instead, they found that greater state negative affect (both depressive and anxious) was associated with increased symptom reporting. Notably, trait negative affect was not significantly related to symptom reporting. In contrast, Cohen et al. (1995) found that both greater trait and state negative affect were independently associated with greater symptom reporting. Interestingly, complaints of subjects high in trait negative affect were independent of actual physical illness whereas complaints of subjects high in state negative affect were linked to the presence of a physical illness. This finding is consistent with the CSM idea linking negative affect to cognitive biases, which enhance symptom reporting (Costa & McCrae, 1985; Watson & Pennebaker, 1989). However, another study (Diefenbach et al., 1996) did not find a relationship between negative affect and cognitive biases, thereby determining that symptom reporting is largely veridical.

Given the inconsistencies across studies, there is some question as to whether the association between negative affect and physical complaints is artifactual due to reporting biases. It is concerning that most studies have solely used retrospective self-reports of illness without documentation from other sources such as medical records. Negative emotional states have been shown to bolster memory for negative emotional experiences such as physical illness (Larsen, 1992). Thus, recall bias could potentially be responsible for the relationship between negative affect and symptom reporting. Support for recall bias playing a role in self-focused symptom reporting comes from a study by Larsen (1992) in which concurrent and retrospective reporting conditions were compared for subjects high in negative affect. The results suggested that recall bias (retrospective reports) and not encoding of illness (concurrent reports) was responsible for the significant relationship between negative affect and symptom reporting for the self. Note that the role of recall bias in reporting of symptom reporting for others, such as infants, was not addressed by the Larsen (1992) study.

Examining Negative Affect's Role at the Diagnostic Level

Previous studies have typically examined the role of negative affect in health care decision-making from a diagnostic rather than from a symptom level. Psychiatric disorders may be a primary motivator for health care use since most patients diagnosed with a mental disorder receive their care from general practitioners. The current evidence suggests that a significantly greater proportion of patients seen for medical care have a comorbid mental illness than is found in the general population (Barsky, 1981; Cohen, et al. 1995). Generalized anxiety disorder co-occurs with major depressive disorder at a greater rate than other anxiety disorders in both medical and general population samples.

Between 15% and 33% of medical inpatients suffer from mood and/or anxiety disorders compared with 2% to 4% of the general population (Katon & Sullivan, 1990). Comorbid generalized anxiety disorder and major depressive disorder is associated with poorer prognosis, greater disability, and distress (Wittchen et al, 1994) than either disorder experienced in isolation. Generalized anxiety disorder and major depressive disorder are believed to share a common genetic diathesis likely distinct from other "affective spectrum" disorders (i.e. bulimia, phobia, panic, dysthymia) (Kendler et al, 1987). With regards to health care, generalized anxiety disorder and major depressive disorder are two of the most common diagnoses of patients with medically unexplained symptoms (e.g. chest pain, irritable bowel syndrome, chronic pain), those diagnosed with somatization disorder, and those who frequently utilize health care (Katon & Sullivan, 1990; Roy-Byrne & Katon, 1997). Importantly, patients with unexplained symptoms and/or somatization disorder and those who frequently utilized health care indicated that their psychological symptoms preceded their physical symptoms (Roy-Byrne, 1996).

Anxiety may be a key to determining which patients are most likely to overuse medical services and under use mental health services. Twice the proportion (i.e. 44%) of generalized anxiety disorder patients seek medical versus psychiatric help for their symptoms (Roy-Byrne & Katon, 1997). High rates of generalized anxiety disorder are found in primary care samples. The point prevalence of generalized anxiety disorder was found to be 6.4% in a primary medical care sample (Roy-Byrne, Katon, Broadhead, et al., 1994) compared with 1.6% in the National Comorbidity Survey (Wittchen, Zhao, Kessler, & Eaton, 1994) representative sample of the U.S. population. Additionally, the twelve-month prevalence rates of anxiety disorders were significantly greater for those

patients deemed high utilizers of health care (29.3%) versus normal utilizers (11.9%; Schmitz & Kruse, 2002). Anxiety symptoms may also indirectly impact health care use, as a moderator of other psychiatric disorders that may more directly affect health care use (Roy-Byrne & Katon, 1997). Anxiety's role as a moderator is especially relevant to the current study's hypotheses, as anxiety symptoms commonly co-occur with depressive symptoms (Clark & Watson, 1991; Roy-Byrne & Katon, 1997), thereby influencing the current study's interest in examining the influence of specific symptomatology (i.e. anxious arousal and anhedonia) as well as negative affect more broadly.

Studies examining links between depressive symptoms and health care seeking for the self are beginning to surface. Physically healthy adults experiencing depressive symptoms have been shown to utilize primary care services significantly more than nondepressed adults (Koopmans & Lamers, 2001; Mandl, Tronick, Brennan, Alpert, & Homer, 1999). In one study, patients experiencing depressive symptoms contacted their physicians more often than any other group with the exception of patients with heart disease (Koopmans & Lamers, 2001). Other researchers have found that healthy adults experiencing depressive symptoms utilize primary care services significantly more than nondepressed adults (Mandl et al., 2002). Others described a "self-perpetuating and mutually reinforcing" relationship between depression and physical illness (i.e. illness leads to depression which leads to further illness; Aneshensel, Freirichs, & Huba, 1984).

Although the mechanisms responsible for the maintenance of the relationship between depression and physical illness are unknown, both social-psychological and biological pathways of importance are suggested (Aneshensel Freirichs, & Huba, 1984). Disruptions of normal functioning in social roles due to illness may foster depressive

symptoms. Failure to meet obligations and goals may threaten self-esteem, disrupt one's sense of identity, and jeopardize social relationships. Illnesses may act as stressors by changing social roles and evoking concomitant stressors (i.e. loss of employment, decreased earnings, financial strain). Depression may then heighten illness susceptibility due to disruption of health habits (e.g. healthy eating, sleep habits). Alternatively or additionally, depression may enhance perceptions of the existence or severity of bodily symptoms.

Using the CSM to Inform Infant Health Care Decision-Making

When considering health care decision-making for infants, the factors highlighted in the CSM and by Cohen et al. (1995) are reconsidered. The CSM provides a useful framework from which to consider infant health care decision-making via examining the impact of maternal negative affect on pediatric health care use. Cohen et al.'s (1995) pathways are also applicable to health care decision-making made by a proxy (i.e. mother evaluating whether to seek care for her infant). Maternal hypervigilance to infant distress and physical symptoms and/or heightened rumination and catastrophising about the importance of infant symptoms could facilitate infant health care use. When an infant appears to be suffering from physical symptoms, uncertainties in symptom characteristics (e.g. cause, severity) may complicate treatment decision-making for the mother, particularly due to the infant's inability to verbally describe his/her physical state. Infant symptoms may trigger emotional responses such as fear, anxiety, discouragement, or irritation in the mother that prompt health care seeking in an attempt to decrease the caregiver's distress. Therefore, in addition to seeking symptom alleviation for the infant, the caregiver may seek emotional regulation.

As highlighted within the CSM, affective and cognitive reactions to symptoms may be independent and may lead to incongruent recommendations regarding treatment seeking (Martin et al., 2003). For example, a mother may experience fear when her infant coughs through the night, but may be too afraid to receive a poor prognosis for her infant to seek medical care. The CSM incorporates negative affect into explanations of treatment seeking, although the nature of the impact of negative affect on treatment seeking behaviors is widely debated. The role of maternal psychopathology, broadly defined, in pediatric health care use is unclear with some studies finding support for maternal psychopathology as a predictor of use (Riley et al., 1993; Tessler & Mechanic, 1978; Woodward et al., 1988) and others not finding such support (Horowitz et al., 1985; Kelleher & Starfield, 1990; Ward & Pratt, 1996; Watson & Kemper, 1995) when examining older children. These conflicting findings may be due to both the way in which researchers measure maternal psychopathology (e.g., depression, anxiety, history of mental health treatment) as well as the way in which pediatric health care use is assessed in individual studies. Few studies have focused on affective influences on treatment decision-making and even fewer on the role of affective influences on health care decision-making made by a proxy (e.g., mothers' health care decision-making for their infants). Taken together, the sparse and conflicting findings suggest a need to examine whether the affective component of the CSM is useful in predicting infant health care use via maternal negative affect.

Parent Distress as a Predictor of Pediatric Health Care

To summarize the above findings, studies have shown that depression and anxiety are positively correlated with greater self-initiated health care use (Aneshensel, Freirichs,

& Huba, 1984; Katon & Sullivan, 1990; Mandl et al., 2002; Roy-Byrne & Katon, 1997; Roy-Byrne, 1996; Wittchen et al., 1994) and that maternal and child health care use are positively related (Newacheck & Halfon, 1986; Riley et al., 1993; Tessler & Mechanic; 1978; Wolfe, 1980). However, few studies have directly examined potential associations of maternal mental health and pediatric health care use. Those studies that have attempted to answer this question examined children of varied ages and socioeconomic statuses, used varying methodologies, and perhaps not surprisingly, obtained mixed results.

The majority of studies examining parental psychosocial characteristics and their influence on pediatric health care use have examined emotional distress or parenting stress as a predictor variable. Early studies found support for a significant relationship between parental emotional distress and pediatric use in children ranging from two to 17 years of age (Tessler, Mechanic, & Dimond, 1976; Mechanic, 1974). Another study found that having a parent who had been treated for "nerves" was significantly associated with health care use in children four to 16 years of age (Woodward, 1988). Unlike studies examining emotional distress and/or nerves, the literature specific to parenting stress suggests that it is not a significant predictor of pediatric use. For example, a study by Abidin (1982) examined the effect of parenting stress on pediatric use during the first two years of life. No significant relationship between parental stress level and pediatric use were found in children up to 18 months of age. In the group of children 19 to 48 months of age, stress level was only significantly related to a traumatic injury variable and not to other forms of use (i.e. well visits, sick visits, infections, diarrhea/vomiting, other services).

There are few studies examining emotional distress and parenting stress in relation to pediatric health care, perhaps due to the complexities of studying parental stress in a pediatric health care context. When predicting health care use, there is likely a complex relationship between symptom type/severity and duration of stress. For example, Cameron and Leventhal (1995) found that those individuals with ambiguous symptoms and chronic stress are the greatest consumers of care (Cameron, 1995). Janicke and Finney (2001) suggest that the way in which the person perceives the stressor is an intervening step affecting the likelihood that an event will result in stress. Using the total number of stressors as the criterion for parental stress rather than the subject's perceptions of their stress level may mask significant findings in the parenting stress and pediatric use literature. As will be discussed further, examining parenting self-efficacy in relation to infant health care decision-making may account for more of the variance in use by focusing on the mothers' perceptions of their abilities to cope with life's demands and stresses.

It is possible that more severe emotional disorders associated with parenting stress such as depressive and anxious symptomatology will more consistently and significantly relate to infant health care use as compared with emotional distress and parenting stress. There is a paucity of research specifically relating maternal negative affect in the context of the CSM and treatment decision-making for pediatric care in which the mother's focus is on external rather than internal triggers. In principle, symptoms or behavioral changes in an infant may trigger maternal emotional responses such as fear, anxiety, discouragement, or irritation similar to maternal emotional responses experienced as a result of internal symptoms. As demonstrated when individuals seek medical care for

themselves (Martin et al., 2003), the mother's emotional response may entail hypervigilance, rumination, and catastrophising about her child's symptoms. This heightened attentiveness to and importance placed on symptoms may lead to an increased likelihood of a mother seeking medical care for her child. It is possible that parental mental illness contributes to family distress and/or dysfunctional behaviors in children via modeling or maladaptive parenting processes. In addition, depressed and anxious mothers may seek pediatric treatment at least partially as an attempt to reduce personal distress, whether or not mothers attribute their distress to child illness. In support of this notion, a prospective study of factors predictive of pediatric care seeking in children ages five to eleven years determined that mothers' worry regarding child health is the best predictor of health care use when children's past use of health care is ignored (Janicke, Finney, & Riley, 2001).

Prior Studies of Maternal Depression and Pediatric Health Care

Several studies have documented significant positive relationships between parental depression and pediatric health care use in children ages three to eighteen (Kramer, Warner, Olfson, Ebanks, Chaput, Weissman, 1998; Mandl, et al., 1999; Olfson, Marcus, Druss, Pincus, & Weissman, 2003; Weissman, et al., 1986). Children ages two to sixteen years categorized as high users of care have been shown to be twice as likely as low users to have parents that reported significant depressive symptoms (i.e. BDI score > 10; Kinsman, Wildman, & Smucker, 1999). In a low-income community sample, one study (Chung, McCollum, Elo, Lee, & Culhane, 2004) reported an increased likelihood of infant hospitalizations when mothers were experiencing depressive symptoms as measured by the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff &

Locke, 1986). Significant levels of depressive symptoms were found in over half of the mothers of asthmatic children seeking Emergency Department services (Bartlett, Kolodner, Butz, Eggleston, Malveaux, & Rand, 2001). Even after controlling for child asthma symptoms and mother's age, mothers with depressive symptoms were 30% more likely to report having used the emergency department within the past six months. In fact, mothers with the most depressive symptoms at entry into the study also reported the greatest incidence of pediatric emergency room use. In the National Cooperative Inner-City Asthma Study, caregiver mental health, examined broadly, showed the strongest correlation with health care utilization (Weil, Wade, Bauman, Lynn, Mitchell, & Lavigne, 1999) in comparison to other examined psychosocial variables (i.e. parenting style, social support, alcohol abuse, and life stress) that were not significantly predictive of child asthma hospitalizations. In another study, caregiver, but not child, mental health as rated by the brief symptom inventory, was the strongest predictor of hospitalizations for child asthma (Wade, et al., 1997).

One study specifically examined the mental health of mothers who attended well child visits with their infants within the first year postpartum. The sample was comprised of 198 low income, predominantly African American (69%), urban women (Chaudron, Szilagyi, Anson, Wadkins, Giannandrea, & Talbot, 2007). Using the Structured Clinical Interview for DSM-IV diagnoses (SCID), 37% of mothers were diagnosed with Major Depression Disorder and 19% were diagnosed with Minor Depression. Onset of the current episode occurred during pregnancy in 58% of the sample. Onset occurred during the first year postpartum for 34% of the sample. Therefore, peripartum onset occurred in 92% of the women. In addition, 19% of mothers were diagnosed with an anxiety

disorder. Fourteen percent were diagnosed with comorbid anxiety and depressive disorders. The authors concluded that there is a high incidence of internalizing disorders in low income, urban, postpartum women attending well child visits.

In a sample of children ages 0 to 30 months, Minkovitz et al. (2005) examined medical records and maternal reports of depressive symptoms measured by the CES-D (Radloff, 1977). Acute pediatric use including hospitalizations, emergency department visits and preventive care (i.e., "well baby" visits, vaccination appointments) were examined using medical records and parental interviews conducted at 2 to 4 and 30 to 33 months of age. The researchers found that children of mothers experiencing depressive symptoms at 2 to 4 months postpartum had a greater likelihood of an emergency department visit between 1.5 and 2.5 years of age. Maternal depressive symptoms at 2 to 4 months postpartum were also predictive of decreased use of children's preventive care (i.e. well-baby visits and vaccinations). The specificity of depressive symptoms' impact according to nature of the visit is consistent with the CSM. Depressive symptoms increased the likelihood of parent-initiated acute care visits, perhaps as a means of reducing maternal distress. Depressive symptoms decreased the likelihood of physician-initiated well child visits perhaps due to lack of motivation to attend or due to diminished ability to cope with the demands of keeping an appointment that was scheduled independent of parental desire for pediatric treatment.

In a study conducted in Singapore, Chee et al. (2008) linked maternal depression with frequent non-routine infant medical visits as a form of maternal help-seeking behavior. Their sample included 471 women screened for depressive symptoms using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987)

during their third trimester. Women were then interviewed using the SCID-IV and diagnosed with either major or minor depressive disorder. Six to twelve months later, women were re-interviewed using the SCID-IV and asked to self-report their frequency of medical contacts with their infants' physician for non-routine (i.e., acute or emergency) visits in the six weeks prior to the interview. Women whose infants visited their physicians three or more times in the prior six weeks were almost three times (OR = 2.87) more likely to meet criteria for a depressive disorder (33%) than those with fewer than three visits during that time period (14%). Consistent with prior literature documenting a negative relationship between social support and postpartum depression (O'Hara, 1986), women who met criteria for a depressive disorder were also more likely to perceive themselves as lacking adequate social support. The authors mention limitations to their methodology common to similar studies, sole use of self-report to document infant medical visits and retrospective reporting of health care use. In addition, it may prove difficult to generalize these findings to a United States sample as health care exists within political and policy contexts that influence health care seeking behaviors. However, the authors' conclusion that physicians should be attentive to the depressive symptomatology of women who frequently seek non-routine health care for their infants is a sound recommendation that could potentially cut across cultures.

Mandl et al. (2002) suggested that women who seek health care frequently for their infants in primary care and/or emergency settings are at an increased risk for depressive symptoms. The authors examined the hypothesis using two protocols. One sample of 1200 mother-infant pairs was recruited from hospital records and interviewed via telephone regarding health services use at three and eight weeks postpartum. An

additional sample was taken from the 1988 National Maternal and Infant Health Survey previously conducted by the National Center for Health Statistics in which a sample of 6,749 mothers from 48 states completed a mailed questionnaire. The main independent variable for each sample was the occurrence of more than one problem-oriented primary care visit and/or emergency department visit during the newborn's first month of life. The main dependent variable across samples was the mother's Center for Epidemiologic Studies Depression Scale (CES-D) score.

Results from both of Mandl et al.'s (2002) samples indicated a dose-response relationship between maternal depressive symptoms and problem-oriented use of infant health care (i.e. more visits were associated with higher levels of depressive symptoms). In fact, women whose infants had more than one problem-oriented visit or any emergency department visits in the first month of life were at a significantly greater risk of developing depression than mothers of infants without problem-oriented or emergency visits. Problem-oriented visits occurring in the second through the fifth months of life were also significantly linked to maternal depressive symptoms. However, well child visits, typically initiated by the physician rather than the mother, were not associated with maternal depression in either sample. Therefore, Mandl et al.'s (2002) findings suggest a specific link between depressive symptoms in mothers and problem-oriented health care use (i.e. acute visits) in their infants. Unfortunately, the directionality of this relationship was not addressed nor were maternal-reported visits authenticated via use of medical records. The authors suggest that future studies corroborate maternal reports using chart review. The lack of relationship between well child visits and maternal depressive symptoms is discrepant with the Minkovitz et al. (2005) findings of a negative correlation

between depressive symptoms and well baby use and suggests that the relationship between pediatric health care use and maternal psychopathology may be specific to mothers prone to initiating medical care for psychosocial concerns (Janicke & Finney, 2000).

Numerous explanations exist for findings significantly linking maternal depressive symptoms and child health care use. The explanations for collateral health care decision-making mimic those for negative affect's influence on self-initiated health care. First, depression may bias a mother's assessment of infant behaviors, cues, and well-being (Fergusson, Lynskey, & Horwood, 1993). Second, mothers of ill children may experience depressive symptoms more frequently due to sadness, stress and grief related to their children's illnesses. However, that was not a reasonable explanation in Mandl et al.'s (2002) study as the overwhelming majority of infants had only minor problems and the most common diagnosis was "no serious problem." Negative affect may heighten susceptibility to contagious illness in the mother (Aneshensel, Freirichs, & Huba, 1984) resulting in child illness. Ward et al. (2006) suggest that correlations between mother and child use may not be solely due to symptom perception and care-seeking propensity, but also to intergenerational morbidity, perhaps due to cross infection and/or unspecified pre and postnatal contextual variables. Alternatively, depressed women may recognize their need to seek help for their own symptoms and may utilize their children's physicians for their own purposes due to a variety of reasons. Therefore, it is possible that patients provide symptoms to physicians that are not directly related to the "real" underlying reason for the visit (Barsky, 1981). Women may find seeking health care for their infant less threatening and stigmatizing than seeking care for their

own psychosocial needs (Bartlett, Kolodner, Butz, Eggleston, Malveaux, & Rand, 2001; Mandl, Tronick, Brennan, Alpert, & Homer, 1999). Furthermore, the woman may perceive her symptoms to be infant related, causing her to seek a pediatrician rather than a mental health professional. Many of the symptoms of postpartum depression overlap with new motherhood (lack of sleep, weight loss/gain, appetite changes, lack of energy, loss of sexual interest). The distinction between normative postpartum adjustment and postpartum affective disorders can be confusing for even mental health providers to tease apart. It is therefore possible that women may be unsure of what are normal conditions of new motherhood versus symptoms of postpartum mental illness.

Not all of the research examining acute pediatric health care use and maternal affective symptoms has demonstrated a significant relationship. In a prospective study of a low socioeconomic status inner city population of children around one year of age, the authors (Watson & Kemper, 1995) examined the impact of maternal substance abuse, depression, and perceived low social support on pediatric health care use by reviewing children's medical records. These predictors were selected due to their association with family stress and negative parenting effects. In particular, maternal depression has been shown to negatively impact parenting behaviors and has been linked to negative health outcomes for children (e.g. mood and attention disorders, behavioral problems, low birth weight, high number of accidents, somatic complaints, and child abuse and neglect; Zuckerman, Amaro, & Beardslee, 1987). However, in Watson and Kemper's study (1995), neither maternal depressive symptoms nor social support significantly predicted pediatric health care use in their sample. The null finding may be due in part to subject

selection (i.e. the use of a low SES sample given accessibility to medical insurance) calling into question the generalizability of the results.

Other studies also lacked significant findings when examining maternal negative affect and children's health care use. Maternal depression and anxiety were not significantly related to pediatric health care seeking in an Australian sample of children four to nine years of age (Ward & Pratt, 1996). Power limitations due to limited sample size and shared variance with a parental stress variable may have accounted for the lack of significant results. Riley et al. (1993) examined child health care in a sample of five to eleven year olds and did not find maternal mental health to be a significant predictor of pediatric medical care. The authors note that their predominantly Caucasian (84%), married (91%) upper middle class sample may not be generalizable to health care decision-making in a more heterogeneous sample. It is possible, if not probable, that maternal mental health has a different influence on pediatric health care in the context of lower socioeconomic status and/or single parent families. Finally, in a nationally representative sample of children ages zero to three, Kahn et al. (2002) found no significant relationship between maternal depression symptoms and child hospitalizations. It is therefore possible that mothers make health care use decisions for their children independent of their negative affect symptoms. These null findings also suggest the need for further research examining the role of maternal anxiety, depression, and overall negative affect in relation to pediatric use, with the guidance of the CSM used within the adult health care use literature.

Prior Studies of Parental Anxiety and Pediatric Health Care

As mentioned above, there is a growing interest in examining anxiety as a significant predictor of health care use (Chaudron et al., 2007; Roy-Byrne & Katon, 1997). Parents high in anxiety may be more likely to initiate and less likely to delay medical care in response to children's symptoms. Parental anxiety may be a specific predictor of or particularly strongly related to use of care in response to minor symptoms, and/or use of urgent/emergency pediatric care use. One study examined maternal response to minor symptoms via tracking maternal telephone contacts to physicians within 72 hours of a 2-month well child vaccination (Hatcher, Powers, & Richtsmeier, 1993). Because the vaccination, diphtheria-pertussis-tetanus (i.e., DPT), is typically given to healthy infants, the authors were able to examine the role of maternal anxiety in treatment decision-making while limiting the influence of child health as a confound. The authors further limited confounds by statistically controlling for trait anxiety, prior parenting experience, and mothers' perceptions of the child's health. In those mothers who were high in anxiety as measured by the State Trait Anxiety Inventory (STAI, Spielberger, Gorusuch, Luchene, Vagg, & Jacobs, 1983) at the time of the well child visit, the vaccination stressor acted as a significant trigger for initiating health care use, more so than in mothers who were low in anxiety during the visit. They concluded that the level of maternal anxiety just prior to onset of symptoms is predictive of treatment seeking via phone contact with a nurse/physician. Interestingly, the number of symptoms reported did not differ among groups who did and did not contact the physician. Additionally, ninety percent of phone contacts regarded symptoms not mentioned in the DPT informational pamphlet provided to mothers at the well child visit, but were

described as side effects of the DPT by the mothers. Further analyses examined whether prior pregnancy difficulties or infant health problems predicted phone contacts post-DPT, and were nonsignificant. The authors proposed that hypervigilance to threat and associated interpretation of ambiguous stimuli as threatening affects how anxious mothers view their infants post-DPT vaccination. Mothers in a state of elevated anxiety may be primed to look for signs of distress or illness in their infants. An ambiguous symptom can be interpreted as threatening by anxious mothers in a state of hypervigilance, thereby leading to professional advice seeking.

Interestingly, infant sex also played a significant role in help seeking within the study by Hatcher et al. (1993). Infant sex, typically not found to be predictive of health care utilization, interacted with maternal anxiety to significantly predict telephone contact with physicians. Specifically, mothers who made telephone contact with physicians were more likely to have been anxious at the time of the well child visit and to have a female infant. Infant sex is a major predictor of parental expectations, perceptions, and behavior (Parke, 1979). Female infants are described as softer, finer featured, weaker, smaller, and more affectionate than male infants (Rubin, Provenzano, & Luria, 1974). It is therefore feasible that differential parental expectations and perceptions of infants based on sex could influence health care seeking.

In addition to infant gender, the type or severity of symptoms exhibited by the infant are also likely important to a proposed relationship between parental anxiety and health care use. An interesting finding in the literature is the link between emergent use of healthcare and parental anxiety, despite a low level of symptom severity. Why do parents decide to bring their children to emergency rooms for minor illnesses? Consistent

with the affective component of the common sense model, Oberlander et al. (1993) found that parents who utilized pediatric care for minor symptoms/illnesses reported reductions in their levels of anxiety following the visit. In fact, the most frequently cited reason for bringing a child to emergency room in their sample was concern over the severity of the child's illness. Therefore, parental anxiety, in part, may drive the decision-making of those who utilize the emergency room for non-emergent reasons. Mothers who perceive their children to be vulnerable to illness use significantly more emergency services for their children, even when their perception is deemed unwarranted by medical professionals (Black & Jodorkovsky, 1994). Studies have documented that having a parent with a history of treatment for "nerves" was shown to be significantly associated with child emergency room visits, but not use versus nonuse of medical care (Oberlander, Pless, & Dougherty, 1993; Woodward et al., 1988). Up to three-fourths of visits to pediatric emergency rooms are for the treatment of nonurgent problems (Oberlander, Pless, & Dougherty, 1993); resulting in high costs, long waiting periods, and discontinuous care.

The link between parental anxiety and child health care use holds for nonemergent visits as well as emergent visits. For example, prior research has shown that parents who utilized pediatric care for minor symptoms/illnesses showed reductions in anxiety following the visit (Oberlander, Pless, & Dougherty, 1993). Interestingly, although parental anxiety was reduced across groups, highly anxious parents remained more anxious than those who were not initially anxious. The parent's continued anxiety suggests a possibility for future anxiety/stress related visits. The findings from the parental anxiety and pediatric health care use literature are consistent with research

indicating that those who relinquish control over demanding tasks experience reductions in stress and anxiety (Ozer, 1995). Parents may be driven by a "second diagnosis" that could be described as anxieties that motivated parents to seek medical care for their children (Oberlander, Pless & Dougherty, 1993).

The Role of Parenting Self-Efficacy

Perhaps some of the discrepant findings within the literature examining maternal affective symptoms and pediatric health care use reflect the influence of a third variable that has yet to be extensively studied. As suggested above, seeking pediatric health care may alleviate the mother's emotional distress and perceived inability to cope with the numerous demands of parenting. The effects of maternal negative affect on pediatric health care use may be mediated by a significant cognitive variable, parenting self-efficacy (Janicke & Finney, 2001; 2003). For example, Leiferman (2002) suggests that maternal depression may impact child health through the behaviors of the mother. She links low self-efficacy common to depressed individuals as an important path by which depression may show its effect across parenting behaviors.

Bandura's (1977) conceptualization of the self-efficacy construct relates to beliefs in one's ability to perform a specified behavior successfully. Parenting self-efficacy, specifically, is defined as parents' beliefs regarding their abilities to perform the numerous and changing tasks associated with parenting (Coleman & Karraker, 1997). According to Bandura's definition, the construct of parenting self-efficacy should encompass both level of knowledge about child-rearing behaviors and degree of confidence in one's ability to perform these tasks. In order for a mother to perceive herself as efficacious, the following should exist: 1) a repertoire of efficacious child care

responses (e.g., methods of soothing an infant, ways to discipline a toddler, or specific to this study, when to call a doctor in response to symptoms), 2) confidence in her ability to accomplish the necessary task, 3) beliefs that her child will respond as intended, and 4) beliefs that friends and loved ones will support her action(s) (Coleman & Karraker, 1997). The stability of parenting self-efficacy over time is little researched. However, one study (Schneewind, 1995) suggested that at least in the first two years postpartum, maternal self-efficacy was relatively stable and predicted maternal attachment, emotional state, and postpartum adjustment.

According to Bandura (1977; Bandura et al., 1992), a perceived inability to influence situations often contributes to symptoms of both depression and anxiety or more broadly, negative affect. Anxiety often leads to decreased efficacy and anticipation of failure experiences in the future. Depression has been conceptualized as hopelessness about the future due to perceived lack of control over one's environment based partially on past failure experiences. Self-efficacy to cope with future challenges is undermined by these failure experiences, resulting in expectancies of future failures. When low self-efficacy exists in a domain of great personal importance, subjective distress is a likely result (Bandura, 1989). Parenting is a demanding role that carries unrelenting time, energy, and emotional requirements and is deemed an essential role by society. If it is accepted that most parents hope to succeed at parenting, those parents experiencing significant self-doubt in their abilities to care for their children are at increased risk of negative emotional experiences.

A number of studies have found self-efficacy to be negatively correlated with anxiety, depression, negative cognitions, demoralization, learned helplessness, maternal

reported stress and passive maternal coping style (Bandura, 1991; Coleman & Karraker, 1997; Cutrona & Troutman, 1986; Donovan, Leavitt, & Walsh, 1990; Ozer & Bandura, 1990; Teti & Gelfand, 1991; Wells-Parker, Miller, & Topping, 1990). Teti, O'Connell and Reiner (1996) examined maternal self-efficacy, specifically, and found it to be a mediator between several psychosocial variables including maternal depression and maternal competence. Notably, when self-efficacy was controlled, the psychosocial variables (depression, sociodemographic status, infant temperament, social supports) were no longer significantly correlated with maternal competence. Significant negative correlations have been found between maternal self-efficacy and learned helplessness (Donovan et al., 1990), maternal reported stress and passive maternal coping style (Wells-Parker et al., 1990). Two groups of researchers (Bugental, et al., 1993; Coleman & Karraker, 1997) have shown that mothers of toddlers and school aged children low in maternal self-efficacy tend to focus on negative aspects of relationships, to be high in negative affect, to show elevated autonomic arousal, to report helplessness in the parenting role, and to use coercive disciplinary tactics.

Notably, mothers who believe they are able to exert control over a situation report less distress even when they do not act to control the situation.   Individuals low in self-efficacy experience anxiety and self-doubt when challenged, assume greater responsibility for failure relative to success, appraise the environment as threatening, avoid challenges, and cope dysfunctionally when problems arise (Ozer, 1995). Mothers high in negative affect are more likely to have negative views of their parenting abilities (Goodman et al., 1993). Depressed mothers envision themselves as having less control over their children's development than nondepressed mothers (Kochanska et al., 1987).

Via these relationships among psychosocial variables of interest (e.g., depression, anxiety, and self-efficacy), a negative cycle is propagated, perhaps influencing infant health care decision-making in mothers experiencing emotional distress. Based on guidance from the CSM regarding main and interactive effects between cognitive (i.e. parenting self-efficacy) and affective (i.e. anxious arousal, anhedonic depression, and general distress) factors, and the findings of self-efficacy acting as a mediator in the relations between psychosocial variables and mental health, the decision was made to examine parenting self-efficacy as a partial mediator.

A mediation role for parenting self-efficacy in the proposed relation between maternal negative affect and infant health care is supported by findings of self-efficacy acting as a mediator in the relations between psychosocial variables and mental health. For example, parenting self-efficacy may impact pediatric health care utilization via its interaction with parental stress level. Under conditions of stress (e.g. mental illness, poverty, multiple jobs, single parenthood), self-efficacy may act as a mediator to child outcomes (Bandura, 1995; Ozer, 1995). High self-efficacy acts as a buffer against sociocultural stressors, whereas low self-efficacy accentuates the negative influences of external stressors on parent-child interactions. In addition, parenting self-efficacy has been shown to be associated with a number of child outcomes such as infant interactive behavior, toddler adjustment, behavior problems, school performance, anxiety, socio-emotional adjustment, self-regulation, and self-worth (Ardelt & Eccles, 2001; Bogenschneider, Small, & Tsay, 1997; Bohlin & Hagekull, 1987; Coleman & Karraker, 1997; Day, Factor, & Szkiba-Day, 1994; Gross & Tucker, 1994; Hill & Bush, 2001).

Implications of Parenting Self-Efficacy for Infant Health Care

The implications of parenting self-efficacy for infant health care use have been largely ignored. In the context of the CSM, parenting self-efficacy may serve as a cognitive factor important to whether health care is sought. Parents who utilize pediatric health care to a great extent may have difficulty juggling their numerous parenting demands and general life stressors due to low parenting self-efficacy (Janicke & Finney, 2003). Mothers low in parenting self-efficacy as pertains to caring for a child's symptoms independently may entrust a knowledgeable and respected other, the child's physician, for symptom and care evaluations. Seeking care for a child's symptoms in this context is not only an attempt to maintain the child's health, but also an attempt to alleviate parental distress and perceived burden. Therefore, mothers high in negative affect may be expected to utilize pediatric care via the influence of low parenting self-efficacy.

The literature on parenting stress and child health care use is suggestive of examining self-efficacy as a mediator determining use versus nonuse of child health care as it is possible that perceived ability to cope with demands is more highly predictive than the number of stressful life events endorsed. Numerous studies document no direct relationship between frequency of stressful events and frequency of pediatric use (Abidin, 1982; Abidin & Wilfong, 1989; Black & Jodorkovsky, 1994; Riley et al., 1993). However, the interaction between cumulative daily hassles and family social support was found to be predictive of increased pediatric use (i.e. mothers who reported frequent/intense hassles utilized pediatric services only if they were living in a less

competent family; Black and Jodorkovsky; 1994). Janicke and Finney (2003)

hypothesized that parental stress and self-efficacy would interact to predict pediatric

primary health care use (i.e., parents high in stress level and low in parenting self-

efficacy will have children who more frequently access health care). Primary care takers

(94.3% mothers) completed self-report measures of stress and perceptions of

effectiveness in the parenting role (i.e., parenting self-efficacy as assessed within the

study). Children's medical records for two years prior to subjects' entrance into the study

were examined for total number of primary care visits. Results indicated that neither

parenting stress nor self-efficacy was significantly predictive of pediatric health care use

when examined independently. As predicted by the authors, the interaction between

parent-reported stress and self-efficacy was significant. When the primary caretaker

reported minimal exposure to daily hassles and stressful events, parenting self-efficacy

was not associated with pediatric health care use. However, when the primary caretaker

reported a high level of stressful events and hassles, low levels of parenting self-efficacy

were associated with less pediatric health care use, a finding opposite to what was

predicted. The interaction accounted for 11.5% of the variance in pediatric primary care

use. The average difference between groups was one medical visit (i.e., 5.6 versus 6.9

visits) for children of parents with below average and above average parenting self-

efficacy, respectively.

The results from Janicke and Finney (2003) call into question the role of

parenting self-efficacy in pediatric health care use as they are discrepant with

hypothesized relations in the literature. How can researchers account for the surprising

findings that parents low in parenting self-efficacy seek pediatric health care less when

stressed than those parents higher in self-efficacy? The authors suggest that pediatric care use may constitute behavioral activation via a skill associated with parenting (i.e., seeking medical care for their child) thereby making confident, efficacious parents those most likely to utilize pediatric care under stressful circumstances. Whether these findings generalize to mothers high in negative affect is unclear and remains to be tested empirically. Nevertheless, it is important to note that there was no main effect linking self-efficacy to child health care use, suggesting that discrepant with the previously theorized importance of parenting self-efficacy to pediatric use, parenting self-efficacy may not mediate the relationship between maternal psychosocial factors and child health care use.

When overwhelmed, individuals low in self-efficacy will seek to relinquish control over situations in which they lack self-efficacy to those considered more skilled or knowledgeable in the area (Bandura, 1982; 1986; 1997). Relinquishing control to a proxy is attractive to those low in self-efficacy because it reduces performance demands and emotional distress linked to being responsible in a given situation. Proxy control is a useful means of describing parents who frequently seek medical care for child-related psychosocial concerns. Ideally, the proxy should hold some legitimate authority to act for the child's well-being instead of the parent. Particularly when a child's medical symptoms are a stressor, a parent may decide to seek help from the child's physician as they are well respected and deemed knowledgeable in our society. Visiting the infant's physician often generates solutions for problems and dissipates the burden of responsibility for the child (Barsky, 1981). Low self-efficacy has been associated with the use of more emotion-based instead of problem-oriented approaches to coping (e.g.

seeking a physician for minor child problems and illnesses versus reading an informative parenting manual before contacting the physician). Seeking care for an infant's symptoms would therefore be seen not only as an attempt to improve health, but also as an attempt to alleviate parental distress and perceived burden. A self-perpetuating cycle may emerge when parents low in self-efficacy avoid seemingly difficult activities and therefore block the acquisition of new knowledge and skills that could bolster their efficacy in performing the task (Bandura, 1982).

Notably, perceptions of coping failure significantly predict self-use of health care services (Cameron, Leventhal, & Leventhal, 1993). Coupled with the discussed relationships between maternal and child health care use, the coping perceptions findings suggest examining the role of parenting self-efficacy in pediatric health care decision-making. Parenting self-efficacy, in the domain of pediatric health care use, entails parents' beliefs regarding their ability to handle their children's symptoms independently as well as their ability to seek medical care when appropriate. From the CSM perspective, parents act as lay physicians when deciding whether to handle their children's symptom(s) independently or to seek aid from a physician. In the CSM, cognitive appraisals such as whether one feels capable of making decisions regarding care for an infant (i.e. a facet of parenting self-efficacy) are important to pediatric health care. Parenting self-efficacy, viewed as a cognitive component in the CSM, would be expected to relate independently and in connection with affective and contextual factors to influence health care use.

The Role of Social Support via Lay Consultation

People experiencing social isolation may visit a physician because they feel uncared for, ignored, and lonely (Barsky, 1981). They may be in need of advice, information, interpersonal stimulation, caring, emotional expression, and a sense of belonging in some social context even if it is only that of a doctor-patient relationship. Meeting individually with a doctor who listens, talks to, and even touches an isolated patient can be an important, pleasurable, and significant social interaction (Barsky, 1981). Health care is sought for the communication, interaction, and interpersonal stimulation the medical visit provides. Moreover, establishing a connection with a physician merely entails enlisting the help of a professional who is required to meet with the patient, rather than more effortful and daunting forms of social support (e.g. joining a new mother's group or reaching out to estranged relatives). In the doctor-patient context, an isolated person can feel somewhat assured that her statements will be treated with respect and will be considered sympathetically and nonjudgmentally without rejection or ridicule (Barsky, 1981). These individuals may lack the connections and social support that others receive from family, friends and social organizations (e.g. religious groups, clubs, neighborhood associations) and therefore turn to hospitals and/or clinics for a sense of social integration and belonging.

Prior research has noted that perceived lack of social support has a negative impact on self-efficacy (Bandura, 1986). Social support may reduce parental vulnerability to stress, although the mechanisms by which this occurs are largely unknown (Janicke & Finney, 2001). It is possible that perceptions of support availability

may lessen negative outcomes associated with stress by enhancing the perceived resources available in stressful situations and decreasing the person's likelihood of feeling overwhelmed (Major, Cozzarelli, Sciacchitano, Cooper, et al., 1990). Especially pertinent to the current study's sample are findings that postpartum depressed women typically report receiving less support from their spouses than nondepressed postpartum women. "Social support in particular may be crucial to understanding depression during the puerperium (O'Hara, pg. 569; 1986)." Social support from spouses and to a lesser degree from friends and loved ones, has been found to significantly predict postpartum depression (Cutrona, 1983; O'Hara, 1986; O'Hara, Rehm, & Campbell, 1983). Social support acts on a continuum in influencing the quality of parent-child interactions; low social support is a risk factor and adequate social support is a protective factor (Watson & Kemper, 1995).

How do the general findings from the social support and health care use literature pertain to infant health care decision-making? Given the findings above, perhaps mothers with inadequate social support may be quick to seek medical care for their infants due to a desire to reduce the worry, anxiety and/or fear attached to their infant's symptomatology. One study examined this question specifically and found social support to be negatively related to mothers seeking care for their children (Horwitz, Morgenstern, & Berkman, 1985). Therefore, particularly when combined with difficulties in related psychosocial realms (e.g. low parenting self-efficacy), it is conceivable that mothers high in negative affect may feel unable to cope with the demands of infant care alone and may utilize their lay consults and potentially the health care system in order to get their support needs met (Rahman, Harrington, & Bunn, 2002).

The nature of the specific influence of social support on health care use is currently unclear and may be complex. Social support may enable parents to cope with children's symptoms and parenting-related stresses, thereby reducing the need for parent-initiated health care. Consistent with this viewpoint are findings that greater levels of family conflict and lower levels of social support predict greater use of pediatric services (Weimer, Hatcher, & Gould, 1983). Alternatively, research has found that treatment seeking may be initiated by friend and/or family endorsement (Zola, 1973). In one study, seeking prior advice from a family member was associated with the least likelihood of an emergency room visit being termed appropriate (based on patient's condition, amount of need to seek physician, and need be seen in an emergency room rather than a outpatient clinic; Oberlander, Pless, & Dougherty, 1993).

Lay Consultation Specificity According to Context

In the CSM, family and friends often serve as consultants during a sufferer's evaluation of symptoms. Consulting with one's social support network reduces the sufferer's affective responses to conditions such as isolation and threat. Social support is negatively related to adults seeking acute care for themselves, however, in prior research, social support accounted for less than 1% of the variance in whether or not an individual sought health care for their symptoms (Berkanovic, Hurwicz, & Landsverk, 1981). Individuals with strong social support systems tend to wait longer to seek medical care; possibly due to their ability to seek help, advice, and support from other lay people (Martin et al., 2003).

Due in part to the complex and at times conflicting findings associated with social support, specificity models predict that support needs vary according to the illness

context (Cutrona,1983; Martin, Davis, Baron, Suls, & Blanchard, 1994). With regards to health care use, social support can have beneficial as well as detrimental effects (Martin, et al., 1994). One method of specifically measuring social support in a health care decision-making context is via lay consultation measures. Lay consultation traditionally refers to the stage in health when an ill or symptomatic individual seeks advice from social supports regarding their symptoms and appraisals of symptom meaning (Dressler & Oths, 1997; Friedson, 1960). Via the process of lay consultation, the symptomatic individual may receive both practical advice and emotional support regarding health care seeking decision-making, thereby embedding health care use in a social interaction context. Therefore, lay consultation spans emotional and informational support that is specific to the health care context. The lay consultants are often comprised of close family member and friends, but can also include extended family, neighbors, coworkers, etc. In a sample of cardiac patients, Bunde and Martin (2006) found that most engaged in lay consultation prior to seeking health care. In the CSM, lay consultations hold high importance at the level of symptom interpretation. Across medical contexts, but especially when a mother is interpreting a nonverbal infant's symptoms, it is likely that mothers and physicians have differing levels of understandings of symptom meaning and treatment ramifications. Lay consultation is important to examine when predicting infant health care use because opinions of friends and family may alter the mother's decision whether or not to seek care or to follow through with physician initiated well baby visits (Sanders, 1989). Sanders goes on to suggest that lay consults may be as or even more influential in treatment decision-making than objective information when available (e.g., via parenting books).

Depending on the opinions, agreement and degree of perceived worry of the lay consultants, having more available consultants may increase or decrease the likelihood of infant health care use. Friedson (1960) stated that the likelihood of a symptomatic individual seeking health care is dependent upon both the cohesiveness of the beliefs of lay contacts and the congruence between the majority's belief and the patient's beliefs. In other words, it is conceivable that different lay consultants would influence a mother in different directions when deciding whether to utilize health care for her child. It is likely that individuals' general tendencies towards health care seeking interact with lay consults' opinions to determine use. The importance of prior health beliefs in interacting with lay consultation is highlighted by a study examining the influence of lay consults in a Scottish sample of working-class families divided into "utilizing" and "underutilizing" subgroups (McKinlay, 1973). After controlling for a number of sociodemographic and enabling variables, significant differences were found between the two groups with respect to their lay consultation networks. Specifically, under utilizers contacted a readily available group of friends and relatives prior to use, whereas utilizers 1) differentiated between friends and relatives and 2) made decisions independent of lay consults' advice. The concept of over utilization or inappropriate use was not addressed by this study. Similar to general social support, lay consultation is significantly correlated with depressive symptoms, but unlike social support, lay consultation has previously demonstrated a positive, rather than a negative relationship with depression status. In a cardiac sample (Bunde & Martin, 2006), depressed individuals were more likely to discuss symptoms with lay consults than nondepressed individuals. However, neither the average number of lay consultants nor the likelihood of lay consultants attributing their

symptoms to cardiac issues differed significantly between groups.   In addition, depressed and nondepressed participants rated the severity of their symptoms and their confidence in their symptom attributions similarly. Most participants who engaged in lay consultation received relevant advice from a consultant. Groups differed on recalling whether or not they had received symptom-related advice, with depressed participants being more likely to report having received advice in general and to report receiving advice to seek medical care, specifically.

Based on the prior findings in the self-use literature and a dearth of findings in the pediatric literature, predicting the influence of lay consultation on infants' health care use proves difficult. In the CSM, the contextual component to health care decision-making, as measured here by the lay consultation variables, is thought to be both independent and interactive with the affective and cognitive domains. Given the theorized likelihood that the influence of lay consultants interacts with characteristics of the consulter (i.e., the mother) the interactions between lay consultation variables and maternal negative affect (i.e.., anxious arousal, anhedonic depression, general distress) were examined for predictive infant health care use. Based on the prior literature examining the role of lay consultation in depressed adults' health care use (Bunde & Martin, 2006), it was believed that lay consult variables would serve as moderators of negative affect, resulting in increased infant health care use over and above the main effects of either negative affect or lay consult variables.

Specific Hypotheses

The specific nature of maternal emotional disturbance that significantly impacts pediatric health care use in infants is currently unclear due to scant literature specific to

this question, mixed findings in the available literature on pediatric use, as well as differing protocols, population characteristics, outcome variables, and predictor variables included in prior studies. The specific hypotheses tested within the dissertation study are depicted by Figure 1. Based on the previously reviewed literature, three possibilities for the impact of maternal negative affect on infant health care use seemed plausible. One possibility was that general maternal emotional distress (i.e. the Mini-MASQ general distress subscore) would be predictive of heightened infant health care use. In other words, the distinction between depressive and anxious symptoms may have been unimportant. Another possibility was the existence of significant and distinct linear effects of maternal anhedonic depression and anxious arousal symptoms in the prediction of infant health care use. Finally, anxious arousal and anhedonic depression symptoms may have an interactive effect with each other in predicting pediatric use (i.e. moderational hypothesis). Therefore, maternal affective variables were entered as a group in order to examine the simultaneous main effects of general distress, anhedonic depression, and anxious arousal (i.e. overall negative affect) on infant health care use. In order to examine each negative affect variable's independent influence on infant health care use, secondary analyses were also conducted for each Mini-MASQ subscale in isolation of the other two subscales in the prediction of both physician and maternal initiated infant health care use.

Parenting self-efficacy is negatively correlated with maternal depression (Cutrona & Troutman, 1986) and anxiety (Ozer, 1995). General self-efficacy is associated with adult health care use (Coleman & Karraker, 1997). Seeking health care for one's infant may not only be an attempt to foster infant health, but also an

attempt to alleviate parental distress and perceived burden. Given prior findings, parenting self-efficacy will be examined by the current study as a partial mediator of the relationship between maternal negative affect and infant health care use.

Friends and family members may act as lay consultants influencing infant health care use via encouraging or discouraging treatment seeking. The study described here focused on specific variables from a measure of Lay Consultation (Martin et al., 2004) for their influence on infant health care use. The main effects of the number of lay consultants contacted over the six month period (LC supports) and the mother's perception of the degree of consultants' worry regarding her infant's symptoms (LC worry) were analyzed as predictors of infant health care use. In addition, interactions between these lay consultation variables and the maternal negative affect variables were examined for a multiplicative effect on infant health care use.

The prior literature suggests that variables influencing pediatric health care use may differ according to the specific type of health care examined (i.e., well visits, acute visits, phone contacts, and total health care use). Therefore, analyses, detailed below, were conducted in order to determine which specific infant health care use variables should be examined as outcomes. Physician initiated visits including well visits and medical follow-ups scheduled by the physician instead of the mother, were suspected to be distinct from ambulatory care that was mother initiated (i.e. acute visits and phone contacts) due to differences in their referral source and reason for visit (i.e. preventative/follow-up care versus symptom driven care). Physician initiated visits have rarely been examined in prior literature examining pediatric health care use. The decision was made to examine phone contacts and acute visits in combination as mother initiated

visits due to their overlap on initiation source (i.e., the mother) and reason for contact (i.e.

symptom driven versus preventative care).

Summary

The purpose of this dissertation study was to examine a group of psychosocial

variables (i.e. maternal depression, maternal anxiety, parenting self-efficacy, and lay

consultation) previously shown to be significantly correlated with each other and to have

been associated with health care use in the prediction of physician and mother initiated

infant health care use, specifically. It is believed that the variables selected will account

for a significant portion of the variance in infant health care use when examined together.

The CSM posits that the cognitive (i.e. self-efficacy), affective (i.e. anhedonic

depression, anxious arousal, general distress) and contextual (i.e. lay consultation)

components are independent as well as potentially interactive in influencing health and

illness behaviors. The CSM fosters consideration of the main and interactive affects of

maternal cognitive, contextual and affective variables potentially important to infant

health care decision-making. Specifically, a mother's interpretation of her infant's

symptom(s), the influences of her lay consultants and the emotional responses the

symptom(s) provoke likely influence whether treatment is sought. Negative affect may

heighten infant health care use overall or may act in specific manners according to visit

type (e.g., mother versus physician initiated health care use). Cognitive appraisals such

as whether one feels capable of caring for the infant independently (i.e. parenting self-

efficacy) come into play in deciding whether to seek medical care. Lay consultants likely

drive infant health care in a manner that is context specific. The CSM can be useful in

deepening understanding of pediatric health care decision-making via examination of the

impact of maternal psychosocial factors on pediatric health care use.

Figure 1

Study Hypotheses to be Tested: Negative Affect (i.e. anxious arousal, anhedonic depression, and general distress) as Moderated by Lay Consultation and Mediated by Parenting Self-Efficacy is Hypothesized to Directly and Indirectly, via Parenting Self-Efficacy, Affect Infant Health Care Use
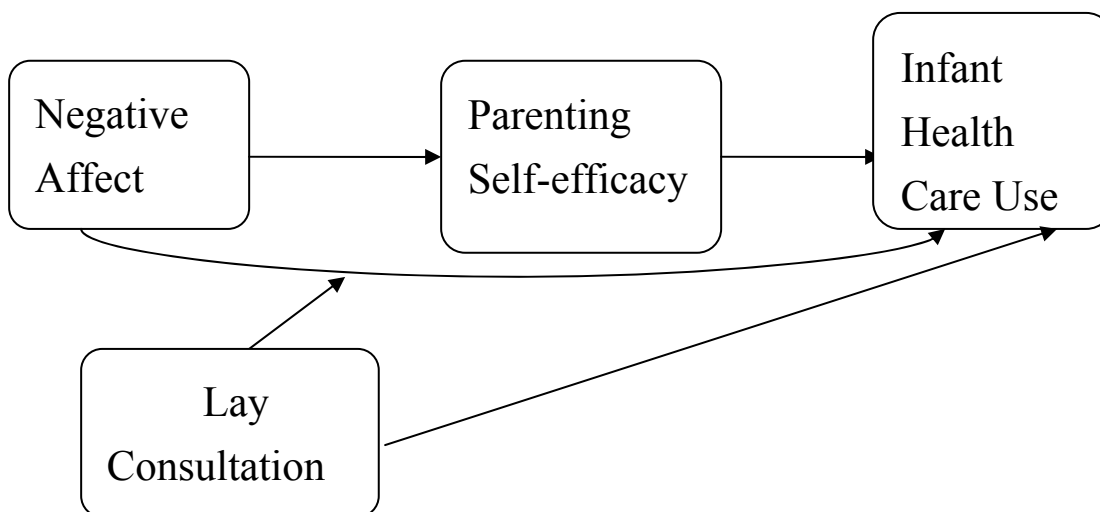
SECTION 2 METHODS

Participants

The participants in this study were 240 women and their newborns. Participants provided consent and were recruited from their rooms on the University of Iowa Hospitals and Clinics' maternity ward during their postpartum stay. Participating mothers were at least 18 years of age. Infants of participating mothers were greater than 36 weeks gestation at birth. Participating infants were not treated in the Neonatal Intensive Care Unit prior to entry into the study. Finally, participating infants were singletons.

Procedures

The procedures of the study described here were reviewed and approved by the University of Iowa's Institutional Review Board (IRB). The study was described and consent was obtained in the mother's maternity ward room. The primary investigator or a trained undergraduate practicum student obtained consent using the study's IRB approved informed consent document (Appendix A). When the mother or her partner wished for the researcher to return at another time, the researcher scheduled a time to come back to describe the study and to obtain consent. At the initial contact in the maternity ward, participants were asked to fill out a short demographic questionnaire, a measure of parenting self-efficacy, and a brief inventory of anxiety and depressive symptoms (i.e. the Mini-Mood and Anxiety Symptom Questionnaire, Mini-MASQ; Casillas & Clark, 2000). Subjects were asked at this time to consent to the examination of their infant's medical records over the first six months of life by trained research

assistants and the primary investigator. The initial time commitment was no more than 10 to 15 minutes.

At two-, four-, and six-months postpartum, the women were called for two separate phone interviews. Each phone contact was approximately 10 to 15 minutes in length (i.e. 20 to 30 minutes total per time period, 60 to 90 minutes total for the entire study). First, a research assistant called women to complete questionnaires assessing parenting self-efficacy (i.e., the Maternal Efficacy Questionnaire; the MEQ; Teti & Gelfand, 1991) and negative affect (i.e., the Mini-Mood and Anxiety Symptom Questionnaire; the Mini-MASQ; Casillas & Clark, 2000) via phone interview. Once the first interview was complete, the primary investigator contacted women to glean information regarding lay consults from family and friends specific to infant health care decision-making (Lay Consultation; Martin et al. (2004). During this second phase of the phone contact, the women were also asked to report any health care use for themselves as well as the index infant since the last researcher contact as recorded in the Longitudinal Interval Follow-up Evaluation (LIFE-II; Keller et al., 1987) treatment section. Health care use variables coded included phone consultations, hospitalizations, acute care visits, and well-baby visits or physicals. In addition, information on the location of the visits and the diagnoses associated with visits was gathered.

An inventory to code health care information was created (i.e. the Infant Treatment Interview; ITI) in order to ease examination of congruence between maternal reported and chart recorded infant health care variables. For each medical contact reported by mothers, the medical record was examined for a matched visit according to visit date. All medical records available for a subject were requested and reviewed. For

UIHC records, both the electronic and paper records were requested and reviewed. When visits did not match according to date, the visit dates were examined for a match according to diagnosis and/or symptoms around the date of the maternally reported visit. When a maternally reported visit did not match according to date or diagnosis, the visit locations were examined. In instances when maternal report and medical records conflicted, the chart reported visits and diagnoses were entered. Medical records were requested from all medical providers contacted by subjects.

Reliability Analysis

In order to assess the inter-rater reliability of the medical record coding, Cohen's Kappa (Cohen, 1960) values of infant health care use variables and related diagnoses for 24 randomly selected cases (10% of the sample) were examined. Kappa represents a comparison of raters' agreement against that which might be expected by chance. The first rater was the primary author, the second rater was an advanced level graduate student in clinical psychology trained in medical record coding according to study protocol. Kappa values were calculated separately for well, acute, and phone contacts at each time point (i.e., two-, four- and six-months of age). Kappa values for physician initiated visits were .87, .70, and .78 (i.e., good agreement), respective to time points. Kappa values for acute visits were 1, 1, and .94, respectively (i.e., excellent agreement). Kappa values for phone contacts were 1, 1, and .92, respectively (i.e., excellent agreement).

As mentioned above, inter-rater reliability for International Classification of Diseases – version 9 (ICD-9) diagnostic coding was evaluated for each infant medical visit. Kappa values for diagnostic reliability ranged from .93 to 1 (i.e., excellent

agreement) at the first time point. Kappa values ranged from .77 to 1 (i.e., good to excellent agreement) at the second time point. Kappa values ranged from .88 to 1 (i.e. good to excellent agreement) at the third time point.

Medical clinics were mailed informed consent documents signed by mothers on behalf of their children along with a brief description of the study. Via the letter describing the study, providers were asked if they would desire reimbursement for copying medical records. If so, the amount requested was reimbursed via check. Subjects earned five dollars per time period completed, for a possible total reimbursement of fifteen dollars. A check for five dollars was mailed to the subject ofollowing each time period completed. Subjects were sent a debriefing statement by mail after completion of the final phone interview at six-months postpartum or after their withdrawal from the study.

Measures

Sociodemographic Questionnaire *(*Appendix B*).* An interview modeled after prior questionnaires of postpartum women was created to obtain sociodemographic information about the infant and his/her family.   The interview was conducted with mothers at study enrollment and contains 30 items previously found to be important in the prediction of pediatric health care use (e.g. parents' ages, parents' marital status, levels of education, occupations, and socioeconomic status, infant race/ethnicity, number of other children in the family, distance to healthcare provider and current medical insurance coverage).

Mini-Mood and Anxiety Symptom Questionnaire (*Mini-MASQ;* Appendix C*;*

Casillas & Clark, 2000). Watson and Clark (1991) originally developed the 90-item

Mood and Anxiety Symptom Questionnaire (MASQ) as a test of their tripartite model of

depression and anxiety. The Mini-MASQ is a shortened (26-item) form developed in

order to lessen administration time and experimenter costs. For each item, participants

rate the extent that they experienced the symptom (1 = not at all, 5 = extremely) over the

past week. General distress, anxious arousal and anhedonic depression scores are each

calculated by summing the items included on the subscale. Items requiring reverse

coding on the anhedonic depression symptoms subscale (i.e. items 1, 9, 15, 19, 23, and

25) were recalculated prior to summing item scores.

In a validational study (Casillas & Clark, 2000), the Mini-MASQ was

administered to both a college student and a primarily African-American, low-income,

rural community sample. A principal factors analysis of the Mini-MASQ yielded three

factors: general distress (GD), anxious arousal (AA), and anhedonic depression (AD). In

total, the three factors accounted for greater than 90% of the variance in each sample.

Scale intercorrelations in both the community sample (i.e. AD-AR = .27; GD-AD = .51;

GD-AR = .48) and the college sample (i.e. AD-AR = .19; GD-AD = .52; GD-AR = .40)

were reflective of good convergent validity between the nonspecific (i.e., GD) and

specific (i.e., AD, AA) scales, as well as evidence of discriminant validity between

Anhedonic Depression and Anxious Arousal. The internal consistencies for all three

scales were good (.83 ≥ α ≤ .88) across samples.

This study used the Mini-MASQ to examine negative affect as a whole as well as

to parse apart maternal anxiety and depressive symptoms as separate predictors as well as

to look at overall general distress. Maternal anxious arousal, anhedonic depression, and

general distress are examined at a symptom level in order to detect the range of predictive power of these variables on infant health care use.

Maternal Efficacy Questionnaire (MEQ; Appendix D; Teti & Gelfand, 1991). The MEQ is a situation-specific (i.e. task level) measure of parenting self-efficacy that specifically pertains to the parenting of infants. Nine of the ten items address the mother's perceived efficacy specific to various infant care tasks (e.g. engaging in daily care, soothing the infant, understanding the infant's wants and needs, etc.). The tenth item addresses more global feelings of maternal self-efficacy (i.e. "In general, how good a mother do you feel you are?"). Each item is scored according to a four point Likert scale. Item scores are summed to determine a total self-efficacy score. The internal consistency of the measure is good (α = .86). The concurrent validity, as measured by its correlation with the Parenting Stress Index Sense of Competence subscale (Abidin, 1986) is high (r = -.75).

Lay Consultation Interview (LC; Appendix E; Martin et al., 2004). The Lay Consultation Interview used by the current study was modeled after the interview created by Martin et al. (2004) for use with cardiac patient samples. The interview as used in the current study questions over the past two months: 1) whether (yes/no) the mother had discussed infant symptoms with a variety of others (i.e., whether she had engaged in lay consultation with her spouse, family, friends, or others), (2) the total number of lay consultants contacted, (3) the lay consultants' advice (i.e. whether to seek medical care versus engage in homedic treatments, ignore the symptom, etc.), (4) how worried or concerned the mother believed her lay consultants to be in general regarding the

symptoms discussed and on a Likert scale from 1 (not at all concerned) to 5 (extremely concerned).

In a prior study using the Lay Consultation Interview with a myocardial infarction sample, perfect inter rater agreement was found for all quantitative items (Bunde & Martin, 2006). Cohen's Kappa was greater than or equal to 0.90 for all content analyses with that sample.

Longitudinal Interval Follow-up Evaluation – II (*LIFE-II; Appendix F; Elkin, et al., 1985; Keller, et al., 1987*). The LIFE-II is a revision of the LIFE that was used in the NIMH Collaborative Program on the Psychobiology of Depression. The LIFE-II is a semistructured interview, used to collect treatment, psychosocial, and psychopathological information over a six-month interval. This study only administered the medical treatment information section of the LIFE-II in order to gain maternal report of self and infant health care utilization. Maternal health care use was collected due to its demonstrated positive correlation with infant health care use. Information regarding the mother's contacts with a health professional (i.e. phone or in-person contact with a doctor or nurse) and medications during the first six months postpartum were recorded as indices of maternal health care use. In an attempt to foster maternal recall and enhance the reliability and validity of maternal reporting, the interview was conducted in two-month, rather than six-month, increments.

In order to collect infant utilization data, the medical treatment section of the LIFE-II was revised to reflect infant contacts with a health professional (Appendix G). Mothers were interviewed regarding infant hospitalizations, acute visits, and mothers' phone contacts regarding the infant with a nurse or physician. The location of visits was

collected in order to facilitate medical record procurement from all providers contacted. The illness or symptoms associated with each medical contact and the associated ICD-9 code, when applicable, were noted. By collecting maternal report of infant health care use, medical contacts that were not found in the infant's medical record for various reasons (e.g. vacations, urgent care, second opinions, etc.) were included in analyses.

Infant's Health Care Index (ITI; Appendix H*).* Following a procedure documented in the health care use literature (Brooks-Gunn, et al. 1994), information regarding infants' number of medical visits and hospitalizations were collected from the infant's medical records at six months postpartum and from the mother's report as obtained from the modified LIFE-II. Hospitalizations occurred in less than two percent of the overall sample. Hospitalizations were therefore coded as acute care visits with each day of hospitalization treated as one acute visit. Physician initiated visits were coded as such if either the visit constituted a well visit or a physician scheduled follow-up visit. Although acute visits and phone contacts made regarding infant symptoms were coded separately on the ITI, they were aggregated for the purpose of data analysis into the mother initiated infant health care variable. In the sample of 220 mothers and infants for whom infant health care visits were collected, phone contacts (total = 390; m = 1.77; SD = 2.26) were generally rare in comparison to acute visits (total = 690; m = 3.14; SD = 3.07) and physician initiated visits (total = 898; m = 4.08; SD = 1.29). The significant correlation between phone contacts and acute visits (r = .33; p < .01) validated the decision to examine the outcome variable according to initiator of visit. Based on the correlation and frequency data, aggregation of acute visits and phone contacts into one outcome variable, physician initiated infant visits, was conducted.

Pilot Data

The descriptive data regarding infant health care use for the present sample can be compared to that of the pilot sample taken from pre-existing data on 4,852 infants who had been treated at the University of Iowa Hospitals and Clinics (UIHC) during their first six months of life. Types of visits included in the pilot analysis were emergency, specialty, other acute and well baby visits. Phone contacts were not included in the pilot data analysis. Pilot visits were categorized into well-baby and acute visits to note the importance of the visit initiator (i.e., mother versus physician) and nature of presenting issue. Due to concern that many infants in the pilot sample may receive their primary care services at other hospitals and clinics, the analyses focused on those infants who had attended at least three well baby visits at UIHC as it was assumed that UIHC was the primary provider of well and acute care for these infants. The average number of acute visits in this pilot group was 2.42 (SD = 2.48) for the six month period in comparison to 3.14 (SD = 3.07) in the current sample, suggesting that the dissertation sample was generally in line with a larger sample of infants regarding number of acute care visits during the first six months of life.

Trained research assistants completed the index by coding information from the infant's medical records in addition to the mother's report (i.e. the LIFE-II infant section). With supervision from the primary investigator, each medical contact within the medical record was compared to maternal reported contacts for agreement regarding date of service, symptoms, diagnosis, and visit location. Decision-making regarding inclusion of maternally reported visits and reliability data are described in the procedures section, above.

SECTION 3 RESULTS

Demographic information

Participants were women who were English speaking, at least 18 years of age and gave birth to singleton infants at or greater than 36 weeks gestation without Intensive Care Unit treatment. Women and their infants were recruited during their maternity ward stays (i.e. the first two to three days post partum) at the University of Iowa Hospitals and Clinics. Initial analyses were conducted on 240 women and their infants. Categorical demographic characteristics for subjects are reported in Table 1. In addition, mothers were 29 years of age, on average (SD = 5.35). The 84% of parents who were married had been for an average of 4.6 years (SD = 3.6) at time of recruitment. The 58% of mothers who had multiple children had one older child in addition to the index infant, on average (SD = 1.1). Social class was calculated using Hollingshead criteria (Hollingshead, 1975). The mean Hollingshead score for the sample was 44.84 (SD = 16.50) indicating an intermediate SES level equivalent to the strata of medium business, minor professional, and technical workers. The mean number of daycare hours that mothers who intended to use daycare (55%) estimated they would use for their infants per week was 28.5 (SD = 12.7).

Completer Analyses

Due to subject attrition and deviations from protocol (i.e., missing one or more phone interviews) at various time points across the six-months postpartum, the Ns of subjects available at each time point for analyses are reported. Table 2 displays the numbers of subjects who completed their assessments across time points. Demographic and clinical variables were compared for those who completed at least two assessment

points (N = 190) and the women who withdrew after the initial intake (N = 50) (see Table 3). Participants who completed versus withdrew were significantly more likely to have infants of non-Hispanic ethnicity, to be married, higher in education and SES, plan to use daycare, and have insurance coverage for their infants. There were no differences between groups for the mini-MASQ subscales or the MEQ conducted at the initial time point. Of the 20 women who withdrew from the study after the initial interview, twelve were removed due to their consent to release their infant's medical records not being completed correctly and their not returning follow-up telephone calls or having disconnected phone lines and unlisted contact information. Two women were not fluent enough in English to complete the questionnaires over the phone. Three infants were enrolled in the Neonatal Intensive Care Unit (NICU) between recruitment into the study and discharge from the hospital. Two women were removed from the study due to having twins. One woman withdrew from further participation upon her infant's death from Sudden Infant Death Syndrome.

ICD-9 Diagnoses

All ICD-9 diagnoses listed for a visit were recorded such that some visits may be represented by more than one diagnosis in the chart. The mean number of diagnoses per infant over the six month time period was 3.3 (SD = 3.50). Of specific interest to the current study, 27% of diagnoses were for signs, symptoms, and/or ill defined conditions (i.e., ICD-9 diagnosis code 780). Common presenting complaints associated with the 780 diagnostic code were vomiting, colic, teething, and difficulty sleeping. When ICD-9 codes were not available for the condition listed as prompting infant health care, a code was created in order to accurately reflect the reason for infant health care seeking. If the

weight loss (1002) and unknown (3333) created codes are collapsed into signs, symptoms, and ill defined conditions (i.e. code 780), the frequency of the 780 diagnostic code increases to 34%.

Measure Descriptive Statistics

The means and standard deviations on maternal psychosocial measures across time points are presented in Tables 4 and 5. The internal consistency coefficients of measures across time points are presented in Table 6. Paired samples t-tests were conducted on psychosocial measures to examine stability over time (Table 7). The anxious arousal subscale of the Mini-MASQ demonstrated a significant decline from the initial to the two-month time point and then stabilized through the six-month time point. The Mini-MASQ anhedonic depression and general distress subscales remained stable throughout the six month time period. Parenting self-efficacy, as measured by the MEQ, demonstrated significant increases from the initial to two-month postpartum period as well as the two to six-month postpartum period. The total number of people consulted regarding the infant's symptoms declined significantly across the six months postpartum. The mother's perceived average degree of worry experienced by the Lay Consults declined significantly from two to six months postpartum. Test-retest reliabilities for the MEQ, Mini-MASQ subscales, and Lay Consultation items across time points were generally significant across time points at the $p < .01$ level (Table 8). The one exception was the correlation for the initial and two-month Anxious Arousal subscale of the Mini-MASQ, which was a trend level relationship.

Physician and Mother Initiated Infant Health Care Use

The bivariate correlations between physician initiated well and mother initiated visits for infants are presented in Table 9. Notably, physician initiated visits were not significantly correlated with mother initiated acute or phone contacts which were significantly correlated with each other ($r = .33$; $p < .01$). The correlational data thereby validate the examination of physician and mother initiated visits separately as outcome variables. The means and standard deviations of infant health care use as measured by physician initiated (i.e. well-baby) visits and mother initiated (i.e. phone plus acute) visits are presented in Table 10. Paired samples t-tests were conducted on physician and mother initiated infant visits to examine stability over time. T-tests found to be significant are presented in Table 11. Physician initiated visits significantly decreased in frequency from two- to four-months and from two- to six-months postpartum, but were stable from four to six-months postpartum. Mother initiated visits were stable from two- to four-months and four- to six-months postpartum, but significantly decreased across the six months postpartum. The bivariate correlations between infant health care visits as measured by physician initiated and mother initiated infant health care across time points and in total were examined next (Table 12). Physician initiated care is not significantly correlated with mother initiated care with the exception of physician initiated care at four to six months of age, which is significantly correlated with both mother initiated care at four to six months of age and total mother initiated care across the first six months of life. Physician initiated care is not significantly correlated across time points. Furthermore, mother initiated care was significantly correlated across time points, suggesting that

mothers showed some consistency in their care seeking behavior across the first six months postpartum.

Correlations: Infant Health Care Use and Maternal Variables

The means and standard deviations of maternal health care use measured across the six month period and in two-month increments are presented in Table 13. There was a significant decrease in mothers' physician initiated visits (i.e. physicals) from two to four months postpartum (t = 11.62, p < .001), and two to six months postpartum (t = 11.82, p < .001), and a trend towards a decrease from four to six months postpartum (t = 1.72, p < .10) consistent with the typical scheduling of a six week maternal postpartum check, but not continued physicals during the postpartum period. Also note that mothers' acute visits remained stable across the six month postpartum period. The bivariate correlations between mothers' acute care seeking for themselves (i.e. self-initiated health care), mothers' attendance at physicals (i.e., physician initiated maternal health care), mother initiated infant health care and physician initiated infant health care were examined next (Table 14). The relationships between mother-initiated self and infant health care use as well as physician initiated self and infant health care use demonstrated trends towards significance. Mother initiated self and infant health care use showed a positive relationship trend. However, the relationship trend between physician-initiated self and infant health care use was unexpectedly negative in direction.

Correlations within a Refined Data Set (N = 190)

A total of 190 subjects had sufficient data to be included in the multiple hierarchical regression analyses requiring the calculation of predictor variable means (i.e., data from at least two of the four measurement occasions for the MASQ and MEQ

and data from at least two of the three measurement occasions for the Lay Consultation Interview). For the MASQ and MEQ, a total of 138 subjects had data for all four assessments, a total of 196 subjects had data for at least three assessments, and 210 subjects had data for at least 2 assessments. For the Lay Consultation Interview, a total of 166 subjects had data for all three measurement occasions and a total of 190 subjects had data for at least two measurement occasions. Therefore, a refined data set in which only participants who had completed study measures for at least two time points of each predictor variable (i.e., mini-MASQ, MEQ, and Lay Consultation Interview) was used to conduct the analyses described below (N = 190).

Prior to conducting multiple hierarchical regression analyses, the bivariate correlations between means of the maternal psychosocial variables were examined (Table 15). The mean Mini-MASQ subscales were all significantly positively correlated with one another ($.32 \leq r \geq .62$; $p < .01$). The mean MEQ was significantly negatively correlated with the general distress ($r = -.32$; $p < .01$) and the anhedonic depression subscales ($r = -.48$; $p < .01$) and showed a trend towards a negative correlation with Mini-MASQ anxious arousal ($r = -.13$; $p < .10$). The two mean Lay Consultation variables were significantly positively correlated ($r = .36$; $p < .01$).

The bivariate correlations between both physician and mother initiated infant health care use and selected demographic variables were calculated (Table 16) using the refined data set (N = 190). Mothers who were of higher socioeconomic status as well as married mothers (as measured by a dichotomous yes – 1, 0 – no dummy variable) were significantly less likely to be compliant with physician initiated infant visits. In addition, higher maternal education level showed a trend towards significance. Specifically,

women with higher education levels were less compliant with physician initiated infant visits. None of the sociodemographic variables were associated with mother initiated infant health care use.

Correlations between the maternal psychosocial measures, physician initiated and mother initiated infant visits were also examined prior to conducting the multiple hierarchical regressions. The correlations were examined, in part, to determine whether a partial mediation model and /or a moderation model were possible. As described by Baron and Kenny (1986), the first requirement in testing mediation is to establish that a significant effect exists that could be mediated. Therefore, the mean of each psychosocial variable across time points (i.e., mean general distress, mean anhedonic depression, and mean anxious arousal) was examined for its relationship to physician initiated and mother initiated infant health care (Table 17). None of the correlations with the Mini-MASQ subscales reached significance, thereby ruling out the possibility of a mediational role for the MEQ (Baron & Kenny, 1986) in the prediction of physician initiated and mother initiated infant health care use. Furthermore, neither the mean of the MEQ nor the mean of LC supports was significantly correlated with either infant health care variable. As described by Baron and Kenny (1986),

> "it is desirable that the moderator variable be uncorrelated with both the predictor and the criterion (the dependent variable) to provide a clearly interpretable interaction term" (p. 1174).

Although the mean Lay Consultation items were not significantly correlated with the Mini-MASQ subscales (Table 15) or with physician initiated infant visits (Table 17), the mean of the Lay Consultation worry items was significantly positively correlated with mother initiated infant visits and the mean of the Lay Consultation support items showed

a trend towards a significant positive correlation with mother initiated infant visits. The significant correlation does not preclude the examination of moderation effects, however, which are tested in the multiple hierarchical regression analyses via entry of main effects and centered interaction terms for the Lay Consultation item means.

When conducting the multiple hierarchical regression analyses, variables were entered in steps into the regression in an order influenced by findings from the prior literature and a priori hypotheses. Analyses were conducted according to the two outcome variables of interest (i.e. physician initiated and mother initiated infant health care use). Maternal affective variables were entered as a group in order to examine the simultaneous main effects of general distress, anhedonic depression, and anxious arousal. In this manner, the overall effect of negative affect on infant health care use was examined. Secondary multiple hierarchical regression analyses were conducted with each maternal affective variable entered in isolation of the other two Mini-MASQ negative affect subscales. Examining general distress, anxious arousal, and anhedonic depression in separate regression analyses did not alter the significance of findings in comparison to when the affective variables are entered as a group as reported below. The secondary analyses entering each negative affect variable in isolation are therefore not reported.

Infants' Physician Initiated Visits as the Outcome Variable

In the first step of the multiple hierarchical regression analysis predicting infants' physician initiated visits, select demographic variables (e.g., infant Hispanic ethnicity, other children in home (as measured by a discrete variable "primiparous" with 0 – no primiparous, 1 - one other child, 2 - two or more other children), maternal age, maternal

education level, parents marital status (as measured by the dichotomous variable with 1 –
yes, 0 – no), daycare care use (as measured by the dichotomous variable with 1 – yes, 0 –
no), and SES as well as enabling variables (e.g., insurance coverage, minutes to the
physician) were entered (Table 18). The following variables were significant or
approached significance when first entered in the equation for the prediction of physician
initiated visits: primiparous ($t = -1.66$, $p < .10$) and SES ($t = -1.96$, $p < .05$). Note that
the Beta weight for the SES variable differed after all variables were entered in the final
step such that its strength was reduced to a trend level ($t = -1.84$; $p < .10$). In interpreting
the results, it seems that family SES demonstrated a significant negative relationship with
physician initiated visits, such that higher SES was associated with fewer physician
initiated visits. In addition, the presence of other children in the home showed a negative
trend with physician initiated visits, such that more children in the home resulted in fewer
physician initiated visits. Next, the main effects of the three mini-MASQ subscales were
entered (i.e., anxious arousal, anhedonic depression, and general distress) as a group.
None of the mini-MASQ subscales were significant in predicting physician initiated
visits. The interaction between anxious arousal and anhedonic depression was entered
third and was not significant. The main effect for the MEQ was entered fourth and was
not significant. Fifth, the Lay Consultation variables in the forms of how many people
she asked for advice (i.e. LC supports) and the mother's perception of how worried her
supports were, on average, regarding the infant's symptoms (i.e., LC worry) were
entered. Neither Lay Consultation variable was significant in predicting physician
initiated visits. Finally, the interactions between each mini-MASQ subscale and the two
Lay Consultation variables were entered to test for a moderating effect of lay consultation

on maternal negative affect. The measures employed in each interaction term (i.e. anxious arousal, anhedonic depression, general distress, lay consultation worry, and lay consultation support) were each centered in reference to their mean prior to being entered into the regression equation in order to address multicolinearity. None of the interactions were significant in the prediction of physician initiated infant health care. None of the models included in the multiple hierarchical regression reached significance.

Infants' Mother Initiated Visits as the Outcome Variable

In analyses predicting infants' mother initiated visits, predictor variables were entered in an identical manner to that described above for physician initiated visits with the exception that the total maternal visits variable was entered first into the equation, due to its prominence in the literature as a significant predictor of ambulatory (i.e. mother initiated) pediatric health care use in school aged children (Table 19). In the current sample, total maternal visits showed a positive trend in the prediction of maternal initiated infant health care ($t = 1.89$, $p < .10$) and therefore model one approached significance ($F = 3.58$, $p < .10$). None of the demographic variables reached significance or approached significance upon entry into the equation. However, the presence of the enabling variable, insurance coverage ($t = 2.05$, $p < .05$), was associated with increased mother initiated infant health care upon entry into the equation. However, the influence of insurance coverage was reduced to trend level upon entry of all of the variables in the final step of the regression ($t = 1.66$; $p < .10$). Next, the main effects of the three Mini-MASQ subscales (i.e., anxious arousal, anhedonic depression, and general distress) were entered. None of the Mini-MASQ subscales were significant in predicting mother initiated visits. The interaction between anxious arousal and anhedonic depression was

entered fourth and was also not significant. The main effect for the MEQ was entered next and was not significant. The Lay Consultation variables in the forms of how many people she asked for advice (i.e. LC supports) and the mother's perception of how worried her supports were, on average, regarding the infant's symptoms (i.e., LC worry) were entered on the sixth step. The specific Lay Consultation worry variable ($t = 3.85$, $p < .001$) and the overall model represented by step six ($F = 2.00$, $F\Delta = 8.60$, $p < .001$) were both significant in predicting physician initiated visits. Specifically, mothers who perceived their lay consultants to be more worried about their infants discussed symptoms were more likely to seek acute care and/or phone contacts for their infants than those who perceived their lay consultants to be less worried. Finally, the interactions between each mini-MASQ subscale and the two Lay Consultation variables were entered to test for a moderating effect of lay consultation on maternal negative affect. The same centered interactions used in analyses conducted for physician initiated visits were entered in order to address multicolinearity. The centered interaction between maternal anxious arousal and lay consultant worry approached significance ($t = 1.67$, $p < .10$). Specifically, women higher in anxious arousal who also perceived their lay consultants as worried showed a trend toward being more likely to seek healthcare than other mothers enrolled in the study. The overall model ($F = 1.71$, $p < .03$) was significant, but did not significantly increase the prediction of mother initiated infant visits over and above model six.

Post-hoc Analyses with Infants' Physician Initiated Visits

When post-hoc regression analyses were conducted examining the potential influence of type of clinic (i.e. family medicine versus pediatrics) on physician initiated

visits, the procedure conducted for the multiple hierarchical regression analyses conducted above were followed with the exceptions that the dummy variable clinic type (coded as 0 = family medicine, 1 = pediatrics), was entered into the first step of the equations, and the significant interactions with clinic type and maternal education level (t = -4.01, p < .05) as well as anxious arousal (t = 2.42, p < .05) were entered into step one and step three, respectively.

The following variables were significant or approached significance when first entered in the equation for the prediction of physician initiated visits: insurance (t = 1.78, p < .10) and SES (t = -2.39, p < .05). Neither clinic type nor the interaction between maternal education level and clinic type was significant in the equation. Note that the Beta weight for the insurance variable differed after all variables were entered in the final step such that its strength was reduced to nonsignificance (t = 1.29; p > .10). In interpreting the results, it seems that family SES demonstrated a significant negative relationship with physician initiated visits, such that higher SES was associated with fewer physician initiated visits. In addition, infant insured status initially showed a positive trend with physician initiated visits, such that the infant being insured resulted in greater physician initiated visits, but no longer demonstrated the trend once all variables were entered into the equation. Next, the main effects of the three mini-MASQ subscales were entered (i.e., anxious arousal, anhedonic depression, and general distress) as a group. None of the mini-MASQ subscales were significant in predicting physician initiated visits. The interaction between anxious arousal and anhedonic depression was entered third and demonstrated a trend towards significance (t = 1.90; p < .10). Note that the interaction between anxious arousal and anhedonic depression was reduced to

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nonsignificance upon entry of all variables in the last step of the equation (t = 1.58; p > .10). The interaction between anxious arousal and clinic type was entered in the same step and was not significant. The main effect for the MEQ was entered fourth and was not significant. Fifth, the Lay Consultation variables in the forms of how many people she asked for advice (i.e. LC supports) and the mother's perception of how worried her supports were, on average, regarding the infant's symptoms (i.e., LC worry) were entered. Neither Lay Consultation variable was significant in predicting physician initiated visits. Finally, the interactions between each mini-MASQ subscale and the two Lay Consultation variables were entered to test for a moderating effect of lay consultation on maternal negative affect. The measures employed in each interaction term (i.e. anxious arousal, anhedonic depression, general distress, lay consultation worry, and lay consultation support) were each centered in reference to their mean prior to being entered into the regression equation in order to address multicolinearity. None of the interactions were significant in the prediction of physician initiated infant health care. None of the models included in the multiple hierarchical regression reached significance.

Comparisons between post-hoc and prior analyses suggest overall agreement. In post-hoc analyses, none of the steps are significantly predictive, similar to prior analyses. Upon entry into the equation, SES remains significant in the negative direction. Other children no longer reached the trend level of significance. Insurance status shows a trend towards significance in the positive direction. None of the Mean Mini-MASQ subscales are significant, consistent with prior findings. The interaction between anxious arousal and anhedonic depression Mini-MASQ subscales showed a positive trend for physician initiated use. Therefore, mothers experiencing both anxious and depressive symptoms

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had a greater number of physician initiated visits. The interaction between anxious arousal and clinic type was not significant. The means of the MEQ, LC worry, and LC support variables were not significant, consistent with prior analyses. The interactions among Mini-MASQ subscales and Lay Consultation variables were not significant and therefore consistent with prior analyses. Overall, the post hoc findings were largely in agreement with prior analyses.

Post-hoc Analyses with Infants' Mother Initiated Visits

For post-hoc regression analyses examining the potential influence of type of clinic on mother initiated visits, the steps outlined for physician initiated visits were followed with the exception that the total maternal visits variable was entered first into the equation. In the current sample, total maternal visits was significant in the prediction of maternal initiated infant health care ($t = 2.26$, $p < .05$) and therefore model one was significant ($F = 5.10$, $p < .05$). None of the demographic variables were significant or approached significance upon entry into the equation. Notably, neither clinic type nor the interaction between maternal education and clinic type was significant. However, the presence of the enabling variable, insurance coverage ($t = 1.85$; $p < .05$), was associated with increased mother initiated infant health care upon entry into the equation. However, the influence of insurance coverage was reduced to trend level upon entry of all of the variables in the final step of the regression ($t = 1.68$; $p < .10$). Next, the main effects of the three Mini-MASQ subscales (i.e., anxious arousal, anhedonic depression, and general distress) were entered. None of the Mini-MASQ subscales were significant in predicting mother initiated visits. The interaction between anxious arousal and anhedonic depression was entered fourth along with the interaction between anxious arousal and

clinic type. Neither was significant. The main effect for the MEQ was entered next and was not significant. The Lay Consultation variables in the forms of how many people she asked for advice (i.e. LC supports) and the mother's perception of how worried her supports were, on average, regarding the infant's symptoms (i.e., LC worry) were entered on the sixth step. The specific Lay Consultation worry variable ($t = 3.76$, $p < .001$) and the overall model represented by step six ($F = 1.88$; $p < .05$ & $F\Delta = 8.03$, $p < .001$) were both significant in predicting mother initiated visits. Specifically, mothers who perceived their lay consultants to be more worried about infants' symptoms were more likely to seek acute care and/or phone contacts for their infants than those who perceived their lay consultants to be less worried. Finally, the interactions between each mini-MASQ subscale and the two Lay Consultation variables were entered to test for a moderating effect of lay consultation on maternal negative affect. The same centered interactions used in analyses conducted for physician initiated visits were entered in order to address multicolinearity. The centered interaction between maternal general distress and lay consultant worry was significant ($t = 2.02$, $p < .05$). Specifically, women higher in general distress who also perceived their lay consultants as worried were more likely to seek healthcare than other mothers enrolled in the study. The overall model for step seven was significant ($F = 1.79$, $p < .05$), but did not significantly increase the prediction of mother initiated infant visits over and above model six ($F\Delta = 1.37$, $p > .10$).

Comparisons between post hoc and prior analyses revealed general agreement. In post-hoc analyses, steps one and six are significant, as compared to step one showing a trend for significance and step six showing significance in the prediction of in the prediction of mother initiated infant health care use. In step two of post hoc analyses,

insurance status showed a trend towards significance, versus showing significance in prior analyses. No other demographic or enabling variables were significant in either set of analyses. Neither the interaction between anxious arousal and anhedonic depression nor the interaction between anxious arousal and clinic type was significant. The means of the MEQ and LC support variables were not significant, consistent with prior analyses. The mean of LC worry was significant in both sets of analyses. The interactions among Mini-MASQ subscales and Lay Consultation variables were not significant and therefore consistent with prior analyses. The interactions among Mini-MASQ subscales and Lay Consultation variables were not significant and therefore consistent with prior analyses. The one exception was the positive interaction between the Mini-MASQ general distress subscale and LC worry in post hoc analyses. Overall, the post hoc findings were largely in agreement with prior analyses.

Table 1

Overall Sample Demographic Characteristics

Variable	Percentage
Maternal race	
Caucasian	82
Asian	6
African American	4
Other	8
Infant race	
Caucasian	77
Asian	4
African American	3
Other	16
Maternal Hispanic	7
Infant Hispanic	10
Infant gender – male	55
Parents married	84
Primiparous	42
Religious affiliation -	
Protestant	35
Catholic	20
Jewish	1
Other	13
None	31
Mother employed	63
Partner employed	85
Household income	
< $30,000	26
< $50,000	16
< $70,000	21
≥ $70,000	34
Infant insured	93

Table 2

Number of Subjects with Completed Maternal and Infant Measures at the Two-, Four- and Six-month Assessments

	2-mo	4-mo	6-mo
Maternal Psychosocial	186	180	189
Medical Record of Infant HCU	220	220	220
Maternal Report of Infant HCU	196	197	196
Maternal Self-Report of HCU	196	195	185

Note: N = 240 at enrollment; HCU = health care utilization

Table 3

Mean Level and Percentage Comparisons between Women Who Completed (N = 190) Versus Withdrew from the Study after the Initial Interview (N = 50)

	Completers % /M (SD)	Withdrawals %/ M (SD)
Mother employed	66	45
Married	86	66
Partner employed	86	79
Infant non-Hispanic	91	76
Infant male	56	41
Primi/ Multiparous	58	59
Daycare use y/n	58	34
Insured	95	83
Mins to physician	78	69
Maternal age	29.35 (5.44)	28.03 (4.52)
Maternal education	15.72 (2.62)	14.41 (2.67)
SES	5.86 (2.31)	4.07 (2.57)
Mini-MASQ (AA)	15.77 (5.20)	15.83 (4.56)
Mini-MASQ (AD)	17.57 (5.06)	19.14 (3.74)
Mini-MASQ (GD)	12.90 (4.33)	12.69 (3.86)
Mini-MASQ (total)	46.29 (10.66)	47.66 (7.32)
MEQ (total)	33.68 (3.48)	33.36 (3.29)

Note: *$p < .05$; **$p < .01$; ***$p < .001$

Table 4

Means and Standard Deviations of Maternal Psychosocial Measures across Assessment Points

	Mean	SD
Initial Assessment (N = 238)		
Mini-MASQ (total)	46.46	10.31
Anxious arousal	15.77	5.12
Anhedonic depression	17.96	4.94
General distress	12.88	4.23
MEQ	33.62	3.12
Two-month Assessment (N =184)		
Mini-MASQ (total)	41.27	10.04
Anxious arousal	11.58	2.5
Anhedonic depression	16.94	5.01
General distress	12.74	4.49
MEQ	34.1	3.51
Four-month Assessment (N=180)		
Mini-MASQ (total)	41.02	9.67
Anxious arousal	11.46	2.69
Anhedonic depression	16.83	4.85
General distress	12.74	4.46
MEQ	35.15	3.21
Six-month Assessment (N = 189)		
Mini-MASQ (total)	40.89	9.82
Anxious arousal	11.14	2.29
Anhedonic depression	17.01	5.27
General distress	12.83	4.52
MEQ	35.53	3.03

Table 5

Mean Level and Percentage Comparisons between Women Who Completed (N = 190) Versus Withdrew from the Study after the Initial Interview (N = 50)

	Mean	_SD_
Two-month Assessment (N = 190)		
LC supports	2.47	3.79
LC worry	1.47	1.48
Four-month Assessment (N = 190)		
LC supports	1.92	3.62
LC worry	1.21	1.43
Six-month Assessment (N = 178)		
LC supports	1.58	2.28
LC worry	1.18	1.4

Note: LC supports represents the number of people mothers asked for advice. LC worry represents the mothers' perceptions of how worried their supports were, on average, regarding the infants' symptoms.

Table 6

Internal Consistency Coefficients of Maternal Psychosocial Measures

	Initial (N = 240)	2-mo (N =190)	4-mo (N=185)	6-mo (N = 195)
AA	0.76	0.63	0.69	0.65
AD	0.8	0.86	0.86	0.88
GD	0.82	0.84	0.8	0.86
MEQ	0.85	0.8	0.79	0.77

Table 7

Significant Paired Samples T-Tests of Psychosocial Measures Across Time Points

	t (df)
MEQ	
Two- to four-month	-5.11 (155)***
Four- to six-month	-2.16 (166)*
Initial to six-month	-8.77 (180)***
Mini-MASQ AA	
Initial to two-month	10.05 (181)***
Two- to six-month	3.08 (157)**
Initial to six-month	12.29 (181)***
LC Worry	
Two- to six-month	2.25 (169)*
LC Support	
Two- to four-month	2.98 (178)**
Two- to six-month	3.21 (169)**

Note: *p < .05; **p < .01; ***p < .001; A negative t-score reflects an increase in score over time.

Table 8

Test-Retest Reliabilities for the MEQ, Mini-MASQ Subscales, and
Lay Consultation Items across Time Points

	2-month (N)	4-month (N)	6-month (N)
Initial MEQ	.53** (177)	.47** (173)	.54** (181)
2-month MEQ	-	.69** (156)	.65** (162)
4-month MEQ	.69** (156)	-	.66** (167)
Initial AA	.13† (180)	.23** (178)	.21** (180)
2-month AA	-	.34** (156)	.43** (156)
4-month AA	.34** (156)	-	.49** (163)
Initial AD	.53** (180)	.38** (178)	.41** (180)
2-month AD	-	.61** (156)	.58** (156)
4-month AD	.61** (156)	-	.47** (163)
Initial GD	.43** (180)	.34** (178)	.48** (180)
2-month GD	-	.58** (156)	.52** (156)
4-month GD	.58** (156)	-	.38** (163)
2-month LCW	-	.42** (179)	.25** (170)
4-month LCW	.42** (179)	-	.41** (173)
2-month LCS	-	.78** (179)	.26** (170)
4-month LCS	.78** (179)	-	.32** (173)

Table 9

*Bivariate Correlations between Physician Initiated Well and Mother Initiated
Acute Visits and Phone Contacts for Infants*

	Physician initiated visits	Mother initiated acute visits	Mother initiated phone contacts
Infant acute visits	0.10		
Infant phone contacts	0.09	0.33**	
Infant total contacts	0.38**	0.84**	0.72

Note: *p < .05; **p < .01; N = 220

Table 10

Means and Standard Deviations of Physician Initiated Visits, Mother Initiated Visits and Total Visits

Visits	*Mean*	*SD*
Physician initiated	2.26	1.08
Mother initiated	1.9	2.14
Total	4.16	2.4
Initial to Two-month Time Period (N =220)		
Physician initiated	0.9	0.51
Mother initiated	1.63	1.98
Total	2.53	2.09
Two to Four-month Time Period (N=220)		
Physician initiated	0.92	0.56
Mother initiated	1.38	1.95
Total	2.31	2.12
Four to Six-month Time Period (N = 220)		
Physician initiated	4.08	1.29
Mother initiated	4.91	4.37
Total	8.99	4.69

Table 11

Significant Paired Samples T-Tests of Infant Medical Visits across Time Points

	t (df)
Physician initiated	
two to four-month	16.56 (219)***
two to six-month	15.88 (219)***
Mother initiated	
two- to six-month	2.98 (219)**

Note: **p < .01; ***p < .001

Table 12

Bivariate Correlations between Mother Initiated (M.I.) and Physician Initiated (P.I.) Infant Health Care

	P.I. 2	P.I. 4	P.I. 6	M.I.2	M.I. 4	M.I. 6
P.I. 4-mo	-0.04	-				
P.I. 6-mo	-0.06	0.05	-			
P.I. total	.77**	.38**	.41**			
M.I. 2-mo	0	0.05	0.07	-		
M.I. 4-mo	0.02	0.08	0.06	.28**		
M.I. 6-mo	0.03	0.07	0.17*	.20**	.35**	-
M.I. total	0.02	0.09	.71**	.71**	0.75**	0.71**

Note: N = 240, *p <.05; **p < .01

Table 13

Means and Standard Deviations of Maternal Health Care Use across Assessment Points

Visits	Initial to Two-month (N=196)	
Physician initiated	0.9	0.64
Self-initiated	0.67	1.64
Total	1.57	1.78
	Two to Four-month (N=195)	
Physician initiated	0.22	0.56
Self-initiated	0.5	1.26
Total	0.7	1.33
	Four to Six-month (N=185)	
Physician initiated	0.12	0.49
Self-initiated	0.5	1.12
Total	0.62	1.19
	Initial to Six Month (N=178)	
Physician initiated	1.24	1.02
Self-initiated	1.76	2.97
Total	2.98	3.29

Table 14

Significant Bivariate Correlations between Maternal Health Care Use and Infant Health Care Use Variables

	Infant Health Care	
Maternal Health Care	*Mother initiated*	*Physician initiated*
Self-initiated	$0.14^{\dagger}$	0.05
Physician- initiated	0.04	$-0.13^{\dagger}$

Note: $^{\dagger}p < .10$; N = 178

Table 15

Bivariate Correlations between Mean Maternal Psychosocial Measures

	Mean MEQ	Mean AD	Mean AA	Mean GD	Mean LCW
Mean MEQ	-	-0.48**	-0.13†	-0.32**	-0.07
Mean AD	-0.48	-	0.32**	0.67**	0.04
Mean AA	-0.13	0.32**	-	0.46**	0.08
Mean GD	-0.32	0.67**	0.46**	-	0.06
Mean LCW	-0.07	0.04	0.08	0.06	-
Mean LCS	0.04	-0.05	-0.06	0.02	0.36**

Note: †p < .10; ** p < .01; *** p < .001; N = 190

Table 16

Bivariate Correlations between Infant Health Care Use and Selected Demographic Variables Within the Data Set that Included the 190 Mothers Who had Completed at Least Two of the Assessment Points for the Mini-MASQ, the MEQ, and the Lay Consultation Interview

	Physician initiated infant visits	*Mother initiated infant visits*
Maternal age	-0.10	0.08
Maternal education	-0.12[†]	-0.05
Married y/n	-0.17*	-0.05
Infant gender	0.09	-0.03
Infant Hispanic	-0.02	0.06
Primiparous	-0.1	0.01
Insurance	-0.05	-0.11
Minutes to doctor	-0.03	0.03
Daycare use y/n	-0.03	0.06
SES	-0.17*	-0.06

Note: [†]$p < .10$, *$p < .05$; N = 185

Table 17

Bivariate Correlations between Infant Health Care Use and the Means of Maternal Psychosocial Variables Within the Data Set that Included the 190 Mothers who had Completed at Least Two of the Assessment Points for the Mini-MASQ, the MEQ, and the Lay Consultation Interview

	Physician initiated infant visits	*Mother initiated infant visits*
General distress	-0.04	0.06
Anxious arousal	0.03	-0.02
Anhedonic depression	-0.01	0.03
LC supports	0.09	0.12†
LC worry	0.13†	0.32**
MEQ	0.05	-0.1

Note: †p < .10, **p < .01; N = 185

Table 18

Multiple Hierarchical Regression Analysis of Physician Initiated Infant Visits on Sociodemographic and Enabling Variables, Maternal Negative Affect, Parenting Self-Efficacy, and Lay Consultation Variables

Predictor(s)	ß	t	df(1, 2)	FΔ	R	R^2
Step 1			(10, 173)	1.49	.28	.08
Maternal age	.07	0.76				
Married y/n	-.11	-1.27				
Infant Hispanic	-.01	-0.12				
Maternal education	-.04	-0.34				
Infant gender	.10	1.38				
Other children	-.14	-1.66[†]				
Insurance y/n	.11	1.36				
Minutes to dr	-.07	-0.91				
Daycare use	-.05	-0.62				
SES	-.20	-1.96*				
Step 2			(3, 170)	.20	.29	.08
Mean AA	.03	0.34				
Mean	.05	0.49				
Mean GD	-.08	-0.77				
Step 3			(1, 169)	1.82	.30	.09
AA x AD	.15	1.35				
Step 4			(1, 168)	.46	.31	.10
Mean MEQ	.06	0.68				
Step 5			(2, 166)	1.42	.33	.11
Mean LC worry	.05	0.65				
Mean LC support	.10	1.20				
Step 6			(6, 160)	.25	.34	.12
AA x LC worry	.10	0.22				
AD x LC worry	.28	0.54				
GD x LC worry	-.25	-0.49				
AA x LC support	.18	0.34				
GD x LC support	.11	0.20				

Note: [†]p < .10; * p < .05; ** p < .01; *** p < .001

Table 19

Multiple Hierarchical Regression Analysis of Mother Initiated Infant Visits on Maternal Health Care Use, Sociodemographic and Enabling Variables, Maternal Negative Affect, Parenting Self-Efficacy, and Lay Consultation Variables

Predictor(s)	ß	t		df (1, 2)	FΔ	R	R^2
Step 1				(1, 182)	3.58†	.14	.02
Total maternal hcu	.14	1.88†					
Step 2				(10, 172)	.96	.27	.07
Maternal age	.16	1.63					
Maternal education	-.05	-0.42					
Married y/n	-.08	-0.92					
Infant Hispanic	.03	0.35					
Infant gender	-.02	-0.27					
Other children	-.05	-0.61					
Insurance y/n	-.16	-2.05*					
Minutes to dr	.04	0.57					
Daycare use	.07	0.94					
SES	-.11	- 1.12					
Step 3				(3, 169)	.32	.28	.08
Mean AA	-.08	-0.86					
Mean AD	-.01	-0.07					
Mean GD	.08	0.69					
Step 4				(1, 168)	.85	.29	.08
AA x AD	-.10	-0.92					
Step 5				(1, 167)	2.26	.31	.09
Mean MEQ	-.13	-1.50					
Step 6				(2, 165)	8.60***	.42	.18
Mean LC worry	.31	3.85***					
Mean LC support	.00	0.01					
Step 7				(6, 159)	.90	.45	.21
AA x LC worry		.76	1.67†				
AD x LC worry		-.36	-0.72				
GD x LC worry		.78	1.59				
AA x LC support		.40	0.80				
AD x LC support		-.08	-0.19				
GD x LC support		.14	0.26				

Note: †p < .10; * p < .05; ** p < .01; *** p < .001

Table 20

Post-hoc Multiple Hierarchical Regression Analysis of Physician Initiated Infant Visits on Sociodemographic and Enabling Variables, Clinic Type, Maternal Negative Affect, Parenting Self-Efficacy, and Lay Consultation Variables

Predictor(s)	ß	t	df(1, 2)	FΔ	R	R²
Step 1			(12, 180)	1.45	.30	.09
Maternal age	.08	0.86				
Married y/n	-.03	-0.30				
Clinic type	-.06	-0.13				
Clinic x mother educ	.19	0.37				
Infant Hispanic	.05	0.70				
Maternal education	-.12	-0.83				
Infant gender	.12	1.57				
Other children	-.13	-1.53				
Insurance y/n	.14	$1.78^{\dagger}$				
Minutes to dr	-.12	-1.52				
Daycare use	.00	0.04				
SES	-.23	-2.39*				
Step 2			(3, 177)	.30	.30	.09
Mean AA	.05	0.52				
Mean AD	.07	0.71				
Mean GD	-.09	-0.85				
Step 3			(2, 175)	1.92	.34	.11
AA x AD	.20	$1.90^{\dagger}$				
AA x Clinic type	.22	0.53				
Step 4			(1, 174)	1.46	.35	.12
Mean MEQ	.10	1.21				
Step 5			(2, 172)	1.15	.36	.13
Mean LC worry	.04	0.52				
Mean LC support	.09	1.13				
Step 6			(6, 166)	.12	.37	.14
AA x LC worry	-.11	-0.29				
AD x LC worry	.14	0.26				
GD x LC worry	-.01	-0.02				
AA x LC support	.22	0.46				
AD x LC support	-.28	-0.69				
GD x LC support	.13	0.25				

Note: $^{\dagger}p < .10$; * p < .05; ** p < .01; *** p < .001

Table 21

Post-hoc Multiple Hierarchical Regression Analysis of Mother Initiated Infant Visits on Maternal Health Care Use, Sociodemographic and Enabling Variables, Clinic Type, Maternal Negative Affect, Parenting Self-Efficacy, and Lay Consultation Variables

Predictor(s)	ß	t	df (1, 2)	FΔ	R	R^2
Step 1			(1, 191)	5.10*	.16	.03
Total maternal hcu	.16	2.26*				
Step 2			(12, 179)	.91	.29	.08
Maternal age	.14	1.63				
Maternal education	-.07	-0.46				
Clinic type	.42	0.86				
Clinic x mother ed	-.32	-0.61				
Married y/n	-.04	-0.45				
Infant Hispanic	.06	0.77				
Infant gender	-.02	-0.30				
Other children	-.07	-0.81				
Insurance y/n	.15	1.85†				
Minutes to dr	-.09	-1.08				
Daycare use	.08	1.10				
SES	-.12	- 1.25				
Step 3			(3, 176)	.07	.29	.08
Mean AA	.02	0.17				
Mean AD	-.04	-0.35				
Mean GD	.04	0.32				
Step 4			(2, 174)	1.69	.32	.10
AA x AD	-.14	-1.31				
AA x Clinic	-.55	-1.31				
Step 5			(1, 173)	2.09	.33	.11
Mean MEQ	-.13	-1.45				
Step 6			(2, 171)	8.03***	.43	.19
Mean LC worry	.30	3.76***				
Mean LC support	-.01	-0.10				
Step 7			(6, 165)	1.37	.48	.23
AA x LC worry	-52	-1.48				
AD x LC worry	-.54	-1.08				
GD x LC worry	.99	2.02*				
AA x LC support	.24	0.53				
AD x LC support	.07	0.17				
GD x LC support	.11	0.22				

Note: †p < .10; * p < .05; ** p < .01; *** p < .001

SECTION 4 DISCUSSION

Attempts to Methodologically Further the Literature

The dissertation study was an attempt to predict infant health care use via maternal psychosocial variables with importance placed on addressing the limitations that have plagued the scant prior literature addressing the topic (Janicke & Finney, 2003). Specifically, rather than using adult models to predict infant health care use, the hypotheses examined here were informed by the adult literature, but were focused on infant health care use and were considered in a pediatric context. Maternal characteristics were specifically examined in order to place infant health care decision-making in a mother-infant interaction framework. The sample recruited was large and purposefully excluded as few women as possible in an attempt to maximize the generalizability of the findings. The sample was specific to early infancy in order to directly assess the predictors important to this formative time period. The methodology was prospective and longitudinal in nature and the measurement of health care use involved a composite of maternal report and medical record data in an attempt to minimize participant recall biases and maximize validity of outcome variable data. Reliability analyses were conducted in order to ensure reliable coding of Infant Treatment Indexes used to compile maternal report and infant medical record data. Measures of psychosocial variables were selected based on their strong psychometric properties and applicability to the study questions. Finally, attempting to minimize confusion common to the literature on this topic, the construct of interest, "pediatric health care use," was defined a priori to encompass a broad scope of health care use (i.e., well baby, emergency visits, acute visits, and phone contacts) and later clearly defined according to initiator source (i.e.

mother or physician) with support from correlation analyses. In so doing, the results of the hierarchical regression analyses suggest that maternal psychosocial factors hypothesized to be related to infant health care use in general at the outset, are more significantly predictive of maternally initiated infant health care use, specifically.

Implications for Predicting Infant Health Care Use

Was the model representative of the study's hypotheses and presented in Figure 1 supported by the analyses? Only to a limited extent, as consistent with prior studies finding that child health status only accounts for a sixth of the variance in children's health care use (Black & Jodorkovsky, 1994; Janicke & Finney, 2001; Kelleher & Starfield, 1990; Newacheck & Halfon, 1986; Starfield et al., 1985; Wolfe, 1980), the model examined only accounted for a small portion of the variance and was specific to mother initiated infant health care use. Researchers seeking to model maternal attendance at physician initiated visits would likely benefit from examining alternative maternal and family characteristics.

Reviewing the correlational data between maternal and physician initiated infant health care use and the sociodemographic, enabling and psychosocial variables reveals few significant relationships. Maternal marital status was significantly correlated with physician initiated infant health care use such that infants of married mothers had fewer physician initiated visits. This finding is interesting in that it may be assumed that married mothers would be more likely to attend perhaps due to greater practical support such as help with transportation to well-baby visits and help with other children's care during scheduled infant appointments. The negative relationship between married status and attendance at physician initiated infant health care could suggest that married women

may need additional support, assistance, or reminders in order to enhance attendance at physician initiated visits. Also initially surprisingly, physician initiated care was negatively associated with maternal education level and socioeconomic status. Therefore, more highly educated and wealthier mothers had fewer physician initiated visits than other mothers. Perhaps the surprising findings can be accounted for by considering the negative relationship not as poorer attendance on the part of mothers, but as reductions in scheduling frequency on the part of the physicians. Specifically, the negative relationships between SES, marital status and having older children with physician initiated visits may be due to lessened physician concern and thereby, fewer physician-scheduled follow-up visits, when treating infants of mothers perceived to have financial resources and/or child rearing experience.

None of the sociodemographic or enabling variables were significantly associated with mother initiated care. These findings conflict with the prior literature documenting factors such as younger child age, white race, non Hispanic ethnicity, higher maternal education level, higher socioeconomic status, and two-parent households to be significantly positively correlated with "ambulatory" (i.e. maternal initiated) visits (Newacheck & Halfon, 1986; Woodward et al., 1988) or total visits without specification of type of care (Riley et al., 1993) for pediatric health care use in school-aged children. Note that prior studies examined an older sample and either did not include or did not specifically predict physician initiated visits, thereby reducing the applicability of findings to the dissertation results. The significant negative relationships with physician initiated care for well educated and higher socioeconomic status mothers and their infants

is concerning in that well-baby visits are necessary for preventative care, vaccinations, developmental assessment for infants as well as psychoeducation for parents.

In line with the correlation results, the multiple regression analyses suggest that the demographic and enabling variables selected based on the prior literature on adult and pediatric health care use were not significantly predictive of infant health care use in this sample. The lack of significant findings was somewhat surprising given findings from the Behavioral Model of Health Service Use (Andersen & Aday 1995) which predicts that enabling and sociodemographic variables will account for the greatest amount of variance in health care use after need factors (i.e., health and symptom measures). However, even in studies documenting significant relationships between sociodemographic and pediatric ambulatory health care use, only a small portion of the variance was accounted for (Newacheck & Halfon, 1986; Riley et al., 1993, Woodward et al., 1988). It may be that infant health care decision-making is predicted by variables not examined in the current study or is more strongly based on mothers' perceptions of consultants worry and other factors not examined here. Of the sociodemographic variables included in the dissertation study, the presence of other children in the home showed a trend towards predicting fewer kept physician initiated visits. This finding is consistent with prior studies suggesting that smaller family size is positively linked to pediatric health care use due to greater parental attention to symptoms, less parenting experience, and/or greater time and energy to seek services (Janicke & Finney, 2001). In addition, higher SES predicted fewer physician initiated visits. As discussed above, the negative relationship between SES and physician initiated visits may be due to lessened

attendance at preventative care or due to reduced scheduling on the part of physicians when treating an infant that appears to have financial means.

The sole significant enabling variable positively predictive of mother initiated infant visits was the existence of insurance coverage. This finding is consistent with prior studies examining the importance of enabling variables including insurance coverage in predicting ambulatory pediatric health care in school-aged children (Newacheck & Halfon, 1986; Riley et al., 1993; Starfield et al., 1985 & Woodward et al., 1988). Future studies may benefit from assessing the type of insurance coverage (i.e. private versus state/federal) or the level of benefits provided rather than using the presence versus the absence of insurance coverage as a predictor variable.

Consistent with prior literature documenting the significant positive relationship between mother and child health care use (Hankin et al., 1984; Janicke et al., 2001; Minkovitz, et al., 2002; Newacheck & Halfon, 1986; Riley et al., 1993; Shor et al., 1987; Starfield et al., 1985; Ward, et al., 2006; Ward & Pratt, 1996; Wolfe, 1980), total maternal visits showed a positive trend towards mother initiated infant health care use. However, the strength of the relationship was less than would be expected given prior findings that maternal health care use is a powerful predictor of child health care use (Newacheck & Halfon, 1986) and twice as powerful as paternal health care use (Shor, et al., 1987). Perhaps the link between maternal and child health care use is less strong in early infancy. Studies examining a longer time period could address this question longitudinally. Note that total maternal visits were not examined as a predictor of physician initiated infant health care use due to lack of a theoretical basis for examining the relationship.

Given the finding at the trend level of total maternal health care use predicting mother initiated infant health care use, a greater focus on the context and the needs of the family in pediatric health care may be warranted. Minkovitz et al. (2002) suggest studying maternal care patterns as a clue to understanding and improving patterns of use for children. The authors suggest that links between maternal and child use will have "profound implications for programs and policies aimed at enhancing appropriate health care use for children" (Minkovitz et al., 2002, p. 86). Further examination into familial patterns of use are needed to enhance understanding of which family characteristics influence unmet health needs as well as unnecessary and/or inappropriate use of health care services. For example, due to recommendations from the granting agency for this study, the characteristics of fathers were not examined. Given the significant findings linking maternal perception of lay consultants' worry, many of whom were fathers, the examination of paternal characteristics' influence on infant health care use may prove interesting.

Post-hoc Analyses Considering Clinic Type

Due to questions regarding the potential importance of the type of clinic (i.e., family medicine versus pediatrics clinics) on both physician and mother initiated infant health care use that arose secondary to the completion of data analysis, post-hoc regression analyses were conducted including the dummy variable, clinic type, and the interactions found to be significant between clinic type and predictor variables included in prior analyses. Specifically, clinic type was significantly positively related to maternal education level and anxious arousal from the Mini-MASQ. Notably, neither the entry of the clinic type variable nor its significant interactions with maternal education and

anxious arousal were significant predictors of infant health care use. Furthermore, the post-hoc regression analyses were generally similar to the prior regression analyses in terms of significance of steps and variables as well as direction of effects. However, the entry of these variables into the equation altered the significance and variance accounted for by some of the variables in the equation. Specifically, in the post-hoc regression analysis for physician initiated visits, primiparous/multiparous status no longer reached the trend level of significance and insurance status showed a trend towards significance. The significant interaction post-hoc interaction between the anxious arousal and anhedonic depression Mini-MASQ subscales suggested that mothers experiencing both anxious and depressive symptoms had a greater number of physician initiated infant visits. In the post-hoc regression analysis for mother initiated visits, step one including the total number of maternal health care visits reached significance as compared to a trend level finding in the prior analyses. Insurance status was reduced to a trend level finding rather than significant. In post hoc analyses, the significant positive interaction between mothers' general distress level and mothers' perception of her lay consultants' worry suggests that mothers prone to general distress who also believed their lay consultants to be distressed were more likely to seek treatment for their infants.

Overall, the comparisons between a priori and post-hoc analyses demonstrate the importance of the variables included in the regression as variables predictive of infant health care use vary in strength and relationship according to the addition of three variables in the equation. Future studies should take note of this volatility by being thorough in predictive variable inclusion and by tempering any conclusions based on one sample or set of variables.

Patterns of Use

When examining patterns of infant health care use over time, mother initiated infant health care was significantly correlated over the six month period, as expected. However, it was unexpected to find that physician initiated infant health care showed no relationship from two to four to six months of age. This lack of relationship for physician initiated care is surprising, particularly at the four to six month time point when physician scheduled appointments might be likely to stabilize due to the typical spacing of well baby visits (i.e. one at four and one at six months of age) and the resolution of conditions often requiring follow-up (e.g., breastfeeding concerns, jaundice). The lack of significant relationships for physician initiated visits is therefore suggestive of nonattendance at physician initiated visits, differing levels of follow-up for infants across the first six months postpartum, factors of importance to physician initiated care not considered here and/or greater randomness to physician initiated care than expected.

Considerations Related to the CSM

Further study of the role of the CSM in health care decision-making made by a proxy (e.g., a mother's health care decision-making for her child) is needed. The CSM was not specifically studied by the dissertation, but rather used as guidance into predictor variables worthy of examination according to contextual factors in, cognitive representations of and affective reactions to caring for an infant that may influence health care decision-making. Numerous findings from the literature linking maternal negative affect to pediatric health care use (Minkovitz et al., 2005; Riley et al., 1993; Tessler & Mechanic, 1978; Woodward et al., 1988) suggest the utility of the CSM as a framework for understanding and furthering research into pediatric health care use. Within the CSM,

mothers would be expected to seek health care for their children according to appraisals of their symptoms when they feel a need for help in coping with pediatric symptoms or with the burden associated with being a parent in emotional distress (Janicke & Finney, 2003; Martin, et al., 2003; Meyer, Leventhal, & Gutmann, 1985). However, the study findings were not consistent overall with CSM predictions (i.e. the negative affect variables examined were not significantly predictive of either mother or physician initiated infant health care use). Prior literature documenting lack of significant relationships between negative affect and health care use lend weight to the current findings (Horowitz et al., 1985; Kelleher & Starfield, 1990; Ward & Pratt, 1996; Watson & Kemper, 1995). Therefore, current and prior work suggests that maternal decision-making regarding infant health care use is not significantly predicted by maternal negative affect. The lack of significant relationships, although counter to the dissertation study's hypotheses, has positive implications for the manner in which infant health care decisions are made by mothers. Mothers in this sample made health care decisions for their infants independent of their symptoms of anxiety, depression, and general distress. Maternal negative affect did not sway infant health care use in a significant manner consistent with either over or underutilization. The independence of maternal decision-making regarding infant health care use from negative affect suggests resilience in this arena worthy of comment. Furthermore, the results provide some assurance to physicians that in general, mothers seeking care for their infants are not doing so out of need for assistance managing their own negative affect.

The cognitive component of the CSM was pertinent to the variables examined in that parenting self-efficacy was hypothesized to influence the likelihood of a mother

initiating health care use. However, no significant main effect or mediating role was found in the current study for parenting self-efficacy. The lack of significant relationship between infant health care use and parenting self-efficacy is suggestive of maternal health care decision-making for infants distinct from maternal perceptions of competency in parenting their infants. The lack of a significant relationship between parenting self-efficacy and infant health care use is consistent with Janicke and Finney's (2003) findings of lack of significant main effects for parenting self-efficacy and stress in the prediction of health care use. However, their interaction was significant such that parenting self-efficacy was only associated with pediatric health care use when the caregiver reported a high level of stress. Assessing the interaction between stress and parenting self-efficacy may therefore prove more useful than examining negative affect and parenting self-efficacy in the prediction of infant health care use. Alternatively, it may be that parenting self-efficacy does not play a significant role in infant health care use, but is predictive for health care use in older children. In addition, a longer observation period than the six months involved in the dissertation methodology may be required to detect differences as the average difference in pediatric health care use amongst groups high and low on parenting self-efficacy in the Janicke and Finney (2003) study was one visit.

The social contextual component of the CSM was better supported by the current study than the affective and cognitive components. A significant main effect for the mothers' perception of their lay consultants' worry regarding infant symptoms was demonstrated for maternal initiated health care use. In fact, the lay consultation worry variable was the sole main effect found in the prediction of infant health care use. In

addition, there was a trend for a positive interaction between maternal anxious arousal and the lay consult worry item such that mothers who were anxious and believed their lay consults to be worried about their infants' symptoms were more likely to seek health care for their infants. This interaction is consistent with the hypothesized interactive nature of the components of the CSM (Martin, et al., 2003; Meyer, Leventhal, & Gutmann, 1985). An interaction between maternal anxiety and perceived worry of lay consults also makes intuitive sense, as mothers more prone to anxiety may demonstrate hypervigilance, rumination, and catastrophising regarding other's concern about their infants' health. The telephone interviews during which mothers completed the Mini-MASQ and the Lay Consultation Interview differed by day, such that state level effects should not bias their reporting. However, this interaction could also represent a mono-method bias via trait level anxiety, as mothers reported on their own level of anxiety as well as on the level of worry of their lay consultants during the same time period.

What happens when lay consultants' advice regarding health care seeking differs from mothers' beliefs regarding whether care should be sought for their infants? In the adult literature, Berkanovic and Telesky (1982) examined the impact of social support networks on medical care decision-making under conditions of congruent and incongruent beliefs between potential patient and consulted supports. In their study, sociodemographic variables, subjective health status, social network characteristics, and health orientations (e.g., perceived seriousness of illness, accessibility of care, efficacy of care, susceptibility to illness, concern, and motivation) contributed little to the variance in health care decision-making, with the exceptions of the amount of network contact and network support. Note that social network characteristics in Berkanovic and Telesky's

(1982) study (i.e., amount of network contact/consulting, frequency of contact, size of network, advice to see a physician) overlapped with the Lay Consultation Interview variables used in this study. The authors clarify that social network characteristics and health orientations may significantly influence health care decision-making when they occur in interaction with advice from supports that is incongruent with their own beliefs regarding need for health care. Specifically, they found that

> "the contribution of these variables [i.e., social network characteristics and health orientations] to the amount of variance explained is .27 when the individual does not believe a doctor can help relieve the symptom and .14 when he/she believes the symptom is serious (Berkanovic and Telesky, 1982, pp. 1025)."

The findings therefore suggest that a potential patient's cognitive health orientations are most likely to influence health care seeking when advice from supports contradicts their own beliefs. Applying these findings to maternal decision-making for infants, one would expect mothers to access health care more/less frequently when the advice of their supports is in conflict with their own beliefs regarding need for care. However, this is not consistent with the trend towards significance of the interaction between the anxious arousal subscale and the mothers' perceived level of lay consultants' worry.

In the overall pediatric health care use literature, the specific nature of maternal psychosocial variables that contribute significantly to health care use were unclear due to scant literature specific to this question, mixed findings in the available literature on pediatric use, and differing protocols, population characteristics, outcome variables, and predictor variables included in these studies. The factors examined in this study are but a few of the many that should be examined for their predictive value in pediatric health care. Furthermore, health care use should consistently be measured using reliable and verifiable means (i.e., maternal report combined with medical record review) as done in

this study. A follow-up study to this dissertation is examining the congruence between maternal and medical record reported visits according to visit dates, diagnoses, and symptoms. It will be informative for future studies to have a marker of maternal accuracy of retrospective reporting of infant health care use.

Generalizability of Findings

There are reasons to examine the generalizability of the above findings. The results generalize to Midwestern United States middle and upper-middle class, highly educated, married Caucasian mothers and their infants. There were significant differences between withdrawers and completers on a number of demographic variables (i.e., infant Hispanic ethnicity, married status, education level, SES, daycare use, and insurance coverage) thereby calling into question whether these findings generalize to a broader sample. It is important to note, however, that with the exceptions of SES and insurance coverage, the remaining sociodemographic and enabling variables examined were not significantly predictive of infant health care use. Furthermore, the lack of significant differences between groups according to maternal psychosocial predictor variables is a positive indicator for the generalizability and lack of bias in the findings. As mentioned by Riley et al. (1993), it is difficult to generalize study findings to other socioeconomic, marital or racial groups as it is likely that family context has an impact on both maternal negative affect and health care decision-making. Riley et al.'s (1993) sample of primarily Caucasian, upper middle class, married similar to the sample under discussion, also did not find significance for maternal mental health in predicting pediatric health care. In addition, the vast majority, 93%, of the sample under discussion had insurance coverage, as is typical for newborns in the state of Iowa. It was therefore

difficult to determine the impact of lack of coverage on maternal decision-making regarding infant health care.

Future studies examining health care use could ensure a more representative sampling of socioeconomic classes, races, and insurance status in order to more thoroughly examine their predictive value for infant health care use. The study could be replicated in a different setting, perhaps a racially diverse, urban, lower SES community, to examine infant health care use in a broader cultural context. The sample included in the dissertation was not screened for negative affect symptoms prior to inclusion due to wanting a full spectrum of symptomatology across anxious arousal, anhedonic depressive and general distress symptoms. Given the lack of significant findings without selection for significant symptomatology, future studies may wish to screen participants for depressive and anxiety symptoms prior to enrollment. Selecting participants high in general distress, anxious arousal and/or anhedonic depression at entry into the study would address the predictive value of significant maternal negative affect symptoms on infant health care use.

Measurement Questions

Given some unexpected findings, measurement characteristics and procedures are important to examine for their potential influences on the reported results. Although the MEQ was chosen for its reliability, validity, and common use in the parenting self-efficacy literature, the lack of a measure of parenting self-efficacy specific to early infancy including items specific to health care decision-making may account for the lack of hypothesized significant findings for parenting self-efficacy. Future studies may wish to validate and utilize a more specific measure of parenting self-efficacy if examining

similar questions. In addition, participants' means on the MEQ (i.e., $33.62 \geq$ mean $\leq$ 35.53) are equivalent to or higher than the normative means for a nondepressed sample of mothers (mean = 33.05; Teti & Gelfand, 1991) when given at some point between three and 13 months postpartum (mean = 7.35 months). In comparison, the depressed group of mothers in the Teti and Gelfand (1991) sample scored significantly lower on the MEQ (mean = 29.63; F [1, 84] = 12.86, p < .001). Therefore, since mothers in our sample on average reported feeling as or more efficacious than the normative sample of nondepressed subjects in Teti and Gelfand's (1991) study, a restriction of range issue may be partially responsible for lack of significant findings relating parenting self-efficacy to infant health care use. An additional measurement question regarding the Mini-MASQ's use in the current study is the timing of its administration in relation to infant health care use. The Mini-MASQ asks questions in reference to how the woman has experienced things during the past week. The dissertation procedures included assessing negative affect every two-months, independent of timing of infant health care use. A prior finding of a significant relationship between state anxiety just prior to the onset of infant symptoms and mother initiated infant health care use (Hatcher, Powers, & Richtsmeier, 1993) suggests that future studies should assess negative affect when a mother schedules an infant visit rather than or in addition to pre-specified time points.

Potential Community Wide and Targeted Interventions

In fostering best practices of infant health care use, first line public health initiatives are prudent starting points which target the general community rather than a specified sample or a high-risk group. For example, Wagner and Greenlick (2001) investigated the impact of increasing public access to health information.   Providing

health care consumers with health information appears to decrease emergency department and inpatient medical services. After providing the targeted community with literature, telephone, and internet based health care information via the Healthwise Communities Project (HCP), the investigators found decreased reporting of pediatric health care. Importantly, Wagner and Greenlick relied solely on retrospective parental report of child symptoms over the past twelve months, without specification of type of visit (e.g. well, acute care) or diagnoses linked to the visits. Also, their findings only documented reduced care and could not speak to appropriateness of care. However, the findings are suggestive that providing mothers and their lay consultants via the community with accurate, in-depth health information for newborns could be a first line of intervention affecting health care use. In order to reach the widest audience of women and their supports, information should be provided across a variety of media, such as literature, videos, internet sites, and mailings. Reminders regarding normative child development, timing of immunizations/ well child visits and medical signs warranting acute services could be mailed to mothers at regular intervals. In this manner, mothers and their lay consultants would have reliable and valid references when having discussions and making decisions about infant medical care.

In addition to community wide efforts, second line public health initiatives directed specifically at mothers and fathers of newborns may prove useful in facilitating best practice health care for infants. The treatment implications of the demonstrated relationship between mothers' perceptions of their lay consultants' worry, maternal anxious arousal and infants' health care use are numerous. First, providing mothers with a knowledgeable consultant associated with the health care clinic would be beneficial as a

first step in accessing care. Nurses and or home visitors would be ideal candidates for knowledgeable consultants. The knowledgeable consultants could proactively provide information regarding infant development and symptomatology during prenatal Lamaze classes and on the maternity ward. Second, the significant positive relationship between maternal perceptions of lay consultant worry and infant health care use may represent mothers' attentiveness to their lay consultants' worry, serving a protective function for infants. However, influences of lay consultation on health care use may best be considered within context and perhaps on an individual basis (Martin, et al., 2003). Based on prior findings, lay consultants may sway mothers towards inappropriate use via frequency of infant health care use (McKinlay, 1973; Sanders, 1989) and/or inappropriateness of services sought (i.e. seeking emergency care for nonemergent symptoms; Oberlander, Pless, & Dougherty, 1993). Therefore, in cases when there is awareness by medical staff that the mother's lay consultants express a great deal of worry over minor infant symptoms and are influencing utilization of services in an undesirable manner, a modification of psychoeducation efforts to include both parents and their lay consultants may be worthwhile. Such psychoeducation efforts could focus on signs and symptoms warranting need for medical attention. Information could be provided regarding when to seek phone contacts, office visits, urgent care and emergency services. Women could be asked to share informative videos and materials with identified family and friends of frequent contact who serve as lay consultants. Psychoeducation could alternatively be provided in the home via home visitations to women enrolled in projects such as the Nurse Family Partnership (NFP; Olds, Henderson, Chamberlain &

Tatelbaum, 1986; Olds, Henderson, Tatelbaum, & Chamberlain, 1986) discussed further below.

Little need for targeted intervention is suggested by the dissertation study findings. However, one point of intervention based on the significant predictive power of mothers' perceptions of lay consults worry and the interaction between perception of lay consult worry and maternal anxious arousal would be to provide an easily accessible professional consultant as a gatekeeper to infant health care. Providing contact information for a pediatric nurse whose primary responsibilities involve coordinating care and parent education regarding infant development and health care decision-making during infancy could lessen parental reliance on lay consults such that health care decisions are made with proactive input from professionals. Including professional consultants within clinics could be especially beneficial in medical settings that are overtaxed by patients and/or under staffed by physicians. Much like a triage nurse in an emergency room setting, the inclusion of a staff member dedicated to streamlining care via expert consultation would be worthwhile to lessen system burden and to ensure a greater quality and availability of care to those in the greatest need of services.

Home visitors are in an ideal position to influence maternal health care decision-making via answering questions regarding infant symptoms and easing maternal worry or distress during home visits or via phone consults. It should be noted that the dissertation findings suggested women not considered "high-risk" by projects such as the NFP (i.e. those high in education level, SES, and married) were less likely to be compliant with physician initiated preventative care. Therefore, broadening the scope of postpartum women's access to home visitors may be required. Having a home visitor would provide

mothers with a knowledgeable consultant with whom they and their infants have more frequent, prolonged and intimate contact than general medical professionals. The rapport hopefully established through the course of home visitation could result in enhanced communication regarding infant medical symptoms and disclosure of the mother's anxiety and her perception of her lay consultants' worry regarding infant symptoms. The home visitors' pediatric medical training over and above that of the average lay consultant combined with established rapport with mothers and infants could be directed at beneficially influencing infant health care use. Specifically, home visitors would provide informed guidance regarding infant symptoms and accessing the health care system, potentially decreasing any unnecessary use and facilitating necessary use. Home visitors could also aid in reducing barriers to care for lower income and overburdened families via providing practical support such as transportation and child care.

The Nurse Family Partnership (NFP)

One home visiting program aimed at improving child health is the Nurse Family Partnership (NFP; Olds et al., 1986). The NFP targets first time pregnant women and aims to 1) improve pregnancy outcomes, 2) improve infant/child health and development, and 3) improve the mother's well-being. Women are enrolled in the NFP prior to the 28th week of pregnancy. Participation continues until the child turns two years of age. Visits occur within the home either weekly or biweekly until the last three months of enrollment when visits become monthly. The program focuses on building rapport and alliance between nurse and mother. Psychoeducation, problem-solving, and support are provided. Unique to Louisiana is a mental health consultation component to NFP programming

(Boris et al., 2006). Licensed mental health professionals in Infant Mental Health provide consultation to the nurses and services to the infants and families.

Randomized, controlled longitudinal outcome studies are examining short-term and long-term effectiveness of the NFP and similar programs. Evaluations of programs conducted in Denver, Elmira, and Memphis found improvements directly and indirectly related to infant health care use, such as a 56% reduction in infant emergency room visits, improved prenatal health via decreases in cigarette smoking and hypertensive disorders and a 79% reduction in child abuse and neglect (Olds, 2006). The benefits per child of the NFP program were three times the cost per child (i.e., benefits per child averaged $26,298 and costs per child averaged $9,118). Furthermore, costs were recovered by benefits by age two. A longitudinal outcome study of the NFP specific to Orleans Parish, Louisiana (Boris et al., 2006), found significant reductions across several domains of interest to Infant health and mental health: 62% reduction in premature births, 43% reduction in antenatal depression, significant decreases in cigarette smoking, significant increases in initiating and maintaining breastfeeding, 98-100% infant immunization compliance, and a 50% reduction in emergency room use for any reason through 15 months of age. In summary, the NFP demonstrates that a home visitation program can make significant short-term and long-term improvements for first-time mothers and their infants with demonstrated positive ramifications for infant health care use.

The implications of home visitors for increased attendance at physician initiated visits, as documented by 98 – 100% immunization compliance have particular relevance to the dissertation study findings. However, neither maternal depressive symptoms nor first-time motherhood significantly predicted infant health care use in this sample,

thereby suggesting the need to widen the group of mothers offered home visiting assistance should intervention be deemed warranted. This goal is lofty in the current United States health care system, but is not unheard of in other Westernized countries. For example, the United Kingdom provides home visits to all postpartum women as part of their national health care system (Holden, 1996; Sheppard, 1996; 1997).

A Shifting Focus for Infant Health Care

An examination of the Swedish health care system has much to offer in terms of pediatric health care policy as well as practice. Sweden provides voluntary health care coverage for children ages zero to six and as a result, boasts a near 100% attendance rate for pediatric visits (Hallberg, Lindbladh, Petersson, Rastam, & Hakansson, 2005). In describing changes to Swedish health care policy and foci over the last century, Hallberg et al. (2005) describe a "shifting focus" from a myopic examination of children's physical symptoms to a broader contextual examination of psychosocial factors for the child and family. This shift complicates current medical practice and policy in that it requires an understanding and appreciation of abstract psychosocial factors that are more open to interpretation and debate than traditional medical terms. Further complicating matters, roles and areas of expertise of practitioners are broadened in a health care system that concerns itself with the overall well-being of child patients and their families. Importantly, parents become critical information gatherers and decision-makers as a part of this medical team, and must be treated as such. Medical staff are trained to assist parents via bolstering of their health education, parenting self-efficacy, and competence during appointments in order to incorporate them as valuable team members, rather than passive recipients of care. By allowing pediatric care to evolve as such, the bridge

between maternal characteristics and child health is strengthened. Researchers examining the materials comprising this bridge, such as the examination of maternal psychosocial factors described herein, broaden the goal of infant health care from mere symptom alleviation to infant and family well-being.

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APPENDIX A

INFORMED CONSENT DOCUMENT

Project Title: **The CUB Project: Care Utilization by Babies**

Research Team: **Tracy Moran, MA**

Christina Franklin, MA

Megan Harney, BS

Crystal Edler, BS

Melissa Buttner, BA

Sarah Acoon, High School

Alison Bahnsen, High School

Lindsay Trenkamp, High School

Jacqulyn Janecek, High School

This consent form describes the research study to help you decide if you want to participate. This form provides important information about what you will be asked to do during the study, about the risks and benefits of the study, and about your rights as a research subject.

- If you have any questions about or do not understand something in this form, you should ask the research team for more information.
- You should discuss your participation with anyone you choose such as family or friends.
- Do not sign this form unless the study research team has answered your questions and you decide that you want to be part of this study.

WHAT IS THE PURPOSE OF THIS STUDY?

This is a research study. We are inviting you to participate in this research study because you have recently given birth.

We are inviting new mothers and their infants to enroll in this study, which has two main purposes. The first purpose is to examine stress, emotional changes, and parenting skills during the first six months postpartum. The second purpose is to examine infants' healthcare use and illnesses during the first six months of life. In order to measure infant healthcare use, we will interview mothers about the number of and purpose for both mother and infant medical visits and we will review the infants' medical records for this information when they are six months of age. The relationship between mothers' well-being after childbirth and infant healthcare use will be examined in order to better inform treatment decision-making for mothers and their infants.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 300 women and their infants will take part in this study conducted by investigators at the University of Iowa.

HOW LONG WILL I BE IN THIS STUDY?

If you agree to take part in this study, your involvement will last for six months. The total time commitment before your discharge from the hospital will be fifteen to twenty minutes. At two-, four-, and six-months after the birth of your baby you will spend between twenty and thirty minutes on the phone with a researcher.

WHAT WILL HAPPEN DURING THIS STUDY?

Should you decide to participate, you will complete a short questionnaire about yourself (e.g. your age, level of education, occupational status, approximate income,

marital status, other children) your spouse (if applicable), and two short measures of your current emotional state and your expectations for parenting before your discharge from the hospital. You will then be contacted by phone at two-, four-, and six-months postpartum. During each of the phone contacts, you will complete questionnaires that will ask you about your experiences parenting, your emotional state and support from your family and friends regarding your infant's health. You will also be asked to report any contacts that you have had with a healthcare professional for yourself and/or your infant. During interviews and when completing questionnaires, you are free to skip any questions that you would prefer not to answer. During your participation in this study, you may be mailed an additional questionnaire examining your experiences with new motherhood that you will have the option of completing. Your choice to complete and return this questionnaire will have no effect on your participation in the current study.

Your medical records will not be included within this study. However, we will obtain your infant's medical records at six months of age in order to examine variables pertinent to our study including: number and type (e.g. emergency, acute care, well-baby) of health visits/phone consultations and diagnoses associated with those visits/calls.

Audio Recording/Video Recording/Photographs

One aspect of this study involves making audio recordings of you. The recordings are being made during phone interviews that take place at 2-, 4-, and 6-months postpartum. They are made so that we have a record of your answers to questions in case of damage to written materials. Only those research staff listed on this informed consent document have access to these video tapes, they will not be labeled with any identifying information and they will be destroyed once all of the data have been entered following the end of subject recruitment.

[ ] Yes   [ ] No   I give you permission to make audio recordings of me during this study.

WHAT ARE THE RISKS OF THIS STUDY?

There may be some risks from being in this study. Some individuals may feel uncomfortable about disclosing personal information regarding their feelings and emotions. However, you are free to skip any questions that you do not feel comfortable answering. Should either you or the primary investigator become concerned because of information gained from the surveys, you will be contacted by the primary investigator and provided a list of referrals for mental health specialists in your area. You are always free to decline treatment. Declining treatment will have no impact on your enrollment in the current study. Should you indicate in responses to questionnaires or during phone interviews that you pose a hazard to yourself or others (i.e. you are actively suicidal or homicidal), your primary care physician will be contacted.

Some individuals may feel uncomfortable about the use of their infant's medical records in this study. However, only members of the research team listed above will have access to the medical records and only the variables listed above (i.e. diagnoses, number of phone consultations, hospitalizations, emergency room visits, acute care visits, and well-baby visits) will be included in this study. All information collected as part of this study will be kept anonymous through the use of id numbers. All information will be kept secure in locked file cabinets and password protected databases.

ARE THERE ANY UNFORESEEN RISKS?

In addition to the risks described above, there may be unknown risks, or risks that we did not anticipate, associated with being in this study.

WHAT ARE THE BENEFITS OF THIS STUDY?

You and your infant will not benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because there is currently little research pertaining to infant healthcare use.

WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study.

WILL I BE PAID FOR PARTICIPATING?

You will be paid for being in this research study. You will need to provide your social security number (SSN) in order for us to pay you. You may also need to provide your address if a check will be mailed to you.

You will receive five dollars for each phone interview completed (three fifteen minute interviews conducted at two-, four-, and six-months postpartum). Therefore, should you complete all portions of the study over the six months, you will receive 15 dollars total.

WHO IS FUNDING THIS STUDY?

The University and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

WHAT ABOUT CONFIDENTIALITY?

We will keep your/ your infant's participation in this research study confidential to the extent permitted by law. However, it is possible that other people may become aware of your/ your infant's participation in this study. For example, federal government regulatory agencies, auditing departments of the University of Iowa and the University of Iowa Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. Some of these records could contain information that personally identifies you/ your infant.

To help protect your confidentiality, we will use coded identification numbers rather than your name in order to keep all information as confidential as possible. All information will be kept in secure storage areas, and electronic information will be stored in password-protected computer files. If we write a report or article about this study or share the study data set with others, we will do so in such a way that you cannot be directly identified.

WILL MY HEALTH INFORMATION BE USED DURING THIS STUDY?

The Federal Health Insurance Portability and Accountability Act (HIPAA) requires your infant's health care provider to obtain your permission for the research team to access or create "protected health information" about your infant for purposes of this research study. Protected health information is information that personally identifies your infant and relates to his/her past, present, or future physical or mental health condition or care.

The research team will access or create health information about your infant, as described in this document, for purposes of this research study. The research team will keep your study-related health information indefinitely for purposes of the research. Once your infant's health care provider has disclosed your protected health information to the research team, it may no longer be protected by federal privacy regulations.

The research team may share your infant's health information related to this study with other parties including federal government regulatory agencies, the University of Iowa Institutional Review Boards and support staff, and/or the NIMH. If the research team shares your infant's health information with others, it may not be protected by federal privacy regulations.

You cannot participate in this study unless you permit your infant's health information to be used by the research team. If you choose *not* to allow us to use your infant's protected health information, we will discuss any non-research alternatives available to you. Your decision will not affect your right to medical care that is not research-related. Your signature on this Consent Document authorizes your infant's health care provider to give the research team permission to use or create health information about you.

Although you may not be allowed to see study information until after this study is over, you may be given access to your health care records by contacting your health care provider. Your permission for us to access or create protected health information about you for purposes of this study has no expiration date. You may withdraw your permission for us to use your health information for this research study by sending a written notice to Tracy Moran, M.A. 830 Jefferson Bldg., University of Iowa, Iowa City, IA 52242. However, we may still use your health information that was collected before withdrawing your permission. Also, if we have sent your health information to a third party, such as the study sponsor, or we have removed your identifying information, it may not be possible to prevent its future use. You will receive a copy of this signed document.

IS BEING IN THIS STUDY VOLUNTARY?

Taking part in this research study is completely voluntary. You may choose not to take part at all. If you decide to be in this study, you may stop participating at any time. If you decide not to be in this study, or if you stop participating at any time, you won't be penalized or lose any benefits for which you otherwise qualify.

<u>WHAT IF I HAVE QUESTIONS?</u>

We encourage you to ask questions. If you have any questions about the research study itself, please contact: Tracy Moran, M.A. or Michael O'Hara, Ph. D. at 1-866-849-6636.

If you have questions, concerns, or complaints about your rights as a research subject or about research related injury, please contact the Human Subjects Office, 340 College of Medicine Administration Building, The University of Iowa, Iowa City, Iowa, 52242, (319) 335-6564, or e-mail <u>irb@uiowa.edu</u>. General information about being a research subject can be found by clicking "Info for Public" on the Human Subjects Office web site, <u>http://research.uiowa.edu/hso</u>. To offer input about your experiences as a research subject or to speak to someone other than the research staff, call the Human Subjects Office at the number above.

This Informed Consent Document is not a contract. It is a written explanation of what will happen during the study if you decide to participate. You are not waiving any legal rights by signing this Informed Consent Document. Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subject's Name - Mother (printed):

_____

Subject's Name - Baby (printed):

_____

Parent/Guardian or Legally Authorized Representative's Name and Relationship to Subject:

_____

(Name - printed)   (Relationship to Subject - printed)

_____

(Signature of Parent/Guardian or Legally Authorized Representative)   (Date)

Statement of Person Who Obtained Consent

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative. It is my opinion that the subject understands the risks, benefits, and procedures involved with participation in this research study.

_____

(Signature of Person who Obtained Consent)   (Date)

APPENDIX B

SOCIODEMOGRAPHIC INTERVIEW

ID _____

Date _____

1. How old are you? Age: ___

2. Are you married?

    a. Married – 1

    b. Separated – 2

    c. Divorced – 3

    d. Widowed – 4

    e. Single – 5

3. Are you currently living with your partner? Yes – 1, No -2

4. What date were you married on? *Date married: ___/___/___*

    a. *Years married ___/___ (year/month)*

5. Do you have a religious preference?

    a. Protestant – 1

    b. Catholic – 2

    c. Jewish – 3

    d. Muslim – 4

    e. Agnostic or Atheist – 5

    f. Other – 6

    g. None – 7

6. Are you Hispanic/Latino? Yes – 1, No – 2

7. What racial group do you classify yourself as?

    a. African American – 1

    b. American Indian or Alaskan Native – 2

    c. Asian – 3

    d. Caucasian – 4

    e. Native Hawaiian/ Other Pacific Islander – 5

    f. Some other race – 6

    g. Two or more races – 7

8. What is your highest level of education? (in years up to 20+) _____

    a. school – 0 1 2 3 4 5 6 7 8 9 10 11 12 (GED – 12)

    b. vocational/ technical – 13 14 15 16

    c. college – 13 14 15 16

    d. post graduate – 17 18 19 20+

9. Are you employed more than 15 hours per week? Yes – 1, No – 2

10. What is your occupation? _____

    a. Hollingshead code _____

11. Did you have a Boy – 1/Girl – 2? Name: _____

12. How many weeks pregnant were you when the baby was born?

    a. Born before 36 weeks – 1

    b. Born at or after 36 weeks – 2

13. Did your baby require Neonatal Intensive Care Unit treatment for longer than 2 days? Yes – 1, No – 2

14. Is your infant Hispanic/Latino? Yes – 1, 2 – No

15. What racial group do you classify your infant as?

    a. African American – 1

    b. American Indian or Alaskan Native – 2

    c. Asian – 3

    d. Caucasian – 4

    e. Native Hawaiian/ Other Pacific Islander – 5

    f. Some other race – 6

    g. Two or more races – 7

16. How many other children are living at home?

17. How old is your partner? Age: _____

18. Is your partner Hispanic/Latino? Yes – 1, No – 2

19. What racial group would you classify him as?

    a. African American – 1

    b. American Indian or Alaskan Native – 2

    c. Asian – 3

    d. Caucasian – 4

    e. Native Hawaiian/ Other Pacific Islander – 5

    f. Some other race – 6

    g. Two or more races – 7

20. What is his highest level of education in years? _____

    h. school – 0 1 2 3 4 5 6 7 8 9 10 11 12 (GED – 12)

    i. vocational/ technical – 13 14 15 16

    j. college – 13 14 15 16

    k. post graduate – 17 18 19 20+

21. Is your partner employed for more than 15 hours per week? Yes – 1, No – 2

22. What is his occupation? _____
    a. Hollingshead code ____

23. Do you have medical insurance coverage for your infant? Yes – 1, No - 2

24. How many minutes by car, approximately, so you live from your infant's

proposed medical provider?
    a. _____ minutes

25. Where are you planning on primarily receiving health care for your infant?
    a. _____   b. _____

26. Who else besides you and your partner will be caring for your infant?

    a. Relative? Yes – 1, No -2

    b. In-home daycare by a nonrelative? Yes – 1, No – 2

    c. Licensed daycare? Yes – 1, No – 2

    d. Unlicensed daycare? Yes – 1, No – 2

27. How many hours per week will your newborn be cared for by someone other than

you and your partner? _____

28. What sort of community do you live in?

    a. Large city – 1

    b. Small city – 2

    c. City suburb – 3

    d. Town – 4

    e. Rural – 5

    f. Farm – 6

29. What is your estimated total household income?

      g. $9,999 or less – 1

      h. $10,000 to $19,999 – 2

      i. $20,000 to $29,999 – 3

      j. $30,000 to $39,999 – 4

      k. $40,000 to $49,999 – 5

      l. $50,000 to $59,999 – 6

      m. $60,000 to $69,999 – 7

      n. $70,000 or more – 8
      o. Refuse – 9

30. Socioeconomic status _____ (*don't ask*)

APPENDIX C

MINI-MASQ QUESTIONNAIRE

Below is a list of feelings, sensations, problems, and experiences that people sometimes have. Read each item and then fill in the blank with the number that best describes how much you have felt or experienced things this way during the past week, including today. Use this scale when answering:

1	2	3	4	5
not at all	a little bit	moderately	quite a bit	extremely

_____ 1. Felt really happy
_____ 2. Felt tense or "high strung"
_____ 3. Felt depressed
_____ 4. Was short of breath
_____ 5. Felt withdrawn from other people
_____ 6. Felt dizzy or lightheaded
_____ 7. Felt hopeless
_____ 8. Hands were cold or sweaty
_____ 9. Felt like I had a lot to look forward to
_____ 10. Hands were shaky
_____ 11. Felt like nothing was very enjoyable
_____ 12. Felt keyed up, "on edge"
_____ 13. Felt worthless
_____ 14. Had trouble swallowing
_____ 15. Felt like I had a lot of interesting things to do
_____ 16. Had hot or cold spells
_____ 17. Felt like a failure
_____ 18. Felt like I was choking
_____ 19. Felt really lively, "up"
_____ 20. Felt uneasy
_____ 21. Felt discouraged
_____ 22. Muscles twitched or trembled
_____ 23. Felt like I had a lot of energy
_____ 24. Was trembling or shaking
_____ 25. Felt like I was having a lot of fun
_____ 26. Had a very dry mouth

APPENDIX D

MATERNAL EFFICACY QUESTIONNAIRE

We want to ask you some questions about <u>yourself and your baby</u>. We are trying to get a general idea of how you usually handle different situations with your baby. We realize that no one is always effective or always ineffective. We all do better in some situations than in others. So we would like to have you think about some situations that all mothers encounter.

1.   When your baby is upset, fussy or crying, how good are you at soothing him or her?

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

2. How good are you at understanding what your baby wants or needs? For example, do you know when your baby needs to be changed or wants to be fed?

1	2	3	4
I do not	I	I	I
understand	understand	understand	understand
my baby	my baby	my baby	my
	some	most	baby all
	of the time	of the time	of the
			time

3. **How good are you at making your baby understand what you want him/her to do? For example, if you want your baby to eat dinner or play quietly, how good are you at making him or her do that?**

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

4. **How good are you at getting your baby to pay attention to you? For example, when you want your baby to look at you, how good are you at making him or her do it?**

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

5. **How good are you at getting your baby to have fun with you? For example, how good are you at getting your baby to smile and laugh with you?**

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

6. How good are you at knowing what activities your baby will enjoy? For example, how good are you at knowing what games and toys your baby will like to play with?

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

7. How good are you at keeping your baby occupied when you need to do housework? For example, how good are you at finding things for the baby when you need to do the dishes?

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

8. How good do you feel you are at feeding, changing, and bathing your baby?

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

9. How good are you at getting your baby to show off for visitors? For example, how good are you at making your baby smile or laugh for people who visit?

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

10.   In general, how good a mother do you feel you are?

1	2	3	4
Not good	Not good	Good	Very
at all	enough	enough	good

APPENDIX E

LAY CONSULTATION INTERVIEW

During the past two months, did you talk to anyone other than a medical professional, like family members or friends, about symptoms your infant was experiencing?

If YES	If NO
↓	↓
Who did you speak to?	
_____*spouse*	*E*
_____*adult child*	*n*
_____*other family*	*d*
_____*friend*	*i*
_____*other (specify:*	*n*
_____*)*	*t*
	e
	r
	v
	i
	e
	w
↓	
How many people did you talk to? *(Need total)*	
↓	

Did any of these people have any medical expertise? *(If so, identify who possessed expertise and type of training.)*

↓

How worried or concerned did these people seem to be about your infant's symptoms?

↓

Could you rate how worried they seemed to be on a scale from 1 to 5?

(not at all concerned) 1   2   3   4   5

(extremely concerned)

↓

What did people seem to think was causing your infant's symptoms?

↓

Did anyone give you any advice or tell you what they thought you should do about your infant's symptoms? *(YES   NO)*

↓

If advice was received: What did s/he tell you to do?

↓

Did anyone tell you that they thought your infant should see a doctor?

(YES   NO)

↓

Did the advice you received lead you to seek healthcare for your infant?

(YES….NO)

↓

If so, how many times in the last 2 months did you seek healthcare based on a friend/relative's advice?

APPENDIX F

LONGITUDINAL INTERVAL FOLLOW-UP EVALUATION – II

TREATMENT INTERVIEW FOR MOTHERS

I am going to ask you some questions about your physical health since

_____

1. HAVE YOU BEEN HOSPITALIZED (NON-PSYCHIATRIC) SINCE

_____ (Record only inpatient hospitalizations with overnight or at

least 24 hour stay - - Does not include observation in ER or labor/delivery)

        1=No   2=Yes

2.   Illness _____

     From (month/date/ year)_____ to_____

                     admit discharge

     2a1.   Illness code   ___ ___ ___.__ __

     2a2.   Illness code   ___ ___ ___.__ __

     2a3.   Illness code   ___ ___ ___.__ __

     2b.   From week   ___ ___

2c.   To week   ___ ___

2d.   Number of Days   ___ ___

3.   Illness _____

     From (month/date/ year)_____ to_____

                     admit discharge

     3a1.   Illness code   ___ ___ ___.__ __

3a2.   Illness code   ___ ___ ___.___ ___

3a3.   Illness code   ___ ___ ___.___ ___

3b.   From week   ___ ___

3c.   To week   ___ ___

3d.   Number of Days   ___ ___

4.   Illness _____

From (month/date/ year)_____ to_____

admit   discharge

4a1.   Illness code   ___ ___ ___.___ ___

4a2.   Illness code   ___ ___ ___.___ ___

4a3.   Illness code   ___ ___ ___.___ ___

4b.   From week   ___ ___

4c.   To week   ___ ___

4d.   Number of Days   ___ ___

Have you seen a physician, nurse practitioner, or chiropractor in an

outpatient   1=NO   2=YES setting (clinic, office, or emergency room)

since _____ <Beginning of Interview Period>**?**

[Include all visits and diagnosed illnesses for which subjects have sought

treatment. Include non-routine eye doctor visits. Do not include dental, routine

eye doctor visits]

I'm going to read a list of reasons why people sometimes seek treatment just to jog your memory. Let me know if you

have seen a health professional for any of these reasons: high blood pressure, angina or heart pain, other heart problem,

diabetes, asthma or allergy, arthritis, physical injury or accident, thyroid, cold or flu, headache, migraine headache

(physician diagnosed), check-up or physical, infection, malignancy trauma (broken bone, cut, bruise, burn)?

For "From Week": Rate 8888 if continued from previous follow-up

For "To Week": Rate 8888 if taking at present

2.   Doctor's Diagnosis _____

                From (month/date/ year)_____ to_____

                # of visits since <Beginning of Interview Period>_____

                2a1.   Illness code   ___ ___ ___.___ ___

                2a2.   Illness code   ___ ___ ___.___ ___

                2a3.   Illness code   ___ ___ ___.___ ___

                2b.   From week   ___ ___

2c.   To week   ___ ___

2d.   Number of visits   ___ ___

3. Doctor's Diagnosis _____

          From (month/date/ year)_____ to_____

          # of visits since <Beginning of Interview Period>_____

          3a1.   Illness code   ___ ___ ___.__ __

          3a2.   Illness code   ___ ___ ___.__ __

          3a3.   Illness code   ___ ___ ___.__ __

          3b.   From week   ___ ___

3c.   To week   ___ ___

3d.   Number of visits   ___ ___

4. Doctor's Diagnosis _____

          From (month/date/ year)_____ to_____

          # of visits since <Beginning of Interview Period>_____

          4a1.   Illness code   ___ ___ ___.__ __

          4a2.   Illness code   ___ ___ ___.__ __

          4a3.   Illness code   ___ ___ ___.__ __

          4b.   From week   ___ ___

4c.   To week   ___ ___

4d.   Number of visits   ___ ___

5. Doctor's Diagnosis _____

From (month/date/ year)_____ to_____

\# of visits since <Beginning of Interview Period>_____

5a1.	Illness code	___ ___ ___.__ __
5a2.	Illness code	___ ___ ___.__ __
5a3.	Illness code	___ ___ ___.__ __
5b.	From week	___ ___

5c.   To week   ___ ___

5d.   Number of visits   ___ ___

6. Doctor's Diagnosis _____

From (month/date/ year)_____ to_____

\# of visits since <Beginning of Interview Period>_____

6a1.	Illness code	___ ___ ___.__ __
6a2.	Illness code	___ ___ ___.__ __
6a3.	Illness code	___ ___ ___.__ __
6b.	From week	___ ___

6c.   To week   ___ ___

6d.   Number of visits   ___ ___

7. Doctor's Diagnosis _____

From (month/date/ year)_____ to_____

\# of visits since <Beginning of Interview Period>_____

7a1.	Illness code	___ ___ ___.__ __
7a2.	Illness code	___ ___ ___.__ __
7a3.	Illness code	___ ___ ___.__ __

7b.	From week	___ ___
7c.	To week	___ ___
7d.	Number of visits	___ ___

8. Doctor's Diagnosis _____

From (month/date/ year)_____ to_____

# of visits since <Beginning of Interview Period>_____

8a1.	Illness code	___ ___ ___.___ ___
8a2.	Illness code	___ ___ ___.___ ___
8a3.	Illness code	___ ___ ___.___ ___
8b.	From week	___ ___
8c.	To week	___ ___
8d.	Number of visits	___ ___

APPENDIX G

LONGITUDINAL INTERVAL FOLLOW-UP EVALUATION - II TREATMENT

INTERVIEW FOR INFANTS

<u>Introduction</u>

I'm going to ask you questions about treatment contacts for your infant's

physical health difficulties since _____ <beginning of interview

period>.

Non-psychiatric illness hospitalization

1. ***Has your infant been hospitalized since _____***

(Record only inpatient hospitalizations with overnight or at least 24 hour stay - -
Does not include observation in ER or labor and delivery)

                    1=No   2=Yes

Hospitalizations were for

2.   Illness _____

    From (month/date/ year)_____ to_____

                                        admit   discharge

             Hospital name   _____

             Hospital location _____

                                        (city/state)

    2a1.   Illness code   ___ ___ ___.___ ___

    2a2.   Illness code   ___ ___ ___.___ ___

    2a3.   Illness code   ___ ___ ___.___ ___

    2b.   From week   ___ ___

    2c.   To week   ___ ___

    2d.   Number of Days   ___ ___

3. Illness_____

   From (month/date/ year)_____ to_____

                              admit   discharge

        Hospital name   _____

        Hospital location _____

                           (city/state)

3a1.	Illness code	___ ___ ___.__ __
3a2.	Illness code	___ ___ ___.__ __
3a3.	Illness code	___ ___ ___.__ __
3b.	From week	___ ___
3c.	To week	___ ___
3d.	Number of Days	___ ___

NON-PSYCHIATRIC MEDICAL VISITS

Has your infant seen a physician, nurse practitioner, or chiropractor in an

outpatient setting (clinic, office, or emergency room) since _____

<Beginning of Interview Period>**?**

Have you had any telephone consultations with medical professionals about

your infant's symptoms since _____Beginning of Interview Period?

                1=NO   2=YES

[Include all visits, phone contacts, and diagnosed illnesses for which subjects

have sought treatment for their infant. If the infant was seen in private practice,

ask for the doctor's name.]

For "From Week": Rate 8888 if continued from previous follow-up

For "To Week": Rate 8888 if taking at present

4. Doctor's Diagnosis _____

        From (month/date/ year)_____ to_____

        # of visits since <Beginning of Interview Period>_____

        Clinic name_____

        Clinic location_____

(city/state)

4a1. Illness code   ___ ___ ___.___ ___

4a2. Illness code   ___ ___ ___.___ ___

4a3. Illness code   ___ ___ ___.___ ___

4b.   From week   ___ ___

4c.   To week   ___ ___

4d.   Number of visits   ___ ___

5. Doctor's Diagnosis _____

From (month/date/ year)_____ to_____

# of visits since <Beginning of Interview Period>_____

Clinic name_____

Clinic location_____

(city/state)

5a1. Illness code   ___ ___ ___.___ ___

5a2. Illness code   ___ ___ ___.___ ___

5a3. Illness code   ___ ___ ___.___ ___

5b.   From week   ___ ___

5c.   To week   ___ ___

5d.   Number of visits   ___ ___

6. Doctor's Diagnosis _____

From (month/date/ year)_____ to_____

# of visits since <Beginning of Interview Period>_____

Clinic name_____

Clinic location_____

(city/state)

6a1. Illness code   ___ ___ ___.___ ___

6a2. Illness code   ___ ___ ___.___ ___

6a3. Illness code   ___ ___ ___.___ ___

6b.   From week   ___ ___

6c.   To week   ___ ___

6d.   Number of visits   ___ ___

7. Doctor's Diagnosis _____

         From (month/date/ year)_____ to_____

         # of visits since <Beginning of Interview Period>_____

         Clinic name_____

         Clinic location_____

                    (city/state)

7a1. Illness code   ___ ___ ___.__ __

7a2. Illness code   ___ ___ ___.__ __

7a3. Illness code   ___ ___ ___.__ __

7b.   From week   ___ ___

7c.   To week   ___ ___

7d.   Number of visits   ___ ___

APPENDIX H

INFANT'S TREATMENT INDEX

Total number of infant well baby visits from birth to six months postpartum.

- Recorded in medical chart:_____
- mother's reported well baby visits (not listed in chart):_____

  (*as recorded on the LIFE-II child section*)

- Total number of well baby visits: _____

Total number of infant acute care visits from birth to six months postpartum

- Recorded in medical chart:_____
- mother's report of acute care (not listed in chart):_____

  (*as recorded on the LIFE-II child section*)

- Total number of acute care visits: _____

ICD-9 codes listed for each visit

1.	**11.**	**21.**
2.	**12.**	**22.**
3.	**13.**	**23.**
4.	**14**	**24.**
5.	**15.**	**25.**
6.	**16.**	**26**
7.	**17.**	**27.**
8.	**18.**	**28.**

Total number of phone contacts made to a physician regarding the infant

from birth to six months postpartum

- Recorded in medical chart: _____
- By mother's report: _____

  (*as recorded on the LIFE-II child section*)

- Total   _____