MOTHER - CHILD COMMUNICATION ABOUT CANCER: THE ROLE OF MATERNAL ANXIETY AND COPING

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In August 2003, I entered graduate school with a passion for pediatric psychology and a desire to work with families facing the fear, uncertainty and immeasurable distress of childhood chronic illness. I am honored to present this research as the culminating project of my graduate career, as it represents my dedication to help those dealing with one of life's most unfair circumstances: a child diagnosed with cancer. I am confident that this project represents the beginning of my career as a pediatric psychologist and my influential work to encourage healthy relationships and optimal functioning within families of sick children.

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CHAPTER I

INTRODUCTION

Childhood Cancer

Approximately 12,400 U.S. children under 20 years old are diagnosed with cancer each year (Ries et al.) with a prevalence of 1 to 2 cases annually per 10,000 children (NCI, 2002). The last 20 years have embodied an important shift in the rate of pediatric cancer. Although childhood cancer remains a relatively rare disease, the incidence has increased from approximately 11 cases per 100,000 children in 1975 to 15 per 100,000 children in 1998 (Gurney et al., 1996). Fortunately, significant advances in treatment have resulted in improved survival and long-term remission for a substantial proportion of children with cancer. The 5-year survival rates for all childhood cancers combined increased from 56% in 1974–76 to 77% in 1992–97 (NCI, 2002).

With the significant increases in survival, families face several challenges in dealing with the diagnosis, treatment and recovery of their child's cancer. Among the challenges for parents are the tasks of communicating illness related information and providing emotional support to their children. The role of parent-child communication in the face of pediatric cancer is paramount to the overall functioning of the family unit as well as that of the ill child. Several studies have related patterns of parent-child communication about illness to behavioral, emotional and physical outcomes in children with a wide range of diseases and conditions (e.g., Slavin, O'Malley, Koocher, & Foster, 1982; Hanna, Juarez, Lenss, & Guthrie, 2003). For example, in families of children with diabetes, several studies have highlighted the need for "healthy" communication, with results that reveal poorer diabetes management and metabolic

control in adolescents who engage in negative or conflictual parent-child communication (Jacobson et al., 1990; Koenigsberg, 1993; Pendley et al., 2002; Wysocki, 1992). Findings also suggest that less agreement between parents and their teens about the management of and adherence to their diabetes medical regimen resulted in poorer metabolic control (Hanna, Juarez, Lenss, & Guthrie, 2003). Given this link between communication and child health and emotional outcomes, the current study seeks to further understand the construct of parent-child communication by looking specifically at mothers, and the variables that may influence how they talk to their sick children, particularly children with cancer.

Mothers were selected as the population of interest for the current study since past studies, though they have included both parents, are weighted more heavily with the participation of mothers, and therefore suggest that mothers are more commonly the parent who engages in primary caretaking responsibilities for their child (e.g., Dalquist, Power, Cox & Fernbach, 1994). Furthermore, classic research on the communication styles of mothers and fathers indicates that parents differ considerably in their approaches to communication and interaction with their children (e.g., Stewart et al., 2003; Stafford & Dainton, 1995; Fitzpatrick & Vangelisti, 1995). Details about these differences are discussed in the following sections of the current paper.

Studies using direct observation of parent-child conversations provide compelling evidence regarding the influential role of illness communication between parents and their sick child. For example, in a study by Morrow (2004), videotaped interactions between parents and children with recurrent abdominal pain were coded for positive parenting behaviors such as sensitivity, cooperation, and open communication. Negative parenting behaviors were also coded and included insensitivity, hostility, as well as unwillingness to discuss the child's pain experiences. When analyzed with parents' report of children's emotional and behavioral

problems, parents who displayed greater levels of positive parenting behaviors reported fewer emotional/behavioral problems for their children. Conversely, parents who displayed greater levels of negative parenting during the interaction reported that their children had higher levels of somatic complaints. The cross-sectional design of this study precluded analyses that would determine the direction of these relationships (Morrow, 2004). That is, whether parents who communicate in a sensitive and open manner may have children who experience fewer symptoms, or conversely, if parents may find it easier to communicate with children who are experiencing few problems. Despite this limitation, this and previously discussed research on the role of parent child communication in pediatric illness provide influential findings that encourage further investigations such as the current study.

In this paper I address several fundamental research topics that inform the proposed study of mother-child communication about cancer. First, a brief review is presented of the elemental characteristics of parent-child communication, with specific attention to the operationalization of "open communication." Then, building on these characteristics, parent-child communication is considered within the framework of pediatric psychology. Last, important predictors of parent-child communication styles are presented, as these variables inform the hypotheses of the proposed investigation. For some of the studies discussed, findings are specific to mother-child communication. In other studies, however, the data regarding the role of communication does not distinguish between mothers and fathers. For these investigations, the findings continue to be informative to the current study since the trends can be appositely applied to mother-only populations.

Overview of Parent-Child Communication

Communication is a fundamental process in virtually all human relationships. Communication is the central means through which interpersonal bonds are formed and maintained, information is exchanged, and empathy and emotional support are provided. Nowhere is the centrality of communication more pronounced than in the relationships between parents and their children. Parents are the primary socialization agents for their children, and communication is the central process through which parents transmit social rules and values. Further, parents play the foremost role in their children's language development and through this process are responsible for shaping their children's ability to develop the capacity to understand and communicate with others in their world (Garner, Robertson & Smith, 1997; Hart & Risley, 1995).

It is not surprising, then, that the study of parent-child communication is well researched across multiple disciplines. Among the many fields attending to this topic are developmental psychology, cognitive psychology, and sociology. Using varying approaches, researchers have investigated the styles of parent-child communication and their relationship to future patterns of attachment, socialization, and academic success. A comprehensive discussion of the numerous theories, measures, and outcomes associated with parent-child communication is beyond the scope of the current literature review. However, select aspects of the research in this area provide a foundation from which we can understand the interconnectedness of parent-child communication and an important challenge that faces all parents and children to some degree---the experience of childhood illness (Kernis, Brown, & Brody, 2000; Leibowitz, Ramos-Marcuse, & Arsenio, 2002).

*Content, Complexity and Style of Parent Child Communication***.** Within the broad arena of parent-child communication lie several rudimentary components, including content, complexity and style. Briefly stated these components encompass the concrete and abstract topics of communication (content); the organization, structure and syntax of language (complexity); and the affective and behavioral elements used by parents during communication (style). While these components contribute equally and uniquely to parent-child communication, the current study will focus on communication style and, more specifically, the elements influencing the construct of "open parent-child communication." Classic research on this construct has largely attended to the Open Approach versus the Protective Approach, and which of these parent-child illness communication strategies supports the best outcomes for the family and patient.

Communication and the Ill Child. Prevalent in the 1950's and 1960's, the protective approach to parental communication sought to shield children from the anxiety and fear that would accompany an open disclosure of their illness. Children were told little if anything about their diagnosis and prognosis, all with the goal of maintaining the "normalcy" of family life. Furthermore, the protective approach allowed parents and medical professionals to delay addressing issues of uncertainty, thereby preserving their own sense of mastery and authority (e.g., Chesler, Paris, & Barbarin, 1986).

More applicable to present day medicine is the "open approach," which considers recent findings suggesting a weak association between the protective approach and lower levels of anxiety and fear (Waechter, 1971). Open communication requires the parent to share feelings, approach difficult topics, and ask for help. Conversely, the protective approach has been researched in work by Slavin et al. (1982) and is conceptualized as "lack of candor" or the

parents' decision to refrain from initial disclosure . Support for the "open approach" has encouraged further research on the relationship between openness and child outcomes. Within the body of research, open versus closed parent-child communication styles have been operationalized to include several components, such as warmth, sensitivity, amount of dialogue, and children's knowledge about illness or other problems (Morrow, 2004; Slavin et al., 1982; Spinetta & Maloney, 1978; van Veldhuizen & Last, 1991).

To better inform the current study's operationalization of "open communication," it is important to briefly review the other investigations that have addressed this construct. In their book *Children with Cancer*, Veldhuizen and Last (1991) investigated parent communication as it related to several measures of child outcome. Both parents and children completed interviews, questionnaires as well as projective tasks that assessed communication about the disease as well as behavioral problems, anxiety, depression, and negative emotions. Based on the interview measure, parents' openness was defined as the degree to which they initiated disease related dialogue with their child and the disease stage during which they did this. For example, children whose parents initiated dialogue during the initial stage of disease about its nature and possible implications were less depressed, less anxious and had less behavioral problems than children who were informed later in the disease progression (van Veldhuizen & Last, 1991). Similarly, Slavin et al. (1982) used disease stage as a marker for open parent-child communication, finding that patients informed early about their diagnosis showed more favorable emotional adjustment those from whom the diagnosis had been kept a secret for a period of time.

Very different from these studies was the operationalization of open communication used by Spinetta and Maloney (1978). For their investigation of patterns of communication between parents and their children with cancer, openness was measured by responses to questions

regarding how much the child knew, the kinds of questions asked by the child, how the parent responds to the child's questions, what kinds of questions the siblings ask, and how the parent responds to the sibling's questions. Responses were then combined with higher scores indicating the most open levels of communication. Findings from this study again highlighted the relationship between communication and child functioning, showing that families reporting higher levels of illness communication had children with better coping, self-esteem, and family relationships in the child.

Qualitative ratings of observed behavior have also been used to measure openness. Kellerman et al. (1977) used nurse rating of in-clinic parent child interactions to assess frequency of illness-related talk. A simple 4-point Likert scale was used to measure instances of illness talk, which were later combined to create an overall composite of disease-related communication.

Clarke et al. (2005) approached communication styles by implementing a thematic analysis of semi-structured interviews given to parents of children with leukemia. Parent's communication styles were categorized into four categories: Minimal information, Ambiguous information, Factual information, and Full information.

Lastly, Cline et al. (2006) deconstructed the "open approach" concept to include four subtypes of communication. The first of these subtypes is *Normalizing*, a pattern of communication by which the parent reframes the medical situation as "normal" by incorporating play, doing homework, or sustaining talk about non-medical events. *Invalidating* communication was characterized by denying, invalidating or challenging the difficulty of the child's experience. Parents exhibiting this style responded with anger, frustration, criticism, and minimizing statements. In contrast, *Supportive* parents engaged in empathic, supportive conversation with their children during the procedure. They acknowledged and validated the experience both

verbally and non-verbally and assured the child of their presence throughout. Lastly, parents exhibiting the *Distancing* pattern of communication frequently disengaged both emotionally and physically. These parents were unengaged and unanimated when talking to their children, communication was often perfunctory, and touches were frequently task-oriented rather than supportive.

In addition to using previous research to inform the current study's definition of "open communication," other research on parent-child illness related communication provides compelling support for the important relationship between communication and child outcomes. There has been some research in this area indicating the important and central role that parents play in communicating and conveying health and illness information to their children. For example, in a study of healthcare use among adolescents, 60.3% of boys and 71.7% of girls identified parents as the most important people they would consult about healthcare concerns (Ackard, Neumark-Sztainer, Story, & Perry, 2006). Beyond the role of confidant, several studies have also shown the potential for parents' style of communication to impact child outcomes. Open communication has been related to higher self esteem in the child, lower defensiveness (Spinetta & Maloney, 1978), decreased depressed mood symptoms (Kellerman et al., 1977), and fewer somatic symptoms (Morrow, 2004) .

Research has also addressed the relationship between child emotional and health outcomes and the absence of direct parent-child communication. As stated by Claflin and Barbarin (1991), "the very experience of living with childhood cancer and its treatment unavoidably presents the child with information about the seriousness of the situation." From the point of diagnosis on, pediatric cancer requires frequent, if not constant attention, monitoring, and participation from various people, including medical staff, parents as well as the ill child.

While the child may remain unaware of such specific details as the diagnosis or treatment techniques, the barrage of information and environmental cues makes it nearly impossible for hesitant parents to maintain complete discretion about their child's illness. Nonverbal cues from parents also provide important information to the child about his illness. Interviews done by Claflin and Barbarin revealed that three of the children with cancer who had not been told of their diagnosis, disclosed to their interviewer that they had "figured it out." Nonverbal cues such as parental distress can play a large role in a child's ability to "figure out" his diagnosis. These non-verbal cues may include elevated levels of anxiety, uncertainty, negative feelings, depression, loneliness, and overall psychological distress (Boman, Viksten, Kogner, & Samuelsson, 2004; Claflin & Barbarin, 1991; Hoekstra-Weebers, Jaspers, Kamps, & Klip, 1999). Clafin and Barbarin found that when these cues were available, children of all ages reported an awareness of their parents' illness related distress.

While these findings provide evidence for the potential outcomes related to paren-child communication, there has been little attention given to the factors that may contribute to patterns of communication between children and their parents. The following section explores these factors.

Gender and Communication. Of the many contributing factors to differing patterns of parent-child communication, child gender is among the most researched. Differences in the ways that mothers and fathers interact with their sons and daughters are pervasive throughout a range of behaviors (e.g., Leaper, Anderson, & Sanders, 1998; Leaper & Smith, 2004). Differences in mothers' and fathers' styles of communications are reflective of general differences in their interactions with their children. For example, research on parents' differing styles of play and interaction highlights fathers' tendency to engage in more rough-and-tumble

play while mothers use more toy-mediated, non-physical and verbal play styles(Lamb, 1981). These differences extend to communicative styles as well.

Mothers have been found to talk more than fathers to their children and about a wider range of topics, particularly social and personal issues. This may be particularly applicable to the personal issues associated with illness. Also, mothers' conversation frequently contains more questions which illicit the child's opinions and convey acceptance and recognition of the child's thoughts than is characteristic of fathers' communication (Stewart et al., 2003). Conversely, fathers' communication focuses on fewer topics and often pertains to school issues and rules (Stafford & Dainton, 1995). Fathers' conversation is also heavily directive and frequently focuses on problem solving (Fitzpatrick & Vangelisti, 1995). These fundamental differences between mothers and fathers suggest that mothers may exhibit a greater frequency of interpretable parent-child illness related communication behaviors, and are therefore an acceptable sub-population with which to explore parent-child communication.

Further differences have been found with regard to parents' communication styles toward daughters versus sons. Fathers, for example show a tendency toward providing sons with problem solving techniques (Fitzpatrick & Vangelisti, 1995). In contrast, with their daughters, fathers have been found to use twice as many positive responses and offer more encouragement than with sons (Buerkel-Rothfuss, Fink, & Buerkel, 1995). For both mothers and fathers, communication with daughters is characterized by warmth, encouragement, and mutual discussion. Mothers also report using more positive emotional expression with their daughters, a tendency that contrasts with parents' propensity to encourage sons to control their emotional expression (Block, 1983; Fitzpatrick & Vangelisti, 1995; Garner, Robertson, & Smith, 1997). Research also indicates that children differentially react to their mothers and fathers with

daughters reporting more active communication and stronger relationships with their mothers, as well as greater self disclosure (Noller & Bagi, 1985; Randall, 1995) .

The emotional content of parent's communication with their children is also of particular importance to the current study, since childhood illnesses can be emotionally intense experiences for parents and their children. Research on emotion and communication again underscores the daughter-son dichotomy that exists in parent-child communication. As early as preschool, mother-daughter talk includes significantly more emotion words than mother-son communication, resulting in daughters' greater use and understanding of emotion terms (Adams, Kuebli, Boyle, & Fivush, 1995). Specifically, mothers talk more about sadness with their daughters and more about anger with their sons (Adams et al., 1995; Fivush, 1989). This same trend has been shown to apply to fathers (Kuebli & Fivush, 1992).

Research by Adams (1995) further examined these findings in a longitudinal design, in order to investigate changes in the emotional content of parent-child conversation over time. Results indicated that while mothers and fathers used comparable amounts of emotion language, there was main effect for child gender, indicating that across time parents used significantly more emotion words with daughters than with sons. This range of emotionality could be of importance to the parent-child dynamic, potentially eliciting more open and intimate communication between parents and daughters than between parents and sons.

The role of gender has also been researched with regard to illness specific parent-child communication. Seiffge-Krenke (2002), for example, revealed significant differences in the communication styles of fathers of healthy adolescent teens versus fathers of teens with diabetes. Transcriptions of father-teen conversations were obtained during a whole-family interaction task and revealed that fathers of healthy teens used more validating statements and explored the teens

input more frequently. In contrast, fathers of diabetic adolescents displayed less validation, were less energetic during the task and responded less frequently to their child's ideas as well as agreeing with them less often. Also explored, was the father's role in supporting the teen as an individual in the family unit. The support of individuation was more characteristic of control group fathers than of fathers with diabetic children (Seiffge-Krenke, 2002).

Given the roles of child and parent gender on parent-child communication, the present study includes hypotheses about child gender as well as a focus on parent gender (i.e., mothers). The focus on mothers is largely due to the challenges in recruiting a sufficiently large sample of fathers.

Parent-Child Communication about Childhood Chronic Illness

Researchers have approached communication and interaction within the family from developmental, social and cultural perspectives. While this general body of research is informative to the current study, the work in the field of pediatric psychology offers a more specific viewpoint from which to consider patterns of parent-child communication about illness. As discussed earlier, parents play a central role in communicating and conveying information about health and illness to their children. Parents of chronically ill children can also experience confusion, distress, uncertainty and frustration, which can all complicate the way parents speak to their sick children (Melnyk, Feinstein, Moldenhouer, & Small, 2001). To begin to understand the importance of parent-child communication in the face of childhood cancer, it is first important to discuss the factors that make pediatric cancer a unique event in comparison to other illnesses that occur in young children. The importance of parent-child communication is reflected in research on specific diseases and illnesses of childhood, which will now be considered.

Type I Diabetes Mellitus is a useful contrast to cancer and compellingly illustrates the especially distressing characteristics of pediatric cancer. Though it can be diagnosed at any age, Type 1 diabetes most commonly appears in children and adolescents, making it similar to pediatric cancer (Atkinson & Eisenbarth, 2001). Additionally, both illnesses share pre-diagnosis symptoms such as sudden weight loss and extreme fatigue, although differentiating symptoms also exist. From the point of diagnosis forward, the experience of diabetes and cancer differ significantly. While research suggests that the diagnosis of diabetes can produce mildly elevated symptoms of psychological distress in children as well as their mothers (Northam, Anderson, Adler, Werther, & Warne, 1996), this distress in qualitatively different from cancer since parents must disclose the diagnosis of diabetes to their child soon, if not immediately after the diagnosis is made.

Due to the daily regimen of insulin shots and blood glucose monitoring, the child must be knowledgeable about his diagnosis and responsible for his own care in whatever ways seem age-appropriate. For this reason, parents do not have the option to shield their child from knowing about their disease. Conversely, disclosure of the cancer diagnosis can often be a difficult decision for parents, especially when such factors as the child's age and the parents' own experiences with cancer are considered.

The challenges of communicating with a diabetic child versus a child with cancer also differ when we consider the treatment and prognosis of these illnesses. Currently, Type 1 Diabetes is an incurable, lifelong illness; however, with vigilant blood sugar monitoring, adherence to insulin dosages, and regular doctor visits, diabetes is a completely controllable disease with a strong likelihood of positive outcomes. A patient who adheres to all aspects of his prescribed regimen will experience minimal disease related complications and no threat of

truncated life expectancy. Children with cancer are not afforded the luxury of a treatment regimen with guaranteed outcomes. This uncertainty can make it difficult for parents to explain the disease course and potential illness outcomes to their child.

In some respects, the diagnoses of diabetes and cancer represent prototypes of the dichotomy between controllable and uncontrollable stressors, a distinction that is very important from a physiological perspective. An unpredictable stressor, such as chronic illness, is experienced as more severe and can, at times, be related to the child's ability to manage his or her illness (Sapolsky, 1998). In a study comparing parents of children with diabetes to those of children with cancer, loss of control was among the variables on which the two illness groups differed significantly (Boman et al., 2004). Linked to the experience of stressors is the construct of open communication and its role as a vehicle for increased controllability and reduced uncertainty. By knowing the potential course and outcomes of a threatening situation, such as cancer, children are less likely to experience despair, anxiety and grief (van Veldhuizen & Last, 1991).

Parent-Child Communication About Cancer

While research has not placed a great emphasis on communication between parents and their children with chronic illnesses such as sickle cell, diabetes, and cystic fibrosis, there seems to be one exception to this trend. Pediatric cancer is a topic that has received far more consideration in the literature.

Even when there is a favorable chance of cure, children and families may experience significant stress. In addition to adjusting to the diagnosis of a potentially life threatening illness, families must cope with the acute side effects of treatment, disruptions in family routines, financial costs, and the lingering possibility of relapse. Further, a substantial proportion of

survivors must adjust to long-term physical late effects from their disease or treatment, such as organ toxicities, cognitive impairments, functional deficits, and cosmetic changes (DeLaat & Lampkin, 1992; Lackner et al., 2000; Oeffinger, Eshelman, Tomlinson, Buchanan, & Foster, 2000). Despite improvements in treatment, the 5-year survival rates may not accurately reflect the number of children who are cured of their disease, as a portion of children who have improved life expectancy ultimately succumb to their disease after five years. It is not uncommon for children to experience multiple relapses over several years. As a result, over 2,300 children die annually from cancer or its treatment, and it continues to kill more children in the U.S. than any other disease (Ries et al.). These statistics begin to illustrate the severity of childhood cancer, as well as suggest the idea that, much like other childhood chronic illness, childhood cancer can have considerable effects on family and individual functioning.

Unlike the previously discussed pediatric chronic illnesses, cancer is associated with very different diagnostic procedures, treatments, disease course, and prognoses. Seldom is a parent, child, or family unit prepared for the illness specific stressors that accompany pediatric cancer, such as receiving the diagnosis and the months or years of treatment that often follow.

Conceptualizing pediatric cancer as an uncontrollable stressor is one way of considering the way it can affect both family and child, and make communication difficult. At the time of diagnosis parents often report disbelief and shock, and over time these feelings may be compounded by anxiety and loneliness (Boman et al., 2004; Munson, 1978). Family dynamics may also shift, becoming overly rigid or extremely permissive and chaotic (Munson, 1978). Here again, open patterns of communication between parent and child, as well as within the family unit, may as an adaptive mechanism for coping with these feelings of uncontrollability and uncertainty.

Diagnosis, Prognosis and Communication. As discussed earlier, the diagnosis of childhood cancer is a time of considerable stress for patients and their families. This time is defined by the adjustment to a potentially fatal diagnosis as well as prognoses that can range from the expectation of complete recovery to loss of significant aspects of personal functioning to death. In all cases, families are faced with significant changes and stressors, which often impact patterns of parent-child communication. The terms diagnosis and prognosis, while related, are not synonymous. While diagnosis refers only to the process of identifying the nature or specific type of disease (e.g., Hodgin's Lymphoma, Leukemia, or brain tumor), prognosis refers to the likely outcome of the disease (i.e., recover, recurrence, or death).

The current study will focus on the latter of these two terms, prognosis, as it considers multiple disease factors and is likely to have an important impact on family dynamic, even more so than diagnosis alone. Many factors affect a cancer prognosis. Some of the most important are the type and location of the cancer, the stage of the disease (the extent to which the cancer has metastasized, or spread), and its grade (how abnormal the cancer cells look and how quickly the cancer is likely to grow and spread). Other factors that may also affect the prognosis include the child's age, general health, and response to treatment. Physicians carefully consider all factors that could affect that a child's disease and treatment and then try to predict what might happen. These predictions are based on information that researchers have collected over many years about thousands of children with cancer.

Once discussed with a family, the prognosis can significantly influence components of family functioning such as patterns of parent-child communication. For example, interviews with parents of children with cancer reveal that parent's who believed their child would die were less likely to inform their child of the diagnosis and more likely to give as little information to

their child as possible. Similarly, in retrospective interviews with parents whose children did die from cancer, most parents reported having not engaged in sufficiently open communication with their child (Clarke et al., 2005) Though retrospective in design, this study suggests that amongst children who were faced with a fatal prognosis, parents were less likely to discuss the disease (Clarke et al., 2005). These previous studies provide evidence linking these variables; however, their reliance on interview and retrospective accounts raises the concern for the accuracy of one's memory for difficult past events. The current investigation used questionnaire data gathered close to the time of diagnosis, thereby alleviating the need for mothers to rely on their memory of past experiences and behaviors.

Anxiety and Communication. Few studies have investigated the impact of parental anxiety on parent-child communication. Within the small body of research; however, are several findings that substantiate the need for further studies on this relationship. First, prospective studies indicate that parental distress, especially anxiety and depression, may be higher near diagnosis for both mothers and fathers but symptoms may decline to normal levels after the first year (e.g., Hoekstra-Weebers, Heuvel, Jaspers, Kamps, & Klip, 1998; Kupst et al., 1995; Sawyer, Antoniou, Toogood, & Rice, 1997). The adjustment of parents of children with cancer may be best conceptualized within the context of post-traumatic stress symptoms (Stuber, 1996). For example, Kazak et al. (2004),in a sample of mothers and fathers whose children had cancer, found that 30% of mothers met criteria for Post Traumatic Stress Disorder (PTSD) subsequent to their child's diagnosis, and at least one parent had current PTSD in approximately 20% of families. Moreover, 99% of families had at least one member (parent or child) who reported the re-experiencing symptoms associated with PTSD (intrusive thoughts or memories). In two similar studies, parents of pediatric cancer survivors have reported significantly higher levels of

PTSD than comparisons (Barakat et al., 1997; Kazak et al., 1997). These studies suggest that parental anxiety is an important factor to consider in relation to parent-child communication about cancer.

Studies looking specifically at the relationship between anxiety and communication have found these variables to be related (Wood, McLeod, Sigman, Hwang, & Chu, 2003). Anxious parents as compared with their less-anxious counterparts are less warm and more controlling in their interactions with their children, grant less autonomy, and are more likely to catastrophize in their interactions with their children (e.g., Moore, Whaley, & Sigman, 2004). These features of parenting and communication may convey to the child that he is incapable of handling challenges and that the world is not a safe place. Additionally, Edwards and Clarke (2004) worked with a population of adult patients and their adult relatives to reveal a significant relationship between anxiety and communication. Specifically, they found that direct and open communication was correlated to lower levels of anxiety while "unclear and dysfunctional" communication between patients and relatives was related to high levels of anxiety.

Within the domain of pediatric populations, similar findings exist. For young children receiving a routine bone marrow aspiration, anxious parents were observed as being less reassuring to their children both before and during the procedure. Moreover, questionnaire data revealed a negative relationship between parental anxiety and qualities of nurturance (Dahlquist, Power, Cox, & Fernbach, 1994). Together these results suggest a theme of poor communication behaviors across anxious parents of chronically ill children. Though this study did not specifically identify communication as a dependent variable, the qualities of nurturance and reassurance can be easily conceptualized as components within the domain of parent-child communication. These studies make a compelling case for the relationship between anxiety and

communication; however, they also represent a small and lacking literature on this topic. Though the literature addressing this relationship is small, each study provides convincing rationale for a decrease in openness as anxiety symptoms intensify.

Coping and Communication. Having discussed cancer as a prototypical uncontrollable stressor, it is important to also discuss how parents' coping with this stressor relates to parents' communication with their children, as this relationship is key to this investigation.

Unlike the body of research on anxiety and communication, several studies have addressed coping and communication together. Most of these studies; however, do not contribute greatly to our understanding of a relationship between these variables, since communication behaviors are often embedded within each coping measure as a specific adaptive strategy for managing external and internal demands (i.e., stressors). Instead, the results of many studies are confounded by the inclusion of open and direct communication as a type of positive coping strategy used by parents. For example, in a longitudinal study by Kupst et al. (1988), families were divided into "good copers" and "poor copers" based on a composite coping index score. Kupst et al. reported a significant difference between these groups, with "good copers" tending to have more open communication within the family.

While seemingly informative, these results are confounded by the inclusion of communication as a criterion in one of the measures used to create the composite score. Moreover, of the studies that do address coping and communication independently, many focus on the patient rather than the parents. These studies show a correlation between positive coping in long-term survivors and open family communication about illness. These findings provide some rationale for a similar relationship between parent coping and communication, but more detailed results are needed. Specifically, it is necessary that coping and communication be parsed

apart in data analysis to provide the opportunity for understanding the clear relationship between the two. The current study will conduct these analyses to better elucidate this relationship.

Given the importance of parent-child communication and the ways that parents and children cope with cancer, the link between communication and coping warrants attention. Many aspects of coping within families are interpersonal in nature and include the exchange of social support during times of stress. Only one study has reported on the coping patterns of parents and communication in a small sample (n = 20) of young children (age 4-7 years) with cancer (Hardy, Armstrong, Routh, Albrecht, & Davis, 1994); however, these investigators did not report on patterns of parent-child communication as they relate to coping.

We have examined coping in three samples of parents and children (depressed parents and their children, children with recurrent abdominal pain and their parents, mothers and daughters at risk for breast cancer). Although none of these samples have included children with cancer, they provide important background for the current study. We view coping as one aspect of a broader set of processes that are enacted in response to stress. We define coping as "conscious volitional efforts to regulate emotion, cognition, behavior, physiology, and the environment in response to stressful events or circumstances" (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001).

Three types of coping responses have been identified and validated in a series of confirmatory factor analytic studies (e.g., Compas et al., 2006; Connor-Smith, Compas, Wadsworth, Thomsen, & Saltzman, 2000; Wadsworth, Rieckmann, Benson, & Compas, 2004). Controlled disengagement responses represent disengagement coping, which includes avoidance, denial, and wishful thinking. Drawing on developmental models of perceived control and the importance of these perceptions in responses to stress, controlled engagement responses are

differentiated as primary control coping and secondary control coping (Compas et al., 2001; Connor-Smith et al., 2000). Primary control coping is characterized by responses aimed at resolving the source of stress or direct attempts to change one's emotional responses to a stressor, including problem-solving, controlled (regulated) expression of emotions, and emotion modulation. Primary control coping is hypothesized to be best suited to stressors that are experienced as under personal control. Secondary control coping involves efforts to adapt to a stressor and is, therefore, best suited to stress that is experienced as beyond personal control. Examples of secondary control coping responses include acceptance, distraction, cognitive restructuring, and optimistic thinking.

Rationale for the Current Study and Proposed Hypotheses

The proposed study was designed to examine the relationships among several important factors, which contribute to parent-child communication about cancer. Prior research has suggested the interconnectedness of these factors, showing that child gender, disease prognosis, coping and anxiety can influence patterns of communication.

The data for this study were gathered using comprehensive questionnaire methods. It was expected that this method will provide detailed and informative data about patterns of communication as well as the several independent variables that may play influential roles on the openness of parent-child communication about cancer. Specifically, research questions approach child gender, prognosis, and parent characteristics of coping and anxiety as predictors of communication openness. Secondly, the association among the latter three variables will explored with attention to the possibility of a mediated relationship.

The hypotheses for this study are as follows:

1) Based on research on gender and communication that has suggested more openness between parents and daughters, I hypothesize that higher levels of open communication will be reported and observed between mothers and daughters than between mothers and sons.

2) In this study, prognosis is measured using mother report. In previous research, qualitative interviews with parents have suggested that the perception of a poor prognosis results is related to less open parental communication. Questionnaire data, however, have not yet been applied to the investigation of this relationship. Therefore, I hypothesize that more openness in mother-child communication will be positively related to a more positive cancer prognosis.

3) It is hypothesized that open mother-child communication behaviors will relate inversely to reported and observed symptoms of parental anxiety and distress. Similarly, open communication behaviors will be positively related to the use of active, engagement coping strategies and inversely related to disengagement coping strategies.

4) Lastly, building on the hypothesized relationships between perceived prognosis, maternal anxiety, maternal coping strategies and parent-child communication behaviors, it is further hypothesized that a mediated model will best represent this relationship. Specifically, it is expected that mothers' anxiety and mothers' coping will act as mediators between prognosis, maternal stress and distress, and maternal-child communication.

CHAPTER II

METHODS

Participants

Participants included 76 mothers and their children (38 boys and 38 girls) who were newly diagnosed cancer patients at the Vanderbilt University Monroe Carroll Children's Hospital and Nationwide Children's Hospital, Columbus, Ohio. Recruited families were part of a larger investigation that included both questionnaire and observational data collection methods. Families included in the current investigation were only those that participated in the questionnaire portion of the larger study. Due to issues of measurement reliability, the observational data were not available for analysis at the time of this investigation. Regarding the participants of this study, families were recruited within the first weeks of diagnosis. At this time all mothers and all children ages 10-18 were asked to complete a battery of questionnaires. Recruitment for the study began in 2006 and the sample used for analyses included families who were recruited through early 2008.

For the questionnaire portion of the study, participants include approximately 76 parent and child pairs that were recruited as of 9/1/06. Families were recruited to include the child with cancer and the parent who is primarily responsible for the child's medical care, which in most cases was the child's mother. Although fathers are encouraged to participate, their enrollment was extremely low relative to that of mothers. Therefore, the primary analyses will focus on mothers and their children. Children's ages ranged from 5-18-years-old and included an equal

number of boys and girls. As mentioned above, children ages 10-18 were eligible to complete child report questionnaires.

Mothers participating in the study had a mean age of 39.3 (*SD* = 9.16) and reported mean education level of 15.5 (*SD* = 4.1), which corresponds to completion of some post high-school education (e.g. trade school). Mothers reported a mean annual income of 2.64 (*SD* = 1.3) which corresponds to $25,000-$50,000. The sample is roughly representative of the regions in which the study was conducted. Of the mothers reporting on martial status (8.4% provided no response), 73.5% were married/partnered, 6% were separated/divorced, and 3.6% were widowed. A total of 46 children completed questionnaires (22 girls, 23 boys, 1 no response). Of the children who completed questionnaires, the mean age was 13.7 years (*SD* = 2.2) and the mean grade level was 8.3 (*SD* = 2.2). (See Table 1 for summary of these descriptive statistics).

Procedure

The Pediatric Hematology/Oncology medical staff at the Vanderbilt University Monroe Carroll Children's Hospital and at Nationwide Children's Hospital (affiliated with Ohio State University) identified all newly diagnosed children between the ages of 5 and 18-years-old currently being treated with curative intent for cancer. A research nurse or other member of the medical staff who was uninvolved in the child's medical treatment was notified of these eligible families. During a clinic visit, the research nurse/recruiter asked the parents of identified patients if they would like to participate in the questionnaire portion of the study. For parents who agreed and provided written consent (and the child provided written assent), the parent and child are given questionnaire packets and consent/assent forms to either complete during their clinic visit to bring home and return by mail.

Both parent and child questionnaire packets included measures of coping, parent-child communication, and emotional distress. Additionally, parent questionnaires included a measure of anxiety symptoms. The majority of the child questionnaires required that the child report on his or her own functioning, and were therefore outside the scope of the study. The only child measures included in analyses were those on which the child was required to report about the mother's communication behaviors.

Measures

Prognosis. Parents were asked to self-report their perception of the child's chance of disease free survival at five years post-diagnosis on a 0% - 100% visual analogue scale. For the current study, this report was considered the perceived diagnosis, since it allowed for the inclusion of medical information as well as spiritual beliefs or optimistic thinking.

Demographic Information. Family demographics were assessed with a questionnaire that we have used successfully in our research. This measure assesses marital status, education, occupation, religious and spiritual beliefs and practices, income, and number and age of children.

Maternal Anxiety and Distress.

The Perceived Stress Scale. The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) was used to provide an index of ongoing levels of chronic stress in the lives of parents. The PSS is a 14-item measure of the degree to which situations in one's life are experienced as stressful. Internal consistency α's from .84 to .86), test-retest reliability (r = .66 over 6 weeks), and concurrent and predictive validity have all been established (Cohen et al., 1983). The PSS has been shown to be a better predictor of psychological and health outcomes than measures of major life events alone (Cohen et al.). This measure provides a current overall index on the level of stress experienced by parents in their lives.

Beck Anxiety Inventory. To measure anxiety symptoms, mothers completed the Beck Anxiety Inventory (Beck, Steer, Ball, & Ranieri, 1996), a well-standardized measure of symptoms of anxiety in non-psychiatric samples. We have used the BAI in our ongoing research with women with breast cancer and α's have been greater than .85 for both measures. The BAI has the best discriminant validity for the self-report assessment of anxiety symptoms in adults (Steer, Ranieri, Beck, & Clark, 1993).

Impact of Events Scale. To measure mothers worries specific to their child's cancer diagnosis, the IES-R (Weiss & Marmar, 1997) was used. This instrument provides an index of parents' distress (e.g., worries, intrusive thoughts, and avoidance) related to cancer and was developed to closely parallel DSM-IV criteria for PTSD. The IES-R demonstrates good reliability and validity with adults (Weiss & Marmar, 1997). Mothers were asked to respond to this measure in reference to their child's illness and treatment.

Beck Depression Inventory. As another measure of maternal distress, the Beck Depression Inventory-II (BDI-II; Beck, Steer, Ball & Ranieri, 1996) was used to assess mothers' current depressive symptoms. The BDI-II is a standardized and widely used self-report checklist of depressive symptoms and has adequate internal consistency, reliability and validity.

Maternal Coping. Mothers also completed the Pediatric Cancer Version of the Responses to Stress Questionnaire (RSQ). The RSQ contains 57 items that ask the parent to report how they responded during the past 6 months to the stressors they endorsed. Factor analyses of the RSQ have identified five primary factors (Connor-Smith et al., 2000): primary control engagement coping (problem solving, emotional expression, emotional modulation), secondary control engagement coping (cognitive restructuring, positive thinking, acceptance, distraction), disengagement coping (avoidance, denial, wishful thinking), involuntary engagement (emotional

arousal, physiological arousal, rumination, intrusive thoughts, impulsive action), and involuntary disengagement (cognitive interference, emotional numbing, inaction, escape). The first three factors reflect voluntary coping processes, and the latter factors reflect involuntary stress responses. The RSQ has demonstrated good internal consistency, test-retest reliability, and convergent and discriminate validity (Connor-Smith et al., 2000). In a previous study of children coping with parental depression, internal consistencies of the five factors were primary control coping, $\alpha = .77$; secondary control coping, $\alpha = .75$; disengagement coping, $\alpha = .83$; involuntary engagement, $\alpha = .89$; and involuntary disengagement, $\alpha = .84$ (Jaser et al., 2005; Langrock, Compas, Keller, & Merdhant, 2002).

The RSQ is adapted to specific stressors or domains of stress while retaining the same item set and item structure; only the references to the specific source of stress are changed in the various versions of the scale. For the current study, the stressors are illness specific and require the respondent to rate, on a scale from 1 (not at all) to 4 (very), "how stressful" each experience has been. The RSQ version used for the current study included stressors that are specific to cancer. These stressors were of particular importance in several data analyses. For the purpose of analyses, the stressors were divided into three categorical groups based on the core subject of each statement. These groups, and the items included in each are detailed in the table below:

Table 1. *RSQ Stressor Groups Used for Data Analyses*

Stressor Group	RSQ Items
Illness-related Stressors	Not knowing if cancer will get better Effects of treatment Not being able to help child feel better Understanding information about cancer
Relationship Stressors	Having less time/energy for others Needing more help support
Financial Stressors	Paying bills Concerns about jobs

The RSQ has been used to obtain adolescents' self-report and parents' reports about their children with samples of children coping with the stress of parental depression (Jaser et al., 2005; Langrock et al., 2002) family conflict and economic strain (Wadsworth & Compas, 2002), recurrent abdominal pain in children (Thomsen et al., 2002)and social stress in a Native American sample (Wadsworth et al., 2004).

In the current study, the pediatric cancer version of the RSQ was used to assess parents and children coping with a child's cancer. Separate versions have been developed to obtain adolescents' self-reports, parents' reports about their children, and parents' reports about their own coping and stress responses (see Appendix for copies). The RSQ has shown good reliability and validity with ethnically diverse samples, including Navajo adolescents, Spanish adolescents, Bosnian adolescents, and adult women with newly diagnosed breast cancer (e.g., Compas et al., 2006; Wadsworth et al., 2004).

Parent-Child Communication.

Family Communication Measures (FCM). Mothers completed a questionnaire pertaining to communication with children about cancer (Vannatta, 2005). Using a 4-point Likert, twelve questions assess how important the parent feels it is to communicate with their child about various aspects of the disease and treatment (e.g., the name and nature of the diagnosis the child has received, treatment side effects that the child might experience, the possibility that treatment might not be successful). Twelve additional questions address how often the parent has spoken to the child about each topic, as well as two questions about how satisfied the parent is with the family's overall communication. Data support the internal consistency of the scales among families affected by breast cancer, as well as associations with child and parent adjustment (Vannatta, 2005). An additional set of items has been added to this questionnaire to assess the emotional quality of parent-child communication about cancer. These items were adapted items from another study completed in the same laboratory.

Family Environment Scale (FES); (Moos & Moos, 1981). The FES was used to measure social and environmental characteristics of the families participating in the study. The scale is based on a three-dimensional conceptualization of families. The Relationship dimension includes measurements of Cohesion, Expressiveness, and Conflict. The Personal Growth dimension involves assessments of Independence, Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation, and Moral-Religious Emphasis. The System Maintenance dimension includes Organization and Control measures. The current study focused on the Cohesion and Expressiveness portions of the Relationship dimension, since these constructs best reflect communication behaviors that were applicable to the goals of the investigation. Internal consistency reliability estimates for the FES subscales range from .61 to

.78. Intercorrelations among these 10 subscales range from -.53 to .45. These data suggest that the scales are measuring relatively distinct characteristics of family environment and with reasonable consistency. Test-retest reliabilities for the FES subscales for range from .52 to .91. These estimates suggest that the scale is reasonably stable across these time intervals.

Parent-Adolescent Communication Scale (PACS); (Barnes & Olon, 1985). Mothers and children (age 10 and older) completed this questionnaire of general experiences of communication with one another. Parents completed the 20-item measure once while children completed the questionnaire once, but in reference to each parent in the home. For the purposes of the current study, only child-report data on the mother was used. Internally consistent scales (α = .80 to .92) with adequate 4 week test-retest reliabilities (r = .64 to .78) reflect Open Family Communication, Problems in Family Communication, and Selective Family Communication. This measure provided a context of family perceptions of their 'typical' communication style and obstacles. Further, it provided a basis for comparing the communication styles of families that choose to participate or not participate in the observational measure of parent-child communication.

The hypotheses for this study are as follows:

1) Higher levels of open communication will be reported and observed between mothers and daughters than between parents and sons.

2) More openness in mother-child communication will be positively related to a more positive cancer prognosis. This hypothesis will be first tested with Pearson correlations between mother-rated prognosis and communication.

3) Open mother-child communication behaviors will relate inversely to reported and observed symptoms of parental anxiety and distress.

4) Open communication behaviors will be positively related to the use of active, engagement coping strategies and inversely related to disengagement coping strategies. Both hypotheses 3 and 4 will be tested with Pearson correlations to assess the relationships among variables of interest

5) Mother's anxiety and mothers' coping will act as mediators between perceived prognosis and open parental communication.

Data Analyses

Data analyses were conducted in several stages. First, descriptive statistics (i.e., central tendency, variability, skewness, kurtosis) were examined for all study variable distributions. Next to address the test hypotheses, hypothesis one was analyzed using an independent samples t-test to determine differences between mothers' communication with daughters versus communication with sons. For the following three hypotheses, bivariate Pearson correlations were conducted to determine the relatedness of the coping, communication, and maternal distress and anxiety. Instead of running a single, all-inclusive correlation matrix, the abovementioned correlations were conducted to include only those measures that were pertinent to each hypothesis. Lastly, to address the final hypothesis regarding maternal anxiety and distress as a mediator of the stress-communication relationship, a series of linear multiple regression analyses were conducted. Given the number of measures included within each construct (e.g., maternal distress and anxiety included four measures) it was necessary to first determine the intercorrelations among the variables of interest, and thereby indicate variables that should be included in each regression equation. To do this, I first identified the dependent variable measures that were significantly correlated to the predictor variable in each regression equation. Only these dependent variable measures were eligible to be entered into Step 1 of the regressions. Next, I identified the mediation variables that were significantly correlated to the Step 1 dependent variable. Only these measures were then tested as mediators in Step 2 of the regression model.

CHAPTER III

RESULTS

Summary of Descriptive Statistics of the Sample.

Descriptive statistics for the reported coping, communication, anxiety, and distress variables are presented in Table 2. All but one of the variables had adequate variance and distribution to allow for correlation and regression analyses. Mother-rated prognosis (M=79.5, *SD* = 22) revealed a highly skewed distribution with little variance. As a result this variable did not allow for correlation analyses. The repercussions of this finding are outlined in the forthcoming sections of the study.

Table 2. *Descriptive Statistics on Age, Communication, Anxiety and Distress, and Coping Variables*

	Mean	SD	N	Possible Values
Child Age	11.0	3.9	76	
Mother Age	39.3	9.2	76	
Communication Variables				
FES Cohesion	7.4	1.7	73	0-9
FES Expressiveness	5.7	2.1	75	0-9
FCM Attitudes	40.9	5.1	76	12-48
FCM Practices	33.8	5.8	76	12-48
Mother-rated PAC Openness	40.0	5.2	73	10-50
Mother-rated PAC Problems	21.8	6.3	72	10-50
Child-rated PAC Openness	42.8	6.3	46	10-50
Child-rated PAC Problems	22.5	7.1	46	10-50
Anxiety and Distress Variables				
BAI Total	11.8	10.1	76	0-63
BDI Total	14.3	9.9	71	0-63
PSS Total	22.0	6.6	75	0-40
IES Total	4.46	2.1	69	0-75
Mother rated Prognosis	79.5	22	76	1-100
RSQ Illness Stressors	11.6	3.2	74	4-16
RSQ Financial Stressors	5.6	2.0	73	2-8
RSQ Relationship Stressors	5.3	1.8	74	2-8
RSQ Total Stressors	22.4	4.3	73	8-36
Coping Variables				
Primary Control Coping	.19	.04	73	
Secondary Control Coping	.26	.05	73	
Disengagement Coping	.13	.03	73	

Note. FES = Family Environment Scale; FCM = Family Communication Measure; PAC = Parent Adolescent Communication Measure; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; PSS = Perceived Stress Scale; IES = Impact of Events Scale; Scores for Primary Control, Secondary Control and Disengagement Coping are z scores calculated from mother reports on the RSQ; Responses to Stress Questionnaire.

Hypothesis 1. *Higher levels of open communication will be reported between mothers and daughters than between mothers and sons.* It was hypothesized that analyses of mother-child communication would reveal a main effect for child gender, with mothers exhibiting higher levels of open communication with their daughters than with sons. Means and standard

deviations for all communication variables are reported in Table 3. Independent sample *t*-tests were conducted to compare communication involving mother and sons vs. mothers and daughters. Contrary to expectations, the means for mother-daughter communication did not indicate higher levels of open communication in comparison to mother-son patterns. Instead, findings show no difference between groups, indicating that communication between mothers and daughter is comparable to communication between mothers and sons.

Table 3. *Means, standard deviations and t-tests comparing mother-daughter and mother-son communication.*

Communication Measure	Daughters	Sons	Significance Tests
	Mean (SD)	Mean (SD)	
Mother rated FES Cohesion (M Cohesion)	7.3 (2.1)	7.5 (1.3)	t (71) = .44, p = .66
Mother rated FES Expressiveness (M Express)	5.6 (2.1)	5.9 (2.1)	t (73) = .63, p = .53
Mother rated FCM Attitudes (MFCM Attitude)	41.2 (4.9)	40.6 (5.3)	t (74) = -.47, p = .64
Mother rated FCM Practices (MFCM Practice)	33.8 (6.6)	33.9 (4.9)	t (74) = .06, p = .95
Mother rated PAC Openness (MPAC Openness)	39.8 (5.7)	40.2 (4.7)	t (71) = .36, p = .72
Mother rated PAC Problems (MPAC Problems)	22.0 (6.4)	21.7 (6.1)	t (70) = -.23, p = .82
Child rated PAC Openness (CPAC Openness)	43.9 (7.0)	42.5 (5.7)	t (43) = -.36, p = .71
Child rated PAC Problems (CPAC Problems)	22.4 (7.6)	22.5 (6.9)	t (43) = .03, p = .98

Note. FES: Family Environment Scale. FCM: Family Communication Measure. PAC: Parent-Adolescent Communication. Abbreviations for each measure are presented in parentheses. These abbreviations will be used to refer to each measure in all other tables.

Hypothesis 2. *More openness in mother-child communication will be positively related to more positive cancer prognosis.* It was predicted that there would be a positive and significant relationship between open communication behaviors and a more positive cancer prognosis. Correlations addressing this hypothesis are shown in Table 4. As can be seen in this table, mothers' ratings of their children's prognosis were significantly negatively correlated only with the mothers' attitudes about communication with their children. This indicates that mothers who rated their children's prognosis as better were also less likely to think that parent-child

communication about cancer is important. No other significant relationships were found between the communication variables and mother-rated prognosis.

Table 4. *Correlations of Mothers' Ratings of Children's Prognosis with Communication*.

	CPAC Openness	CPAC Problems	M Cohesion	M Express	MFCM Attitude	MFCM Practice	MPAC Openness	MPAC Problems
Mother's Rating of Child Prognosis	-.04	.06	-.09	-.14	-.32**	-.08	-.15	.08

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

Since the correlations did not provide compelling evidence for the role of prognosis as a significant factor in patterns of mother-child communication, additional analyses were conducted to determine other specific stressors that may be associated with communication between mothers and their ill children. The stressors used for this analysis were derived from the Responses to Stress Questionnaire, which contains a list of cancer-related stressors that are rated by the respondent, in this case, mothers (see methods section). The stressors were divided into three groups based on the core subject of each statement (see appendix): Illness related stressors (e.g., not knowing if cancer will get better; effects of treatment); Relationship stressors (e.g., having less time/energy for others; needing more support); and Financial stressors (e.g., paying bills; concerns about jobs).

Table 5 shows correlations between the subtypes of stressors on the RSQ and all communication variables. As can be seen, Illness Related Stressors were significantly correlated with only one measure of communication, the FCM Attitudes scale (r=-.32, p<.01). Relationship stressors, however, were significantly correlated with two communication measures, FCM Attitudes (r=-.46, p <.01) and Mother-rated Problems on the PAC (r=.26, p<.05) scores. These

correlations indicate that mothers reporting greater relationship stressors are less likely to believe communication about cancer is important and more likely to use poor communication strategies in talking with their ill child. In addition to these two significant correlations, the correlation of relationship stress with FES Expressiveness and FCM Practices also approached significance ($p < .10$). While neither of these correlations meets the $p<.05$ criteria for significance, they suggest that when faced with stress in their relationships, mothers may struggle with providing a comfortable and supportive family environment and are less likely to engage in cancer related talk with their child.

Table 5. *Correlations between mothers' ratings of cancer-related stress and communication*.

	CPAC Openness	CPAC Problems	M Cohesion	M Express	MFCM Attitude	MFCM Practice	MPAC Openness	MPAC Problems
Illness Stress	-.04	.06	-.09	-.14	-.32**	-.09	-.15	.08
Relationship Stress	.11	.04	-.14	-.22	-.46**	-.22	-.16	.26*
Financial Stress	-.17	.04	-.24*	-.19	-.19	-.18	-.22	.19
Total Stress	-.05	.06	-.17	-.22	-.41**	-.18	-.22	-.20

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

In contrast to illness and relationship stress, financial stress is significantly correlated with FES Cohesion (r =-.24, $p<.05$), highlighting mothers' tendency to be less helpful, supportive and close with her ill child when confronted with a greater amount of money-related problems. Financial stress is also uniquely related to mother-rated PAC Openness with a correlation that approaches significance (r=.22, p=.069), indicating that greater financial stress negatively impacts a mother's ability to express affection, trust, and empathy in communication with her ill child.

When the RSQ stressor subtypes were considered together under the RSQ Total Stress variable, a similar pattern of correlations was found. This suggests that each of the stressor subtypes contributes uniquely to our understanding of the relationship between stress and communication. Therefore, the RSQ Total Stressor variable was excluded from subsequent analyses, since these data provide no unique information beyond the subtypes of stress.

Hypothesis 3. *Open mother-child communication behaviors will relate inversely to symptoms of anxiety and distress.* The third hypothesis investigated the relationship between mother-child communication and maternal distress and anxiety. It was expected that patterns of open mother-child communication would relate inversely to symptoms of anxiety and distress. The Table 6 correlation matrix shows each of the anxiety and distress measures with each measure of communication and reports Pearson correlations for all variables.

Table 6. *Correlations of Mother Distress and Anxiety with Communication*

	CPAC Openness	CPAC Problems	M Cohesion	M Express	MFCM Attitude	MFCM Practice	MPAC Openness	MPAC Problems
IES Total	.22	-.08	-.15	-.26*	-.37**	-.12	-.16	.12
BDI Total	.13	-.01	-.23*	-.26*	-.35**	-.17	-.24[a]	.24[a]
BAI Total	.21	-.07	-.18	-.22[a]	-.26*	-.09	-.21	.19
PSS Total	.10	-.17	-.27*	-.13	-.35**	-.13	-.27*	.11

[a]*<.10, *p < .05, ** p < .01*

The maternal depressive symptoms on the BDI stand out, as BDI scores are significantly related to several measures of communication. Three of the eight correlations are significant, while two others approached significance, all in the negative direction. Fewer depressive symptoms, for example, are related to greater supportiveness and togetherness in the family environment as measured by the FES Cohesion subscale (r= -.22, p<.05). Similarly, mothers with lower BDI scores describe their families as being more expressive as measured by the FES

Expressiveness Subscale Score (r= -.26, p<.05). The correlation between Maternal BDI and the FCM Attitudes score also reached significance, indicating that mothers with fewer depressive symptoms are more likely to advocate the importance of open and forthright illness-related dialogue (r= -.35, p<.05). In considering the relationship between Maternal BDI and the MPAC Subscales, correlations reveal values which approach significance (MPAC Openness: r= -.24, p<.10; MPAC Problems: r= .24, p<.10). Despite the fact that these values fail to reach conventionally accepted levels of significance, the consistency with which the Maternal BDI Total Score correlated with other distress and anxiety measures make these particular correlations important and informative. For mothers reporting fewer symptoms of depression on the BDI, parent-child communication tends to be more open, affectionate and empathetic and Mothers with higher scores on the BDI, parent-child communication tends to be more callous, uncomfortable and difficult.

In addition to the BDI, several other associations in Table 5 support Hypothesis 3. Mothers' scores on the IES are inversely related to FES Expressiveness as well as FCM Attitudes (r= -. 26, p<.05 and r= -.37, p<.05, respectively.) These data support the idea that higher levels of maternal distress are associated with lower levels of family togetherness as mothers' decreased belief in the importance of open cancer-related communication with her child. Mother distress as measured by the PSS Total Score illustrates, yet again, the inverse relationship between openness and high levels of distress. When correlated with FES Cohesion, FCM Attitudes, and MPAC Openness, the PSS Total Score reveals significant values, all in the negative direction.

The BAI represents the sole measure of maternal anxiety in the current study. When correlated with measures of open communication, the BAI was significantly related to the FCM

Attitudes scale (r= -.26, p<.05). The negative correlation of these variables suggests that more highly anxious mothers are less likely to find value in talking to her ill child about cancer. Additionally, the correlation between the BAI and FES Expressiveness approaches significance (r= -.22, p=.058), suggesting a potentially important relationship between these variables.

Hypothesis 4.*Open communication will be positively related to use of active, engagement coping strategies and inversely related to disengagement coping.* Maternal coping strategies are yet another important consideration in the current investigation. Hypothesis 4 incorporates the ways that mothers cope with their child's cancer and posits that open communication behaviors will be positively related to active, engagement coping strategies, while disengagement coping techniques will be inversely correlated to open communication. Table 7 supports this hypothesis. Across three of the eight measures of open communication, Primary Control Coping correlates significantly in the positive direction. Specifically, Primary Control Coping correlates with FES Cohesion (r=.25, p=.034), FES Expressiveness (r=.36, p=.002), and Mother-rated PAC Openness (r=.355, p=.003). When correlated with Mother-rated PAC Problems, Primary Control Coping reveals a significantly negative relationship, highlighting mother's tendency to have fewer communication problems when using primary control as a strategy. Secondary Control Coping revealed one significant correlation with the FCM Attitudes (r=.24, p=.04). In contrast, Disengagement Coping was significantly and negatively correlated with one measure of communication, Mother-rated PAC Openness (r=-.27, p=.024).

Table 7. *Correlations of mothers' coping with mother-child communication.*

	Mothers' Primary Control Coping	Mothers' Secondary Control Coping	Mothers' Disengagement Coping
CPAC Openness	.04	.04	-.23
CPAC Problems	-.14	-.03	-.01
MFES Cohesion	.25*	.02	-.10
MFES Express	.36**	.02	-.19
MFCM Attitude	.04	.24*	-.21
MFCM Practice	.14	.05	-.16
MPAC Openness	.36**	.22	-.27*
MPAC Problems	-.28*	-.20	.22

[a]*<.10, *p < .05, ** p < .01*

Hypothesis 5. *Mothers' anxiety, distress and coping will act as mediators between prognosis and open communication.* It was expected that a mediation model would best represent the role of maternal anxiety and distress in the relationship between cancer-related stress and mother-child communication. Tables 8 and 9 show correlations among all variables included in the regression equations. The measures of maternal anxiety and distress were significantly correlated with all of the subtypes of stress and all three types of coping (primary control, secondary control, and disengagement coping). Therefore, all the types of stress and coping were possible mediators of the relations with mother-child communication.

Table 8. *Correlations of RSQ Grouped Stressors with Maternal Anxiety and Distress*

	IES Total	BDI Total	BAI Total	PSS Total
RSQ Illness Stressors	.57 **	.52**	.46**	.52**
RSQ Relationship Stressors	.58**	.54**	.55**	.37**
RSQ Financial Stressors	.36**	.34**	.28*	.43**

** $p < .01$

Table 9. *Correlations of Coping with Maternal Anxiety and Distress*

	IES Total	BDI Total	BAI Total	PSS Total
Primary Control Coping	-.42**	-.64**	-.44**	-.43**
Secondary Control Coping	-.67**	-.53**	-.50**	-.62**
Disengagement Coping	.36**	.35**	.19	.43**

** $p < .01$

Table 10 shows only those regression equations that yielded significance in either step of the regression. The first set of regression equations (i.e. Equations 1 - 5) was used to predict maternal open communication as measured by the FCM Attitudes subscale and with RSQ Illness Stress entered as the independent variable. To test for mediation, each of the four measures of maternal anxiety and distress and one measure of maternal coping were entered in Step 2. A total of five equations were conducted with each revealing a significant negative relationship in step one, indicating that mothers are less likely to think cancer specific communication is important as their experience of illness-related stress increases. With regard to the test of mediation, only one equation approached significance and suggested the presence of a mediated model. When entered along with Maternal BDI Total, the previously significant relationship between RSQ Illness Stress and Mother FCM Attitudes was no longer present ($F(2,66) = 4.9$, $p = .01$) and the relationship between illness-related stressors and attitudes about communication was no longer significant when the BDI was included in the regression equation. This model suggests that mothers experiencing higher levels of illness-related stress are less likely to think cancer communication is important when faced with increasing levels of depressive symptoms.

The second set of regression equations (i.e. Equations 6-10) was again used to predict maternal open communication as measured by the FCM Attitudes subscale, but with RSQ Relationship Stress entered as the independent variable. For these equations, BDI, BAI, PSS, and

Secondary Control Coping were entered as mediators. In each of these regressions RSQ Relationship Stress maintained a significant and negative relationship with FCM Attitudes through both steps of the equation, and provided no evidence for a mediated model.

Regression 11 used RSQ Relationship Stress to predict maternal communication as measured by the Mother-rated PAC Problems subscale and with BDI Total was entered as the mediator. Though significant in step one, both variables were non-significant in step two of the equation.

The final regression assessed RSQ Financial Stress as the predictor and FCM Cohesion as the outcome variable. For this equation, BDI Total was used to test mediation. In both steps of the regression, RSQ Financial Stress retained a significant and negative relationship with FES Cohesion indicating that mothers' experience of financial hardship deleteriously impacts their ability to promote family togetherness, even when we account for their level of depressive symptoms.

Table 10. *Regression Equations Testing Maternal Anxiety and Distress and Mediators*

Equation 1- Mother FCM Attitudes (DV)	Final R^2 = .14 F(2,64) =5.3, p = .01
Block 1. R^2 change = .12	β
RSQ Illness Stress	-.33**
Block 2. R^2 change = .03	
RSQ Illness Stress	-.22
Mother IES Total	-.20

Equation 2 - Mother FCM Attitudes (DV)	Final R^2 = .13 F(2,66) = 4.9, p = .01
Block 1. R^2 change = .08	β
RSQ Illness Stress	-.29**
Block 2. R^2 change = .05	
RSQ Illness Stress	-.16
Mother BDI Total	-.25[a]

Equation 3 – Mother FCM Attitudes (DV)	Final R^2 = .11 F(2, 70) = 4.4, p=.02
Block 1. R^2 change = .10	β
RSQ Illness Stress	-.32**
Block 2. R^2 change = .01	
RSQ Illness Stress	-.263*
Mother BAI Total	-.12

Equation 4 – Mother FCM Attitudes (DV)	Final R^2 = .11 F(2, 71) = 4.5, p=.02
Block 1. R^2 change = .08	β
RSQ Illness Stress	-.29**
Block 2. R^2 change = .03	
RSQ Illness Stress	-.19
Mother PSS Total	-.20

Equation 5 – Mother FCM Attitudes (DV)	Final R^2 = .10 F(2, 70) = 4.1, p =.02
Block 1. R^2 change = .10	β
RSQ Illness Stress	-.32**
Block 2. R^2 change = .003	
RSQ Illness Stress	-.27[a]
Secondary Control Coping	-.07

Equation 6 – Mother FCM Attitudes (DV)	Final R^2 = .22 F(2, 64) = 9.0, p=.000
Block 1. R^2 change = .21	β
RSQ Relationship Stress	-.46***
Block 2. R^2 change = .01	
RSQ Relationship Stress	-.41**
Mother IES Total	-.10

Equation 7 – Mother FCM Attitudes (DV)	Final R^2 = .23 F(2, 66) = 9.8, p =.000
Block 1. R^2 change = .212	β
RSQ Relationship Stress	-.47***
Block 2. R^2 change = .01	
RSQ Relationship Stress	-.41**
Mother BDI Total	-.11

Equation 8 – Mother FCM Attitudes (DV)	Final R^2 = .21 F(2,71) = 9.7, p=.000
Block 1. R^2 change = .21	β
RSQ Relationship Stress	-.46***
Block 2. R^2 change = .000	
RSQ Relationship Stress	-.47***
Mother BAI Total	-.02

Equation 9 – Mother FCM Attitudes (DV)	Final R^2 = .22 F(2, 70) = 9.6 p=.000
Block 1. R^2 change = .19	β
RSQ Relationship Stress	-.44***
Block 2. R^2 change = .02	
RSQ Relationship Stress	-.39***
Mother PSS Total	-.15

Equation 10 – Mother FCM Attitudes (DV)	Final R^2 = .21 F(2, 70) = 9.2, p=.000
Block 1. R^2 change = .20	β
RSQ Relationship Stress	-.44***
Block 2. R^2 change = .01	
RSQ Relationship Stress	-.41***
Secondary Control Coping	.12

Equation 11 – Mother-rated PAC Problems (DV)	Final R^2 = .08 F(2, 62) = 2.6, p=.08
Block 1. R^2 change = .07	β
RSQ Relationship Stress	.26*
Block 2. R^2 change = .01	
RSQ Relationship Stress	.19
Mother BDI Total	.12

Equation 12 – FES Cohesion Score (DV)	Final R^2 = .08 F(2, 64) = 2.7, p=.08
Block 1. R^2 change = .07	β
RSQ Financial Stress	-.47***
Block 2. R^2 change = .03	
RSQ Relationship Stress	-.41**
Mother BDI Total	-.11

[a]p<.10, * p<.05, **p<.01, ***p<.001

CHAPTER IV

DISCUSSION

The present study was designed to extend previous research on parent-child communication about pediatric cancer. Though several studies have addressed the topic of illness related parent-child communication, there is a dearth of information regarding the role of parental distress in parent-child communication behaviors as well as the applicability of findings to populations of children diagnosed with cancer. To this end, the current study had two primary aims: 1) to understand the inter-relationships among variables of mother-child communication, maternal distress and illness-related stressors and 2) to isolate maternal distress and coping behaviors as potentially important mediators in the relationship between stress and patterns of communication. Given the increasing rates of pediatric cancer diagnosis as well as the strong relationship between communication and child functioning, these study goals may be particularly important for understanding the methods for promoting adaptive communication behaviors and for identifying mothers at risk for difficulty within the domain of parent-child illness communication.

To date, previous studies have asserted the need for "open communication" with differing conceptualizations of the specific components that comprise this method of talking with ill children (e.g., Morrow, 2004; Slavin et al., 1982; Spinetta & Maloney, 1978; van Veldhuizen & Last, 1991). Additionally, past research has lacked in its considerations of potential factors that may alter a parent's capacity for engaging in open communication with an ill child. The current study addressed these limitations in several ways. To provide a more comprehensive conceptualization of open communication, the current study utilized several parent-report and

child-report questionnaires, which together, embody various aspects of open communication behaviors. Additionally, the current study had a primary goal of investigating the role of maternal distress and coping as important variables in the communication behaviors reported by mothers of children with cancer.

As evidenced by the descriptive statistics of this sample, it is clear that mothers of newly diagnosed children are engaging in a range of communication behaviors. Together these measures of communication represent a relatively broad conceptualization of communication, as each measure captures a unique part of communication. The FCM Attitudes reflects the unspoken attitudes and beliefs that may motivate or hinder the mother's approach to open communication. Conversely, the PAC Openness, the FES Cohesion and the FES Expressiveness scales provide measures of the verbal and nonverbal engagement strategies used by mothers to provide a supportive and accepting environment for the discussion of difficult topics with their ill child. Lastly, the FCM Practices scale taps directly into the communication behaviors of mothers by measuring the extent to which mother actually engage in cancer-related dialogue with their child. Together these measures capture conceptually diverse components of one common construct, thereby strengthening the meaning and applicability of the findings.

Descriptive statistics of maternal distress and anxiety also reveal that mothers reported a range of symptoms in these domains. On the BDI and the BAI, the mean reported scores fell in the moderate and mild ranges, respectively. These scores mirror previous research that has identified a child's cancer diagnosis as a time when mothers' and fathers' may experience heightened symptoms of anxiety and depression (e.g., Hoekstra-Weebers et al., 1998; Kupst et al., 1995; Sawyer et al., 1997). The current sample of mothers reported anxiety and depression symptoms that convey the difficulty of having a child diagnosed with cancer. Regarding

mothers' distress as a result of their child's diagnosis, scores on the IES-R (M=4.46, s.d.=2.1) reveal that mothers in this sample were not experiencing significant levels of distress or PTSD-like symptoms in response to the diagnosis of cancer. This finding may be explained by the recency of diagnosis relative to data collection. Some research has stated that parents may not exhibit post-traumatic stress symptoms until one year or more after their child's diagnosis (Boman et al., 2004). Mothers in the current sample had not yet faced the multiple long-term hardships of pediatric cancer (e.g., hospitalizations, treatments, relapse) and therefore these experiences were not reflected in their responses on the IES.

On the PSS, mothers' stress ratings were comparable to those in the non-clincal sample on which the measure was normed (Cohen et al., 1983). This suggests that mothers of children with newly diagnosed cancer do not perceive life stress greater than that which would be expected in any community sample. This finding suggests that the global stressors captured by the PSS may be less pertinent to mothers of children with cancer. Instead, stressors specific to cancer may play a larger role in their experience of distress.

For the first hypothesis of this investigation tested group differences in mother-child communication between girls and boys. Contrary to the expected outcome, child gender was not found to be a significant indicator for the majority of communication behaviors; that is, on seven of the eight communication measures mothers did not differ in the way they talked to their sons and daughters. Previous research provides some rationale for this lack of group differences. For example, research by Stewart et al. (2003) indicated that across child gender, mothers talk more to their children that do fathers and about a wider range of topics, particularly social and personal issues. As noted previously, this may be particularly applicable to the personal issues associated with illness. Furthermore, mothers' conversations frequently contains more questions which

illicit the child's opinions and convey acceptance and recognition of the child's thoughts. For mothers, then, open communication may be the "status quo" regardless of their child's gender. Furthermore, cancer may represent a unique circumstance that requires mothers to transcend beyond the traditional parent-daughter and parent-son dichotomy.

To further understand the potential correlates of mother-child communication, the second hypothesis tested children's cancer prognosis as an important factor in mothers' openness. Contrary to the expected positive and significant relationship between prognosis and open communication, findings generally revealed no significant relationship between these variables. This unexpected finding brought attention to the truncated distribution of mother-reported prognoses ratings, which were likely influential in the non-significant correlations. Specifically, analysis of the distribution revealed that mothers' ratings of their children's cancer prognoses were highly positively skewed and leptokurtic; that is mothers tended to rate their children as having a high likelihood of 5-year survival (M=79.5, s.d. = 22). This means that on average, mothers thought that their child had a 79.5% likelihood of being alive in five years. To determine the accuracy of mothers' ratings was beyond the scope of the current investigation, however; given the representativeness of the sample, it can be deduced that this prognosis distribution was a less than accurate depiction of the true likelihood of survival. Instead, it is probable that mothers of children with cancer found it difficult to give a poor prognosis rating to their ill child, since doing so might amplify the difficulty of the situation. Additionally, mothers' ratings may reflect religious, spiritual and cultural considerations that result in a more hopeful prognosis than a prognosis that is more objectively derived. Overall, these considerations elucidate the factors contributing to the skewness of the mother-rated prognosis variable.

When considered from a statistical standpoint, the skewness of the prognosis variable explains the non-significant correlation between prognosis and communication. Specifically, variables that are highly skewed and that have limited variance (like the prognosis variable) cannot correlate with other variables or are limited in the degree to which they can correlate with other variables. Given the truncated range of prognosis ratings given my mothers and the variable's non-significant relationship with other study measures, the prognosis variable was deemed an inappropriate operationalization of illness related stress. That is to say, since mothers, on average, conceptualized their children as highly likely to survive, mothers' ratings of their child's prognosis did not represent an illness related stressor, as was expected at the onset of the study.

To address this unexpected finding regarding the poignant stressors experienced by mothers of children with cancer, the goal of the second hypothesis shifted to include other stressors related to pediatric cancer diagnosis. These stressors were gathered using the Responses to Stress Questionnaire (Connor-Smith et al., 2000) and included Relationship stressors, Financial Stressors, and Illness-related Stressors. For mothers of children with cancer, each of these areas of potential stress proved meaningful in some aspect of their communication attitudes and behaviors. When experiencing relationship difficulties such as lack of help and support, mothers were less likely to engage in cancer related talk with their children and more likely to use poor communication and eschew the importance of open dialogue between parent and child. Similarly, mothers experiencing stressors related directly to their child's cancer were also less likely to believe in the utility of open communication. In the face of financial stressors, mothers reported less warmth of communication as well as less supportiveness and closeness with her ill child. As delineated by these findings, each stressor subtype appears to have a

specific association with varying measures of communication behavior. For the utility of this study as well as application within clinical practice, these findings should be considered from a more global viewpoint. When considered more globally these findings can be interpreted as evidence for a stress-communication relationship. That is to say, overall mothers of children with cancer tend to exercise less supportive, warm, and expressive communication strategies when faced with cancer-related stressors.

With regard to mothers' experience of anxiety and distress, evidence from the current investigation provided some support for the hypothesis regarding the association between maternal distress and communication. For mothers reporting fewer symptoms of depression, parent-child communication was more open, affectionate and empathetic. For mothers reporting higher levels of depressive symptoms, parent-child communication tended to be less open, more uncomfortable and difficult. Beyond the role of depressive symptoms, mothers with higher levels of anxiety symptoms encouraged less openness and expressiveness within the family unit and found relatively less value in talking with their ill child about cancer. Regarding their experience of general life stressors, mothers reporting higher levels of perceived life stress reported a struggle to use the strategies of openness and togetherness with their sick child. Overall, these results provide validation of an important relationship between communication and maternal distress, underscoring the impact that general life stress, cancer-related stress, and anxiety symptoms can have on a mother's ability to be informative, supportive and empathetic when communicating with her sick child.

Evidence from the current study also tested the relationship between maternal coping behaviors and communication. Results of these analyses revealed strong support for the hypothesis. Previous research has identified Primary Control and Secondary Control coping as

adaptive strategies for those dealing with chronic illness (e.g., Campbell et al., 2008). For mothers in this sample, active, engagement coping was related to both verbal and non-verbal communication behaviors that convey supportiveness, expressiveness, and willingness to approach the difficult topics related to their child's cancer. Conversely, when mothers endorsed greater levels of disengagement coping, this strategy was associated with lower ability or desire to exhibit empathy, affection and comfortable exchange of feelings within communication interactions with their child. These results are limited by their ability to reveal the mutual exclusivity of each coping strategy. To increase the interpretability of these results, ad hoc analyses were completed to determine the mutual exclusivity of mothers' coping strategies. A simple correlation between active, engagement coping and disengagement coping revealed a significant, negative correlation, suggesting that mother did not simply respond to the stress of their child's illness with a disorganized array of coping strategies. Instead, mothers who responded with primary and/or secondary control strategies tended to do so in the absence of disengagement coping as a mechanism for dealing with their child's illness.

The final hypothesis of the current study tested maternal distress, anxiety and coping as mediators of the stress-communication relationship. Results of this test were largely non-significant suggesting that, in most cases, mediation does not best represent the role of maternal coping, anxiety and distress. For several regressions, both predictor variables were non-significant in the second step of the equation. This finding is a consequence of the high correlations among the measures of maternal distress, coping and anxiety, which resulted in shared variance between step two variables. For one regression equation, mediation was supported, suggesting that maternal depressive symptoms accounted for the relationship between mothers' experience of illness-related stress and mother' attitude about cancer-related

communication. Specifically, mothers reporting greater amounts of illness stress were less likely to think cancer-related talk was important as a function of their increase in depressed symptoms. Relationship stress also proved an important difficulty for mothers. Though the regression equations that included relationship stress as the independent variable were non-significant, this stressor maintained a significant and negative relationship to communication in both steps of the equation. This finding suggests that despite a mother's approach to coping or level of anxiety and distress, her experience of relationship stress, is a strong direct predictor how she will approach and carry out communication with her sick child.

Strengths

As mentioned previously, the use of several parent-child communication measures strengthens this study's conceptualization of open communication. Previous research has limited the meaning of open communication to very specific measures or observations, thereby decreasing the meaning and applicability of the findings (e.g. (Morrow, 2004; Slavin et al., 1982; Spinetta & Maloney, 1978; van Veldhuizen & Last, 1991). In the current study, several components of communication were considered. This provided clarity regarding specific communication behaviors and their relationship to mothers' coping, distress and anxiety. Furthermore, this approach highlighted the complexity of communication and the need for a multilevel approach when measuring this construct

The timing of assessment also represents a strength of the current investigation. Some previous research has utilized retrospective methodologies, requiring parents to recall their communication behaviors at the time of diagnosis (e.g. Clarke et al., 2005). The current study improved on this approach by collecting data within weeks of each child's diagnosis. This allowed mothers to provide information about their recent and current experiences. By

ameliorating the reliance on mothers' recall, the current study strengthened the utility of the findings.

Lastly, the sample of the current study represents a strength, in that previous research samples have been much smaller. In several of the previously discussed studies, which collected information from parents, sample sizes ranged between 29 to 67 participants. (Dalquist et al., 1994; Clark et al., 2005; Cline et al., 2006; Moore et al., 2003). With 76 mothers participating, this study improved upon the small samples of previous studies, allowing the current findings to detect group differences and significant relationships among maternal anxiety, distress, coping and communication.

Limitations

This study had several limitations regarding the characteristics of the sample and design that should be addressed. As noted above, only a limited number of fathers were available for the current study, resulting in their exclusion. Though all mothers participating in the study identified themselves as the primary caretakers, inclusion of fathers in future research would provide meaningful information about the role of father-child communication about cancer. Furthermore, because mothers in the current sample showed no gender effect for communication, future research may uncover similarly surprising findings regarding fathers' communication behaviors with girls versus boys.

Cultural considerations also represent a limitation of the current study. There is some evidence in the literature that suggests cultural differences in patterns of parent-child communication. For example, in a sample of African-American adolescents and their parents, findings suggested that parent-child conflict about small daily events are typical in African American families, but do not deleteriously effect parent-child relationships (Smetana & Gaines,

2003). This finding may inflate ratings on measures such as the Family Environment Scale or the Parent-Adolescent Communication Scale, and incorrectly reflect problematic parent-child communication attitudes and behaviors.

Although the use of several communication measures reflects an improvement in comparison to other studies that have relied solely on one aspect of communication as a measure of the construct, future studies should incorporate observation. This approach would allow investigators to measure components of communication that parents and children may be unaware of, and therefore unable to report on. The larger study of which the current investigation was a part, includes observations of parents and child talking about cancer. These data were unavailable for the current analyses but will provide additional evidence to strengthen the findings reported here.

Finally, the cross-sectional design of this study represents a limitation. Prospective research is needed to determine the direction of effects of the demographic factors and especially the relationships of maternal anxiety, coping and distress and maternal communication behaviors.

Implications for Future Research and Practice

Parent-child communication is a multidimensional construct and should be treated as such within the contexts of future research and clinical practice. The findings of this study attempt to address the many layers of communication and suggest that maternal anxiety, distress and coping demonstrate important relationships with mothers' ability to communicate openly with their ill children. For example, mothers' experience of relationship stress is highly related to her ability to recognize cancer-related talk as an important practice. Considered together with previous research on the positive relationships between open communication and optimal

emotional and behavioral functioning in parents and children, this study's findings have important implications for clinical practice.

It will be important for future research to examine mechanisms for addressing the symptoms of depression and anxiety in parents of newly diagnosed children. Doing so will better inform researchers and clinicians, so that they may develop interventions for parents and children alike. For example, parents should be educated about the effects of developmentally-appropriate open communication about cancer. Furthermore, open dialogue should be facilitated by medical and mental health professionals. Parent should also be educated about coping strategies and the important of self-care, since these components will allow mothers and father better address the needs of their ill child.

REFERENCES

Ackard, D. M., Neumark-Sztainer, D., Story, M., & Perry, C. (2006). Parent–Child Connectedness and Behavioral and Emotional Health Among Adolescents. *American Journal of Preventive Medicine, 30*(1), 59-66.

Adams, S., Kuebli, J., Boyle, P. A., & Fivush, R. (1995). Gender differences in parent-child conversations about past emotions: A longitudinal investigation. *Sex Roles, 33*(5), 309-323.

Atkinson, M. A., & Eisenbarth, G. S. (2001). Type 1 diabetes: new perspectives on disease pathogenesis and treatment. *The Lancet, 358*(9277), 221-229.

Barakat, L. P., Kazak, A. E., Meadows, A. T., Casey, R., Meeske, K., & Stuber, M. L. (1997). Families surviving childhood cancer: A comparison of posttraumatic stress symptoms with families of healthy children. *Journal of Pediatric Psychology, 22*(6), 843–859.

Barnes, H. L., & Olon, D. H. (1985). Parent-Adolescent communication scale. In D. H. Olson (Ed.), *Family Inventories: Inventories used in a national survey of families across the family life cycle - revised edition*. St. Paul: Famiy Social Science, University of Minnesota.

Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. F. (1996). Comparison of Beck Depression Inventories I and II in psychiatric outpatients. . *Journal of Personality Assessment, 67*(3), 588-597.

Block, J. H. (1983). Differential Premises Arising from Differential Socialization of the Sexes: Some Conjectures. *Child Development, 54*(6), 1335-1354.

Boman, K. K., Viksten, J., Kogner, P., & Samuelsson, U. (2004). Serious illness in childhood: the different threats of cancer and diabetes from a parent perspective. *The Journal of Pediatrics, 145*(3), 373-379.

Buerkel-Rothfuss, N. L., Fink, D. S., & Buerkel, R. A. (1995). Communication in the father–child dyad: The intergenerational transmission process. *Parents, children, and communication: Frontiers of theory and research*, 63–85.

Chesler, M. A., Paris, J., & Barbarin, O. A. (1986). " Telling" the Child with Cancer: Parental Choices to Share Information with Ill Children. *Journal of Pediatric Psychology, 11*(4), 497.

Claflin, C. J., & Barbarin, O. A. (1991). Does “telling” less protect more? Relationships among age, information disclosure, and what children with cancer see and feel. *Journal of Pediatric Psychology, 16*(2), 169-191.

Clarke, S. A., Davies, H., Jenney, M., Glaser, A., & Eiser, C. (2005). Parental communication and children's behaviour following diagnosis of childhood leukaemia. *Psycho-Oncology, 14*(4), 274-281.

Cline, R. J., Harper, F. W., Penner, L. A., Peterson, A. M., Taub, J. W., & Albrecht, T. L. (2006). Parent communication and child pain and distress during painful pediatric cancer treatments. *Soc Sci Med*.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *J Health Soc Behav, 24*(4), 385-396.

Compas, B. E., Boyer, M. C., Stanger, C., Colletti, R. B., Thomsen, A. H., Dufton, L. M., et al. (2006). Latent variable analysis of coping, anxiety/depression, and somatic symptoms in adolescents with chronic pain. *J Consult Clin Psychol, 74*(6), 1132-1142.

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. *Psychol Bull, 127*(1), 87-127.

Connor-Smith, J. K., Compas, B. E., Wadsworth, M. E., Thomsen, A. H., & Saltzman, H. (2000). Responses to stress in adolescence: measurement of coping and involuntary stress responses. *J Consult Clin Psychol, 68*(6), 976-992.

Dahlquist, L. M., Power, T. G., Cox, C. N., & Fernbach, D. J. (1994). Parenting and child distress during cancer procedures: A multidimensional assessment. *Children's Health Care, 23*(3), 149-166.

DeLaat, C. A., & Lampkin, B. C. (1992). Long-term survivors of childhood cancer: evaluation and identification of sequelae of treatment. *CA: A Cancer Journal for Clinicians, 42*(5), 263-282.

Edwards, B., & Clarke, V. (2004). The psychological impact of a cancer diagnosis on families: The influence of family functioning and patients' illness characteristics on depression and anxiety. *Psycho-Oncology, 13*(8), 562-576.

Fitzpatrick, M. A., & Vangelisti, A. L. (1995). *Explaining Family Interactions*: Sage Publications, Inc., 2455 Teller Road, Thousand Oaks, CA 91320 (paperback: ISBN-0-8039-5479-4, $26.95, clothbound: ISBN-0-8039-5478-6).

Fivush, R. (1989). Exploring sex differences in the emotional content of mother-child conversations about the past. *Sex Roles, 20*(11), 675-691.

Garner, P. W., Robertson, S., & Smith, G. (1997). Preschool Children's Emotional Expressions with Peers: The Roles of Gender and Emotion Socialization. *Sex Roles, 36*(11), 675-691.

Gurney, J. G., Davis, S., Severson, R. K., Fang, J. Y., Ross, J. A., & Robison, L. L. (1996). Trends in cancer incidence among children in the U. S. *Cancer, 78*(3), 532-541.

Hanna, K. M., Juarez, B., Lenss, S. S., & Guthrie, D. (2003). Parent-adolescent communication and support for diabetes management as reported by adolescents with Type 1 diabetes. *Issues in Comprehensive Pediatric Nursing, 26*(3), 145-158.

Hardy, M. S., Armstrong, F. D., Routh, D. K., Albrecht, J., & Davis, J. (1994). Coping and communication among parents and children with human immunodeficiency virus and cancer. *J Dev Behav Pediatr, 15*(3), S49-53.

Hart, B., & Risley, T. R. (1995). Meaningful Differences in the Everyday Experience of Young American Children.

Hauser, R. M. (1994). Measuring Socioeconomic Status in Studies of Child Development. *Child Development, 65*(6), 1541-1545.

Hoekstra-Weebers, J. E., Heuvel, F., Jaspers, J. P., Kamps, W. A., & Klip, E. C. (1998). Brief report: an intervention program for parents of pediatric cancer patients: a randomized controlled trial. *Journal of Pediatric Psychology, 23*, 207-214.

Hoekstra-Weebers, J. E., Jaspers, J. P., Kamps, W. A., & Klip, E. C. (1999). Risk factors for psychological maladjustment of parents of children with cancer. *J Am Acad Child Adolesc Psychiatry, 38*(12), 1526-1535.

Jacobson, A. M., Hauser, S. T., Lavori, P., Wolfsdorf, J. I., Herskowitz, R. D., Milley, J. E., et al. (1990). Adherence among children and adolescents with insulin-dependent diabetes mellitus over a four-year longitudinal follow-up: I. The influence of patient coping and adjustment. *Journal of Pediatric Psychology, 15*(4), 511-526.

Jaser, S. S., Langrock, A., Keller, G., Merchant, M. J., Benson, M. A., Reeslund, K., et al. (2005). Coping with the stress of parental depression: II. Adolescent and parent reports of coping and adjustment. *Journal of Clinical Child and Adolescent Psychology, 34*, 193-205.

Kazak, A. E., Alderfer, M. A., Streisand, R., Simms, S., Rourke, M. T., Barakat, L. P., et al. (2004). Treatment of posttraumatic stress symptoms in adolescent survivors of childhood cancer and their families: a randomized clinical trial. *J Fam Psychol, 18*(3), 493-504.

Kazak, A. E., Barakat, L. P., Meeske, K., Christakis, D., Meadows, A. T., Casey, R., et al. (1997). Posttraumatic stress, family functioning, and social support in survivors of childhood leukemia and their mothers and fathers. *J Consult Clin Psychol, 65*(1), 120-129.

Kellerman, J., Rigler, D., Siegel, S. E., & Katz, E. R. (1977). Disease-Related Communication and Depression in Pediatric Cancer Patients. *Journal of Pediatric Psychology, 2*(2), 52.

Kernis, M. H., Brown, A. C., & Brody, G. H. (2000). Fragile Self-Esteem in Children and Its Associations With Perceived Patterns of Parent-Child Communication. *Journal of Personality, 68*(2), 225-252.

Koenigsberg, H. W. (1993). Expressed emotion and glucose control in insulin-dependent diabetes mellitus (Vol. 150, pp. 1114-1115): Am Psychiatric Assoc.

Kuebli, J., & Fivush, R. (1992). Gender differences in parent-child conversations about past emotions. *Sex Roles, 27*(11), 683-698.

Kupst, M. J., Natta, M. B., Richardson, C. C., Schulman, J. L., Lavigne, J. V., & Das, L. (1995). Family coping with pediatric leukemia: Ten years after treatment. *Journal of Pediatric Psychology, 20*(5), 601-617.

Kupst, M. J., & Schulman, J. L. (1988). Long-Term Coping with Pediatric Leukemia: A Six-Year Follow-Up Study. *Journal of Pediatric Psychology, 13*(1), 7.

Lackner, H., Benesch, M., Schagerl, S., Kerbl, R., Schwinger, W., & Urban, C. (2000). Prospective evaluation of late effects after childhood cancer therapy with a follow-up over 9 years. *European Journal of Pediatrics, 159*(10), 750-758.

Lamb, M. E. (1981). Fathers and child development: An integrative overview. *The role of the father in child development, 2*, 1–70.

Langrock, A. M., Compas, B. E., Keller, G., & Merdhant, M. J. (2002). Coping with the stress of parental depression: Parents' reports of children's coping and emotional/behavioral problems. *Journal of Clinical Child and Adolescent Psychology, 31*, 312-324.

Leaper, C., Anderson, K. J., & Sanders, P. (1998). Moderators of gender effects on parents' talk to their children: A meta-analysis. *Developmental Psychology, 34*(1), 3–27.

Leaper, C., & Smith, T. E. (2004). A meta-analytic review of gender variations in children's language use: Talkativeness, affiliative speech, and assertive speech. *Developmental Psychology, 40*(6), 993-1027.

Leibowitz, J., Ramos-Marcuse, F., & Arsenio, W. F. (2002). Parent-child emotion communication, attachment, and affective narratives. *Attachment & Human Development, 4*(1), 55-67.

Melnyk, B. M., Feinstein, N. F., Moldenhouer, Z., & Small, L. (2001). Coping in parents of children who are chronically ill: Strategies for assessment and intervention. *Pediatric Nursing, 27*(6), 548-558.

Moore, P. S., Whaley, S. E., & Sigman, M. (2004). Interactions between mothers and children: impacts of maternal and child anxiety. *J Abnorm Psychol, 113*(3), 471-476.

Moos, R. H., & Moos, B. S. (1981). *Family Environment Scale Manual*: Consulting Psychologists Press Palo Alto, Calif.

Morrow, S. B. (2004). *The Role of Parent-child Interaction in Recurrent Abdominal Pain.* University of Vermont.

Munson, S. W. (1978). *The child and death*. St. Louis, MO: The C.V. Mosby Company.

Nakao, K., & Treas, J. (1992). *The 1989 Socioeconomic Index of Occupations; Construction from the 1989 Occupational Prestige Scores (General Social Survey Methodological Report No. 74*. Chicago: University of Chicago, National Opinion Research Center.

Noller, P., & Bagi, S. (1985). Parent-adolescent communication. *J Adolesc, 8*(2), 125-144.

Northam, E., Anderson, P., Adler, R., Werther, G., & Warne, G. (1996). Psychosocial and family functioning in children with insulin-dependent diabetes at diagnosis and one year later. *J Pediatr Psychol, 21*(5), 699-717.

Oeffinger, K. C., Eshelman, D. A., Tomlinson, G. E., Buchanan, G. R., & Foster, B. M. (2000). Grading of late effects in young adult survivors of childhood cancer followed in an ambulatory adult setting. *Cancer, 88*(7), 1687-1695.

Pendley, J. S., Kasmen, L. J., Miller, D. L., Donze, J., Swenson, C., & Reeves, G. (2002). Peer and Family Support in Children and Adolescents With Type 1 Diabetes. *Journal of Pediatric Psychology, 27*(5), 429-438.

Randall, D. (1995). Doing" mother–daughter: Conversation analysis and relational contexts in traditional and single-father families. *Parents, children, and communication: Frontiers of theory and research*, 113–124.

Ries, L. A. G., Eisner, M. P., Kosary, C. L., Hankey, B. F., Miller, B. A., Clegg, L., et al. SEER cancer statistics review, 1975–2001. Bethesda, MD: National Cancer Institute, 2004.

Sapolsky, R. M. (1998). *Why zebras don't get ulcers: an updated guide to stress, stress-related diseases, and coping*: WH Freeman.

Sawyer, M., Antoniou, G., Toogood, I., & Rice, M. (1997). Childhood cancer: a two-year prospective study of the psychological adjustment of children and parents. *J Am Acad Child Adolesc Psychiatry, 36*(12), 1736.

Seiffge-Krenke, I. (2002). " Come on, Say Something, Dad!": Communication and Coping in Fathers of Diabetic Adolescents. *Journal of Pediatric Psychology, 27*(5), 439-450.

Slavin, L. A., O'Malley, J. E., Koocher, G. P., & Foster, D. J. (1982). Communication of the cancer diagnosis to pediatric patients: impact on long-term adjustment. *Am J Psychiatry, 139*(2), 179-183.

Spinetta, J. J., & Maloney, L. J. (1978). The child with cancer: Patterns of communication and denial. *Journal of Consulting and Clinical Psychology, 46*(6), 1540-1541.

Stafford, L., & Dainton, M. (1995). Parent–child communication within the family system. *Parents, children, and communication: Frontiers of theory and research*, 3–21.

Steer, R. A., Ranieri, W. F., Beck, A. T., & Clark, D. A. (1993). Further evidence for the validity of the Beck Anxiety Inventory with psychiatric outpatients. *Journal of Anxiety Disorders, 7*, 195-205.

Stewart, L., Henson, R., Kampe, K., Walsh, V., Turner, R., & Frith, U. (2003). Brain changes after learning to read and play music. *NeuroImage, 20*(1), 71-83.

Stuber, M. L. (1996). Posttrauma symptoms in childhood leukemia survivors and their parents (Vol. 37, pp. 254-261): Acad Psychosom Med.

Thomsen, A. H., Compas, B. E., Colletti, R. B., Stanger, C., Boyer, M. C., & Konik, B. (2002). Parent reports of coping and stress responses in children with recurrent abdominal pain. *Journal of Pediatric Psychology, 27*, 215-226.

van Veldhuizen, A. M., & Last, F. (1991). *Children with Cancer: Communication and Emotions*: Swets En Zeitlinger BV.

Vannatta, K. (2005). *Psychometrics of the Family Communication Questionnaire*: Columbus, OH.

Wadsworth, M. E., & Compas, B. E. (2002). Coping with family conflict and economic strain: The adolescent perspective. *Journal of Research on Adolescence, 12*, 243-274.

Wadsworth, M. E., Rieckmann, T., Benson, M. A., & Compas, B. E. (2004). Coping and responses to stress in Navajo adolescents: Psychometric properties of the Responses to Stress Questionnaire. *Journal of Community Psychology, 32*(4), 391-411.

Waechter, E. H. (1971). Children's Awareness of Fatal Illness. *The American Journal of Nursing, 71*(6), 1168-1172.

Weiss, D. S., & Marmar, C. R. (1997). The Impact of Event Scale-Revised. *Assessing psychological trauma and PTSD*, 399–411.

Wood, J. J., McLeod, B. D., Sigman, M., Hwang, W. C., & Chu, B. C. (2003). Parenting and childhood anxiety: theory, empirical findings, and future directions. *Journal of Child Psychology and Psychiatry, 44*(1), 134-151.

Wysocki, T. Associations among teen-parent relationships, metabolic control, and adjustment to diabetes in adolescents. *Journal of Pediatric Psychology, 18*, 441-452.

Wysocki, T. (1992). Use of blood glucose data by families of children and adolescents with IDDM. *Diabetes Care, 15*(8), 1041-1044.