Couples Coping with Cancer: An Exploratory Study of Blame, Perceived Control, and Communication Patterns

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Couples Coping with Cancer:
An Exploratory Study of Blame, Perceived Control, and Communication Patterns

Alison G. Wong, PhD
University of Connecticut, 2013

The effects of cancer extend beyond the individual survivor and affect those who have relationships with the survivor as well. Unlike family members and friends, partners often experience similar or higher levels of distress as a person diagnosed with cancer. Over the past decade, there has been increased interest in the lifestyle and behavioral causes of cancer such as smoking, diet, physical activity, and exposure to environmental hazards. Awareness of these factors may cause newly diagnosed survivors and their partners to wonder what they might have done to contribute to the development of cancer and may affect how survivors and partners interact. Although blame has been studied in the context of cancer, virtually no research has investigated the effects of survivor and partner self- and other-blame on relationship satisfaction among couples coping with cancer. Furthermore, few researchers have examined how self-blame relates to couple interaction during communication about cancer-related issues. Knowledge of these relationships is crucial to properly assess couples’ dyadic coping efforts, especially if behavioral change is required to influence the progression of cancer. The present study provides an exploratory examination of (a) the prevalence of self- and other-blame among survivors and partners, (b) the association between survivor and partner relationship satisfaction, blame, couple communication, and perceived control, and to (c) evaluate correlates of survivor and partner relationship satisfaction. Results indicated that the relationships between self- and other-blame and other study variables varied between survivors and partners at both the individual and dyadic
levels. Also, perceived control was a significant predictor of both survivor and partner relationship satisfaction, and these effects were moderated by participants’ role as survivor or partner. Finally, all cancer-related communication patterns significantly predicted survivor and partner relationship satisfaction, though not all effects were moderated by participation status. Data gained from this study provide preliminary information about how couples assess and respond to the dyadic stressor of cancer, and clinical implications for marriage and family therapists to help couples recognize feelings of blame, communicate appraisals, and find positive ways to gain control and communicate as a couple.
Couples Coping with Cancer:
An Exploratory Study of Blame, Perceived Control, and Communication Patterns

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A Dissertation
Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy at the University of Connecticut

2013
Doctor of Philosophy Dissertation

Couples Coping with Cancer:
An Exploratory Study of Blame, Perceived Control, and Communication Patterns

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CHAPTER 1
INTRODUCTION

A cancer diagnosis can present a significant strain on individuals and their partners. According to the American Cancer Society (2013), it is estimated that over 1.6 million new cancer cases will be diagnosed in 2013. Fortunately, advanced technology and increased awareness about cancer screening have allowed physicians to detect and treat the disease earlier. Many cancer survivors are faced with the long lasting side effects of treatment and must cope with the psychological effects of diagnosis and treatment.

The effects of cancer extend beyond the individual survivor and affect those who have relationships with the survivor as well. Unlike family members and friends, partners often experience similar or higher levels of distress as a person diagnosed with cancer (Baider, Walach, Perry, & De-Nours, 1998; Northouse et al., 2002). Survivor and partner distress can lead to physical and mental health problems in both the individual and the couple. High levels of survivor and caregiver distress are often associated with higher rates of depression (Bambauer et al., 2006; Fleming et al., 2006; Kurtz, Kurtz, Given, & Given, 1995), anxiety (Segrin, Badger, Dorros, Meek, & Lopez, 2007; Hegel et al., 2006), and development or acceleration of physical illness (Vitaliano et al., 2002) in both partners. Survivor and partner distress are also associated with lower relationship satisfaction (Manne et al., 2004). Nevertheless, research has also shown that spousal support and positive couple interaction can buffer the negative effects of cancer on individual and couple distress and relationship satisfaction (Gremore at al., 2011; Hagedoorn et al., 2011). These studies show the influence that partners have on one another, thus providing evidence that the strength of the couple relationship can impact survivors and partners’ physical and emotional response to cancer and vice versa.
According to Bodenmann (1995), a couple’s ability to cope with a stressor is referred to as dyadic coping. He describes dyadic coping as the process by which partners appraise a stressor, communicate their appraisals to one another, and engage in shared coping strategies. Over the past decade, there has been increased interest in the lifestyle and behavioral causes of cancer such as smoking, diet, physical activity, and exposure to environmental hazards (Danaei, Ding, Mozaffarian, Taylor, Rehm, et al., 2009; Danaei, Vander Hoorn, Lopez, Murray, & Ezzati, 2005). According to the American Cancer Society (2013), 25% to 33% of cancers in the United States and other wealthier countries can be attributed to poor nutrition, physical inactivity, excess weight, and other health-related behaviors like smoking. Awareness of these factors may cause newly diagnosed survivors and their partners to question themselves and wonder what they might have done to contribute to the development of cancer. As a result of these attributions, couples may appraise the cancer diagnosis as an event brought on by themselves.

Survivors and partners who engage in behaviors commonly associated with cancer might experience self-blame or blame from their partner. Results from preliminary studies of blame in couples coping with cancer indicate that blame is associated with psychological distress at the time of diagnosis, which can lead to many deleterious effects on individual adjustment and relationship satisfaction (Bennett, Compas, Beckjord, and Glinder; 2005; Carmack Taylor et al., 2008). These studies suggest that feelings of responsibility and blame for the diagnosis of cancer may serve as hindrances to spousal support and positive interaction in the couple relationship. However, only one study has investigated partner-directed blame, showing that 10% of study survivors blamed their partners for the cause of cancer (Taylor, Lichtman, & Wood, 1984). To this end, it may be important that couple therapists and other clinicians address the presence of
self- and partner-blame in order to foster effective coping and minimize psychological distress among couples coping with cancer.

To understand the role of blame among couples coping with cancer, it is necessary to examine blame in its historical and theoretical context. Further, it is essential to understand how blame relates to the other components of the dyadic coping process, in addition to related mechanisms by which they function. In the second chapter, Bodenmann’s (1995) dyadic approach to stress and coping is presented and used to conceptualize blame and communication among couples coping with cancer. In the third chapter, the methodology used in the present study is described. Results of the study are presented in the fourth chapter. Finally, in the fifth chapter, an analysis of the present study and suggestions for future research and practice with couples coping with cancer are presented.
CHAPTER 2
REVIEW OF LITERATURE

A diagnosis of cancer can be a traumatic event for both the survivor and his or her partner. The ways in which the couple communicate about and cope with the demands of the illness can influence both individual and couple outcomes. Couple therapy research shows that among couples coping with chronic illness, inclusion of the partner in therapy can improve treatment and medication adherence, decrease emergency room visits, and improve health behaviors (Glasgow, Orleans, Wagner, Curry, & Solberg, 2001; Shields, Finley, Chawla, & Meadors, 2012). These findings highlight the significance of the couple relationship when coping with cancer. It is important to understand the ways in which survivors and their partners cope together because the nature of the couple relationship could serve as a source of positive or negative support.

In this section, Bodenmann’s (1995, 1997, 2005) dyadic approach to stress and coping, also known as the systemic-transactional approach, is presented. Next, the approach is applied to better understand how couples appraise cancer cause, communicate about cancer, and experience their relationships in the midst of cancer. A review of psycho-oncology research relevant to these concepts is offered. Finally, the research questions and hypotheses that guided the present study are outlined.

**Dyadic Approach to Stress and Coping**

concepts of dyadic stress and dyadic coping, and has served as a theoretical framework for the study of couples coping with various stressors such as relationship conflict (Randall & Bodenmann, 2009), depression (Gabriel, Beach, & Bodenmann, 2010), and chronic illnesses such as diabetes (Seidel, Franks, Parris Stephens, & Rook, 2012) and cancer (Baucom et al., 2012).

*Dyadic stress* is defined as any form of emotional or problem-centered stress that directly or indirectly concerns the couple as a unit. Bodenmann suggests that couples respond to dyadic stress through a stress communication process in which partners appraise a stressor, communicate that stress appraisal to one another, and respond with dyadic coping, as illustrated in Figure 1.

![Diagram of interaction between stress communication and dyadic coping between partners.](image)

**Figure 1.** Interaction between stress communication and dyadic coping between partners. Adapted from “Dyadic Coping and its Significance for Marital Functioning,” by G. Bodenmann, 2005, *Couples Coping with Stress: Emerging Perspectives on Dyadic Coping*, p. 37. Copyright 2005 by American Psychological Association.
Appraisal includes perceptions about the significance and impact of the stressor, as well as attributions for the cause of the stressor. Partners decode one another’s appraisal and respond with some form of behavioral or emotional response, also referred to as dyadic coping. Dyadic coping is defined as the process by which partners activate their stress management resources in order to maintain or restore a state of homeostasis among both partners as individuals and as a couple. Dyadic coping can be positive or negative. Positive coping involves partners working together, supporting one another, and negotiating tasks. Negative coping includes hostile, ambivalent, and superficial interaction. The objective of effective dyadic coping is to enhance relationship quality by fostering feelings of trust, reliability, and commitment among the couple in the face of dyadic stressors (Bodenmann 1995, 1997, 2005). When examining the effects of cancer on the couple, use of the dyadic coping framework allows researchers to examine couple perceptions, behaviors and interactions in the context of psychological adjustment.

Stress Appraisal

At the onset of a stressor, couple members appraise the stressor’s severity, intensity, threat, and significance on their lives and relationship (Bodenmann, 1997). Survivors and partners often appraise the diagnosis of cancer as an emotional and threatening stressor that causes them to question themselves and their behaviors (Bigatti et al., 2011). Stress appraisal also includes the individual and couple’s causal attributions of the stressor. According to attribution theory, after an adverse event, people make causal attributions in order to help them feel as if they are in control of their environment and response to the event (Kelley, 1973; Taylor, 1983; Wong & Weiner 1981). Couples who perceive themselves as having control of the future of the cancer are more likely to consider behavior change, particularly if they attribute the cancer to their behavior and experience blame (Christensen et al., 1999). Behavioral factors such
as smoking, poor diet, and physical inactivity are associated with 25% to 33% of cancer diagnoses in the United States (American Cancer Society, 2013). Frequency of these factors, coupled with increased media attention of these factors, may lead survivors and their partners to wonder about the cause of the diagnosis and who or what is to blame. Blame is considered to be an emotion-based construct that is associated with one’s personal beliefs about what is right and wrong, deserved or undeserved (Shaver & Drown, 1986). Blame is also highly associated with social stigma and the negative perceptions of others (Badr & Carmack Taylor, 2006). If directed towards oneself or partner, the presence of blame among survivors and their partners significantly affects couples’ interactions and ability to cope with cancer (Shaver & Drown, 1986; Carmack Taylor et al., 2008). Therefore, it is necessary for clinicians and healthcare providers to understand the complexity of blame.

**Conceptualizing Blame**

The most common distinction when conceptualizing blame was introduced by Janoff-Bulman (1979), who noticed two types of self-blame arise in her research on blame attributions among individuals coping with depression or rape. The first type is characterological self-blame, in which blame is directed towards one’s personality and internal state. Characterological self-blame is associated with feelings of helplessness because blame is associated with stable traits that cannot be changed. The second type is behavioral self-blame, which is directed towards one’s habits and behaviors. Behavioral self-blame has been associated with successful psychological adaptation because blame for one’s behavior can foster a sense of control and motivation to change, whereas personality is stable and cannot be changed (Janoff-Bulman, 1979; Tennen, Affleck, & Gershman, 1986).

**Characterological vs. Behavioral Self-blame**
The construct of blame has only recently appeared in the cancer literature, and is primarily studied as self-blame rather than partner-blame. Consistent results indicate that characterological and behavioral self-blame have been found to be associated with distress, poor quality of life, and poor psychological adjustment (Glinder & Compas, 1999; Phelan, Griffin, & Jackson, 2011; Friedman et al., 2007; Else-Quest, LoConte, Schiller, & Hyde, 2009). In a study of 1109 male colorectal survivors, 25% of participants blamed themselves for their cancer, and self-blame was significantly related to depressive symptoms (Phelan, Griffin, & Jackson, 2011). Another study of 123 women with breast cancer by Friedman and colleagues (2007) showed that breast cancer survivors who blamed themselves for their cancer reported more mood disturbance and poorer quality of life. Self-blame was also assessed in 96 lung, 30 breast and 46 prostate cancer survivors, showing that self-blame was associated with poor psychological adjustment (Else-Quest et al., 2009). Combined, these studies indicate that self-blame can occur across all types of cancers and genders, and plays a significant role in survivors’ ability to cope. Although it is clear that self-blame has negative psychological effects on the individual, research has also suggested that self-blame may influence positive behavior change.

**Perceived Control and Behavior Change**

Perceived control is the extent to which an individual feels he or she can influence outcomes pertaining to his or her life. The degree to which individuals perceive control over a situation is influenced by whether he or she holds an internal or external locus of control. An individual with an internal locus of control attributes causes and changes to the self, whereas an individual with an external locus of control attributes causes and changes to others, or to the environment (Rotter & Mulry, 1965; Rotter, 1966). It is common that individuals experience both types of locus of control to varying degrees, depending on the situation and its context.
Individuals who experience characterological and/or behavioral self-blame in a situation are considered to have an internal locus of control, blaming their internal state or own behavior for the cause of the situation (Janoff-Bulman, 1979). Individuals who engage in behavior change are often thought to hold a higher internal locus of control because they attribute change to themselves and actions that they can control (Wallston, 2005). However, behavior change becomes very complex among individuals in relationships because individuals may appraise situations differently and rely on one another as the source of change.

In her work with trauma victims, Janoff-Bulman (1979) proposed that individuals who experience behavioral self-blame have a greater sense of perceived control over their future, as opposed to those who experience characterological self-blame. As a result, individuals who experience behavioral self-blame are more likely to change their behaviors and take proactive steps to prevent future problems. To date, results are mixed regarding this proposed relationship between perceived control and characterological and behavioral self-blame among individuals coping with cancer. Christensen and colleagues (1999) asked 55 men and women with head and neck cancer the extent to which they felt their cancer was due to their actions and specifically, their smoking and alcohol use. Participants were more likely to decrease their smoking and alcohol use the more they attributed their cancer to their behaviors and felt that they had control over the disease’s progression or recurrence. Rabin and Pinto (2006) found similar results among 55 breast cancer survivors who were three months post-treatment and 33 of their first-degree relatives. Survivors who attributed their breast cancer with behaviors such as unhealthy diet, insufficient exercise, and alcohol consumption were more likely to change their behaviors than those who did not associate their cancer with behavioral causes. Similar results were found among the survivors’ first-degree relatives, although the study did not specify the nature of the
relationships between survivors and first-degree relatives. Conversely, in another study of 115 newly diagnosed breast cancer survivors, Bennett, Compas, Beckjord, and Glinder (2005) found that neither characterological nor behavioral self-blame was associated with perceived control. Further research is needed to understand the unique role of perceived control in the distinction between characterological and behavioral self-blame among cancer survivors.

Only one study has addressed blame in couples coping with cancer. In their study of 169 lung cancer survivors and 167 spouses, Carmack Taylor and colleagues (2008) found that spouses who blamed the survivor for causing their lung cancer were more likely to report distress. Results also showed that survivors’ self-blame and partners’ blame of the survivor were correlated. Finally, the study indicated that use of behavioral disengagement coping was a predictor for both survivor and partner individual distress. Results suggest that blame influences how survivors and their partners behave towards one another and the extent to which they engage in the couple relationship. Carmack Taylor et al.’s study marks the beginning of the exploration of blame among couples with cancer, and there is much to be discovered. For example, the study did not indicate the effect of survivor blame on the distress of the couple relationship. Also, the study did not address the extent to which the partner is blamed for his or her behavior and how partner-directed blame relates to survivor and partner outcomes. Taylor, Lichtman, and Wood (1984) found that, in a study of 78 breast cancer survivors, 10% blamed their partners for the cause of their cancer. However, the study did not include the partners. More knowledge in these areas would allow clinicians to guide couples to better recognize blame and its effects on the couple relationship.
Dyadic Coping

Considerable research has focused on the psychosocial effects of cancer within individuals (see Carlsson & Hamrin, 1992; Bloch et al., 2007 for a review), whereas less is known about the ways in which cancer affects couple relationships. Couple researchers have stressed the importance of studying the coping process at the dyadic level in order to understand how couples adjust to chronic illness within the context of the intimate couple relationship (Northouse, Mellon, Harden, & Schafenacker, 2009; Northouse, Mood, Templin, Mellon, & George, 2000). Bodenmann (1997) describes dyadic coping as an interaction process aimed at managing a stressor’s demands, meeting both the individuals’ and couple’s needs, and enhancing relationship quality. Examples of dyadic coping strategies range from positive relationship behaviors such as clear communication and problem solving to negative relationship behaviors such as hostility and withdrawal. These behaviors have often been conceptualized and studied as communication patterns, which is an interaction process that takes into account both partners (Bodenmann, Kaiser, Hahlweg, & Fehn-Wolfsdorf, 1998). The extent to which partners engage one another in discussion about a stressor, problems presented by the stressor, and possible solutions will influence their ability to adapt (Gill, Christensen, & Fincham, 1999; Ledermann, Bodenmann, Rudaz, & Bradbury, 2010). Through his research on dysfunctional patterns of communication, Christensen (1988) identified three types of communication interaction patterns that couples engage in when problems arise, during problem discussions, and after problem discussions. He labeled these patterns constructive communication, mutual avoidance, and demand-withdrawal. Researchers have observed these patterns in distressed and non-distressed couples (Eldridge, Sevier, Jones, Atkins, & Christensen, 2007). Recently, researchers have
begun to examine these communication patterns in relation to distress and adjustment among couples coping with cancer (Manne et al., 2004; Manne, Badr, Zaider, Nelson, & Kissane, 2010).

**Communication about Cancer**

Diagnosis and treatment of cancer can bring about numerous physical and emotional stressors such as side effects, uncertainty, and fear. Survivors may find these topics difficult to discuss with those closest to them, particularly their partners, due to feelings of embarrassment, confusion, or worry (Boehmer & Clark, 2000). Partners may also disengage or avoid discussing the impact of cancer on their lives for fear of taking focus away from the survivor (Hodgson, Shields, & Rousseau, 2003; Badr, Carmack Taylor, 2006). However, there is evidence to support that communication plays a significant role in couples’ ability to cope with the stressors of cancer. Frequent and open communication about cancer-related issues is associated with increased adjustment in survivors (Pistrang & Barker, 1995; Manne et al., 2004). Similarly, couples that engaged in positive communication strategies in order to maintain the relationship are more likely to show lower psychological distress and higher adjustment (Badr & Carmack Taylor, 2008). On the other hand, couples that engage in a demand-withdrawal interaction when discussing cancer-related topics were more likely to report personal and relationship distress (Manne & Glassman, 2000; Manne et al., 2006; Manne, Badr, Zaider, Nelson, & Kissane, 2010). These results are also found in terms of the impact of treatment side effects. In a study by Badr and Carmack Taylor (2009), partners of survivors with erectile dysfunction were more likely to report avoiding communication and lower adjustment; whereas couples that engaged in more mutual constructive communication reported higher adjustment, regardless of their sexual satisfaction. Despite its benefits, constructive communication may be difficult if survivors or partners blame themselves or one another for the cause of cancer (Taylor et al., 2008). Overall,
these studies indicate that a couple’s ability to communicate negative emotions and appraisals can influence the degree of support that the couple relationship provides.

**Summary**

Although blame has been studied in the context of cancer, virtually no research investigates the effects of survivor and partner self- and other-blame on relationship satisfaction among couples coping with cancer. Furthermore, few researchers have examined how self-blame relates to couple interaction during communication about cancer-related issues. Knowledge of these relationships is crucial to properly assess couples’ dyadic coping efforts, especially if behavioral change is required to influence the progression of cancer. In order to address the limitations of the current research and further investigate Bodenmann’s (1995, 1997, 2005) systemic-transactional approach, the present study provides an exploratory examination of (a) the prevalence of self- and other-blame among survivors and partners, (b) the association between survivor and partner relationship satisfaction, blame, couple communication, and perceived control, and to (c) evaluate correlates of survivor and partner relationship satisfaction. The following general research questions and hypotheses guided the study:

1. Are there differences between survivors and their partners regarding reported amounts of self- and other-blame?

   *Hypothesis 1.* Survivors will report more self-blame than partners, and partners will experience more other-blame. In other words, blame will be more survivor-directed than partner-directed.

2. What are the associations between survivor and partner communication, perceived control, self-blame, other-blame, and relationship satisfaction?
Hypothesis 2. Behavioral self-blame will be more associated with perceived control than characterological self-blame.

Hypothesis 3. Couples who perceive control over the course of cancer and engage in constructive communication patterns will be more satisfied in their relationship than those who engage in blame and negative patterns of communication.

3. To what extent do survivor and partner communication, perceived control, self-blame, and other-blame predict survivor and partner relationship satisfaction?

Hypothesis 4. Survivor and partner low self- and other-blame, high perceived control, and constructive communication will significantly predict survivor and partner relationship satisfaction over and above any other predictor or set of predictors.
CHAPTER 3

METHODOLOGY

Participants

Participants for this study totaled 132 survivors and 53 partners of survivors diagnosed with breast, prostate, colorectal, or lung cancer within the past two years. Among the 185 total participants, 11 complete couples (n = 22; 12%) were identified, in which both a survivor and his or her partner completed the survey.

For the purpose of this study, a couple was defined as two persons who are over the age of 21 and who are in a relationship that both individuals deem romantic and significant. Participants self-identified as members of a qualifying couple. Participants were predominantly Caucasian (n = 165; 89%). Other ethnic groups represented in the sample were African American (n = 5; 2.7%), Hispanic (n = 7; 3.8%); and Asian (n = 4; 2.2%). Most participants had an education level of an Associate’s degree or higher (n = 105; 64%) and had a mean reported household incomes ranging from $76,000 to $99,000 annually. On average, participants were 51.3 years old, with a range in age from 21 to 79. Six and a half percent (n = 12) were between the ages of
21 and 35; 23.8% (n = 44) were between the ages of 36 and 50; 43.2% (n = 80) were between the ages of 51 and 65; and 7% (n = 13) were between the ages of 66 and 80.

Among the survivors (n = 132), 120 (90.9%) were female and 12 (9.1%) were male. Cancer types included breast (n = 100; 75.8%), prostate (n = 5; 3.8%), colorectal (n = 9, 6.8%), and lung (n = 13; 9.8%). Five survivors (3.7%) did not indicate their cancer type. Approximately 25% (n = 33) indicated that their cancer was metastatic and 19.7% (n = 26) indicated that they had been diagnosed with cancer in the past. Among the partners (n = 53), 30 (56.6%) were female and 23 (43.4%) were male, and 10 (18.9%) had been diagnosed with cancer in the past. More descriptive information of the sample is outlined in Table 1, and group comparisons can be found in Chapter 4.

Of the 11 complete couples identified in the sample, all were heterosexual with an average relationship length of approximately 24 years. Ten couples (91%) were married and one couple (9%) was living together. All couples were Caucasian. None of the survivors or partners in the couples reported a past diagnosis of cancer. Comparisons were made between the survivors and partners of the couples who completed the survey and individuals whose significant others did not complete the survey on demographic and available medical (cancer type, time since diagnosis, and past cancer diagnoses) data. Results indicated that survivors whose partner also completed the survey were older by an average of seven years. There were no differences among the partners who participated individually and those who participated as a couple.
Data was collected through a web-based survey design using the Qualtrics survey platform. Study participants were recruited in three ways. First, radiation oncologists and nursing staff at the Hartford Hospital Helen and Harry Gray Cancer Center identified eligible survivors who attended radiation treatment. Eligible survivors were given a study announcement
(see Appendix A) and an information letter from Dr. Andrew Salner, Director of the Center, (see Appendix B) that described the study and contained a link to the survey. Of the 450 recruitment flyers given to survivors and partners, 22 (4.9%) began the survey and 14 (3.1%) completed the survey (eight survivors and six partners).

Second, study announcements were posted via the websites, e-newsletters, discussion boards, and email listservs of organizations and institutions including the Hartford Hospital Helen and Harry Gray Cancer Center, University of Connecticut faculty and student listservs, American Cancer Society, Connecticut Challenge, Collaborative Family Healthcare Association, Society of Behavioral Medicine, and Livestrong. In all cases, website and listserv managers gave permission to post the study announcement.

Finally, study announcements were posted on social and community networking websites such as Facebook, Twitter, Backpage, and Craigslist, targeting users who identified cancer, volunteerism, research, education, and family as their interest(s) or cause(s) of interest. The study announcement included a description of the study and an embedded link to the survey. The electronic advertisement appeared over 540,000 times across the various Internet outlets. The survey website was visited over 4,800 times, and 335 participants assented to begin the survey. A total of 171 participants (124 survivors and 47 partners) completed the survey.

Hartford Hospital and University of Connecticut IRB permitted a waiver to document consent because no identifying information was collected at any point during the study. Instead, informed assent for the survey was collected by providing detailed information about the study on the first webpage of the survey. Participants were required to select ‘Agree’ in order to continue the survey. Participants had the option to skip any survey question, and was given the option to exit the survey at any time. Survivors and partners completed separate surveys. In
order to match survivor and partner data while maintaining participants’ anonymity, each couple had a unique identification code. Couples recruited with paper flyers were given a random three-digit number, whereas couples recruited electronically were asked to construct their own identification code consisting of a combination of letters and numbers. The partner survey did not include all medical questions, and measures were reworded to fit the partner’s experience.

**Measures**

**Demographic and Medical Information**

Demographic information collected from both survivors and partners included age, gender, race, employment status, education, income, and relationship status. Survivors were also asked about their medical information including cancer type, whether their cancer is metastatic, time since diagnosis, treatment type, and previous cancer diagnoses. Survivors were also asked to identify the ages of any children under 18 years old that they were responsible for during cancer treatment. Partners were asked if they had ever been diagnosed with cancer and if so, what type. A copy of the demographic and medical information questions appears in Appendix C.

**Perceived Control**

The Cancer Locus of Control Scale Course of Illness subscale (CLCS; Watson, Greer, Pryn, & Van Den Borne, 1990) is a 17-item measure that assesses an individual’s sense of control over the cause and course of cancer. A copy of the CLCS appears in Appendix D. Items include, “By living healthily I can influence the course of my illness” and “I can influence the course of my illness by fighting against it.” All items are scored on a 4-point Likert scale (1 = *Strongly disagree* to 4 = *Strongly agree*). Internal consistencies range from .77 to .80 in cancer survivors (Watson et al., 1990). In this study, only the Course of the Illness subscale was used.
Internal consistency reliabilities for this sample were $\alpha = .76$ for survivors and $\alpha = .84$ for partners.

**Self- and Other-Blame**

In this study, *survivor characterological self-blame* referred to the extent to which the survivor blamed his or her personality or internal state for the cancer. *Survivor behavioral self-blame* referred to the extent to which the survivor blamed his or her own habits or behaviors for the cancer. *Survivor other-blame* referred to the extent to which the survivor blamed his or her partner’s behaviors for the cancer. *Partner behavioral self-blame* referred to the extent to which the partner blamed his or her own habits or behaviors for the survivor’s cancer. Finally, *partner other-blame* referred to the extent to which the partner blamed the survivor’s behaviors for the cancer.

Survivors were assessed for both characterological and behavioral self-blame, while partners were assessed for behavioral self-blame only. Both survivors and partners were assessed for other-blame. Self- and other-blame were assessed using items from the Cancer Locus of Control Scale Cause of Disease subscale (CLCS; Watson, Greer, Pryn, & Van Den Borne, 1990) and items developed from results of a previous qualitative study (Ferrucci et al., 2011). Ferrucci and colleagues (2011) asked survivors diagnosed with ten types of cancer to write about their beliefs regarding the cause of their cancer. Results included internal attributions such as lifestyle, genetics, and personality, and external attributions such as God and chance.

Attribution items developed from the results of the Ferrucci et al. (2011) study were answered on a visual analogue scale in order to increase the precision and variability in self-blame scores. A Visual Analogue Scale (VAS) is a measurement instrument used to measure
participants’ subjective response to a question or statement that is believed to range across a continuum of values (Freyd, 1923). The VAS is a 100mm horizontal line with descriptive statements located on both ends indicating the extremes of the continuum. The VAS has been useful in measuring pain, depression, anxiety, and other clinical phenomena (see Wewers & Lowe, 1990 for a review). Survivors and partners indicated their response by marking along the line ranging from 0.0 to 10.0. VAS descriptors were “This did not contribute at all” and “This contributed very much.” A copy of the attribution items appears in Appendix E.

**Characterological self-blame (CSB).** Survivor characterological self-blame was assessed with three items from the CLCS Cause of Disease subscale and two VAS attribution items developed from the qualitative results from the Ferrucci et al. (2011) study. CLCS Cause of Disease subscale items included “It is partly my fault that I became ill;” “Becoming ill had something to do with my personality;” and “My becoming ill was especially due to something about me.” VAS attribution items included “My personality” and “I deserved it.” Survivors’ scores were mean scores, calculated from the z-scores of the five items. For survivors in this sample, internal consistency reliability was \( \alpha = .59 \).

**Behavioral self-blame (BSB).** Survivor and partner behavioral self-blame were assessed with two items from the CLCS Cause of Disease subscale and two VAS attribution items developed from the qualitative results from the Ferrucci et al. (2011) study. The CLCS Cause of Disease subscale items were, “Becoming ill/my partner becoming ill was a result of my lifestyle” and “It is partly my fault that I/my partner became ill.” and the VAS attribution items were “Harmful behaviors” and “My lifestyle.” Participants’ scores were mean scores, calculated from the z-scores of the four items. For this sample, internal consistency reliabilities were \( \alpha = .76 \) for survivors and \( \alpha = .77 \) for partners.
Other-blame. Survivor other-blame was assessed with a one-item VAS attribution item, “My partner’s behavior(s).” Partner other-blame was assessed with two VAS attribution items, “My partner’s behavior(s)” and “My partner’s lifestyle.” Partner other-blame scores were computed as the average of both items. Internal consistency reliability for partner other-blame was $\alpha = .66$.

Cancer-related Communication

The Communication Patterns Questionnaire (CPQ; Christensen & Sullaway, 1984; Christensen, 1988) assesses couple communication interaction patterns before, during, and after discussion of a relationship issue. The CPQ consists of three subscales: Mutual Constructive Communication, Mutual Avoidance, and Demand-Withdrawal. The original version of the measure asks survivors to rate how they typically deal with problems in the relationship. Manne and colleagues (2006) created a cancer-related adaptation of the CPQ by asking the couple to rate how they typically deal with cancer-related stressors and problems. All items are rated on a 9-point Likert scale. The cancer adaptation of the CPQ appears in Appendix F.

The Mutual Constructive Communication subscale assesses for mutual discussion, expression of feelings, understanding of views, and feeling that the issue has been resolved. In the original CPQ (Christensen & Sullaway, 1984; Christensen, 1988) the Mutual Constructive Communication subscale score was calculated by subtracting the sum of four negative items from the sum of three positive items. In Manne et al.’s (2006) cancer-related adaptation of the CPQ, the subscale score consists of the sum of five positive items. This study used Manne et al.’s adaptation of the Mutual Constructive Communication subscale because it showed greater reliability. In previous studies, scores on the cancer-related Mutual Constructive Communication subscale have shown adequate internal consistencies ranging from $\alpha = .79$ to $.84$ in survivors and
α = .76 to .79 in partners (Manne et al., 2006; Manne et al., 2010). Also, due to technological errors in the survey software used to conduct the study, one item of the subscale was not included. The absence of this item rendered the original subscale calculation disproportionate, while maintaining reliability and interpretability using Manne et al.’s adaptation of the subscale. The internal consistency reliabilities for this sample were α = .73 for survivors and α = .80 for partners.

The Mutual Avoidance subscale consists of three items that assess mutual avoidance of discussion and mutual withdrawal after a discussion. Scores on the cancer-related Mutual Avoidance subscale have shown internal consistencies ranging from α = .63 to .79 in survivors and partners (Manne et al., 2006; Manne et al., 2010). For survivors in this sample, internal consistency reliability was α = .73 and for partners, α = .82.

The Demand-Withdrawal subscale consists of six items that assess how often one partner pressures the other to talk about an issue and the other partner withdraws or avoids discussion. Three items assess survivor demand-partner withdrawal and three items assess partner demand-survivor withdrawal. Among cancer survivors and their partners, the Demand-Withdrawal subscale scores have shown internal consistencies ranging from α = .64 to .73 for survivors and α = .70 to .79 for partners (Manne et al., 2006; Manne et al., 2010). The internal consistency reliabilities for the Demand-Withdrawal subscale were α = .78 for survivors and α = .80 for partners. The internal consistency reliabilities for the survivor demand-partner withdrawal items were α = .67 for survivors and α = .76 for partners, and for the partner demand-survivor withdrawal items α = .74 for survivors and α = .61 for partners.
**Relationship Satisfaction**

Couples completed the 16-item Couples Satisfaction Index (CSI-16; Funk & Rogge, 2007). The CSI-32, CSI-16, and CSI-4 were developed with a pool of items from a wide variety of measures, including the Dyadic Adjustment Scale (DAS; Spanier, 1976), Marital Adjustment Test (MAT; Locke & Wallace, 1959), Kansas Marital Satisfaction Scale (KMS; Schumm, Nichols, Schectman, & Grinsby, 1983), Quality of Marriage Index (QMI; Norton, 1983), Relationship Assessment Scale (RAS; Hendrick, 1988), and Semantic Differential (SMD; Karney & Bradbury, 1997). The CSI represents the only measure of relationship satisfaction developed using item response theory, and has been shown to measure relationship satisfaction more precisely than previous satisfaction measures. All three versions of the CSI have been shown to be effective, and the varying lengths meet the needs of numerous settings and applications. The CSI-16 was developed using sound item response theory analysis and scores have shown internal consistency of $\alpha = .94$ (Funk & Rogge, 2007). The internal consistency reliabilities for this sample were $\alpha = .98$ for survivors and $\alpha = .96$ for partners. The CSI-16 appears in Appendix G.

**Data Analysis**

Data from this study were collected at both the individual and dyadic level. Although study recruitment called for survivors and their partners to participate, survivors and partners of survivors participated despite the non-participation of their significant other. Therefore, data were analyzed at both the individual and dyadic levels.

**Individual-Level Analyses**

For the individual-level analyses, data were from survivors and partners of survivors who identified as being part of a couple, but whose significant others did not participate in the study.
Due to the unexpected collection of individual-level data, the original research questions and corresponding analysis strategies were slightly modified to better fit the data. These individual-level analyses were conducted to explore the differences between and relationships among self-blame, other-blame, perceived control, communication patterns, and relationship satisfaction. Statistical procedures included independent-samples $t$ tests to test differences among survivors and partners on study variables, bivariate correlations to test the relationships among study variables, and hierarchical regression analyses to determine predictors of relationship satisfaction. Analyses aimed to better understand the differences between survivors and partners as groups that are independent from one another.

**Dyadic-Level Analyses**

Dyadic-level analyses were conducted to explore the relationships between the study variables among the eleven couples in which both survivor and partner participated in the study. Statistical procedures included paired samples $t$-tests to test differences between survivors and partners on study variables, bivariate correlations to evaluate relationships among study variables, and the pooled regression approach of the Actor-Partner Interdependence Model (APIM; Cook & Kenny, 2005) to investigate how survivor and partner predictor variables influence one another’s relationship satisfaction. A more detailed description and rationale of the APIM is described in Chapter 4.

**Missing Data**

Overall, there was less than three percent of missing data on all variables of interest. The variable with the most missing data was the demographic variable of age, with 19% of participant non-response. Bivariate correlations indicated that age was not significantly correlated to any of the target variables. Thus, age was not included in the individual-level
multiple regression analyses in order to preserve power. Additional comparisons showed no significant differences on the demographic or target variables between participants who completed the entire survey and those with missing data. In order to conduct data analyses, missing data points on a participant’s CSI, CLCS, and CPQ were replaced with the mean of his or her completed responses on that measure. An additional data modification was made to calculate the CPQ Mutual Constructive Communication subscale score. As stated before, an error in the survey software resulted in a missing CPQ-MCC subscale item. Because this item was missing for every participant, the item was removed in the calculation of the subscale.

**Statistical Power**

A power analysis was conducted for the individual-level analyses to determine the size of effects that could be adequately detected with the current sample size. Given an alpha level of .05, power of .80, and using multiple regression with at most eight independent variables predicting relationship satisfaction, an effect size of .08 (i.e. small) could be detected with the current sample size (Cohen & Cohen, 1983). Small sample sizes are a common challenge for psycho-oncology and family therapy research, as for this study (Sprenkle & Piercy, 2005). To increase power, data in these analyses also included one randomly selected member of each of the 11 couples in which both members participated. For the dyadic analysis, previous studies have shown patient and partner relationship satisfaction to be correlated at .3 and above (Carmack Taylor et al., 2008; Manne et al., 2010; Hagedoorn et al., 2011). In order to obtain the recommended power of .80 to detect non-independence (Cohen, 1988) that is consistent with a correlation of .3 found in previous studies, Kenny et al. (2006) suggest a sample size of at least 80 dyads in order to use structural equation modeling (SEM) to test the APIM. Due to the limited dyadic data (11 couples) collected in this study, the APIM was estimated using the
pooled regression approach, which is appropriate for smaller sample sizes (Kenny et al., 2006; Tambling, Johnson, & Johnson, 2011). Sufficient power was preserved by estimating the effects of each predictor on relationship satisfaction individually, rather than estimating a model containing all predictors.
CHAPTER 4

RESULTS

The present study aimed to provide an exploratory examination of the dyadic coping process among cancer survivors and their partners. From the diagnosis of cancer to life after treatment, survivors and their partners are constantly appraising the situation, communicating their appraisals to one another, and making efforts to cope together. This study investigated the presence and effects of self- and other-blame, perceived control, and communication patterns as correlates of survivor and partner relationship satisfaction. Data from this study were collected at both the individual and dyadic level. Although study recruitment called for survivors and their partners to participate, survivors and partners of survivors participated despite the non-participation of their significant other. Therefore, data were analyzed at both the individual and dyadic levels.

Individual-Level Analyses

Survivor and Partner Group Differences

In order to address the first research question, group differences were evaluated between survivors and partners as individual groups. First, two-tailed, independent-samples $t$ tests, chi-square, and bivariate correlation analyses were conducted to compare survivors and partners on demographic and medical information. Results indicated a significant difference in partners’ relationship length, $t(172) = -2.066, p = .04$, with partners reporting that their relationships with their significant others were on average, ten years longer than those of survivors that completed the survey. There were no other differences regarding demographic or medical variables. For example, there were no differences on any of the study variables among survivors and partners with and without previous cancer diagnoses. Also, there were no significant associations
between relationship length and any of the communication patterns. Relationship length and the other demographic variables were not significantly associated with survivor or partner predictor or outcome variables. Thus, they were removed from the regression models presented later in the section.

Second, independent-samples t tests were conducted to evaluate survivor and partner group differences on study outcome and target variables. Means and standard deviations for the CSI and key study variables (CSB, BSB, OB, CLCS, and CPQ) for survivors and partners are presented in Table 2. Overall, partners reported higher mean scores on the CSI, but the difference between survivor and partner scores were not significant. Survivor and partner mean scores on each of the CPQ subscales were very similar, with no significant differences. Similarly, survivors and partners reported similar BSB scores, with no significant difference. However, the difference between survivor and partner OB mean scores approached significance (\(M = .74\) for survivors and \(M = 1.5\) for partners, \(t(1) = 3.57, p = .06\)). Thus, Hypothesis 1 regarding higher reports of self-blame among survivors and higher reports of other-blame among partners was nearly partially supported. The only significant difference found was between survivor (\(M = 23.46, SD = 3.39\)) and partners’ (\(M = 18.70, SD = 5.13\)) CLCS subscale scores, \(t(163) = 6.83, p < .01\). Results showed that survivors on average indicated a higher sense of perceived control of the course of their illness than partners felt they had in regards to their partner’s illness.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Survivors</th>
<th></th>
<th></th>
<th>Partners</th>
<th></th>
<th></th>
</tr>
</thead>
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<tr>
<td>CSI</td>
<td>55.96</td>
<td>21.69</td>
<td>127</td>
<td>62.26</td>
<td>17.11</td>
<td>47</td>
</tr>
<tr>
<td>CSB</td>
<td>-0.019</td>
<td>0.628</td>
<td>124</td>
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<td>--</td>
<td>--</td>
</tr>
<tr>
<td>BSB</td>
<td>0.088</td>
<td>3.023</td>
<td>124</td>
<td>-0.120</td>
<td>2.837</td>
<td>46</td>
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<td>OB</td>
<td>0.741</td>
<td>2.228</td>
<td>122</td>
<td>1.5</td>
<td>2.371</td>
<td>43</td>
</tr>
<tr>
<td>CLCS**</td>
<td>23.46</td>
<td>3.39</td>
<td>123</td>
<td>18.70</td>
<td>5.13</td>
<td>42</td>
</tr>
<tr>
<td>CPQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
- Mutual Constructive Communication (MCC) 17.65 6.86 122 18.36 6.52 45
- Demand Withdrawal (DW) 14.80 9.50 122 15.62 9.98 45
  - Survivor demands/Partner withdraws (SDPW) 7.59 5.30 122 4.64 5.99 45
  - Partner demands/survivor withdraws (PDSW) 7.21 5.56 122 7.98 5.17 45
- Mutual Avoidance (MA) 8.14 5.54 122 8.12 5.86 45

Note. CSI = Couples Satisfaction Index; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; OB = Other-blame; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire. Negative CSB and BSB scores exist because scores were calculated as z-scores. ** p < .001

Relationships Between Outcome and Target Variables

To address the second research question regarding the associations between communication patterns, perceived control, self-blame, other-blame, and relationship satisfaction, bivariate correlations were computed for survivors and partners. The results of the correlational analyses are presented in Tables 3 and 4.
Table 3

*Survivor Correlations (n = 127)*

<table>
<thead>
<tr>
<th>Survivor Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
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<th>10</th>
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<td>2. CLCS</td>
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<td>3. CPQ-MCC</td>
<td>.70*</td>
<td>.19*</td>
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<tr>
<td>4. CPQ-DW</td>
<td>-.64**</td>
<td>-.15</td>
<td>-.60**</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. CPQ-SDPW</td>
<td>-.54**</td>
<td>-.16</td>
<td>-.63**</td>
<td>.67**</td>
<td>--</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6. CPQ-PDSW</td>
<td>-.57**</td>
<td>-.10</td>
<td>-.44**</td>
<td>.88**</td>
<td>.53**</td>
<td>--</td>
<td></td>
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<td>7. CPQ-MA</td>
<td>-.63**</td>
<td>-.14</td>
<td>-.62**</td>
<td>.80**</td>
<td>.74**</td>
<td>.67**</td>
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<td>8. CSB</td>
<td>-.09</td>
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<td>-.06</td>
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<td>.13</td>
<td>.15</td>
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<tr>
<td>9. BSB</td>
<td>.03</td>
<td>.23*</td>
<td>-.28</td>
<td>.12</td>
<td>.13</td>
<td>.07</td>
<td>.07</td>
<td>.60**</td>
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<tr>
<td>10. OB</td>
<td>-.36**</td>
<td>.03</td>
<td>-.26**</td>
<td>.36**</td>
<td>.32**</td>
<td>.31**</td>
<td>.38**</td>
<td>.29**</td>
<td>.15</td>
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</tbody>
</table>

*Note.* CSI = Couples Satisfaction Index; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire; MCC = Mutual Constructive Communication; DW = Demand/Withdrawal; SDPW = Survivor Demand/Partner Withdrawal; PDSW = Partner Demand/Survivor Withdrawal; MA = Mutual Avoidance; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; and OB = Other-blame

Note. **p < .01, * p < .05

Table 4

*Partner Correlations (n = 47)*

<table>
<thead>
<tr>
<th>Partner Variable</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
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<tr>
<td>11. CSI</td>
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<td>12. CLCS</td>
<td>.18</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. CPQ-MCC</td>
<td>.59**</td>
<td>.20</td>
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<tr>
<td>14. CPQ-DW</td>
<td>-.37*</td>
<td>-.31*</td>
<td>-.36*</td>
<td>--</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>15. CPQ-SDPW</td>
<td>-.40**</td>
<td>-.31</td>
<td>-.31*</td>
<td>.91**</td>
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<td></td>
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<tr>
<td>16. CPQ-PDSW</td>
<td>-.24</td>
<td>-.22</td>
<td>-.34*</td>
<td>.88**</td>
<td>.60**</td>
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<td>-.37*</td>
<td>.75**</td>
<td>.70**</td>
<td>.63**</td>
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<td>18. BSB</td>
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<td>.19</td>
<td>-.26</td>
<td>-.19</td>
<td>-.27</td>
<td>-.16</td>
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<td>19. OB</td>
<td>.27</td>
<td>-.05</td>
<td>.11</td>
<td>.03</td>
<td>-.08</td>
<td>.14</td>
<td>.03</td>
<td>.17</td>
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</tbody>
</table>

*Note.* CSI = Couples Satisfaction Index; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire; MCC = Mutual Constructive Communication; DW = Demand/Withdrawal; SDPW = Survivor Demand/Partner Withdrawal; PDSW = Partner Demand/Survivor Withdrawal; MA = Mutual Avoidance; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; and OB = Other-blame

Note. **p < .01, * p < .05
Self- and other-blame. There were no significant correlations between partner BSB, OB, and any of the other study variables. This was not the case for survivors. Survivor CSB was positively correlated with survivor OB ($r = .30, p < .01$). Survivor BSB scores were significantly correlated with survivor CLCS scores ($r = .21, p < .05$), whereas survivor CSB scores were not significantly correlated with survivor CLCS scores, which was consistent with Hypothesis 2. Survivor OB scores were also significantly associated with survivor CPQ-MA scores ($r = .38, p < .01$), while neither survivor CSB nor BSB scores were significantly associated with the other CPQ subscales. Survivor OB scores were also significantly associated both CPQ-DW ($r = .36, p < .01$) subscales, with a correlation of $r = .32, p < .01$ for the survivor-demand/partner-withdrawal pattern scores, and a correlation of $r = .31, p < .01$ for the partner-demand/survivor-withdrawal pattern scores. Finally, survivor OB was negatively associated with survivor CSI ($r = -.36, p < .01$) and CPQ-MCC ($r = -.26, p < .01$).

Communication patterns. Scores on the CPQ-DW and CPQ-MA subscales were significantly correlated for both survivors ($r = .80, p < .01$) and partners ($r = .75, p < .01$). When the CPQ-DW subscale scores were further separated into behaviors by role, survivor-demand/partner-withdrawal (SDPW) and partner-demand/survivor-withdrawal (PDSW), their associations with one another ($r = .53, p < .01$ for survivors and $r = .60, p < .01$ for partners) and with the larger subscale remained significant.

Relationship satisfaction. CSI scores were positively correlated with CPQ-MCC subscale scores for survivors ($r = .70, p < .01$) and partners ($r = .59, p < .01$) and significantly negatively associated with CPQ-DW and CPQ-MA subscale scores. Upon further examination of the demand/withdrawal subscale, the relationship between partner CSI and partner CPQ-PDSW was not significantly correlated, whereas partner CSI was significantly correlated to
partner CPQ-SDPW ($r = -.40, p < .01$). This was not the same for survivors, in which both survivor demand/withdrawal role behaviors were significantly correlated to survivor CSI ($r = -.54, p < .01$ for CPQ-SDPW and $r = -.57, p < .01$ for CPQ-PDSW). Survivor other-blame was also negatively correlated survivor CSI ($r = -.36, p < .05$), but partner other-blame was not significantly associated with partner CSI. Neither survivor nor partner CLCS were significantly associated with CSI. These associations among survivor and partner CSI and study variables indicate that Hypothesis 3 was only partially supported for both survivors and partners.

**Predictors of Relationship Satisfaction**

To address the final research question regarding the influence of communication patterns, perceived control, self-blame, and other-blame on relationship satisfaction, hierarchical regression analyses were conducted for both survivors and partners. The results from the bivariate correlation analyses, in addition to variable relationships suggested by Bodenmann’s (1995, 1997, 2005) systemic-transactional approach, guided the development of the models. Bivariate analyses also showed no significant associations between any demographic or variables and survivor or partner predictor or outcome variables. Thus, they were removed from the regression models. Summaries of the survivor and partner regression analyses are presented in Tables 5 and 6.

**Table 5**

*Regression Analysis Summary for Survivor Self-Blame, Other-Blame, Perceived Control, and Communication Patterns Predicting Survivor Relationship Satisfaction*

<table>
<thead>
<tr>
<th>Survivor Variable</th>
<th>$B$</th>
<th>$SE B$</th>
<th>$p$</th>
<th>$\beta$</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1</strong></td>
<td></td>
<td></td>
<td></td>
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<td>.14***</td>
</tr>
<tr>
<td>CSB</td>
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<td>0.77</td>
<td>n.s.</td>
<td>-0.02</td>
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</tr>
<tr>
<td>BSB</td>
<td>0.72</td>
<td>0.78</td>
<td>n.s.</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>OB</td>
<td>-7.94</td>
<td>1.93</td>
<td>&lt;.001</td>
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<tr>
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<td>0.72</td>
<td>0.78</td>
<td>n.s.</td>
<td>0.07</td>
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</table>
Survivor predictors. A multiple regression analysis was conducted to predict survivor relationship satisfaction from self-blame and other-blame. The regression equation with CSB, BSB, and OB accounted for a significant amount (14%) of the variability in CSI, $R^2 = .14$, 

<table>
<thead>
<tr>
<th>Partner Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$p$</th>
<th>$\beta$</th>
<th>$\Delta R$</th>
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<td>1.38</td>
<td>1.17</td>
<td>n.s.</td>
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<td>0.25</td>
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<td>0.53</td>
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<td>0.17</td>
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<td><strong>Model 3</strong></td>
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<td></td>
<td></td>
<td>.29**</td>
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<td>.042</td>
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<td>CPQ-MA</td>
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<td>0.62</td>
<td>n.s.</td>
<td>-0.08</td>
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Note. Total $F(7, 31)$ for Model 3 = 3.36**, $R^2 = .43$, Adjusted $R^2 = .30$
* * $p = .01$. 

A multiple regression analysis was conducted to predict survivor relationship satisfaction from self-blame and other-blame. The regression equation with CSB, BSB, and OB accounted for a significant amount (14%) of the variability in CSI, $R^2 = .14$, 

<table>
<thead>
<tr>
<th>Partner Variable</th>
<th>$B$</th>
<th>SE $B$</th>
<th>$p$</th>
<th>$\beta$</th>
<th>$\Delta R$</th>
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<tr>
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<td>&lt;.001</td>
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<td>n.s.</td>
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<td><strong>Model 3</strong></td>
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<td></td>
<td></td>
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<td>.44***</td>
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<td>n.s.</td>
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<td>0.55</td>
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<tr>
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<td>n.s.</td>
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<td>0.39</td>
<td>n.s.</td>
<td>0.02</td>
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<tr>
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<td>0.32</td>
<td>.004</td>
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</tr>
<tr>
<td>CPQ-MA</td>
<td>-0.54</td>
<td>0.42</td>
<td>n.s.</td>
<td>-0.14</td>
<td></td>
</tr>
</tbody>
</table>

Note. Total $F(8, 112)$ for Model 3 = 21.45***, $R^2 = .61$, Adjusted $R^2 = .58$
* * * $p < .001$. 

Table 6
Regression Analysis Summary for Partner Self-Blame, Other-Blame, Perceived Control, and Communication Patterns Predicting Partner Relationship Satisfaction
adjusted $R^2 = .12$, $F(3, 117) = 6.32$, $p = .001$. Survivor other-blame was the only significant predictor of survivor relationship satisfaction, $t(120) = -4.12$, $p < .01$. These results suggest that after controlling for their experiences of self-blame, survivors who attributed their cancer to their partners’ behaviors were less satisfied in their relationship with their partner.

A second analysis was conducted to evaluate whether perceived control predicted relationship satisfaction over and above self- and other-blame. In this equation, CLCS improved prediction of CSI when added to the model containing CSB, BSB, and OB, $R^2$ change = .03, $F(4, 116) = 5.69$, $p < .001$. In this model, survivor OB continued to be a significant predictor of CSI, $t(120) = -4.14$, $p < .001$, after controlling for CSB, BSB, and CLCS. The strength of CLCS as a predictor of CSI approached significance, $t(120) = 1.85$, $p = .067$, after controlling for the other variables in the equation. These results suggest that the more survivors perceived that they had control over the course of their illness, and the less they attributed their illness to their partner’s behaviors, the more likely they were to report satisfaction in their relationship with their partner.

Finally, the four communication patterns were entered into the model. Results showed that the MCC, SDPW, PDSW, and MA subscales of the CPQ accounted for a significant proportion of the CSI variance, $R^2$ change = .44, $F(8, 112) = 21.44$, $p < .001$, after controlling for CSB, BSB, OB, and CLCS. Both MCC, $t(120) = 6.09$, $p < .001$ and PDSW, $t(120) = -2.97$, $p = .004$, made a significant contribution to the prediction equation over and above the other variables. Thus, Hypothesis 4 regarding survivor predictors of relationship satisfaction were partially supported, indicating that the presence of mutual constructive communication and partner-demand/survivor-withdrawal behaviors predict higher and lower relationship satisfaction among survivors, respectively. With the addition of the CPQ subscales into the regression equation, CLCS was no longer a significant predictor. The change from significance to non-
significance of CLCS indicates that one or more of the CPQ subscales may potentially mediate the relationship between CLCS and CSI scores. Together, self-blame, other-blame, perceived control, and communication patterns predicted 61% of the variance in relationship satisfaction.

**Partner predictors.** A similar multiple regression analysis was conducted to predict partner relationship satisfaction from partner self-blame and other-blame, perceived control, and communication patterns. First, partner BSB and OB were entered into the regression equation. BSB and OB accounted for 10% of the variance in partner CSI, but this amount was not significant ($R^2 = .10$, adjusted $R^2 = .05$, $F(2, 36) = 2.02$, $p = .15$). Neither BSB nor OB predicted CSI over and above the other variable.

Next, perceived control was entered into the model to test whether it predicted partner relationship satisfaction over and above self- and other-blame. Similar to the addition of survivor perceived control in the survivor model, CLCS increased $R^2$ by three percent, but this increase was not significant ($R^2$ change = .03, $F(3, 35) = 1.77$, $p = .17$). None of the variables in this model significantly predicted CSI. These results are expected because none of the predictors in this model were significantly correlated with partner CSI, as seen in Table 4.

Finally, partners’ four communication patterns were entered into the model. Results showed that the partner MCC, SDPW, PDSW, and MA subscales of the CPQ accounted for a significant proportion of the CSI variance, $R^2$ change = .30, $F(7, 31) = 3.31$, $p = .01$, after controlling for BSB, OB, and CLCS. Together, partner predictors accounted for 43% of the variance in partner CSI. Similar to survivors, partners’ reports of MCC significantly predicted CSI, $t(38) = 2.12$, $p < .05$, indicating that the presence of mutual constructive communication predicted higher relationship satisfaction among partners. None of the other predictors were significant. The strength of the model and its predictors may be due to the limited partners in the
sample. Thus, the role of mutual constructive communication in predicting partner relationship satisfaction anticipated in Hypothesis 4 was supported, while the roles of other target variables as predictors of partner relationship satisfaction were not supported.

**Dyadic-Level Analyses**

Dyadic-level analyses were conducted to explore the relationships between the study variables among the eleven couples in which both survivor and partner participated in the study. To address the first and second research questions, statistical procedures included paired samples t-tests and bivariate correlations. For the third research question, dyadic data analysis was conducted.

**Survivor and Partner Group Differences**

In order to address the first research question, paired-samples t tests were conducted to evaluate differences on study outcome and target variables between survivors and partners. Means and standard deviations of survivor and partner scores on the CSI and key study variables (CSB, BSB, OB, CLCS, and CPQ) are presented in Table 7.

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>n</th>
<th>M</th>
<th>SD</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSI</td>
<td>59.64</td>
<td>19.93</td>
<td>11</td>
<td>66.51</td>
<td>12.47</td>
<td>11</td>
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<tr>
<td>CSB</td>
<td>-0.003</td>
<td>0.53</td>
<td>11</td>
<td>--</td>
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<tr>
<td>BSB</td>
<td>-0.27</td>
<td>2.51</td>
<td>11</td>
<td>0.16</td>
<td>4.90</td>
<td>11</td>
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<tr>
<td>OB*</td>
<td>0.06</td>
<td>0.13</td>
<td>10</td>
<td>0.99</td>
<td>1.16</td>
<td>10</td>
</tr>
<tr>
<td>CLCS*</td>
<td>22.45</td>
<td>3.01</td>
<td>11</td>
<td>17.91</td>
<td>4.43</td>
<td>11</td>
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<tr>
<td>CPQ</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mutual Constructive Communication (MCC)</td>
<td>20.45</td>
<td>4.74</td>
<td>11</td>
<td>19.68</td>
<td>5.30</td>
<td>11</td>
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<tr>
<td>- Demand Withdrawal (DW)</td>
<td>13.73</td>
<td>9.85</td>
<td>11</td>
<td>14.64</td>
<td>8.26</td>
<td>11</td>
</tr>
<tr>
<td>- Survivor demands/Partner withdraws (SDPW)</td>
<td>6.00</td>
<td>3.46</td>
<td>11</td>
<td>6.91</td>
<td>4.59</td>
<td>11</td>
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<tr>
<td>- Partner demands/survivor withdraws (PDSW)</td>
<td>7.73</td>
<td>7.11</td>
<td>11</td>
<td>7.73</td>
<td>5.10</td>
<td>11</td>
</tr>
<tr>
<td>- Mutual Avoidance (MA)</td>
<td>7.73</td>
<td>5.39</td>
<td>11</td>
<td>6.55</td>
<td>3.62</td>
<td>11</td>
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</tbody>
</table>
Results were similar to those among individual survivors and partners whose significant others did not participate in the study. Specifically, survivors and partners reported similar BSB scores, with no significant differences. However, partners reported significantly more OB than survivors ($M = .99$ for survivors and $M = .06$ for survivors, $t(10) = -2.69, p < .05$), lending partial support for Hypothesis 1. Overall, partners reported higher mean scores on the CSI, but the difference in CSI scores were not significant. Also, survivor and partner mean scores on the CPQ subscales were not significantly different. Comparisons only yielded one significant difference. Survivors’ mean CLCS ($M = 22.45, SD = 3.01$) was significantly greater than partners’ mean CLCS ($M = 17.91, SD = 4.43$), $t(10) = 4.09, p < .05$.

**Relationships Between Outcome and Target Variables**

To address the second research question regarding the associations between communication patterns, perceived control, self-blame, other-blame, and relationship satisfaction, bivariate correlations were computed for survivors and partners. The results of the separate survivor and partner correlational analyses are presented in Tables 8 and 9. Results of the correlational analyses were similar to those found in the individual-level analyses, with a few differences.
Table 8
Survivor Correlations (n = 11)

<table>
<thead>
<tr>
<th>Survivor Variable</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<tbody>
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<td>.38</td>
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<tr>
<td>4. CPQ-DW</td>
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<td>-.14</td>
<td>-.63*</td>
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<tr>
<td>5. CPQ-SDPW</td>
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<td>-.54</td>
<td>.86**</td>
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<tr>
<td>6. CPQ-PDSW</td>
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<td>-.03</td>
<td>-.61*</td>
<td>.97**</td>
<td>.70*</td>
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<tr>
<td>7. CPQ-MA</td>
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<td>.10</td>
<td>-.56</td>
<td>.87**</td>
<td>.80**</td>
<td>.81**</td>
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<td>8. CSB</td>
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<td>.13</td>
<td>-.06</td>
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<td>9. BSB</td>
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<td>.39</td>
<td>-.12</td>
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<td>-.01</td>
<td>-.18</td>
<td>.01</td>
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<tr>
<td>10. OB</td>
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<td>.29</td>
<td>.31</td>
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<td>-.03</td>
<td>-.06</td>
<td>.64</td>
<td>.38</td>
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</tbody>
</table>

Note. CSI = Couples Satisfaction Index; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire; MCC = Mutual Constructive Communication; DW = Demand/Withdrawal; SDPW = Survivor Demand/Partner Withdrawal; PDSW = Partner Demand/Survivor Withdrawal; MA = Mutual Avoidance; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; and OB = Other-blame

Table 9
Partner Correlations (n = 11)

<table>
<thead>
<tr>
<th>Partner Variable</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
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<th>17</th>
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<td></td>
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<tr>
<td>13. CPQ-MCC</td>
<td>.46</td>
<td>-.67*</td>
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<td></td>
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<td>.84**</td>
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</tr>
<tr>
<td>16. CPQ-PDSW</td>
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<td>.25</td>
<td>-.62*</td>
<td>.87**</td>
<td>.45</td>
<td>--</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17. CPQ-MA</td>
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<td>-.05</td>
<td>-.54</td>
<td>.87**</td>
<td>.69*</td>
<td>.80**</td>
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</tr>
<tr>
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<td>.15</td>
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<td>-.29</td>
<td>-.32</td>
<td>-.33</td>
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<tr>
<td>19. OB</td>
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<td>-.01</td>
<td>.14</td>
<td>-.25</td>
<td>-.20</td>
<td>-.22</td>
<td>-.07</td>
<td>.75*</td>
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</tr>
</tbody>
</table>

Note. CSI = Couples Satisfaction Index; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire; MCC = Mutual Constructive Communication; DW = Demand/Withdrawal; SDPW = Survivor Demand/Partner Withdrawal; PDSW = Partner Demand/Survivor Withdrawal; MA = Mutual Avoidance; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; and OB = Other-blame

Note. ** p < .01, * p < .05
<table>
<thead>
<tr>
<th>Survivor Variables</th>
<th>CSI</th>
<th>CLCS</th>
<th>CPQ-MCC</th>
<th>CPQ-DW</th>
<th>CPQ-SDPW</th>
<th>CPQ-PDSW</th>
<th>CPQ-MA</th>
<th>BSB</th>
<th>OB</th>
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<tbody>
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<td>CSI</td>
<td>.69*</td>
<td>-1.1</td>
<td>.49</td>
<td>-3.3</td>
<td>-2.5</td>
<td>-3.2</td>
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<td>.57</td>
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<td>-4.1</td>
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<td>.40</td>
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<td>-4.8</td>
<td>-5.5</td>
<td>.23</td>
<td>.29</td>
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<tr>
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<td>.30</td>
<td>-.67*</td>
<td>.07</td>
<td>-.08</td>
<td>.18</td>
<td>.16</td>
<td>-2.4</td>
<td>-3.9</td>
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*Note.* CSI = Couples Satisfaction Index; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire; MCC = Mutual Constructive Communication; DW = Demand/Withdrawal; SDPW = Survivor Demand/Partner Withdrawal; PDSW = Partner Demand/Survivor Withdrawal; MA = Mutual Avoidance; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; and OB = Other-blame

*Note.* **p < .01, *p < .05
**Self- and other-blame.** For survivors, there were no significant correlations with CSB, BSB, or OB scores. For partners, OB was positively associated with BSB ($r = .75, p < .05$). Unlike the individual-level analyses, Hypothesis 2 was not supported; CLCS was not associated with any type of blame for survivors.

**Communication patterns.** For both survivors and partners, the MCC and DW subscales were correlated. For survivors, the MCC and DW subscale scores were negatively correlated ($r = -.63, p < .05$), but upon further examination, MCC was only significantly negatively correlated with PDSW ($r = -.61, p < .05$). For partners, MCC was not significantly correlated with DW, but was significantly negatively correlated with PDSW ($r = -.62, p < .05$). Further, survivors’ SDPW and PDSW scores were significantly correlated ($r = .70, p < .05$) while partners’ scores were not ($r = .45, p = \text{n.s.}$).

**Relationship satisfaction.** CSI scores were only significantly correlated with CPQ-DW and CPQ-MA subscales in the negative direction, partially confirming Hypothesis 3 regarding the relationship of target variables with relationship satisfaction. For survivors, CSI scores were indirectly correlated with the total CPQ-DW subscale ($r = -.63, p < .05$), and more specifically, the CPQ-PDSW subscale scores ($r = -.63, p < .05$) but not the CPQ-SDPW subscale. For partners, CSI scores were indirectly correlated with the CPQ-MA subscale scores ($r = -.78, p < .01$).

**Survivor and partner correlations.** A correlation analysis was also conducted to evaluate the associations between survivors and partners’ scores on each variable. These correlations are presented in Table 10. Interestingly, survivor OB scores and partner BSB scores were significantly correlated in a positive direction ($r = .88, p < .01$), indicating that scores of cancer attribution to partners’ behaviors were associated with partner self-blame. Also, it must
be noted that survivor and partner CSI scores were directly correlated at a significant level ($r = .69$, $p < .05$), but no other variables were significantly correlated with CSI scores. Given the results from the individual-level analyses, it appears that these correlations may not accurately describe the relationships between study variables. Additionally, survivors and partners’ scores were not significantly correlated on any of the study variables but relationship satisfaction. This suggests that survivors’ responses were not associated with their partner’s responses to any significant degree. To more accurately explore the nature of the relationships between survivor and partner variables in these couples, dyadic data analysis strategies were implemented.

**Dyadic Data and Non-Independence**

Unlike the individual-level data, couple data are not independent because the survivors and partners are nested within a larger grouping variable – the couple. Thus, the dyadic data is interdependent, which violates the assumption of inferential statistics that the errors in observations are sampled independently. If errors are not independent, but instead are correlated, they remain in the residual term. Unless the dependencies are modeled in the data analysis, inferential test statistics are biased (Kenny, 1995; Kenny & Judd, 1986). Specifically, because couple member observations are typically positively correlated, analyses would result in an underestimation of the standard errors and increase risk of Type I error (Cook, 1998; Kenny, 1995; Kenny & Judd, 1986; Newsom, 2002). Thus, the dyad needs to be treated as the unit of analysis.

In order to address the interdependence of survivor and partner data, analysis utilized the Actor Partner Interdependence Model (APIM; see Cook & Kenny, 2005, for a description). The APIM explicitly models the interdependence of the model and allows for the study of how the
survivor influences the partner and how the partner influences the survivor. Figure 2 shows the path model of the APIM.

![Figure 2. The Actor-Partner Interdependence Model. Adapted from “The Actor-Partner Interdependence Model: A model of bidirectional effects in developmental studies,” by W.L. Cook and D.A. Kenny, 2005, International Journal of Behavioral Development, 29(2), p. 102. Copyright 2005 by Psychology Press. Note. X = data for partner; Y = outcome; X' = data for partner; Y' = outcome; e = error; a = actor effects; p = partner effects.]

The APIM approach adjusts for and calculates the extent of non-independence of the data through the analysis of actor effects and partner effects. *Actor effects* (represented by the straight lines $a$) are the effects of one person’s independent variable scores on his or her own dependent variable score ($X$ on $Y$, or $X'$ on $Y'$). *Partner effects* (represented by the diagonal lines $p$) are the effects of one person’s independent variable scores on his or her partner’s dependent variable score ($X$ on $Y'$, or $X'$ on $Y$). Interdependence is modeled through the partner effects. The APIM takes into account the correlation between partners’ independent variables, as represented by the curved bidirectional arrow between $X$ and $X'$, which allows for the control of shared variance in the outcome variable. Thus, the APIM examines both actor and partner effects at the same time, independently of one another. In addition, the extent to which $X$ and $X'$ do not predict $Y$ and $Y'$ is represented by the error terms $e$ and $e'$. These error terms are also correlated, as represented by the curved bidirectional arrow between $e$ and $e'$, allowing for the control of other sources of non-independence (Kenny, 1995). Finally, the APIM allows for the examination of the influence...
that the distinguishing factor. In this study, dyad members were distinguishable by participation status as survivor or partner. Due to the limited dyadic data collected in this study, the APIM was estimated using the pooled regression approach, which is appropriate for smaller sample sizes (Kenny et al., 2006; see Tambling, Johnson, & Johnson, 2011, for detailed instructions).

**Predictor Actor and Partner Effects on Relationship Satisfaction**

In order to explore the extent to which survivor and partner communication, perceived control, self-blame, and other-blame predict survivor and partner relationship satisfaction, actor and partner effects were estimated using the APIM pooled regression approach (Kenny et al., 2006; Tambling et al., 2011). For this approach, two regression equations are computed for each predictor – a within-dyads regression equation and a between-dyads regression equation.

The within-dyads regression equation is:

\[ Y_{1i} - Y_{2i} = b_w(X_{1i} - X_{2i}) + E_{wi} \]

In the within-dyads regression, the difference between survivor and partner’s scores on the predictor variable \((X_1 - X_2)\) are regressed on the difference between the survivor and partner’s scores on the outcome variable \((Y_1 - Y_2)\). The intercept is not estimated because it does not matter whether survivors’ scores are subtracted from partners’ scores, or vice versa. In other words, the direction of the difference is arbitrary (Kenny et al., 2006; Tambling et al., 2011).

The between-dyads regression equation is:

\[ \frac{Y_{1i} + Y_{2i}}{2} = b_0 + b_b \frac{X_{1i} + X_{2i}}{2} + E_{bi} \]

In the between-dyads regression, the dyads’ outcome variable mean \([\frac{(Y_1 + Y_2)}{2}]\) is regressed on the dyads’ predictor variable mean \([\frac{(X_1 + X_2)}{2}]\).

The regression coefficients from these two equations \((b_b\) and \(b_w)) are then used to estimate the actor and partner effects (Kenny et al., 2006; Tambling et al., 2011):
Because actor and partner effects are computed using coefficients from two separate regressions, the standard errors of the coefficients from both equations must be pooled (Kenny et al., 2006).

The equation for the pooled standard error is as follows:

\[
SE_p = \sqrt{\frac{s_b^2 + s_w^2}{4}}
\]

Then, \( t \) statistics for each effect is calculated by dividing the actor and partner effects by the pooled standard error to determine whether actor and partner effects differ significantly from zero (Kenny et al., 2006; Tambling et al., 2011):

\[
t_{actor} = \frac{a}{SE_i} \quad t_{partner} = \frac{p}{SE_i}
\]

Significance testing of the \( t \) statistics is then conducted using a \( t \) table to locate the correct number of degrees of freedom and determine the cut-off value for the desired level of significance. The equation for the degrees of freedom is as follows:

\[
df = \frac{(s_b^2 + s_w^2)^2}{\frac{s_b^4}{df_b} + \frac{s_w^4}{df_w}}
\]

**Models tested in the present study.** Due to the very small number of couples in this study, the original model was modified to accommodate the limits of the data. Rather than testing the actor and partner effects of CSB, BSB, OB, and CLCS with each of the four CPQ subscales in four separate models (see Figure 1), each predictor was tested alone. The models tested using the pooled-regression approach to testing the APIM are presented in Figures 3 – 10:
Figure 3. Model testing whether survivor CSB scores predictCSI scores.  
*Note.* Partner actor and partner effects were not tested because partner characterological self-blame was not assessed.

Figure 4. Model testing whether BSB scores predict CSI scores.

Figure 5. Model testing whether OB scores predict CSI scores.
Figure 6. Model testing whether CLCS scores predict CSI scores.

Figure 7. Model testing whether CPQ-MCC scores predict CSI scores.

Figure 8. Model testing whether CPQ-SDPW scores predict CSI scores.

Figure 9. Model testing whether CPQ-PDSW scores predict CSI scores.
The model in Figure 3 depicts the estimation of actor and partner effects of survivor CSB scores only, because characterological self-blame was not assessed in partners. The models in Figures 4-10 depict the estimation of actor and partner effects from scores collected from both survivors and partners. To illustrate the calculations required to estimate the actor and partner effects using the pooled regression approach, the estimation of the parameters for the models presented in Figure 3 (CSB) and Figure 6 (CLCS) are described. Data required to perform the calculations for the estimation of all models appear in Tables A1-A8 in Appendix H. Results of all predictor APIM models are presented below in Table 11.

For all within- and between-dyads regression equations, scores on each predictor variable were centered by subtracting the sample mean from each individual’s score. Centering the scores allowed for straightforward interpretations of results (Kenny et al., 2006; Tambling et al., 2011). Also, in order to accommodate for the limited sample size and increase power, significance levels for $t$ tests were raised to $p = .10$.

**Characterological self-blame.** In the first model, survivor CSB scores were used to predict survivor and partner CSI scores. First, the actor and partner effects were estimated:

$$actor_{csb} = \frac{b_a + b_w}{2} = \frac{1.32 + (-8.61)}{2} = -3.65$$
Actor and partner effects can be interpreted as unstandardized regression coefficients (Kenny et al., 2006). In other words, the CSB actor effect of -3.65 indicates that each point above the mean score on CSB is associated with a CSI score that is 3.65 points lower. Therefore, individuals who experience higher CSB report lower CSI. The CSB partner effect of 4.97 indicates that each point above the mean on an individual’s CSB is associated with a 4.97 point increase on his or her partner’s CSI score. To test whether these actor and partner effects were significantly different from zero, a $t$ test is conducted. In order to do so, the standard errors from the between and within regression coefficients were pooled:

$$SE_p = \sqrt{\frac{s^2_b + s^2_w}{4}} = \sqrt{\frac{9.41^2 + 9.29^2}{4}} = \sqrt{\frac{88.55 + 86.30}{4}} = \sqrt{43.71} = 6.61$$

Then, $t$ statistics were calculated by dividing the actor and partner effects by the pooled standard error:

$$t_{actor} = \frac{a}{SE_i} = \frac{-3.65}{6.61} = -.55 \quad t_{partner} = \frac{p}{SE_i} = \frac{4.97}{6.61} = .75$$

Finally, the degrees of freedom were calculated:

$$df = \frac{(s^2_b + s^2_w)^2}{\frac{s^4_b}{df_b} + \frac{s^4_w}{df_w}} = \frac{(88.57 + 86.34)^2}{\frac{7844.10}{10} + \frac{7454.81}{11}} = \frac{30593.51}{1462.12} = 20.92$$

Using a $t$ table to determine if the results of the $t$ statistics were significant at the $p = .10$ level for 20.92 degrees of freedom, it was concluded that neither the actor nor partner effects of CSB scores were significantly different from zero.

**Perceived control.** In the second model, survivor and partner CLCS scores were used to predict survivor and partner CSI scores. For the calculations in this model, additional terms were
added in the within and between regression equations to test whether Participation Status (PS) as survivor or partner moderated the actor and partner effects (Tambling et al., 2011). Because the within-dyads regression equation is based on the differences between dyad members, the difference between CLCS scores were used to predict differences is CSI scores. Thus, the within regression equation becomes:

$$CSI_{DIFF} = b_{w1}(CLCS_{DIFF}) + b_{w2}(PS_{DIFF}) + b_{w3}(CLCSINT_{DIFF}) + E_{wi}$$

The Participation Status variable (PS) was created by assigning survivors a value of 1 and partners a value of -1, such that the difference in participation status (PSDIFF = 2) is the same for each couple. The values assigned to survivors and partners, and the direction of their difference, are arbitrary – as long as the difference was the same non-zero value for each couple. A CLCS and PS interaction term was also created (CLCSINT) by multiplying each participant’s CLCS centered score by his or her PS value. A difference variable (CLCSINTDIFF) represents the difference between survivor and partner CLCSINT scores.

The between regression equation is based on average scores between the dyad, meaning that this equation uses CLCS and CLCSINT average scores to predict CSI average scores. Thus, the between-dyads regression equation becomes:

$$CSI_{AVG} = b_{b0} + b_{b1}(CLCS_{AVG}) + b_{b2}(CLCSINT_{AVG}) + E_{bi}$$

Interaction and PS terms were also included in the within and between regression equations for the BSB, OB, and CPQ subscale models. Using the same equations describe above, actor effects, partner effects, and t statistics were calculated for both the main and interaction effects. First, for the main CLCS effects, the actor and partner effects were:

$$actor_{CLCS} = \frac{(b_{b1} + b_{w1})}{2} = \frac{(1.90 + 1.03)}{2} = 1.47$$
An actor_{CLCS} effect of 1.47 indicated that each point above the mean on the CLCS score was associated with a CSI score that was 1.47 points higher. The partner_{CLCS} effect of 0.44 indicated that each point above the mean on an individual’s CLCS was associated with his or her partner’s CSI score being 0.44 points higher. The pooled standard error for the CLCS main effects was:

$$SE_{CLCS} = \sqrt{\frac{s^2_a + s^2_w}{4}} = \sqrt{\frac{1.40^2 + 1.50^2}{4}} = \sqrt{\frac{1.96 + 2.25}{4}} = \sqrt{1.05} = 1.03$$

And the t statistics were:

$$t_{CLCSactor} = \frac{a_{CLCS}}{SE_{CLCS}} = \frac{1.47}{1.03} = 1.43$$

$$t_{CLCSpartner} = \frac{p_{CLCS}}{SE_{CLCS}} = \frac{0.44}{1.03} = 0.42$$

After consulting a t distribution table, it was discovered that neither the CLCS main actor or partner effects were significant at the \( p = .10 \) level.

The same process was completed to determine if the actor and partner effects of the CLCS-PS interaction were significantly different from zero. First, the actor and partner effects were calculated:

$$actor_{CLCSINT} = \frac{(b_{a3} + b_{w3})}{2} = \frac{(5.37 + 0.24)}{2} = 2.81$$

$$partner_{CLCSINT} = \frac{(b_{a3} - b_{w3})}{2} = \frac{(5.37 - 0.24)}{2} = 2.57$$

Unlike the actor and partner main effects, the interaction effects cannot be interpreted as is. The distinguishing variable must be taken into account and an extra calculation is required. For this study, survivors were assigned a value of 1 and partners were assigned a value of -1. In order to interpret the survivor actor and partner interaction coefficients, they must be added (because they
were assigned *positive* 1) to the main CLCS actor effect calculated earlier (actor_{CLCS} = 1.47, partner_{CLCS} = 0.44). In order to interpret the *partner* actor and partner interaction coefficients, they must be *subtracted* (because they were assigned a value of *negative* 1) from the main CLCS actor and partner effects. So, the interpreted values are as follows:

\[
\begin{align*}
\text{survivor actor}_{CLCS} &= 1.47 + 2.81 = 4.28 \\
\text{survivor partner}_{CLCS} &= 0.44 + 2.57 = 3.01 \\
\text{partner actor}_{CLCS} &= 1.47 - 2.81 = -1.34 \\
\text{partner partner}_{CLCS} &= 0.44 - 2.57 = -2.13
\end{align*}
\]

The survivor actor effect of 4.28 indicates that survivors who score one point above the mean CLCS score had a CSI score that was 4.28 points higher. The survivor partner effect of 3.01 indicates that survivors who scored one point above the mean CLCS had partners with CSI scores 3.01 points higher. In other words, survivors and their partners had higher CSI scores if the survivor’s CLCS score was higher. Conversely, the partner actor effect of -1.34 indicated an indirect relationship between partner CLCS and CSI scores. Partners who scored one point above the mean had CSI scores that were 1.34 points lower. The partner partner effect of -2.13 indicates that survivors scored 2.13 points lower on the CSI for every point their partner scored above the mean CLCS. In other words, the higher the partner’s CLCS, the lower the survivor and partner CSI. Note that this additional step was required for interpretation purposes only.

The remainder of the calculations for the \( t \) significance tests was the same. The standard error of the interaction coefficients from the within and between regression equations was computed:

\[
SE_{CLCS\text{INT}_p} = \sqrt{\frac{s_h^2 + s_w^2}{4}} = \sqrt{\frac{2.52^2 + 0.84^2}{4}} = \sqrt{\frac{6.35 + 0.71}{4}} = \sqrt{1.76} = 1.33
\]

And the \( t \) statistics were computed:
Finally, the degrees of freedom were calculated and a $t$ table was consulted to determine if the actor and partner effects were moderated by participation status.

$$t_{\text{CLCSINTactor}} = \frac{a_{\text{CLCSINT}}}{SE_{\text{CLCSINT}}} = \frac{2.81}{1.33} = 2.11$$

$$t_{\text{CLCSINTpartner}} = \frac{P_{\text{CLCSINT}}}{SE_{\text{CLCSINT}}} = \frac{2.57}{1.33} = 1.93$$

According to the $t$ table, both the actor and partner effects of the CLCSxPS interaction were significant at the $p = .10$ level. These results indicate that the extent to which survivors and partners perceive control over the course of the survivor’s cancer influences one another’s relationship satisfaction. Based on the interpretations calculated above, it appears that survivors’ CLCS scores influence greater change in survivor and partner CSI than partners’ CLCS scores. However, partners’ CLCS scores are more impactful on CSI scores in the negative direction. Thus, the role of perceived control in predicting survivor and partner relationship satisfaction anticipated in Hypothesis 4 was supported. The same pooled regression APIM approach was implemented for the remaining study variables.
Table 11
*APIM* Pooled Regression Actor and Partner Effects

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Note. CSI = Couples Satisfaction Index; CSB = Characterological Self-Blame; BSB = Behavioral Self-Blame; OB = Other-blame; CLCS = Cancer Locus of Control Scale; CPQ = Communication Patterns Questionnaire; MCC = Mutual Constructive Communication; DW = Demand/Withdrawal; SDPW = Survivor Demand/Partner Withdrawal; PDSW = Partner Demand/Survivor Withdrawal; and MA = Mutual Avoidance

Note. **p < .05, * p < .10
**Behavioral self-blame and other-blame.** Significance tests for the actor and partner effects for BSB and OB showed that none of the main or interaction effects were significant. These results suggest that BSB and OB scores were not significant predictors of CSI scores, and that role as survivor or partner was not a mediator.

**Communication patterns.** Hypothesis 4 in regards to the role of communication patterns as predictors of relationship satisfaction was confirmed for the mutual constructive communication and mutual avoidance subscales, but not the demand-withdrawal subscales. As seen in Table 11, results indicated that the CPQ-MCC actor effect was significant, $actor_{MCC} = 1.49$, $t(19.28) = 2.37$, $p = .05$, but was not moderated by participation status. This means that individuals with higher scores of MCC also report higher scores of CSI. This was the only CPQ subscale main actor or partner effect that was significant. Among the interaction actor and partner effects, the CPQ-MA partner effect was the only significant effect, $partner_{MAINT} = 1.51$, $t(16.67) = 2.28$, $p = .05$. Further interpretation calculations indicated that $survivor\ partner_{MA} = -.05$ and $partner\ partner_{MA} = -3.07$. These results suggest that higher scores of partner MA were associated with a decrease in survivor CSI scores. This decrease was greater than the effect of survivors’ MA scores on partners’ CSI scores. In other words, although mutual avoidance behaviors were associated with decreases in relationship satisfaction for both survivors and partners, it appears that partner reports of higher MA were more influential.
CHAPTER 5
DISCUSSION

While there has been attention given to the topics of attribution and coping surrounding illness, the study of how couples appraise and cope with the diagnosis of cancer is still in its infancy. This study offered an exploratory investigation of how couples communicate about cancer-related issues given the degree of self-blame, other-blame, and perceived control they experience, and most importantly, how these factors influenced survivor and partners’ relationship satisfaction. The study was guided by the research questions, (1) Are there differences between survivors and their partners regarding reported amounts of self- and other-blame? (2) What are the associations between survivor and partner communication, perceived control, self-blame, other-blame, and relationship satisfaction? And (3) To what extent do survivor and partner communication, perceived control, self-blame, and other-blame predict survivor and partner relationship satisfaction? Results partially supported study hypotheses, which conceptualized the effects of self- and other-blame, perceived control, and communication patterns on relationship satisfaction through Bodenmann’s (1995, 1997, 2005) dyadic coping approach.

Associations Between Blame and Other Study Variables (Hypotheses 1 and 2)

The relationships between self- and other-blame and other study variables varied between survivors and partners at both the individual and dyadic levels. Results from the individual and dyadic level analyses indicated no significant differences between reports of CSB and BSB among survivors and partners, suggesting that on average, neither survivors nor partners experienced more self-blame for the cause of cancer. However, results indicated that survivor CLCS was only significantly related to survivor BSB, not CSB, at the individual level. Although
the correlation was somewhat weak, it is consistent with previous findings that mark perceived control as a key difference between characterological and behavioral self-blame (Christensen et al., 1999; Rabin & Pinto, 2006). It is also important to note that CSB and BSB were directly correlated among survivors, suggesting that attribution to both one’s character and behaviors are related. Overall it appears that the evidence distinguishing characterological and behavioral self-blame remains inconsistent and needs further investigation.

Results from this study also suggested that neither characterological nor behavioral self-blame were associated with poor relationship satisfaction in survivors. This result was unlike other studies in which self-blame was related to negative outcomes (Carmack Taylor et al., 2008; Else-Quest et al., 2009; Friedman et al., 2007, and Phelan, Griffin, & Jackson, 2011). Differences might be explained by the types of cancer studied. Previous studies primarily consisted of survivors of lung (Carmack Taylor et al., 2008; Else-Quest et al., 2009) and colorectal (Phelan et al., 2011) cancers, whereas the current study mainly consisted of breast cancer survivors. Differences in stigma and associated behaviors such as smoking and poor diet could have contributed to higher rates of blame in lung and colorectal cancers. Also, a difference between previous studies and the current study is that previous studies focused on individual outcomes such as distress and adjustment while the present study focused on the dyadic outcome of relationship satisfaction. This suggests that while survivors experience both types of self-blame, aspects found within the couple relationship might buffer their effects.

This study also aimed to explore the presence of other-blame, and the extent to which survivors and partners attributed each other’s behaviors as the cause of cancer. Dyadic-level results showed that on average, partners attributed their significant others’ behaviors for his or her cancer diagnosis. Individual-analyses supported this notion with a near significant
relationship. Thus, hypothesis 1 was supported regarding the differences in other-blame. Surprisingly, individual-level analysis showed that survivor CSB and OB scores were highly correlated in the positive direction, suggesting that reports of blame directed towards survivors’ own personality and internal state were related to blame directed towards partners behaviors. It was expected that reports of BSB and OB would be associated because they share a behavioral component, but this was not the case. Among survivors, OB scores were also related to less mutual constructive communication and more demand-withdrawal and mutual avoidance communication behaviors. Finally, survivor OB was a significant predictor of poorer CSI in the individual-level analyses. Together, these results suggest that among survivors, blame directed towards partners was more detrimental to the couple relationship than self-directed blame. It also appears that partner-directed blame was communicated through withdrawal and avoidance behaviors when cancer-related issues arise. These results support the theoretical notion that dyadic coping mediates the relationship between stress appraisal and relationship outcomes (Bodenmann, 1997).

Most noteworthy, the relationships between self- and other-blame and the other study variables were found among survivors, not partners. Through the lens of attribution theory (Kelley, 1973; Taylor, 1983; Wong & Weiner 1981), this imbalance might be explained by survivors’ need to reduce self-blame in order to gain control of the course of their illness. As a result of not being able to completely minimize their own self-blame, they might also direct blame towards the person closest to them – often their partner. This does not mean that partners are free from self- or other-blame. Partners might be hesitant to report self- or other-blame for fear of directing attention away from the survivor, and they might feel guilty if they admitted that they blame the survivor for his or her cancer. Coyne and Smith (1991) describe this response as
a relationship-focused coping strategy called “protective buffering,” where one partner hides or conceals his or her concerns and feelings in order to protect the other partner and avoid conflict. This relationship dynamic has been explored among cancer survivors and their partners and has been found to have both beneficial and damaging effects on the couple relationship (Kuijer, Ybema, Buunk, & Dejong, 2000; Manne, Dougherty, Veach, & Kless, 1999; Manne et al., 2007). Overall, the results from this study and previous studies highlight the fact that each couple relationship is unique and subject to many changing factors such as media attention and simultaneous stressors. Thus, the effects of cancer on relationships are constantly evolving. More investigation is needed to distinguish the experiences of survivors and partners with self- and other-blame and their influences.

**Relationships between Target Variables and Relationship Satisfaction (Hypotheses 3 and 4)**

The current study also aimed to provide an exploratory analysis of the ways in which self- and other-blame, perceived control, and communication patterns relate to relationship satisfaction. More importantly, the study aimed to identify the role of target variables as predictors of relationship satisfaction at both the individual and dyadic levels. Results partially supported study hypotheses, identifying perceived control and mutual constructive communication as the primary predictors of relationship satisfaction.

**Moderated effects of perceived control on relationship satisfaction.** Perceived control was a significant predictor of both survivor and partner relationship satisfaction, and these effects were moderated by participants’ role as survivor or partner. Bodenmann’s (1995, 1997, 2005) systemic-transactional approach describes stress appraisal as the compilation of several cognitive appraisals: who initially perceives the stressor, what caused the stressor, and the controllability of the stressor. This study sought to explore two causal attributions of the stressor (self- and
other-blame), but it appears that controllability (perceived control) played a more influential role in predicting survivor and partner relationship satisfaction. In both the individual and dyadic analyses, survivors reported more CLCS than partners, indicating that overall, survivors felt more in control over the course of their cancer than their partners did. This was expected because it is the survivor’s body that is experiencing the physical effects of the cancer and its treatment. However, other results regarding perceived control varied among individual and dyadic level analyses.

In the individual analyses, CLCS was positively associated with CPQ-MCC scores for survivors and negatively associated with CPQ-DW scores in partners. These results were expected, suggesting that the more control survivors and partners feel they have over the course of the survivor’s cancer, the more confident they will feel to face the issues raised by the cancer because they are seen as temporary. For survivors, CLCS was also a significant predictor of CSI scores, but when the CPQ subscale scores were added to the regression equation, CLCS was no longer a significant predictor. These results suggest that communication patterns might mediate the effect of CLCS on survivor relationship satisfaction. The existence of a mediation effect would support previous studies of communication as a form of dyadic coping (Bodenmann et al., 1998; Manne et al., 2004; Manne, Badr, Zaider, Nelson, & Kissane, 2010) and confirm Bodenmann’s (1997) dyadic coping approach. The mediation was not explored in this study due to the limited sample size, but should be considered in future research.

Upon further investigation in the dyadic data analyses, actor and partner estimates showed that participation status moderated the effects of CLCS on CSI scores. Higher survivor CLCS scores predicted higher CSI scores in both survivors and partners, while higher partner CLCS scores predicted lower CSI scores in both survivors and partners. These results indicate
that among the small number of couples in the sample, survivors’ perception of control over the course of their cancer was associated with a larger difference in relationship satisfaction than partners’ perception of control. Furthermore, correlation analysis results showed that partner CLCS scores were negatively associated with CPQ-MCC scores in survivors, suggesting that partners who felt more control over the course of the illness observed less mutual constructive communication among the couple.

The opposing effects of perceived control on communication and relationship satisfaction suggest that control is weighted differently for survivors and their partners. For survivors, perceived control was associated with confidence, satisfaction, and hope for the future. This supports Manne and Glassman’s (2000) findings that survivors who felt more perceived control felt that they were coping with the illness well. It is likely that survivors are more likely to engage in communication with their partner if they feel that they have control of the situation because they know what they need from their partner and will embrace opportunities to communicate. Conversely, partner perceived control had stifling effects on relationship satisfaction, suggesting that more control among partners might take away from the survivor’s coping experience. However, it is important to return to the study finding that survivor and partner CLCS scores were highly correlated, meaning that higher survivor perceived control was associated with higher partner survivor control. Overall, it appears that partners’ perceived control is not enough. It is possible that the survivor’s perceived control is key for couple communication about cancer-related issues and relationship satisfaction.

Associations between cancer-related communication and relationship satisfaction.

All cancer-related communication patterns significantly predicted survivor and partner relationship satisfaction, though not all effects were moderated by participation status. In the
individual-level analyses, mutual constructive communication was a significant predictor of both survivor and partner relationship satisfaction. Further examination in the dyadic-level analysis showed that the effects of mutual constructive communication on relationship satisfaction were not moderated by participation status. These results suggest that survivors and partners similarly value mutual constructive communication and that it is equally influential on survivor and partner relationship satisfaction. These results support previous studies of breast cancer survivors and their partners (Manne et al., 2004; Manne et al., 2006) and extend prior work evaluating the effects of mutual expression of feelings and striving to feel that the issue has been resolved.

Demand-withdrawal communication was negatively associated with relationship satisfaction, which is consistent with previous studies of distressed couples (Eldridge, Sevier, Jones, Atkins, & Christensen, 2007). The present study offers a unique contribution to the literature, finding that partner-demand/survivor-withdrawal behaviors were the most detrimental to survivor relationship satisfaction in the individual-level analyses. Survivor-demand/partner-withdrawal communication was not associated with any other study variables. Cancer can be very stressful for both survivors and their partners, each coping in different ways. Survivors often expect partners to be supportive, but if they feel overwhelmed or pressured by partners they might withdrawal during cancer-related discussions. Support may be offered and received in different ways, potentially causing confusion and incongruence in coping. Studies investigating both individual and dyadic coping strategies may shed light on the interaction between survivor and partners’ intentions and reactions to individual and dyadic coping strategies.

Mutual avoidance communication behaviors also had a negative impact on both survivor and partner relationship satisfaction in the dyadic-level analyses and was moderated by participation status. Partner effects showed that partners’ perception of mutual avoidance
communication was more negatively impactful on survivor relationship satisfaction than survivors’ perception of mutual avoidance communication on partners’ relationship satisfaction. These findings are similar to those found by Manne et al. (2010), in which couples with mutual avoidance communication reported lower relationship intimacy and greater distress. Mutual avoidance communication was not a significant predictor of relationship satisfaction in the individual-level analysis, suggesting that factors in the couple relationship that were not accounted for in the study could explain the effects of mutual avoidance.

An interesting result found in the current study was that demand-withdrawal and mutual avoidance CPQ subscale scores were highly correlated. Their relationship supports previous studies that found that disengaging communication was associated with lower relationship satisfaction (Hodgson et al., 2003). Based on the context of this study, it appears that withdrawal and avoidance behaviors have a similar effect on relationship satisfaction. It is unclear whether withdrawal and avoidance are distinct concepts or if they appear the same during and after discussions of cancer-related issues.

Overall, this study makes several important contributions to the study of dyadic coping among couples coping with cancer. It has provided support for the notion that couples appraise a stressor and communicate in ways that ultimately affect the quality of the couple relationship. Results of this study enhance the body of knowledge related to the relational impacts of cancer. Though this study makes several meaningful contributions to the literature, there are some limitations that must be considered when interpreting the results of this study.

**Limitations**

As with any research, there were challenges that likely influenced the results of the study. The primary limitations of this study have to do with sample size and measurement. Having so
few participants for both the individual- and dyadic-level analyses limited the data analytic options and weakened the power of the tests. Other limitations were related to participant recruitment.

**External validity.** There are several factors that may influence the external validity of the study. First, the sample was a convenience sample gathered from a regional cancer center and through Internet recruitment. Participants from the regional cancer center were recruited by the same team of nurses, whose role in participants’ treatment may have influenced participants’ decision to participate. Participants recruited via the Internet had access to and knowledge of how to use the Internet, particularly websites such as Craigslist or Facebook. Second, only survivors and their partners coping with breast, prostate, lung, and colorectal cancer were considered for the study. Participants in this study were primarily Caucasian and coping with breast cancer. Therefore, results may not generalize to individuals and couples of different ethnic backgrounds and those coping with other cancers. Finally, partners were not asked to confirm survivors’ illness information such as cancer type and time since diagnoses. Thus, it is unclear whether partners in the individual-level analyses were partners of survivors who met the inclusion criteria of the study. Despite these limitations, the sampling procedure appropriately reflected the exploratory nature of the study and the study’s aim to provide a preliminary look at the relationships between study variables.

**Construct validity.** Threats to construct validity were found in the measurement of characterological self-blame, behavioral self-blame, and other-blame. Survivor and partner scores on these variables were constructed from items of the CLCS Cause of Disease subscale combined with the attribution items from Ferrucci et al. (2011) that were converted to visual analog scale items. Although the items for each variable were consistent and reliable, they had
not been used together in the past to assess for self- and other-blame. However, no validated measures of self- or other-blame exist to date. In addition, items used attribution language and asked about contribution and cause of disease, rather than directly asking participants whether they experienced “blame.” However, the word “fault” was used. It could be debated whether the emotional element of blame was truly assessed.

**Conclusion validity.** Finally, there are threats to conclusion validity in the present study. First, the number of partners was less than half of the survivors in the individual analysis, and the number of couples in the dyadic analysis was extremely small. These factors may call the veracity of the results into question. Reasons for significant others’ non-participation are unknown. It is possible that significant others were no longer living, were too ill to participate, or were not interested. The statistical tests that were conducted were likely to have had insufficient power to accurately observe differences in the data, rendering the tests ineffective. However, various steps were taken, including modifying statistical analyses and models, to best suit the data. The goal of the current study was to provide an exploratory examination of the target variables and how they relate to one another. Results from this study provide preliminary support for Bodenmann’s (1997) dyadic coping approach and further provide directions for future studies.

**Future Directions**

The aim of this study was to better understand the dyadic coping process in the context of cancer. Based on the exploratory results obtained from this study, it appears that blame attribution, perceived control, and communication may co-exist in a process in which perceived control and communication serve as mechanisms for dyadic coping and relationship satisfaction. A proposed dyadic model created from the results of this study is illustrated in Figure 11, where
perceived control moderates feelings of self- and other-blame and communication patterns mediate the relationship between stress appraisal and relationship satisfaction. This model is congruent with but extends Bodenmann’s (2005) dyadic coping process.

![Proposed dyadic coping model](image)

**Figure 11.** Proposed dyadic coping model.

Further dyadic research with a sufficient sample size and appropriate measures is needed to evaluate this model. As noted in the results section, the demand/withdrawal and mutual avoidance communication subscales of the CPQ were highly correlated. Further research and development is needed to distinguish whether these are two distinct constructs. It may be the case that withdrawal and avoidance are perceived as similar behaviors, or they are not distinguished enough in the measure’s instructions. Additionally, an established measure of self-
and other-blame is needed. This measure would need to be able to assess the emotional components of blame as compared to attribution, and would need to distinguish between characterological and behavioral self-blame.

**Clinical Implications**

Cancer is becoming a more common occurrence, and the general population is gaining more knowledge about the behavioral causes of cancer (American Cancer Society, 2013). Cancer is becoming known as a treatable disease, and perceptions of its course are changing. This study suggests that the focus of couples coping with cancer may be shifting more towards the future than the past. Within the first three years of diagnosis, as investigated by this study, positive outcomes may be less influenced by causal attributions and more influenced by individuals and couples’ perceptions of control over the course of the illness. It is important that couple therapists and other clinicians consider individual and couples’ causal attributions in the context of fostering perceptions of control to facilitate feelings of optimism and self-efficacy for the future. If partners’ views are not congruent or are directed negatively towards one another, self- and other-blame and limited perceived control may hinder relationship well-being by impacting how partners communicate about cancer.

There are various strategies and models that marriage and family therapists (MFTs) can draw upon to accompany couples through the appraisal process, normalizing any negative emotions and validating the desire for answers and need for control. Specifically, medical family therapists (MedFTs) are family therapists that are specially trained to help families coping with medical conditions. They are trained to deliver brief interventions in medical settings and seek collaboration with other healthcare providers. One approach that MFTs and MedFTs can engage the couple in is Emotion-Focused Therapy (Greenberg & Johnson, 2010), which focuses on
improving emotional intelligence and understanding they ways in which negative emotions can be constructive. For example, a couple experiencing blame may be searching to find explanations because they are scared and uncertain about the future. Assigning a source of blame may be an effort to ease anxiety. In this case, therapists could assist couples to better understand their feelings of blame by providing a place to discuss the association with fear and uncertainty.

Another therapeutic approach is Strategic Therapy (Haley, 1963; Madanes, 1981), which focuses on helping families identify patterns of behavior that are the family’s effort to address change but are actually maladaptive solutions. For example, a couple might engage in demand/withdrawal, mutual avoidance, or buffering behaviors in order to maintain the survivor’s role as “the strong one” in the family. Although these efforts are based in good intentions, the survivor may feel unsupported. In this case a strategic family therapist would help the couple or family identify maladaptive patterns of interaction, their intended purposes, and more productive solutions. In general, if partners can share their stress appraisals with one another, clinicians can help couples minimize unnecessary protective buffering efforts. By establishing standards of open communication, couples can engage in positive dyadic coping strategies to facilitate relationship growth and well-being. These and other couple and family therapy models (see Badr & Krebs, 2013; Baik & Adams, 2011, for a review) can be implemented as brief interventions to fit with the physical and temporal demands of cancer treatment.

Another significant opportunity for clinicians to educate and support survivors and their partners is through the survivorship care plan (SCP). The Institute of Medicine (IOM) recommends providing survivors with an SCP, which is a comprehensive document consisting of a treatment summary, potential treatment side effects, surveillance and follow-up care guidelines,
health advisories, and suggestions for improving health-related quality of life (IOM, 2006; IOM, 2007). The American College of Surgeons’ Commission on Cancer mandates the implementation of SCPs by 2015 (American College of Surgeons’ Commission on Cancer, 2012). Preliminary studies are being conducted to evaluate specific support strategies that will increase survivors’ use of the SCP (Ashing-Giwa et al., in press). Although an SCP is intended for the survivor as an individual, the document can provide information and direction to survivors, partners, and family. The initial phases of SCP implementation provide MedFTs the opportunity to show that they are a valuable contribution to the survivorship care team, helping families gain knowledge, increase their perceived control, and learn how to advocate for their own care.

In conclusion, cancer can be a challenging experience for both survivors and partners, and the couple relationship can provide strength and support. The present study contributes to the literature in the area of relational impacts of cancer. Data gained from this study provide preliminary information about how couples assess and respond to the dyadic stressor of cancer, and what couple therapists can do to help couples cope together and endure the cancer experience.
REFERENCES


doi:10.1371/journal.pmed.1000058


Eldridge, K. a, Sevier, M., Jones, J., Atkins, D. C., & Christensen, A. (2007). Demand-withdraw communication in severely distressed, moderately distressed, and nondistressed couples:


You and your partner are invited to participate in a study exploring couples’ perspectives about cancer. Your participation will contribute towards the future development of services and supports to help couples coping with cancer.

To participate, please go to the website:

http://tinyurl.com/couplesurvey

and complete an **anonymous** internet survey that will take 10-15 minutes to complete.

You and your partner will complete separate surveys.

Both partners will enter the same identification number listed below in order to ensure anonymity:

**ID Number: __________________**

Please contact Alison Wong if you have any questions:
alison.wong@uconn.edu or (602) 295-4990

This study has been approved by Hartford Hospital and the University of Connecticut IRB [SALN003956HU].
Dear Friend,

You are being invited to participate in a study entitled “Couples’ Communication Patterns and Beliefs about Cancer” because you are 21 years or older and you have been diagnosed with, or have a partner who has been diagnosed with, breast, prostate, colorectal, or lung cancer within the past two years. The goal of this study is to explore perceptions about the cause of cancer and how couples communicate about cancer-related issues. This study will help researchers better understand the impacts of cancer on relationships.

Your participation will contribute towards the development of future interventions to help couples coping with cancer. As a participant, we are asking that you complete an Internet survey by going to the website: www.tinyurl.com/couplesurvey. The survey will take 15-25 minutes. All information you provide in the survey will be anonymous and will not have any connection to your Care Team at Hartford Hospital. You and your partner are both invited to participate, but you do not have to participate together. You and your partner will be asked to complete separate surveys, both of which can be completed at your convenience. The attached flyer contains a random identification number that you and your partner will use when completing the Internet survey. This identification number will protect your identity while allowing us to pair your responses with your partner’s responses.

If you have any questions about this study please contact the study coordinator at the number listed below.

Thank you very much for your consideration in participating in this important research.

Sincerely,

Andrew L. Salner, MD
Director
Helen & Harry Gray Cancer Center
Hartford Hospital
860-545-2852

Alison Wong, MA
Doctoral Candidate
University of Connecticut
602-295-4990
APPENDIX C
Survivor Demographic and Medical Survey Questions

1. Are you?
   - The Person with breast, prostate, colorectal, or lung cancer
   - The Partner of the person with breast, prostate, colorectal, or lung cancer

2. What is your age? __________

3. What is your sex?
   - Male
   - Female
   - Other

4. What is your race?
   - White/Caucasian
   - African American
   - Hispanic
   - Asian
   - Native American
   - Pacific Islander
   - Other ____________________

5. What is your religious/spiritual preference? ________________________________

6. How important is religiosity/spirituality to you?
   - Very important
   - Somewhat important
   - Not too important
   - Not at all important
7. What is your current employment status?
   - Employed full time
   - Employed part time
   - Unemployed
   - Unable to work
   - Retired
   - Student
   - Other

8. What is the highest level of education you have attained to date?
   - Some middle school
   - Some high school
   - High school graduate/GED
   - Trade school
   - Some college
   - College graduate (2 yrs)
   - College graduate (4 yrs)
   - Some graduate studies
   - Master's/Professional
   - Post master's degree
   - Other (please specify) ____________________

9. Please indicate your total household income:
   - Under $10,000
   - $10,000 to 25,000
   - $26,000 to 50,000
   - $51,000 to 75,000
   - $76,000 to 99,000
   - $100,000+
   - I do not know

10. What type of cancer have you been diagnosed with?
    - Breast
    - Prostate
    - Colorectal
    - Lung
11. How long ago were you diagnosed with cancer?
   ______ Years
   ______ Months
   ______ Days

12. Is your cancer metastatic?
   ☐ Yes
   ☐ No

13. Please describe your treatment(s)

14. Have you been diagnosed with cancer in the past?
   ☐ Yes
   ☐ No

15. What type(s) of cancer have you been diagnosed with in the past?
   1st Diagnosis
   2nd Diagnosis
   3rd Diagnosis

16. At the time of your cancer treatment, were you/are you responsible for raising children under the age of 18?
   ☐ Yes
   ☐ No

17. How many children in each of the following age ranges were you responsible for raising?
   0-5 years
   6-10 years
   11-14 years
   15-18 years
APPENDIX D
Cancer Locus of Control Scale

For each of the following statements, indicate how much it applies to you and your views about your diagnosis of cancer and subsequent feelings about that.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Somewhat Disagree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. My becoming ill was without a doubt a matter of coincidence over which I had no influence</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b. I can definitely influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c. I became ill partly because God decided so</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>d. My doctor can definitely influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e. My spouse/partner/family can definitely influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>f. Becoming ill was a result of my lifestyle</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>g. God can definitely influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>h. My becoming ill was mainly caused by the pollution in the environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>i. It is partly my fault that I became ill</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>j. By taking extra care of myself (i.e., through exercise and diet) I can influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>k. Unfortunate or disappointing events in my past have contributed to the fact that I became ill</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>l. My religion has an influence on the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>m. By living healthily I can influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>n. Becoming ill had something to do with my personality</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>o. If I follow the advice of my doctor, I can definitely influence the course of my illness</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>p. I can influence the course of my illness by fighting against it</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>q. My becoming ill was especially due to something about me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Many different things can cause cancer. Please rate the extent to which you feel that each of the following items might have contributed to your cancer. Select a response nearest the description that best fits your experience:

- a. Alcohol use
- b. Tobacco use or smoking
- c. Delay in healthcare
- d. Diet
- e. Stress
- f. Use of hormones (i.e., birth control)
- g. Reproductive history
- h. Lifestyle
i. I deserved it

j. Harmful behavior

k. Sun exposure

l. God

m. Aging

n. Heredity/genetics

o. My personality

p. Environment

q. Occupational hazards

r. Second-hand smoke

s. Chance/luck

t. Infection
u. Previous medical condition

v. Trauma/injury

w. My partner's behaviors

x. Other ____________________________
APPENDIX F
Communication Patterns Questionnaire – Cancer Adaptation

**Directions:** We are interested in how you and your partner typically deal with problems or issues in your relationship which are related to cancer.

**Examples of such cancer-related problems or issues might be the following:**
* Your partner is feeling tired from his/her treatments and has not carried out an important household task which is usually his/her responsibility.
* The effects of the cancer or its treatment have been interfering with the leisure or social activities you and your partner usually engage in.
* You are worrying about how you and your partner will manage child care now because of the cancer or its treatment.

Now think about the cancer-related problems or issues which have arisen in your own relationship and how you and your partner deal with them.

Please rate each item on a scale of 1 (= very unlikely) to 9 (= very likely). For each question, please circle a number for the one answer that comes closest to matching your response.

**A. WHEN SOME CANCER-RELATED PROBLEM/ISSUE IN THE RELATIONSHIP ARISES,**

<table>
<thead>
<tr>
<th>Very Likely</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Both members avoid discussing the problem.........................1</td>
<td>2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>2. Both members try to discuss the problem.................................1</td>
<td>2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>3. You try to start a discussion while your partner tries to avoid a discussion........................................1</td>
<td>2 3 4 5 6 7 8 9</td>
</tr>
<tr>
<td>4. Your partner tries to start a discussion while you try to avoid a discussion........................................1</td>
<td>2 3 4 5 6 7 8 9</td>
</tr>
</tbody>
</table>

**B. DURING A DISCUSSION OF A CANCER-RELATED RELATIONSHIP PROBLEM/ISSUE,**

<table>
<thead>
<tr>
<th>Very Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Both members avoid discussing the problem.................................1</td>
</tr>
<tr>
<td>2. Both members try to discuss the problem.................................1</td>
</tr>
<tr>
<td>3. You try to start a discussion while your partner tries to avoid a discussion........................................1</td>
</tr>
<tr>
<td>4. Your partner tries to start a discussion while you try to avoid a discussion........................................1</td>
</tr>
</tbody>
</table>
1. Both members blame, accuse, and criticize each other........................1 2 3 4 5 6 7

2. Both members express their feelings to each other.................................1 2 3 4 5 6 7

3. Both members threaten each other with negative consequences..............1 2 3 4 5 6 7

4. Both members suggest possible solutions and compromises..................1 2 3 4 5 6 7

5. You nag and demand while your partner withdraws, becomes silent, or refuses to discuss the matter further.................................1 2 3 4 5 6 7

6. Your partner nags and demands while you withdraw, become silent, or refuse to discuss the matter further.................................1 2 3 4 5 6 7

7. You criticize while your partner defends self.................................1 2 3 4 5 6 7

8. Your partner criticizes while you defend yourself.................................1 2 3 4 5 6 7

9. You call your partner names, swear at your partner, or attack your partner’s character.................................1 2 3 4 5 6 7

10. Your partner calls you names, swears at you, or attacks your character........................................1 2 3 4 5 6 7

C. AFTER A DISCUSSION OF A CANCER-RELATED RELATIONSHIP PROBLEM/ISSUE,

1. Both feel understood by the other......................................................1 2 3 4 5 6 7
<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Both withdraw from each other after the discussion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>3. Both feel that the problem has been solved.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>4. Neither partner is giving to the other after the discussion.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>
APPENDIX G
Couples Satisfaction Index (CSI-16)

1. Please indicate the degree of happiness, all things considered, of your relationship.

<table>
<thead>
<tr>
<th>Extremely Unhappy</th>
<th>Fairly Unhappy</th>
<th>A Little Unhappy</th>
<th>Happy</th>
<th>Very Happy</th>
<th>Extremely Happy</th>
<th>Perfect</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

   All the time  Most of the time  More often than not  Occasionally  Rarely  Never

2. In general, how often do you think that things between you and your partner are going well?

   | Not at all | A little | Some-what | Mostly | Almost Completely | Completely |
|------------|----------|-----------|---------|--------|------------------|-----------|
| TRUE       | TRUE     | TRUE      | TRUE    | TRUE   | TRUE             | TRUE      |
| 0          | 1        | 2         | 3       | 4      | 5                | 5         |

3. Our relationship is strong

4. My relationship with my partner makes me happy

5. I have a warm and comfortable relationship with my partner

6. I really feel like **part of a team** with my partner

7. How rewarding is your relationship with your partner?

8. How well does your partner meet your needs?

9. To what extent has your relationship met your original expectations?

10. In general, how satisfied are you with your relationship?

For each of the following items, select the answer that best describes *how you feel about your relationship*. Base your responses on your first impressions and immediate feelings about the item.

11. **INTERESTING**  5 4 3 2 1 0 **BORING**
12. **BAD**  0 1 2 3 4 5 **GOOD**
13. **FULL**  5 4 3 2 1 0 **EMPTY**
14. **STURDY**  5 4 3 2 1 0 **FRAGILE**
15. **DISCOURAGING**  0 1 2 3 4 5 **HOPEFUL**
16. **ENJOYABLE**  5 4 3 2 1 0 **MISERABLE**
## Appendix H

Data for APIM Regression Analyses of Models Illustrated in Figures 3-10

### Table A1: Summary of Regression Analysis for CSB

<table>
<thead>
<tr>
<th></th>
<th>Between</th>
<th>Within</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>1.32</td>
<td>-8.61</td>
</tr>
<tr>
<td><strong>SE(B)</strong></td>
<td>.941</td>
<td>9.29</td>
</tr>
</tbody>
</table>

### Table A2: Summary of Regression Analysis for BSB

<table>
<thead>
<tr>
<th></th>
<th>Between</th>
<th>Within</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>-1.13</td>
<td>-2.92</td>
</tr>
<tr>
<td><strong>SE(B)</strong></td>
<td>2.08</td>
<td>1.99</td>
</tr>
<tr>
<td>df</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

### Table A3: Summary of Regression Analysis for OB

<table>
<thead>
<tr>
<th></th>
<th>Between</th>
<th>Within</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>31.13</td>
<td>-25.40</td>
</tr>
<tr>
<td><strong>SE(B)</strong></td>
<td>45.52</td>
<td>23.64</td>
</tr>
<tr>
<td>df</td>
<td>10</td>
<td>11</td>
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</tbody>
</table>

### Table A4: Summary of Regression Analysis for CLCS

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<tr>
<th></th>
<th>Between</th>
<th>Within</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>1.90</td>
<td>1.03</td>
</tr>
<tr>
<td><strong>SE(B)</strong></td>
<td>1.40</td>
<td>1.50</td>
</tr>
<tr>
<td>df</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

### Table A5: Summary of Regression Analysis for CPQ-MCC

<table>
<thead>
<tr>
<th></th>
<th>Between</th>
<th>Within</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>2.21</td>
<td>.77</td>
</tr>
<tr>
<td><strong>SE(B)</strong></td>
<td>.99</td>
<td>.77</td>
</tr>
<tr>
<td>df</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>

### Table A6: Summary of Regression Analysis for CPQ-SDPW

<table>
<thead>
<tr>
<th></th>
<th>Between</th>
<th>Within</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B</strong></td>
<td>-2.52</td>
<td>-1.27</td>
</tr>
<tr>
<td><strong>SE(B)</strong></td>
<td>1.61</td>
<td>.74</td>
</tr>
<tr>
<td>df</td>
<td>10</td>
<td>11</td>
</tr>
</tbody>
</table>
Table A7: Summary of Regression Analysis for CPQ-PDSW

<table>
<thead>
<tr>
<th></th>
<th>Main Effect</th>
<th></th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE(B)</td>
<td>df</td>
</tr>
<tr>
<td>Between</td>
<td>-1.81</td>
<td>.89</td>
<td>10</td>
</tr>
<tr>
<td>Within</td>
<td>-1.06</td>
<td>.53</td>
<td>11</td>
</tr>
</tbody>
</table>

Table A8: Summary of Regression Analysis for CPQ-MA

<table>
<thead>
<tr>
<th></th>
<th>Main Effect</th>
<th></th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE(B)</td>
<td>df</td>
</tr>
<tr>
<td>Between</td>
<td>-.79</td>
<td>1.23</td>
<td>10</td>
</tr>
<tr>
<td>Within</td>
<td>-.67</td>
<td>.63</td>
<td>11</td>
</tr>
</tbody>
</table>